750 NORTH ST. PAUL STREET, SUITE 600, DALLAS, TX 75201
PHONE: (214) 953-0045
FAX: (214) 754-0819

TECHLAW INC.

December 31, 1998

RECEIVED
JAN 0 5 1999
NM ENVIRONMENT DEPARTMENT
OFFICE OF THE SECRETARY

Mr. Charlie de Saillan
Assistant Attorney General for Natural Resourses
State of New Mexico
Environmental Enforcement Division
Bataan Memorial Building
Santa Fe, NM 87504

Reference: Contract No. 68-W4-0006; WA No. R06022 - Sparton Technology; Task 08 Administrative Record.

Dear Mr. de Saillan:

As instructed by Mike Hebert, EPA Site Manager, enclosed is a copy of Volumes 20 through 22 of the EPA Sparton Technology Administrative Record.

If you have any questions please feel free to contact me or Phebe Davol at 214-953-0045.

Sincerely,

Debra Pandak
Regional Manager

cc: Rena McClurg, EPA RPO
W. Jordan
P. Davol
Dallas Files

REFERENCE

SPARTON TECHNOLOGY, INC.
EPA ID NO. NMD083212332

ADMINISTRATIVE RECORD
FOR
THE FINAL
ADMINISTRATIVE ORDER

Volume 20

008983 through 009578

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

September 16, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

C.T. Corporation System
Registered Agent for Sparton Technology, Inc.
119 East Marcy
Santa Fe, NM 87501

Re: Initial Administrative Order under Section 3008(h) of RCRA
Sparton Technology, Inc., Docket No. RCRA-VI-001(h)-96-H
EPA I.D. No. NMD083212332

Dear Sir/Madam:

Enclosed is an Initial Resource Conservation and Recovery Act (RCRA) Section 3008(h) Administrative Order (Order) for Sparton Technology, Inc. (Sparton), Albuquerque, New Mexico. This Order has been developed pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency (EPA) by Section 3008(h) of RCRA, 42 U.S.C. § 6928(h). The authority to issue this Order has been delegated to the Regional Administrator by EPA Delegation Nos. 8-31 and 8-32, dated April 16, 1985, and further delegated to the Director of the Compliance Assurance and Enforcement Division. The Order requires Sparton to implement the remedy selected by EPA in the Final Decision and Response to Comments document dated June 24, 1996.

As you know, EPA has attempted to negotiate a RCRA Section 3008(h) Administrative Order on Consent to implement the remedy selected by EPA. However, since Sparton has refused to implement the selected remedy, EPA is issuing this Initial Administrative Order.

We call your attention to Section XXVII of the Order entitled "Notice of Opportunity to Request a Hearing." Should you request such a hearing, your written request must be filed with the Regional Hearing Clerk within thirty (30) days after service of this Order. If Sparton fails to file a response and request for a hearing, such failure constitutes a binding admission of all allegations contained in the Order, a waiver of Sparton's right to hearing, and the Order becomes a Final

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Administrative Order. Furthermore, failure or refusal to carry out the terms of the Order in a manner deemed satisfactory to EPA, subjects Sparton to a civil penalty in an amount not to exceed $25,000 for each day of noncompliance.

You have the right to be represented by your attorney at any stage of the proceedings. Please be advised that the Rules of Practice at 40 C.F.R. § 24.09 prohibit unilateral discussions of the merits of the case with the Regional Administrator or the Presiding Officer after issuance of the Order.

If you have any questions regarding this matter, please address your correspondence to Evan Pearson, Senior Attorney (6RC-C), U.S. Environmental Protection Agency, Region 6, 1445 Ross Avenue, Dallas, Texas 75202-2733, or by telephone at (214) 665-8074.

We urge your prompt attention to this matter.

Sincerely yours,

Samuel Coleman

Samuel Coleman, P.E.
Director
Compliance Assurance and
Enforcement Division

Enclosures

cc: Richard D. Mico, Sparton Technology, Inc.
R. Jan Appel, Sparton Corporation
Jim Harris, Thompson & Knight
Ana Marie Ortiz, New Mexico Environment Department
Gary O'Dea, City of Albuquerque
Charlie de Saillan, New Mexico Attorney General's Office
Steve Cary, New Mexico Office of Natural Resource Trustee

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

INITIAL ADMINISTRATIVE

ORDER UNDER SECTION

3008(H) OF THE RESOURCE

CONSERVATION AND RECOVERY

ACT, AS AMENDED

42 U.S.C. § 6928(H)

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ATTACHMENT 1 - CORRECTIVE ACTION PLAN

EXHIBIT A - FINAL DECISION AND RESPONSE TO COMMENTS (FDRTC)

008987

I. JURISDICTION

1. This Initial Administrative Order (Order) is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency (EPA) by Section 3008(h) of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, (RCRA), and further amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. § 6928(h). The authority to issue this Order has been delegated to the Regional Administrator by EPA Delegation Nos. 8-31 and 8-32, dated April 16, 1985, and further delegated to the Director of the Compliance Assurance and Enforcement Division, Region 6 (Director).

2. This Order is issued to Sparton Technology, Inc. (Respondent), the owner and operator of the facility located at 9621 Coors Road NW, Albuquerque, New Mexico 87114 (Facility). This Order is based on the administrative record complied by EPA and incorporated herein by reference. The administrative record has been filed with the Regional Hearing Clerk, and is available for review by Respondent and the public at EPA's Region 6 office at 1445 Ross Avenue, Dallas, Texas 75202-2733.

II. STATEMENT OF PURPOSE

1. The purpose of this Order is to require Respondent to: (a) identify, investigate, and remediate the releases of hazardous wastes and/or hazardous waste constituents to the environment; (b) implement the corrective measures selected by EPA for the Facility; and (c) perform any other activities necessary to correct or evaluate actual or potential threats to human health and/or the environment resulting from the releases of hazardous waste and/or hazardous waste constituents at or from the Facility.

2. This Order requires Respondent to: (a) operate the existing on-site ground water extraction and treatment system and monitor existing ground water monitoring wells; (b) further characterize the extent of contamination in the ground water and vadose zone; (c) install and operate an on-site soil vapor extraction system; and (d) install and operate additional ground water extraction well(s) and a treatment and disposal system.

III. PARTIES BOUND

1. This Order is issued to Sparton Technology, Inc. (Respondent), the owner and operator of the Facility located at 9621 Coors Road NW, Albuquerque, New Mexico 87114.

2. This Order shall apply to and be binding upon Respondent, its officers, directors, employees, agents, receivers, successors and assigns, heirs, trustees, and all other persons, including, but not limited to, contractors, and consultants acting under or on behalf of Respondent in connection with the implementation of this Order.

3. No change in ownership, corporate, or partnership status relating to the Facility will in any way alter the status or responsibility of Respondent under this Order. Any conveyance of title, easement, or other interest in Respondent's Facility or a portion of Respondent's Facility shall not affect Respondent's obligations under this Order. Respondent shall be responsible for and liable for any failure to carry out all activities required of Respondent by this Order, irrespective of its use of employees, agents, contractors, or consultants to perform any such tasks.

4. Respondent shall provide a copy of this Order to all contractors, subcontractors, laboratories, and consultants retained to conduct or monitor any portion of the work performed pursuant to this Order within seven (7) days of the effective date of this Order or date of such retention of services, and shall condition all such contracts on compliance with the terms of this Order.

5. Any documents transferring ownership and/or operations of the Facility from Respondent to a successor-in-interest shall include written notice of this Order; however, Respondent shall, no less than thirty (30) days prior to transfer of ownership or operation of the Facility, provide written notice of this Order to its successor-in-interest, and written notice of said transfer of ownership and/or operation to EPA and the New Mexico Environment Department (NMED).

IV. FINDINGS OF FACT

1. Sparton Technology, Inc. (Respondent), is a corporation incorporated under the laws of the State of New Mexico.

2. Respondent is the owner and operator of a hazardous waste management facility (Facility) located at 9621 Coors Road NW, Albuquerque, Bernalillo County, New Mexico 87114.

3. Respondent is a generator of hazardous waste, and engaged in the treatment, storage, or disposal of hazardous waste at the Facility subject to the interim status requirements of 40 C.F.R. Part 265, and New Mexico's authorized RCRA program.

4. Respondent owned and operated the Facility as a hazardous waste management facility on or after November 19, 1980, the applicable date which renders facilities subject to the interim status requirements, or the requirement to have a permit, under Sections 3004 and 3005 of RCRA, 42 U.S.C. §§ 6924 and 6925.

5. Pursuant to Section 3010(a) of RCRA, 42 U.S.C. § 6930(a), Sparton Southwest, Inc. (the predecessor corporation to the Respondent) notified EPA of its hazardous waste activity. In its Notification dated August 12, 1980, Sparton Southwest, Inc. identified itself as a generator of hazardous waste, and as an owner and operator of a hazardous waste treatment, storage, or disposal facility located at 9621 Coors Road NW, Albuquerque, New Mexico.

6. In its Notification, Sparton Southwest, Inc. notified EPA that it handled the following hazardous waste:

   a. Characteristic hazardous wastes identified at 40 C.F.R. Part 261, Subpart C: ignitable, corrosive, reactive, and toxic;

   b. Hazardous wastes from non-specific sources identified at 40 C.F.R. § 261.31: F001, F002, F003, F005, F006, F007, F008, and F009; and

   c. Commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products identified at 40 C.F.R. § 261.33(f): P030, P098, U002, U057, U108, U122, U134, U154, U159, U162, U220, U226, U228, U238, and U239.

7. Pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e), on or about November 17, 1980, Sparton Southwest, Inc. submitted its RCRA Part A permit application, and identified itself as a Facility generating and treating, storing, or disposing of the following hazardous wastes:

   a. Hazardous wastes from non-specific sources identified at 40 C.F.R. § 261.31: F001, F002, F003, F005, F006, F007, F008, and F009; and

   b. Commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products identified at 40 C.F.R. § 261.33(f): U002, U122, U134, U159, U226, and U228.

8. On or about June 30, 1987, the Facility's interim status was terminated by the New Mexico Health and Environment Department.

9. From 1983 - 1988, one or more of the following hazardous wastes and/or hazardous waste constituents were detected in ground water monitoring wells at the Facility: trichloroethylene, 1,1,1-trichloroethane, 1,1-dichloroethylene, methylene chloride, tetrachloroethylene, toluene, benzene, and chromium.

10. On October 1, 1988, EPA and Respondent entered into a corrective action Consent Order (RFI/CMS Order), U.S. EPA Docket No. VI-004(h)-87-H, pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h). The RFI/CMS Order required Respondent to conduct interim measures, a RCRA Facility Investigation (RFI), and a Corrective Measures Study (CMS) for the Facility.

11. On or about May 21, 1992, Respondent submitted a Final RFI Report to EPA for approval. EPA approved the Final RFI Report on July 1, 1992.

12. On or about December 8, 1995, EPA issued for public comment, a Statement of Basis which described the various remedial alternatives for the Facility. The Statement of Basis and the administrative record for the Facility were made available to the public for review and comment from December 8, 1995, to February 8, 1996. A public hearing to receive comments on the remedial alternatives was held on February 1, 1996.

13. Based on analyses of ground water samples collected in January 1996, trichloroethylene (TCE) contamination resulting from Facility operations ranges from 7,600 ppb at the Facility, 3,200 ppb near the center of the off-site contaminant plume, to less than 5 ppb at a distance of at least ½ mile from the Facility.

14. The ground water contaminant plume originating from the Facility is in an aquifer utilized by the City of Albuquerque and New Mexico Utilities as a public drinking water supply. A public drinking water supply well, New Mexico Utilities Well No. 2, is approximately two (2) miles downgradient from the leading edge of the ground water contaminant plume.

15. On or about May 13, 1996, Respondent submitted a Final CMS Report to EPA for approval. EPA approved the Final CMS Report with concerns on June 24, 1996.

16. Section IV.A.3 and Task IX of the Corrective Action Plan (CAP) of the RFI/CMS Order provided that EPA would select the remedy for the Facility.

17. On June 24, 1996, EPA issued a Final Decision and Response to Comments (FDRTC) which identified the selected remedy for implementation at the Facility, and provided responses to all significant comments received at the public hearing, and all significant written comments received during the public comment period. The FDRTC (excluding the index to the administrative record) is attached as Exhibit A and incorporated by reference into this Order.

18. In the FDRTC, EPA concluded that due to the release of hazardous waste into the environment, corrective action is necessary to protect human health and the environment. EPA selected Alternative 4 - Expanded Ground Water Extraction and Soil Vapor Extraction, as the remedy for the Facility.

19. On June 24, 1996, EPA terminated the RFI/CMS Order.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

1. Respondent is a "person" as that term is defined at Section 1004(15) of RCRA, 42 U.S.C. § 6903(15), and 40 C.F.R. § 260.10.

2. Respondent is the owner and operator of an "existing hazardous waste management facility" as that term is defined at 40 C.F.R. § 260.10.

3. Respondent was authorized to operate under interim status pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e).

4. Certain wastes and constituents found at the Facility are "hazardous wastes" or "hazardous waste constituents" as those terms are defined or set forth by Section 1004(5) and 3001 of RCRA, 42 U.S.C. §§ 6903(5) and 6921, and 40 C.F.R. Part 261.

5. "Hazardous waste" or "hazardous waste constituents", as those terms are defined or set forth by Sections 1004(5) and 3001 of RCRA, 42 U.S.C. §§ 6903(15) and 6921, and 40 C.F.R. Part 261, were released into the environment from the Facility.

6. Based on the release of hazardous waste and/or hazardous waste constituents into the environment from the Facility, the Director has determined that the actions required by this Order are consistent with RCRA, and the actions ordered below are necessary to protect human health and/or the environment.

7. Based on the foregoing, it is hereby ORDERED that Respondent perform the actions set forth in this Order in the manner and by the dates specified therein.

VI. PROJECT MANAGER

1. Within ten (10) days of the effective date of this Order, EPA and Respondent shall each designate a Project Manager, and notify each other and the New Mexico Environment Department (NMED) in writing of the Project Manager it has selected. Each Project Manager shall be responsible for overseeing the implementation of this Order. The EPA Project Manager will be EPA's designated representative for the Facility. Except as otherwise provided in this Order, all communications between Respondent and EPA, including all documents, reports, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the Project Managers, or counsel.

2. The Parties shall provide written notice within five (5) days after changing Project Managers.

3. The absence of the EPA Project Manager from the Facility shall not be cause for the stoppage or delay of work.

VII. WORK TO BE PERFORMED

Respondent shall undertake, continue to take, and complete each of the following actions to the satisfaction of EPA and in accordance with the terms, procedures, and schedules set forth in Attachment I - Corrective Action Plan (CAP). The CAP is hereby incorporated into this Order by reference as if reproduced in full herein.

TASK I: OPERATION OF EXISTING ON-SITE GROUND WATER EXTRACTION SYSTEM AND TREATMENT SYSTEM AND CONTINUED MONITORING OF EXISTING GROUND WATER MONITORING WELLS

1. Effective upon the date of this Order, Respondent shall operate, and maintain continuous operation of the existing ground water recovery well network and treatment system at the Facility. This ground water recovery well network consists of the following recovery wells: PW-1, MW-18, MW-23, MW-24, MW-25, MW-26, MW-27, and MW-28. Respondent shall perform the reporting and sampling and analyses set forth in the CAP. Treatment and disposal of recovered waters under this provision shall be performed in compliance with all Federal, State, or local laws, regulations, permits, or ordinances. Operation of the existing ground water recovery well network and treatment system shall be incorporated into, and modified as necessary to be

consistent with, the operation of the Ground Water Extraction Measure set forth in Task V of the CAP.

2. Within twenty (20) days of the effective date of this Order, Respondent shall submit a Ground Water Monitoring Plan for the existing on-site and off-site ground water monitoring wells, capable of determining: (a) the concentration of the hazardous waste or hazardous waste constituents in the ground water; and (b) the ground water elevations. EPA will approve or modify the Ground Water Monitoring Plan. The Ground Water Monitoring Plan, as approved or modified by EPA, shall become the Final Ground Water Monitoring Plan for the existing on-site and off-site ground water monitoring wells.

   Effective upon the 10th day of the first full month following EPA approval of the Ground Water Monitoring Plan, and every three months thereafter, Respondent shall conduct quarterly sampling and analyses of the existing on-site and off-site ground water monitoring wells.

3. Concurrent with the submission of the Operations and Maintenance Plan for the Ground Water Extraction Corrective Measure in Task V.B.4 of the CAP, Respondent shall submit a revised Ground Water Monitoring Plan for integration into the Operations and Monitoring Plan for the Ground Water Extraction Corrective Measure. EPA will approve or modify the revised Ground Water Monitoring Plan. The revised Ground Water Monitoring Plan, as approved or modified by EPA, shall become the Final Ground Water Monitoring Plan for the ground water monitoring well system.

TASK II: HEALTH AND SAFETY PLAN

4. Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Health and Safety Plan to EPA for all field activity associated with the Vadose Zone Investigation Workplan and the Ground Water Investigation Workplan. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence.

TASK III: PUBLIC INVOLVEMENT PLAN

5. Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Public Involvement Plan to EPA for review and approval. A schedule for community relations activities shall be included in the Public Involvement Plan. EPA will approve or modify the Public Involvement Plan. The Public Involvement Plan, as approved or modified by EPA, shall become the Final Public Involvement Plan.

TASK IV: SOIL VAPOR EXTRACTION CORRECTIVE MEASURE

6. Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Vadose Zone Investigation Workplan to EPA for review and approval. EPA will approve or modify the Vadose Zone Investigation Workplan. The Vadose Zone Investigation Workplan, as approved or modified by EPA, shall become the Final Vadose Zone Investigation Workplan. Respondent shall implement the Final Vadose Zone Investigation Workplan according to the schedule set forth in the Workplan. The Vadose Zone Investigation Workplan shall, at a minimum, include the following plans: (1) a Project Management Plan; (2) a Data Collection Quality Assurance Plan; and (3) a Data Management Plan.

7. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit a Vadose Zone Investigation Report to EPA for review and approval. EPA will approve or modify the Vadose Zone Investigation Report. The Vadose Zone Investigation Report, as approved or modified by EPA, shall become the Final Vadose Zone Investigation Report.

8. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit the Design Plans and Specifications for the Soil Vapor Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the design package. The design package, as approved or modified by EPA, shall become the Final Design Plans and Specifications.

9. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit a Construction Workplan for the Soil Vapor Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the Construction Workplan. The Construction Workplan, as approved or modified by EPA, shall become the Final Construction Workplan.

10. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit an Operations and Maintenance (O&M) Plan for the Soil Vapor Extraction Project to EPA for review and approval. EPA will approve or modify the O&M Plan. The O&M Plan, as approved or modified by EPA, shall become the Final O&M Plan.

11. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation

Workplan, Respondent shall submit an updated Health and Safety Plan for the Soil Vapor Extraction Corrective Measure to EPA. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall be developed as a stand alone document.

12. Upon receipt of written notification from EPA, Respondent shall commence the construction process for the Soil Vapor Extraction Corrective Measure and implement the Construction Workplan in accordance with the schedule and provisions contained therein.

13. Within ninety (90) days following completion of the construction of the Soil Vapor Extraction Corrective Measure, Respondent shall submit a Construction Completion Report to EPA for review and approval. EPA will approve or modify the Construction Completion Report. The Construction Completion Report, as approved or modified by EPA, shall become the Final Construction Completion Report.

14. Respondent shall prepare and submit a Corrective Measure Completion Report to EPA for review and approval when the corrective measure completion criteria have been achieved for the Soil Vapor Extraction Corrective Measure. EPA will approve or modify the Corrective Measure Completion Report. The Corrective Measure Completion Report, as approved or modified by EPA, shall become the Final Corrective Measure Completion Report.

TASK V: GROUND WATER EXTRACTION CORRECTIVE MEASURE

15. Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Ground Water Investigation Workplan to EPA for review and approval. EPA will approve or modify the Ground Water Investigation Workplan. The Ground Water Investigation Workplan, as approved or modified by EPA, shall become the Final Ground Water Investigation Workplan. Respondent shall implement the Final Ground Water Investigation Workplan according to the schedule set forth in the Workplan. The Ground Water Investigation Workplan shall, at a minimum, include the following plans: (1) a Project Management Plan; (2) a Data Collection Quality Assurance Plan; and (3) a Data Management Plan.

16. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit a Ground Water Investigation Report to EPA for review and approval. EPA will approve or modify the Ground Water Investigation Report. The Ground Water Investigation Report, as approved

or modified by EPA, shall become the Final Ground Water Investigation Report.

17. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit the Design Plans and Specifications for the Ground Water Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the design package. The design package, as approved or modified by EPA, shall become the Final Design Plans and Specifications.

18. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit a Construction Workplan for the Ground Water Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the Construction Workplan. The Construction Workplan, as approved or modified by EPA, shall become the Final Construction Workplan.

19. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit an Operations and Maintenance (O&M) Plan for the Ground Water Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the O&M Plan. The O&M Plan, as approved or modified by EPA, shall become the Final O&M Plan.

20. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit an updated Health and Safety Plan for the Ground Water Extraction Corrective Measure to EPA. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall be developed as a stand alone document.

21. Upon receipt of written notification from EPA, Respondent shall commence the construction process for the Ground Water Extraction Corrective Measure and implement the Construction Workplan in accordance with the schedule and provisions contained therein.

22. Within ninety (90) days following completion of the construction of the Ground Water Extraction Corrective Measure, and/or upon written notice from EPA regarding completion of the construction of one or more components in the Ground Water Extraction Corrective Measure (e.g., containment well system, treatment system, etc.,), Respondent shall submit a Construction Completion Report to

EPA for review and approval. EPA will approve or modify the Construction Completion Report. The Construction Completion Report, as approved or modified by EPA, shall become the Final Construction Completion Report.

23. Within sixty (60) days of receipt of written notification from EPA, Respondent shall submit a Corrective Measure Assessment Report for the Ground Water Extraction Corrective Measure to EPA for review and approval. The Corrective Measure Assessment Report shall thereafter be submitted to EPA for review and approval annually for a period of two (2) years, and every five years thereafter until this Order is terminated pursuant to Section XXVI of this Order. EPA will approve or modify the Corrective Measure Assessment Report. The Corrective Measure Assessment Report, as approved or modified by EPA, shall become the Final Corrective Measure Assessment Report for the time period covered by the Report.

24. Respondent shall prepare and submit a Corrective Measure Completion Report to EPA for review and approval when the corrective measure completion criteria have been achieved for the Ground Water Extraction Corrective Measure. EPA will approve or modify the Corrective Measure Completion Report. The Corrective Measure Completion Report, as approved or modified by EPA, shall become the Final Corrective Measure Completion Report.

VIII. SUBMISSIONS / AGENCY APPROVAL / ADDITIONAL WORK

1. Within five (5) days of receipt of approval or modification by EPA of any Workplan(s), Respondent shall commence work and implement the tasks required by the Workplan(s), in accordance with the standards, specifications, and schedule stated in the Workplan(s), as approved or modified by EPA.

2. Beginning with the month following the effective date of this Order, Respondent shall provide EPA with the progress reports every month, due on the tenth (10th) day of the following month. The progress reports shall conform to requirements in relevant Scopes of Work contained in the CAP.

3. Respondent shall provide EPA with the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants which in any way relates to the Facility and/or off-site contamination, regardless of whether such sampling or testing is required by this Order, in the monthly progress reports, as specified in Sections VIII.2 and X of this Order.

4. EPA will review all reports, workplans, or other submittals required under this Order, and notify Respondent in writing

of EPA's approval or modification of the deliverables or any part thereof. Upon EPA approval or modification, the submittal shall be deemed incorporated into and part of this Order.

Notwithstanding the foregoing, EPA reserves the right to disapprove of, or provide comments on, any deliverable or any part thereof. Within thirty (30) days of receipt of EPA's disapproval or comments on any deliverable, Respondent shall address the deficiencies to EPA's satisfaction and submit a revised submittal. EPA shall approve or modify the revised submittal. Upon EPA approval or modification, the submittal shall be deemed incorporated into and part of this Order.

5. Any noncompliance with such EPA approved plans, reports, specifications, schedules, and attachments shall be construed as a violation(s) of the terms of this Order, and subject to the penalty provisions of Section XVI. Oral advice or approvals given by EPA representatives shall not relieve Respondent of its obligation to obtain any formal, written approvals required by this Order.

6. Four (4) copies of all deliverables shall be sent to the EPA Project Manager. An additional one (1) copy shall be sent to NMED, addressed to the following:

   Ed Kelly, Director
   Water and Waste Management Division
   New Mexico Environment Department
   P.O. Box 26110
   Santa Fe, New Mexico 87502-6110

   Unless otherwise specified in this Order, or otherwise notified in writing by EPA, all notifications to NMED shall be made to the aforementioned person.

7. In all instances which this Order requires written submissions to EPA, each submission must be accompanied by the following certification signed by a "responsible official":

   > I certify that the information contained in or accompanying this submission is true, accurate, and complete. As to those identified portions of this submission for which I cannot personally verify the truth and accuracy, I certify as the Facility Official having supervisory responsibility for the person(s) who, acting upon my direct instructions, made the verification, that this information is true, accurate, and complete.

008999

For the purpose of this certification, a "responsible official" means person in charge of a principal Facility function, or any other person who performs similar decision-making functions for the Facility.

8. EPA may determine, or Respondent may propose that certain tasks, including investigatory work, engineering evaluation, procedure/methodology modifications, or construction are necessary in addition to or in lieu of the tasks included in any EPA-approved workplan, when such additional work is necessary to meet the purposes set forth in Section II: Statement of Purpose. If EPA determines that Respondent shall perform additional work, EPA will notify Respondent in writing and specify the basis for its determination that the additional work is necessary. Within fifteen (15) days after the receipt of such determination, Respondent shall have the opportunity to meet or confer with EPA to discuss the additional work. If required by EPA, Respondent shall submit for EPA approval, a workplan for the additional work. EPA will specify the contents of such workplan. Such workplan shall be submitted within thirty (30) days of receipt of EPA's determination that additional work is necessary, or according to an alternative schedule established by EPA. Upon approval or modification of a workplan by EPA, Respondent shall implement it in accordance with the schedule and provisions contained therein.

IX. FACILITY ACCESS AND RECORD RETENTION

1. EPA and any EPA authorized-representative(s), are authorized, allowed, and permitted pursuant to Section 3007(a) of RCRA, 42 U.S.C. § 6927(a), to enter and freely move about all property at the Facility, and all other property owned or operated by Respondent which in any way relates to the implementation of the corrective measures, at all reasonable times, for the purposes of enforcing the requirements of RCRA and this Order, including:

   a. interviewing site personnel and contractors, inspecting records, operating logs, and contracts related to the Facility;

   b. reviewing the progress of Respondent in carrying out the terms of this Order;

   c. conducting such tests as EPA deems necessary;

   d. using a camera, video camcorder, sound recorder, or other documentary type equipment; and

   e. verifying the reports and data submitted to EPA by Respondent.

2. Respondent shall permit EPA to inspect and copy all documents, and other writings, including all sampling and monitoring data, which in any way pertains to work undertaken pursuant to this Order.

3. To the extent that work being performed pursuant to this Order must be done beyond the Facility property boundary, Respondent shall use its best efforts to obtain site access agreements from the present owners to perform work pursuant to this Order no later than thirty (30) days from the date that the need for such access becomes known to Respondent. Best efforts shall include, but not be limited to, requiring Respondent to pay reasonable rental costs and compensation for losses sustained by the owner or occupant of the realty. Access agreements shall provide access to Respondent, its contractor(s), the United States, EPA, the State of New Mexico, NMED, and their representatives, including contractors. Any such access agreements shall be submitted to the Project Manager and incorporated by reference into this Order. In the event that site access agreements are not obtained within thirty (30) days of approval of any workplan for which access is required, or of the date that the need for access became known to Respondent, Respondent shall notify EPA by telephone within twenty-four (24) hours after expiration of the above thirty (30) day period, and shall within seven (7) days of the oral notification, submit a complete report to EPA in writing regarding its efforts to obtain access agreements, including the names, dates, addresses, and phone numbers of the person(s) it contacted in order to obtain access. If EPA is able to obtain access, Respondent shall perform work described in this Order.

4. Nothing in this subsection is intended to limit, affect or otherwise constrain EPA's or NMED's right of access to property pursuant to applicable law.

5. All data, information, and records created or maintained in connection with the implementation of work under this Order, including Respondent's employees and Respondent's contractors, shall be made available to EPA upon request. Respondent shall retain all such data, information, or records for five (5) years after termination of the Order, and provide notification to EPA and NMED sixty (60) days prior to the destruction of any such documents.

X. SAMPLING AND DATA/DOCUMENT AVAILABILITY

1. Respondent shall submit to EPA and NMED the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants which in any way relates to the Facility and/or off-site contamination, regardless of whether such sampling or testing is required by this Order.

Data which has not yet undergone QA/QC, shall be submitted with the monthly progress reports stamped "Subject to Revision".

2. Respondent shall submit these results in monthly progress reports as described in Task VI of the CAP, and Section VIII.2 of this Order, or upon request of the Project Manager.

3. Respondent shall specify the name and address of the laboratory to be used for sample analysis. EPA reserves the right to conduct a performance and QA/QC audit of the above specified laboratory. If the audit reveals deficiencies in lab performance or QA/QC, resampling and analysis shall be required.

4. At the request of EPA, Respondent shall allow split or duplicate samples to be collected by EPA, and/or its authorized representatives, of any samples collected by Respondent. Respondent shall notify EPA not less than fourteen (14) days in advance of any field sampling or installation activity.

XI. QUALITY ASSURANCE

Throughout all sample collections and analysis activities, Respondent shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures, which shall be part of proposed and approved plans. In addition, Respondent shall:

1. Follow all EPA guidance for sampling and analysis unless determined by EPA not to be applicable;

2. Ensure that EPA and NMED receive written notification not less than fourteen (14) days in advance of any field sampling or installation activity;

3. Ensure that EPA receives written notification not less than fourteen (14) days in advance which laboratories will be used by Respondent, and use its best efforts to ensure that EPA personnel and EPA authorized representatives have reasonable access to the laboratories and personnel used for analysis;

4. Ensure that laboratories used by Respondent for analyses perform such analyses according to EPA methods (SW-846, 3rd Edition or as superseded) or other methods deemed satisfactory to EPA. If methods other than EPA methods are to be used, Respondent shall submit all protocols to be used for analyses to EPA for approval at least thirty (30) days prior to the commencement of analyses; and

5. Ensure that laboratories used by Respondent for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA. As part of such a program, and upon request by EPA, such laboratories shall perform analysis on known samples provided by EPA to demonstrate the quality of the analytical data.

XII. DISPUTE RESOLUTION

1. The Parties to this Order shall make reasonable efforts to informally resolve disputes at the Project Manager or immediate supervisor level. If resolution can not be achieved informally, the procedures of this section shall be implemented to resolve a dispute. The failure to invoke these Dispute Resolution procedures shall constitute a waiver of the right to contest a specific requirement of this Order.

2. If Respondent disagrees, in whole or in part, with any EPA disapproval, modification of a submittal, decision, or directive made by EPA pursuant to this Order, Respondent shall notify the Chief of the Hazardous Waste Enforcement Branch (Branch Chief) or his successor, in writing of its objections and the basis therefore within ten (10) days of receipt of EPA's disapproval, modification, decision, or directive. Said notice shall set forth the specific points of the dispute, the position Respondent is maintaining should be adopted as consistent with the requirements of this Order, the basis for Respondent's position, and any matters which it considers necessary for EPA's determination. Within ten (10) days of EPA's receipt of such written notice, the Branch Chief shall provide to Respondent his decision on the pending dispute.

3. EPA's decision pursuant to paragraph two (2) of this Section shall be binding upon both Parties to this Order, unless within ten (10) days of receipt of such written notice, Respondent notifies EPA in writing of its continued objection(s), and requests the Director, or his designee, to convene an informal conference for the purpose of discussing Respondent's objections and the reasons for EPA's determination. The Director shall issue a written decision within ten (10) days from the date of the informal conference, which shall be binding on both Parties to this Order. The written decision will be incorporated by reference into this Order.

4. In any dispute, Respondent shall have the burden of showing that EPA's position, including without limitation, any interpretation of the terms and conditions of this Order, and of applicable Federal and State law and regulations, was

arbitrary and capricious, and not in accordance with the law.

5. The existence of a dispute as defined herein, and EPA's consideration of such matters as placed into dispute, shall not excuse, toll, or suspend any compliance obligation or deadline required pursuant to this Order.

XIII. RESERVATION OF RIGHTS

1. EPA expressly reserves all statutory and regulatory powers, authorities, rights, remedies, both legal and equitable, which may pertain to Respondent's failure to comply with any of the requirements of this Order, including without limitation, the assessment of penalties under Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2). This Order shall not be construed as a waiver or limitation of any rights, remedies, powers and/or authorities, civil or criminal, which EPA has under RCRA, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Safe Drinking Water Act (SDWA), or any other statutory, regulatory, or common law enforcement authority of the United States.

2. EPA reserves the right to perform any portion of the work consented to herein, or any additional site characterization, feasibility study, and remedial work as it deems necessary to protect human health and/or the environment. EPA may exercise its authority under CERCLA to undertake response actions at any time. In any event, the United States reserves its right to seek reimbursement from Respondent for costs incurred by the United States. Notwithstanding compliance with the terms of this Order, Respondent is not released from liability, if any, for the costs of any response actions taken or authorized by EPA.

3. This Order shall not be construed as a ruling or determination of any issue related to any Federal, State, or local permit whether required in order to implement this Order, or required in order to continue or alter operations of the Facility (including, but not limited to, construction, operation, or closure permits required under RCRA), and Respondent shall remain subject to all such permitting requirements. EPA's approval of any workplan does not constitute a warranty or representation that the workplans will achieve the required cleanup or performance standards. Compliance by Respondent with the terms of this Order shall not relieve Respondent of its obligations to comply with RCRA, or any other applicable Federal, State, or local laws, regulations, permits, and ordinances.

4. Nothing in this Order is intended to release or waive any claim, cause of action, demand, or defense in law or equity, administrative or judicial, that any party to this Order may have against any person(s) or entity not a party to this Order, or that any person or entity not a party to this Order may have against any party to this Order.

5. EPA expressly reserves all rights and defenses that it may have, including the right both to disapprove of work performed by Respondent pursuant to this Order, and to order that Respondent perform additional tasks.

6. In any action brought by EPA for a violation of this Order, Respondent shall bear the burden of proving that EPA's actions were arbitrary and capricious and not in accordance with the law.

7. If EPA determines that activities in compliance or noncompliance with this Order have caused or may cause a release of hazardous waste and/or hazardous waste constituents, or is a threat to human health or the environment, or that Respondent is not capable of undertaking any studies or corrective measure ordered, EPA may order Respondent to discontinue work being conducted pursuant to this Order for such period of time as EPA determines may be needed to abate any such releases or threats, and/or to undertake any action which EPA determines is necessary to abate such releases or threats. Failure to comply with EPA's stop work order may result in a penalty of not to exceed $25,000 per day of continued non-compliance with EPA's stop work order, pursuant to Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2).

8. In the event EPA suspends the work or any other activity at the Facility, EPA may extend affected schedules under this Order for a period of time equal to that of the suspension of the Work or other activities, plus reasonable additional time for resumption of activities. Any extensions in the schedules set out in this Order or its attachments must be made by EPA in writing, and incorporated by reference into this Order.

XIV. FINANCIAL ASSURANCE

1. Within thirty (30) days of the effective date of this Order, Respondent shall submit to EPA for review and approval, an assurance of its financial ability to meet the present worth cost estimate for Alternative 4 - Expanded Ground Water Extraction and Soil Vapor Extraction (Without Ion Exchange for Metals Removal), as described in the Final Decision and Response to Comments document (Exhibit A). Respondent's financial assurance shall be in one or a combination of the

following forms: (a) a performance or surety bond; (b) a letter of credit from an FDIC regulated financial institution; (c) a corporate guarantee by a third party; (d) an escrow performance guarantee account; (e) a trust fund; or (f) a financial test which allows EPA to determine that Respondent has sufficient financial assets available to perform the requirements of the Order. Respondent shall utilize 40 C.F.R. Part 265, Subpart H, as guidance in preparing the financial assurance submittal.

2. Concurrent with the submittal of the Construction Workplan for the Ground Water Extraction Corrective Measure (Task V.B.3), Respondent shall submit to EPA for review and approval, an updated assurance of its financial ability to meet the current cost estimate for the Corrective Measures Implementation, including both capital costs and operation and maintenance costs. Respondent's financial assurance shall be in one of the forms set forth in Paragraph 1 of this Section.

3. If Respondent chooses one or a combination of the instruments described in Paragraphs 1(a) through 1(e) of this Section, Respondent shall submit a copy of the instrument(s), and describe the nature and extent to which the instrument(s) is available for access by EPA for the purpose of ensuring the completion of all requirements of this Order. If Respondent chooses the instrument described in Paragraph 1(f) of this Section, Respondent shall submit audited financial reports or other reliable evidence, as deemed appropriate by EPA, of Respondent's financial assets.

4. EPA shall review the submittals described in Paragraphs 1, 2, and 3 of this Section, and shall provide written notice to Respondent as to the adequacy of the existing financial assurance measures, and shall indicate what additional financial assurances, if any, must be provided by Respondent to ensure compliance with the terms of this Order.

5. Within thirty (30) days of receipt of EPA's notice that Respondent's financial assurance measures are inadequate, Respondent shall establish additional financial assurances according to the terms provided in said notice, and submit the additional financial assurances to EPA for review and approval.

6. Annually, on the anniversary of EPA's approval of the financial assurance required by this Section, Respondent shall submit an updated financial assurance, as described in Paragraphs 2 and 3 of this Section, that accounts for the rate of inflation. EPA will follow the procedures in Paragraphs 4 and 5 of this Section to determine if

Respondent's updated financial assurance measures are adequate.

7. In the event that Respondent determines at any time that it is unable, or reasonably expects that it will be unable to maintain the financial assurance provided pursuant to this Section, Respondent shall obtain and submit to EPA for approval, one or a combination of the other forms of financial assurance listed in Paragraph 1 of this Section within thirty (30) days of the earlier of: (a) the event that causes such inability; or (b) receipt of information that gives rise to the reasonable expectation of such inability.

8. Respondent's inability to demonstrate financial ability to complete the Corrective Measures Implementation shall not excuse performance of any activities required under this Order.

9. This Order in no way negates Respondent's obligation to establish and/or maintain financial assurances for closure care, post-closure care, and liability requirements under 40 C.F.R. Part 265, Subpart H.

XV. INDEMNIFICATION OF THE UNITED STATES

Respondent shall indemnify, save, and hold harmless the United States, its agencies, departments, agents, and employees, from any and all claims or causes of action arising from or on account of acts or omissions of Respondent or its officers, directors, employees, agents, receivers, successors and assigns, heirs, trustees, contractors, and consultants in carrying out activities required by this Order. This indemnification shall not be construed in any way as affecting or limiting the rights or obligations of Respondent or the United States under their various contracts.

XVI. PENALTY PROVISIONS

Failure or refusal to carry out the terms of this Order in a manner deemed satisfactory to EPA may subject Respondent to a civil penalty in an amount not to exceed $25,000 for each day of non-compliance with this Order, in accordance with Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2).

XVII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Order shall be undertaken in accordance with the requirements of all applicable Federal, State, and local laws, regulations, permits, and ordinances. Respondent shall obtain or cause its representatives to obtain all permits and approvals necessary under such laws and

regulations. This Order does not relieve Respondent of any duty to obtain any Federal, State, or local permits needed to carry out its terms.

XVIII. REPORTING AND PUBLIC ACCESS TO DOCUMENTS AND SAMPLING DATA

1. Respondent may assert a business confidentiality claim covering all or part of any information submitted to EPA pursuant to this Order. Analytical data generated pursuant to this Order shall not be claimed as confidential. Confidentiality claims shall be submitted to EPA in accordance with the procedures outlined in 40 C.F.R. Part 2 [originally published in the Federal Register at 41 Fed. Reg. 36902 (September 1, 1976)], in particular, 40 C.F.R. § 2.203(b), and shall include a written statement explaining how the information claimed to be confidential meets the substantive criteria for use in confidentiality determinations found in 40 C.F.R. § 2.208, or such claim shall be deemed waived. If EPA approves the claim, EPA will afford the information confidential status, as specified in 40 C.F.R. Part 2, Subpart B. Information determined not to be confidential may be made available to the public without further notice to Respondent. If Respondent makes no claim of confidentiality for information submitted pursuant to this Order, EPA may make the information available without further notice to Respondent.

2. If Respondent asserts a business confidentiality claim, it shall clearly mark each page of each document included in its claim with the term "Confidential", and shall provide a redacted version of the information with all confidential business information deleted.

3. The information requested by EPA by this Order is not subject to the Paperwork Reduction Act of 1980, as amended, 44 U.S.C. § 3501 et seq.

XIX. OTHER CLAIMS

Nothing in this Order shall constitute or be construed as a release from any claim, cause of action, demand, or defense in law or equity, against any person, firm, partnership, or corporation for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous waste constituents, hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or migrating from the Facility. Additionally, this Order does not constitute any decision on preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2).

XX. SUBSEQUENT MODIFICATION OF ORDER

1. This Order may be modified by EPA to ensure protection of human health and/or the environment. Such amendments shall be in writing, and shall be effective and incorporated into this Order thirty (30) days after service of the amendment on Respondent, unless Respondent files an objection to the modification with EPA and the Regional Hearing Clerk. 40 C.F.R. Part 24 shall govern the proceedings under this section, and the hearing shall be limited to the scope of the proposed amendment.

2. This Order may also be modified by mutual agreement of EPA and Respondent. Any agreed modifications shall be in writing, signed by both parties, shall have as their effective date the date on which they are signed by EPA, and shall be incorporated into this Order. Upon request of Respondent, EPA may extend the deadlines set forth in this Order.

XXI. FINAL AGENCY ACTION

Notwithstanding any other provision of this Order, no action or decision by EPA pursuant to this Order, shall constitute final agency action giving rise to any right of judicial review prior to EPA's initiation of a judicial action to enforce this Order, including an action for penalties or an action to compel Respondent's compliance with the terms and conditions of this Order.

XXII. SURVIVABILITY/PERMIT INTEGRATION

Except as otherwise expressly provided in this section, this Order shall survive the issuance or denial of a RCRA permit or post-closure order for the Facility, and this Order shall continue in full force and effect after either the issuance or denial of such permit or order. Accordingly, Respondent shall continue to be liable for the performance of obligations under this Order notwithstanding the issuance or denial of such permit or order. If the Facility is issued a permit or order, and that permit or order expressly incorporates all or a part of the requirements of this Order, or expressly states that its requirements are intended to replace some or all of the requirements of this Order, Respondent may request a modification of this Order and shall, with EPA approval, be relieved of liability under this Order for those specific obligations.

XXIII. STATEMENT OF SEVERABILITY

If any provision or authority of this Order, or the application of this Order to any party or circumstances, is held by any judicial or administrative authority to be invalid, the

application of such provisions to other Parties or circumstances and the remainder of the Order shall not be effected thereby.

XXIV. PARTICIPATION IN COMMUNITY RELATIONS ACTIVITIES

Respondent shall be given notice of, provide support, and shall participate in public meetings, as appropriate, which may be held or sponsored by EPA to explain activities at or concerning the Facility.

XXV. COSTS

Each party shall bear its own costs and attorneys' fees.

XXVI. TERMINATION AND SATISFACTION

1. Respondent may seek termination of this Order by submitting to EPA a written document which indicates Respondent's compliance with all requirements of this Order, and the associated dates of approval correspondence from EPA. The provisions of this Order shall be deemed satisfied upon Respondent's and EPA's execution of an "Acknowledgment of Termination and Agreement for Record Preservation and Reservation of Rights" (Acknowledgment). The Acknowledgment shall specify that Respondent has demonstrated to the satisfaction of EPA that the terms of this Order, including any additional tasks determined by EPA to be required pursuant to this Order, have been satisfactorily completed. Respondent's execution of the Acknowledgment will affirm Respondent's continuing obligation: (1) to preserve all records as required in Section IX - Facility Access and Record Retention; and (2) to recognize EPA's reservation of rights as provided in Section XIII - Reservation of Rights, after all other requirements of the Order are satisfied.

2. This Order may also be terminated upon Respondent's receipt of written notice from EPA that Respondent has demonstrated to the satisfaction of EPA, that the terms of the Order, including any additional tasks determined by EPA to be required pursuant to this Order, have been satisfactorily completed. This notice shall also affirm Respondent's continuing obligation: (1) to preserve all records as required in Section IX - Facility Access and Record Retention; and (2) recognize EPA's reservation of rights as provided in Section XIII - Reservation of Rights.

XXVII. NOTICE OF OPPORTUNITY TO REQUEST A HEARING

1. In accordance with Section 3008(b) of RCRA, 42 U.S.C. § 6928(b), and 40 C.F.R. § 24.05(a), this Initial Administrative Order becomes a Final Administrative Order thirty (30) days after service of the Order, unless Respondent files with a response and requests a hearing with

the Regional Hearing Clerk. The response to the initial administrative order and request for a hearing must be in writing and mailed to, or personally served on the following:

Regional Hearing Clerk (6C)
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

2. A copy of the response and request for a hearing, if any, and copies of all subsequent documents filed in this action shall be sent to the following:

Evan L. Pearson
Senior Attorney (6RC-C)
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

3. This section constitutes notice of Respondent's right to request a hearing with respect to any issue of material fact or the appropriateness of the proposed corrective action, in accordance with 40 C.F.R. § 24.02(c)(3).

4. The response to the Order shall specify each factual or legal determination, or relief provision in the Initial Administrative Order Respondent disputes, and shall briefly indicate the basis upon which it disputes such determination or provision.

5. The hearing, if requested, will be conducted in accordance with the provisions of 40 C.F.R. Part 24. A copy of these rules is enclosed.

6. Respondent's failure to file a response and request for a hearing within thirty (30) days after service of this Order shall constitute a binding admission of all allegations contained in the Order, and a waiver of Respondent's right to a hearing, and this Order shall become a Final Administrative Order.

XXVIII. SETTLEMENT CONFERENCE

1. Whether or not Respondent requests a hearing, it may confer with EPA concerning settlement. EPA encourages settlement consistent with the provisions and objectives of RCRA. A request for a settlement conference does not extend the thirty (30) days period during which the response and request for a hearing must be filed. The settlement

conference procedure may be pursued as an alternative to, and simultaneously, with the formal hearing procedures.

2. To explore the possibility of settlement in this matter, address your correspondence to Evan L. Pearson, Senior Attorney (6RC-C), U.S. Environmental Protection Agency, Region 6, 1445 Ross Avenue, Dallas, Texas 75202-2733, or by telephone call (214) 665-8074.

XXIX. EFFECTIVE DATE

This Order shall become effective as provided in Section 3008(b) of RCRA, 42 U.S.C. § 6928(b), and 40 C.F.R. Part 24.

IT IS SO ORDERED:

Dated: 9/16/96 By: Samuel Coleman

Samuel Coleman, P.E.
Director
Compliance Assurance and Enforcement Division
U.S. Environmental Protection Agency Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

CERTIFICATE OF SERVICE

I hereby certify that on the 16th day of September, 1996, the original of the foregoing Initial Administrative Order was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that true and correct copies of the Initial Administrative Order, and the Rules Governing Issuance of and Administrative Hearings on Interim Status Corrective Action Orders were sent to the following by the method indicated below:

CERTIFIED MAIL - RETURN RECEIPT REQUESTED P 435 988 346

Richard D. Mico
Vice President and General Manager
Sparton Technology, Inc.
4901 Rockaway Blvd., SE
Rio Rancho, New Mexico 87124

CERTIFIED MAIL - RETURN RECEIPT REQUESTED P 435 988 347

C.T. Corporation System
Registered Agent for Sparton Technology, Inc.
119 East Marcy
Santa Fe, New Mexico 87501

ATTACHMENT I

CORRECTIVE ACTION PLAN

SCOPE OF WORK
CORRECTIVE MEASURES IMPLEMENTATION
SPARTON TECHNOLOGY, INC.

PURPOSE

The purpose of the Corrective Measures Implementation (CMI) Scope of Work (SOW) is to set forth the requirements for the design, construction, operation, maintenance, and monitoring of the Corrective Measures selected by EPA in the RCRA Final Decision and Response to Comments (FDRTC) dated June 24, 1996, for the Sparton Technology, Inc. facility located at 9621 Coors Road NW in Albuquerque, New Mexico (Facility). Respondent shall furnish all personnel, materials, and services necessary to implement the CMI program. EPA may require Respondent to conduct additional tasks beyond what is discussed in the following tasks in order to support the CMI program. Respondent shall furnish all personnel, materials, and services necessary to conduct the additional tasks.

PERFORMANCE STANDARDS

The Performance Standards for the CMI shall include remediation goals, cleanup levels, remedial objectives, and other substantive requirements, criteria, or limitations set forth in the FDRTC for the Facility or in this Order. The selected remedy, as described in the FDRTC, has four distinct components:

1. Continued operation of the existing on-site ground water extraction and treatment system, and continued monitoring of existing ground water monitoring wells;

2. Further characterization of the extent of contamination in the ground water and vadose zone;

3. Installation and operation of an on-site soil vapor extraction and treatment(SVE) system; and

4. Installation and operation of additional ground water extraction well(s) and a treatment and disposal system.

EPA will use the Performance Standards to determine if the Corrective Measures Implementation has been completed.

SCOPE

The Scope of Work (SOW) for each document is specified below. The SOWs are intended to be flexible documents capable of addressing both simple and complex site situations. If Respondent can justify to the satisfaction of EPA, that a plan and/or report or portion(s) thereof is not needed in the given site-specific situation, then EPA may waive that requirement.

The CMI program consists of the following tasks:

Task I: Operation of Existing On-Site Ground Water Extraction and Treatment System and Continued Monitoring of Existing Ground Water Monitoring Wells

Task II: Health and Safety Plan

Task III: Public Involvement Plan

Task IV: Soil Vapor Extraction Corrective Measure

- A. Vadose Zone Investigation Workplan
- B. Soil Vapor Extraction Project
  1. Vadose Zone Investigation Report
  2. Design Plans and Specifications
  3. Construction Workplan
  4. Operation and Maintenance Plan
  5. Health and Safety Plan
  6. Commencement of Construction
- C. Construction Completion Report
- D. Corrective Measure Completion Report

Task V: Ground Water Extraction Corrective Measure

- A. Ground Water Investigation Workplan
- B. Ground Water Extraction and Treatment Project
  1. Ground Water Investigation Report
  2. Design Plans and Specifications
  3. Construction Workplan
  4. Operation and Maintenance Plan
  5. Health and Safety Plan
  6. Commencement of Construction
- C. Construction Completion Report
- D. Corrective Measure Assessment Reports
- E. Corrective Measure Completion Report

Task VI: Progress Reports

TASK I - CONTINUED OPERATION OF THE EXISTING ON-SITE GROUND WATER EXTRACTION AND TREATMENT SYSTEM AND CONTINUED MONITORING OF EXISTING GROUND WATER MONITORING WELLS

A. Operation of the Existing On-Site Ground Water Extraction and Treatment System

Effective upon the date of this Order, Respondent shall operate, and maintain continuous operation of the existing ground water recovery well network and treatment system at the Facility. This ground water recovery well network consists of the following recovery wells: PW-1, MW-18, MW-23, MW-24, MW-25, MW-26, MW-27, and MW-28. Respondent shall report the total monthly volume of recovered ground water from each recovery well in the Monthly Progress Reports.

At a minimum, Respondent shall conduct monthly sampling and analyses of the recovered ground water both prior to treatment, and following treatment, for the following constituents:

- Volatile organic constituents as listed in 40 C.F.R. Part 264, Appendix IX; and
- Hexavalent Chromium.

The efficiency of the treatment system as measured by the percent reduction of hazardous waste constituents will be monitored on a monthly basis. Treatment and disposal of recovered waters under this provision shall be performed in compliance with all Federal, State, or local laws, regulations, permits, or ordinances. Operation of the existing ground water recovery well network and treatment system shall be incorporated into, and modified as necessary to be consistent with, operation of the Ground Water Extraction Corrective Measure set forth in Task V.

B. Ground Water Monitoring Plan

Within twenty (20) days of the effective date of this Order, Respondent shall submit a Ground Water Monitoring Plan for the existing on-site and off-site ground water monitoring wells, capable of determining: 1) the concentration of the hazardous waste or hazardous waste constituents in the ground water; and 2) the ground water elevations. EPA will approve or modify the Ground Water Monitoring Plan. The Ground Water Monitoring Plan, as approved or modified by EPA, shall become the Final Ground Water Monitoring Plan for the existing on-site and off-site ground water monitoring wells.

Effective upon the 10th day of the first full month following EPA approval of the Ground Water Monitoring Plan, and every three months thereafter, Respondent shall conduct quarterly sampling and analyses of the existing on-site and off-site ground water monitoring wells. Respondent shall have the samples analyzed for the following constituents:

- Volatile organic constituents as listed in 40 C.F.R. Part 264, Appendix IX;
- Total metals as listed in 40 C.F.R. Part 264, Appendix IX; and
- Hexavalent Chromium.

The sample analyses results and ground water elevations shall be included in the Monthly Progress Reports (Task VI). Potentiometric surface maps and contaminant concentration contour maps shall be prepared for each of the flow zones in the aquifer (e.g., upper, upper lower, etc.) and included in the Monthly Progress Reports.

C. Concurrent with the submission of the Operation and Maintenance Plan for the Ground Water Extraction Corrective Measure in Task V.B.4, Respondent shall submit a revised Ground Water Monitoring Plan for integration into the Operation and Monitoring Plan for the Ground Water Extraction Corrective Measure. EPA will approve or modify the revised Ground Water Monitoring Plan. The revised Ground Water Monitoring Plan, as approved or modified by EPA, shall become the Final Ground Water Monitoring Plan for the ground water monitoring well system.

TASK II: HEALTH AND SAFETY PLAN

Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Health and Safety Plan to EPA for all field activity associated with the Vadose Zone Investigation Workplan and the Ground Water Investigation Workplan. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall, at a minimum, include the following elements:

A. Objectives: Describe the goals and objectives of the health and safety program (must apply to both on-site and off-site personnel and visitors). The Health and Safety Plan shall be consistent with the OSHA Regulations, NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985), all state and local regulations, and other EPA guidance as provided.

B. Hazard Assessment: List and describe the known hazardous substances that could be encountered by field personnel during construction and/or operation and maintenance activities. Respondent shall, at a minimum, discuss the following:

- Inhalation Hazards
- Dermal Exposure
- Ingestion Hazards
- Physical Hazards
- Overall Hazard Rating

Respondent shall include a table that, at a minimum, lists: known hazardous substances, highest observed concentration, media, and symptoms/effects of acute exposure.

C. Personal Protection/Monitoring Equipment

- Describe personal protection levels and identify all monitoring equipment for each operational task.
- Describe any action levels and corresponding response actions (i.e., when will levels of safety be upgraded).
- Describe decontamination procedures and areas.

D. Site Organization and Emergency Contacts

List and identify all contacts (include phone numbers). Identify the nearest hospital and provide a regional map showing the shortest route from the Facility to the hospital. Describe site emergency procedures and any site safety organizations. Include evacuation procedures for neighbors (where applicable). Include a Facility map showing emergency station locations (first aid, eye wash areas, etc.).

TASK III: PUBLIC INVOLVEMENT PLAN

Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Public Involvement Plan to EPA for review and approval. The purpose of the Public Involvement Plan is to disseminate information to the public regarding the investigation and remedial activities and results. A schedule for community relations activities shall be included in the Public Involvement Plan. EPA will approve or modify the Public Involvement Plan. The Public Involvement Plan, as approved or modified by EPA, shall become the Final Public Involvement Plan.

Respondent shall never appear to represent or speak for the EPA before the public, other government officials, or the media.

Public Involvement activities that may be required of Respondent include the following:

A. Providing written and/or verbal notification to local residents or businesses prior to conducting field investigation or construction activities under this Order. Such notification shall include, but not be limited to, a description and estimated duration of the field investigation or construction activity, and contact person for the Respondent (including phone number).

B. Conducting an open house or informal meeting (i.e., availability session) in a public location where people can talk to Agency officials and Respondent on a one-to-one basis;

C. Preparing fact sheets summarizing current or proposed corrective action activities (all fact sheets shall be reviewed by the EPA prior to public distribution);

D. Communicating effectively with people who have vested interest in the corrective action activities, (e.g., providing written or verbal information in the foreign language of a predominantly non-English-speaking community); and

E. Maintaining an easily accessible repository of information on the facility-specific corrective action program, including this Order, approved workplans, and/or other reports at the Taylor Ranch Branch Library, 5700 Bogart Street, N.W., Albuquerque, New Mexico 87120. EPA may designate another repository as a replacement for the Taylor Ranch Branch library.

TASK IV: SOIL VAPOR EXTRACTION CORRECTIVE MEASURE

Task IV sets forth the plans and schedules for those activities to be undertaken by Respondent in order to develop the final plans, drawings, specifications, general provisions, and special requirements necessary to design, construct, operate, and monitor the performance of the Soil Vapor Extraction Corrective Measure selected in the FDRTC. Information on the design, construction, operation, and performance monitoring of the soil vapor extraction system can be found in the following EPA publications:

U.S. EPA. Guide for Conducting Treatability Studies under CERCLA: Soil Vapor Extraction; EPA/540/2-91/019A.

U.S. EPA. Soil Vapor Extraction Technology: Reference Handbook; EPA/540/2-91/003.

U.S. EPA. Evaluation of Soil Venting Application; Ground Water Issue; EPA/540/S-92/004.

U.S. EPA. Decision-Support Software for Soil Vapor Extraction Technology Application: HyperVentilate; EPA/600/R-93/028.

U.S. EPA. Innovative Site Remediation Technology: Vacuum Vapor Extraction, Volume 8; EPA/542/B-94/002.

U.S. EPA. Review of Mathematical Modeling for Evaluating Soil Vapor Extraction Systems; EPA/540/R-95/513.

A. Vadose Zone Investigation Workplan

Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Vadose Zone Investigation Workplan to EPA for review and approval. The objectives of the Vadose Zone Investigation Workplan are to define the location and extent of the lithologic units which may control the fate and transport of contaminants in the vadose zone, to define the nature and extent, both horizontally and vertically, of contamination in the vadose zone, and to collect the appropriate data required to design, construct, operate, and monitor the performance of the Soil Vapor Extraction Corrective Measure selected in the FDRTC. EPA will approve or modify the Vadose Zone Investigation Workplan. The Vadose Zone Investigation Workplan, as approved or modified by EPA, shall become the Final Vadose Zone Investigation Workplan. Respondent shall implement the Final Vadose Zone Investigation Workplan according to the schedule set forth in the Workplan. The Vadose Zone Investigation Workplan shall, at a minimum, include the following plans:

1. Project Management Plan

Respondent shall prepare a Project Management Plan which shall include a discussion of the technical approach, schedules, budget, and an outline of proposed activities necessary to complete the design of the soil vapor extraction system. The technical approach shall address all the requirements necessary to implement the requirements of this Task.

2. Data Collection Quality Assurance Plan

Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed during the investigation, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. This plan shall, at a minimum, address the following:

a. Data Collection Strategy

The Data Collection Strategy shall, at a minimum, include the following:

(1) Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

(2) Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data; and

(3) Description of the methodology used to assure that the data accurately and precisely represents the characteristics of a population, parameter variations at a sampling point, and process conditions or environmental conditions. Examples of factors which shall be considered and discussed include:

(a) Environmental conditions at the time of sampling;
(b) Number of sampling points;
(c) Representativeness of selected media; and
(d) Representativeness of selected analytical parameters.

b. Sampling

The sampling section shall, at a minimum, discuss the following:

(1) Selecting appropriate sampling locations, depths, etc.;
(2) Determining a statistically sufficient number of sampling sites;
(3) Determining which media are to be sampled (e.g., soil, soil gas, etc.);
(4) Determining which parameters are to be measured and where;
(5) Selecting the frequency of sampling and length of sampling period;
(6) Selecting the types of samples and number of samples to be collected;
(7) Documenting field sampling operations and procedures, including:

    (a) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
    (b) Calibration of field devices;
    (c) Collection of replicate samples;
    (d) Construction materials and techniques associated with soil vapor monitoring probes/wells;
    (e) Field equipment listing and sample containers; and
    (f) Decontamination procedures.

(8) Selecting appropriate sample containers; and
(9) Chain-of-custody, including:

    (a) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and
    (b) Pre-prepared sample labels containing all information necessary for effective sample tracking.

c. Field Measurements

The Field Measurements section shall, at a minimum, discuss the following:

(1) Selecting appropriate field measurement locations, depths, etc.;

(2) Providing a statistically sufficient number of field measurements;
(3) Measuring all necessary ancillary data;
(4) Determining conditions under which field measurement should be conducted;
(5) Determining which media are to be addressed by appropriate field measurements (e.g., soil, soil gas, etc.);
(6) Determining which parameters are to be measured and where;
(7) Selecting the frequency of field measurement and length of field measurements period; and
(8) Documenting field measurement operations and procedures, including:

(a) Procedures and forms for recording raw data, and the exact location, time, and facility-specific considerations associated with the data acquisition;
(b) Calibration of field devices;
(c) Collection of replicate measurements;
(d) Construction materials and techniques associated with soil vapor monitoring wells used to collect field data;
(e) Field equipment listing;
(f) Order in which field measurements were made; and
(g) Decontamination procedures.

d. Contaminated Material Disposal

All contaminated material generated by activities required in the CMI shall be disposed of in accordance with all Federal and State laws and regulations.

e. Sample Analysis

The Sample Analysis section shall, at a minimum, specify the following:

(1) Chain-of-custody procedures, including:

(a) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;

(b) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
(c) Specification of laboratory sample custody procedures for sample handling, storage, and disbursement for analysis.

(2) Sample storage procedures and holding times;
(3) Sample preparation methods;
(4) Analytical procedures, including:

(a) Scope and application of the procedure;
(b) Sample matrix;
(c) Potential interferences;
(d) Precision and accuracy of the methodology;
(e) Method detection limits;
(f) Calibration procedures and frequency;
(g) Data reduction, validation, and reporting;
(h) Internal quality control checks, laboratory performance, and systems audits and frequency, including:

1) Method blank(s);
2) Laboratory control sample(s);
3) Calibration check sample(s);
4) Replicate sample(s);
5) Matrix-spiked sample(s);
6) Blind quality control sample(s);
7) Control charts;
8) Surrogate samples;
9) Zero and span gases; and
10) Reagent quality control checks.

(i) Preventive maintenance procedures and schedules;
(j) Corrective action (for laboratory problems); and
(k) Turnaround time.

3. Data Management Plan

Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and the

conclusions of the investigation. The plan shall, at a minimum, address the following:

a. Data Record

The data record shall, at a minimum, include the following:

(1) Unique sample or field measurement code;
(2) Sampling or field measurement location and sample or measurement type;
(3) Sampling or field measurement raw data;
(4) Laboratory analysis ID number;
(5) Property or component measured; and
(6) Result of analysis (e.g., concentration).

b. Tabular Displays

The following data shall be presented in tabular displays:

(1) Unsorted (raw) data;
(2) Results for each medium, or for each constituent monitored;
(3) Data reduction for statistical analysis;
(4) Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
(5) Summary data.

c. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

(1) Display sampling locations and sampling grids;
(2) Contaminant concentrations at each sampling location;
(3) Display average and maxima contaminant concentrations;
(4) Geographical extent of contamination and illustrate changes in concentration in relation to distance from the source and depth;
(5) Indicate features affecting intramedia transport; and
(6) Illustrate the stratigraphy in the area of the vadose zone contamination.

B. Soil Vapor Extraction Project

1. Vadose Zone Investigation Report

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit a Vadose Zone Investigation Report to EPA for review and approval. EPA will approve or modify the Vadose Zone Investigation Report. The Vadose Zone Investigation Report, as approved or modified by EPA, shall become the Final Vadose Zone Investigation Report. This Report shall, at a minimum, include the following:

a. The location and extent of lithologic units which may control the fate and transport of contaminants in the vadose zone. Based on field data and tests, a representative and accurate description of the subsurface stratigraphy in the vadose zone which is a part of the migration pathways at the Facility, including:

(1) Lithology, grain size, sorting;
(2) Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants; and
(3) Cross sections showing the extent (depth, thickness, lateral extent) of units which may be part of the migration pathways;

b. A description of the nature and extent, both horizontally and vertically, of contamination in the vadose zone. The description shall include maps of the horizontal and vertical extent, including concentration profiles of the contaminants originating from the source area(s) at the Facility in both the soil matrix and soil gas; and

c. The appropriate data for the design and implementation of a soil vapor extraction system. This shall include a field pilot test to provide data to determine design parameters and projected effectiveness of the full-scale soil vapor extraction sytem.

2. Design Plans and Specifications

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit the Design Plans and Specifications for the Soil Vapor

Extraction Corrective Measure to EPA for review and approval. The design package shall consist of the detailed drawings and specifications needed to construct the corrective measure(s). EPA will approve or modify the design package. The design package, as approved or modified by EPA, shall become the Final Design Plans and Specifications. The Design Plans and Specifications shall, at a minimum, include the following documents:

a. General Site Plans;
b. Process Flow Diagrams;
c. Mechanical Drawings;
d. Electrical Drawings;
e. Piping and Instrumentation Diagrams;
f. Structural Drawings;
g. Excavation and Earthwork Drawings;
h. Site Preparation and Field Work Standards;
i. Construction Drawings;
j. Installation Drawings;
k. Equipment Lists; and
l. Specifications for Equipment and Material.

3. Construction Workplan

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit a Construction Workplan for the Soil Vapor Extraction Corrective Measure to EPA for review and approval. The purpose of the Construction Workplan is to document the overall management strategy, construction quality assurance procedures, and schedule for constructing the corrective measure. EPA will approve or modify the Construction Workplan. The Construction Workplan, as approved or modified by EPA, shall become the Final Construction Workplan. The Construction Workplan shall, at a minimum, include the following elements:

a. Project Management: Describe the construction management approach including levels of authority and responsibility (include organization chart).

b. Project Schedule: The project schedule shall specify all significant steps in the process, including the timing for key elements of the bidding process, the timing for initiation and completion of all construction tasks as specified in the Design Plans and Specifications.

c. Waste Management Practices: Describe the wastes generated by the construction of the corrective measure, and how they will be managed.

d. Required Permits: List and describe the permits needed to construct and operate the corrective measure. Indicate on the project schedule when the permit applications will be submitted to the applicable agencies, and an estimate of the permit issuance date.

e. Quality Assurance Project Plan: The purpose of construction quality assurance is to ensure, with a reasonable degree of certainty, that a completed corrective measure will meet or exceed all design criteria, plans, and specifications. Sampling and monitoring activities may also be needed for construction quality assurance/quality control and/or other construction related purposes. To ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented, Respondent shall prepare a Quality Assurance Project Plan (QAPjP) to document all monitoring procedures, sampling, field measurements, and sample analysis performed during these activities. Respondent shall use quality assurance, quality control, and chain-of-custody procedures approved by the EPA. These procedures are described in EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, December 29, 1980, or as superseded by EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5).

f. Construction Contingency Procedures:

(1) Changes to the design and/or specifications may be needed during construction to address unforeseen problems encountered in the field. Procedures to address such circumstances, including notification of EPA, shall be included in the Construction Workplan.

(2) The Construction Workplan shall specify that in the event of a construction emergency (e.g. fire, earthwork failure, etc.), Respondent shall orally notify the EPA within twenty-four (24) hours of the event, and shall notify the EPA in writing within seven (7) days of the event. The written notification shall, at a minimum, specify

what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment; and

(3) Procedures to be implemented if unforeseen events prevent corrective measure construction.

g. Cost Estimate

Respondent shall develop a cost estimate that includes both corrective measure construction and operation and maintenance costs. The purpose of the cost estimate is to assure that Respondent has the financial resources necessary to construct and implement the corrective measure(s).

h. Documentation Requirements

Respondent shall describe how analytical data and results will be evaluated, documented, and managed, consistent with SW-846, 3rd Edition, or as superseded.

i. Appendices, including:

(1) Design Data - Tabulations of significant data used in the design effort;

(2) Equations - List and describe the source of major equations used in the design process;

(3) Sample Calculations - Present and explain at least one example calculation for significant or unique design calculations; and

(4) Laboratory or Field Test Results.

4. Operation and Maintenance Plan

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit an Operation and Maintenance (O&M) Plan for the Soil Vapor Extraction Project to EPA for review and approval. The O&M Plan shall outline the procedures for performing operations, long term maintenance, and monitoring of the corrective measure. EPA will approve or modify the O&M Plan. The O&M Plan, as approved or modified by EPA, shall become the Final O&M Plan. The O&M plan shall, at a minimum, include the following elements:

a. Project Management: Describe the management approach, including levels of authority and responsibility (include organization chart), during the operation and management phases of the remedy implementation.

b. System Description: Describe the soil vapor extraction and treatment system and identify and describe significant equipment.

c. Start-Up Procedures: Describe system start-up procedures including any operational testing.

d. Operation and Maintenance Procedures: Describe normal operation and maintenance procedures, including:

   (1) Description of tasks for operation;

   (2) Description of tasks for maintenance;

   (3) Description of prescribed treatment or operation conditions; and

   (4) Schedule showing frequency of each O&M task.

e. Replacement schedule for equipment and installed components.

f. Waste Management Practices: Describe the wastes generated by operation of the corrective measure and how they will be managed.

g. Quality Assurance Project Plan: Sampling and monitoring activities may be needed for effective operation and maintenance of the corrective measure. To ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented, Respondent shall prepare a Quality Assurance Project Plan (QAPjP) to document all monitoring procedures, sampling, field measurements, and sample analyses performed during these activities. Respondent shall use quality assurance, quality control, and chain-of-custody procedures approved by the EPA. These procedures are described in EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, December 29, 1980, or as superseded by EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5).

h. Corrective Measure Monitoring: Describe the following:

(1) monitoring objectives;
(2) the types of measurements to be made (e.g., vapor pressure, contaminant concentrations, etc.);
(3) measurement locations;
(4) measurement methods, equipment, and procedures;
(5) measurement schedules; and
(6) record-keeping and reporting requirements.

This data and information shall be used to prepare Progress Reports and the Corrective Measure Completion Report.

i. O&M Contingency Procedures:

(1) Procedures to address system breakdowns and operational problems, including a list of redundant and emergency back-up equipment and procedures;

(2) Alternate procedures to be implemented if the corrective measure suffers complete failure. The alternate procedures must be able to prevent release or threatened releases of hazardous wastes and/or hazardous waste constituents which may endanger human health and/or the environment or exceed media cleanup standards;

(3) The O&M Plan shall specify that in the event of a major breakdown and/or complete failure of the corrective measure (includes emergency situations), Respondent shall orally notify the EPA within twenty-four (24) hours of the event, and shall notify the EPA in writing within seven (7) days of the event. Written notification shall, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment; and

(4) Procedures to be implemented in the event that the corrective measure is experiencing major operational problems, is not performing to design specifications, and/or will not achieve the remediation goals, objectives, or cleanup levels in the expected time frame.

j. Data Management and Documentation Requirements: The O&M Plan shall specify that Respondent collect and maintain the following information:

(1) Progress Report Information;

(2) Monitoring and laboratory data;

(3) Records of operating costs; and

(4) Maintenance and inspection records.

This data and information shall be used to prepare Progress Reports and the Corrective Measure Completion Report.

5. Health and Safety Plan

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit an updated Health and Safety Plan for the Soil Vapor Extraction Corrective Measure, as set forth in Task II, to EPA. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall be developed as a stand alone document.

6. Commencement of Construction

Upon receipt of written notification from the EPA, Respondent shall commence the construction process and implement the Construction Workplan in accordance with the schedule and provisions contained therein.

C. Construction Completion Report - Soil Vapor Extraction Project

Within ninety (90) days following completion of the construction of the Soil Vapor Extraction Corrective Measure, Respondent shall submit a Construction Completion Report to EPA for review and approval. The Construction Completion Report shall document how the completed project is consistent with the Final Design Plans and Specifications. EPA will approve or modify the Construction Completion Report. The Construction Completion Report, as approved or modified by EPA, shall become the Final Construction Completion Report. The Construction Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure, design criteria, and certification that the corrective measure was

constructed in accordance with the Final Design Plans and Specifications;

2. Explanation and description of any modifications to the Final Design Plans and Specifications, and why these were necessary for the project;

3. Results of any operational testing and/or monitoring, indicating how initial operation of the corrective measure compares to the design criteria;

4. Summary of significant activities that occurred during construction. Include a discussion of problems encountered and how they were addressed;

5. As built drawings; and

6. Schedule indicating when any treatment systems will begin full scale operations.

D. Corrective Measure Completion Report

Respondent shall prepare and submit a Corrective Measure Completion Report to EPA for review and approval when the Performance Standards have been achieved for the Soil Vapor Extraction Corrective Measure. The purpose of the Corrective Measure Completion Report is to fully document how the Performance Standards have been satisfied, and to justify why the corrective measure and/or monitoring may cease. EPA will approve or modify the Corrective Measure Completion Report. The Corrective Measure Completion Report, as approved or modified by EPA, shall become the Final Corrective Measure Completion Report. The Corrective Measure Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure;

2. Demonstration that the Performance Standards have been met. Include results of testing and/or monitoring, indicating how operation of the corrective measure compares to the completion criteria;

3. Summary of work accomplishments (e.g., performance levels achieved, total hours of treatment operation, total treated and/or excavated volumes, nature and volume of wastes generated, etc.);

4. Summary of significant activities that occurred during operations. Include a discussion of problems encountered and how they were addressed;

5. Summary of inspection findings (include copies of key inspection documents in appendices);

6. Summary of total operation and maintenance costs; and

7. An evaluation of implementing additional source control measures to further reduce the remaining source material in the aquifer and soil beneath the Facility. Such measures could include the implementation of additional measures (e.g., incorporating an air sparging system with the soil vapor extraction system) in the aquifer where possible nonaqueous phase liquid (NAPL) contaminants remain relatively unaffected by ground water extraction.

TASK V: GROUND WATER EXTRACTION CORRECTIVE MEASURE

Task V sets forth the plans and schedules for those activities to be undertaken by Respondent in order to develop the final plans, drawings, specifications, general provisions, and special requirements necessary to design, construct, operate, and monitor the performance of the Ground Water Extraction Corrective Measure selected in the FDRTC. Respondent may draft the Design Plans and Specifications, the Construction Workplan, the Operation and Maintenance Plan, and the accompanying schedules so as to implement the Ground Water Extraction Corrective Measure in a phased approach, as outlined in the FDRTC. Information on the design, construction, operation, and performance monitoring of the ground water extraction system can be found in the following EPA publications:

U.S. EPA. Basics of Pump-and-Treat Ground Water Remediation Technology; EPA/600/8-90/003.

U.S. EPA. Methods for Evaluating the Attainment of Cleanup Standards, Volume 2: Ground Water; EPA/230/R-92/014.

U.S. EPA. Methods for Monitoring Pump-and-Treat Performance; EPA/600/R-94/123.

U.S. EPA. Ground-Water and Leachate Treatment Systems Manual; EPa/625/R-94/005.

A. Ground Water Investigation Workplan

Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Ground Water Investigation Workplan to EPA for review and approval. The objectives of the Ground Water Investigation Workplan are to define the location and extent of the lithologic units which may control the fate and transport of contaminant in the aquifer, define the nature and extent, both horizontally and vertically, of contamination in the aquifer, and to collect the appropriate data required to design, construct, operate, and monitor the performance of the Ground Water Extraction Corrective Measure selected in the FDRTC. EPA will approve or modify the Ground Water Investigation Workplan. The Ground Water Investigation Workplan, as approved or modified by EPA, shall become the Final Ground Water Investigation Workplan. Respondent shall implement the Final Ground Water Investigation Workplan according to the schedule set forth in the Workplan. The Ground Water Investigation Workplan shall, at a minimum, include the following:

1. Project Management Plan

Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and an outline of proposed activities necessary to complete the design of the ground water extraction system. The technical approach shall address all the requirements necessary to implement the requirements of this Task.

2. Data Collection Quality Assurance Plan

Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed during the investigation so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. This plan shall, at a minimum, include the following:

a. Data Collection Strategy

The Data Collection Strategy shall, at a minimum, include the following:

(1) Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

(2) Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data; and

(3) Description of the methodology used to assure that the data accurately and precisely represents the characteristics of a population, parameter variations at a sampling point, and process conditions or environmental conditions. Examples of factors which shall be considered and discussed include:

(a) Environmental conditions at the time of sampling;
(b) Number of sampling points;
(c) Representativeness of selected media; and
(d) Representativeness of selected analytical parameters.

b. Sampling

The sampling section shall, at a minimum, discuss the following:

(1) Selecting appropriate sampling locations, depths, etc.;
(2) Determining a statistically sufficient number of sampling sites;
(3) Determining which media are to be sampled (e.g., ground water, etc.);
(4) Determining which parameters are to be measured and where;
(5) Selecting the frequency of sampling and length of sampling period;
(6) Selecting the types of samples and number of samples;
(7) Documenting field sampling operations and procedures, including;

(a) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);
(b) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
(c) Documentation of specific sample preservation method;
(d) Calibration of field devices;
(e) Collection of replicate samples;
(f) Submission of field blanks, where appropriate;
(g) Construction materials and techniques associated with monitoring wells and piezometers;
(h) Field equipment listing and sample containers;
(i) Sampling order; and
(j) Decontamination procedures.

(8) Selecting appropriate sample containers;
(9) Sample preservation; and
(10) Chain-of-custody, including:

(a) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and

(b) Pre-prepared sample labels containing all information necessary for effective sample tracking.

c. Field Measurements

The Field Measurements section shall, at a minimum, discuss the following:

(1) Selecting appropriate field measurement locations, depths, etc.;
(2) Providing a statistically sufficient number of field measurements;
(3) Measuring all necessary ancillary data;
(4) Determining conditions under which field measurement should be conducted;
(5) Determining which media are to be addressed by appropriate field measurements (e.g., ground water, etc.);
(6) Determining which parameters are to be measured and where;
(7) Selecting the frequency of field measurement and length of field measurements period; and
(8) Documenting field measurement operations and procedures, including:

(a) Procedures and forms for recording raw data, and the exact location, time, and facility-specific considerations associated with the data acquisition;
(b) Calibration of field devices;
(c) Collection of replicate measurements;
(d) Submission of field blanks, where appropriate;
(e) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;
(f) Field equipment listing;
(g) Order in which field measurements were made; and
(h) Decontamination procedures.

d. Contaminated Material Disposal

All contaminated material generated by activities required in the CMI shall be disposed of in accordance with all Federal and State laws and regulations.

e. Sample Analysis

The Sample Analysis section shall, at a minimum, specify the following:

(1) Chain-of-custody procedures, including:

(a) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
(b) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
(c) Specification of laboratory sample custody procedures for sample handling, storage, and disbursement for analysis.

(2) Sample storage procedures and holding times;
(3) Sample preparation methods;
(4) Analytical procedures, including:

(a) Scope and application of the procedure;
(b) Sample matrix;
(c) Potential interferences;
(d) Precision and accuracy of the methodology;
(e) Method detection limits;
(f) Calibration procedures and frequency;
(g) Data reduction, validation, and reporting;
(h) Internal quality control checks, laboratory performance, and systems audits and frequency, including:

1) Method blank(s);
2) Laboratory control sample(s);
3) Calibration check sample(s);
4) Replicate sample(s);
5) Matrix-spiked sample(s);
6) Blind quality control sample(s);
7) Control charts;
8) Surrogate samples;
9) Zero and span gases; and
10) Reagent quality control checks.

(i) Preventive maintenance procedures and schedules;

(j) Corrective action (for laboratory problems); and
(k) Turnaround time.

3. Data Management Plan

Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation. The plan shall, at a minimum, include the following:

a. Data Record

The data record shall, at a minimum, include the following:

(1) Unique sample or field measurement code;
(2) Sampling or field measurement location and sample or measurement type;
(3) Sampling or field measurement raw data;
(4) Laboratory analysis ID number;
(5) Property or component measured; and
(6) Result of analysis (e.g., concentration).

b. Tabular Displays

The following data shall be presented in tabular displays:

(1) Unsorted (raw) data;
(2) Results for each medium, or for each constituent monitored;
(3) Data reduction for statistical analysis;
(4) Sorting of data by potential stratification factors [e.g., location, ground water flow zone (upper, upper lower, etc.)]; and
(5) Summary data.

c. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

(1) Display sampling locations and sampling grids;

(2) Contaminant concentrations at each sampling location;
(3) Display average and maxima contaminant concentrations;
(4) Geographical extent of contamination and illustrate changes in concentration in relation to distance from the source and depth;
(5) Indicate features affecting intramedia transport; and
(6) Illustrate the stratigraphy in the area of the ground water contamination.

B. Ground Water Extraction and Treatment Project

1. Ground Water Investigation Report

Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit a Ground Water Investigation Report to EPA for review and approval. EPA will approve or modify the Ground Water Investigation Report. The Ground Water Investigation Report, as approved or modified by EPA, shall become the Final Ground Water Investigation Report. This Report shall, at a minimum, include the following:

a. A description, including maps, of the horizontal and vertical extent, including concentration profiles, of the contaminants in the ground water originating from the Facility;

b. Based on field data and aquifer tests, a representative and accurate description of the hydrogeologic units which are a part of the migration pathways for the contaminant plume, including:

(1) Hydraulic conductivity;
(2) Lithology, grain size, sorting;
(3) Velocity of ground water;
(4) Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants;
(5) Cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways;
(6) Water-level contour and/or potentiometric maps; and

(7) Hydrologic cross sections showing vertical gradients.

c. Definition of the containment area (two-dimensional) and volume (three-dimensional);

d. Appropriate data and analyses for the design and implementation of a ground water extraction system, treatment system, and disposal system. This shall include the appropriate field pilot test(s), aquifer test(s), etc., to provide data to determine design parameters and projected effectiveness of the full-scale ground water extraction system, treatment system, and disposal system. The ground water extraction system shall be capable of hydraulically containing the contaminant plume, and reducing contaminant concentrations to comply with the cleanup goals by maximizing contaminant mass removal and minimizing cleanup time.

e. The necessary contaminant reductions (e.g., volatile organic compounds, chromium, etc.), in the extracted ground water to comply with Federal, State, and local standards prior to disposal; and

f. The recommended disposal method for the treated ground water which is consistent with the criteria in the FDRTC document for conservation of the ground water resource.

2. Design Plans and Specifications

Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit the Design Plans and Specifications for the Ground Water Extraction Corrective Measure to EPA for review and approval. The design package shall consist of the detailed drawings and specifications needed to construct the corrective measure(s). EPA will approve or modify the design package. The design package, as approved or modified by EPA, shall become the Final Design Plans and Specifications. The Design Plans and Specifications shall, at a minimum, include the following documents:

a. General Site Plans;
b. Process Flow Diagrams;
c. Mechanical Drawings;
d. Electrical Drawings;
e. Piping and Instrumentation Diagrams;

f. Structural Drawings;
g. Excavation and Earthwork Drawings;
h. Site Preparation and Field Work Standards;
i. Construction Drawings;
j. Installation Drawings;
k. Equipment Lists; and
l. Specifications for Equipment and Material.

3. Construction Workplan

Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit a Construction Workplan for the Ground Water Extraction Corrective Measure to EPA for review and approval. The purpose of the Construction Workplan is to document the overall management strategy, construction quality assurance procedures, and schedule for constructing the corrective measure. EPA will approve or modify the Construction Workplan. The Construction Workplan, as approved or modified by EPA, shall become the Final Construction Workplan. The Construction Workplan shall, at a minimum, include the following elements:

a. Project Management: Describe the construction management approach including levels of authority and responsibility (include organization chart).

b. Project Schedule: The project schedule shall specify all significant steps in the process, including the timing for key elements of the bidding process, the timing for initiation and completion of all construction tasks as specified in the Design Plans and Specifications.

c. Waste Management Practices: Describe the wastes generated by the construction of the corrective measure, and how they will be managed.

d. Required Permits: List and describe the permits needed to construct and operate the corrective measure. Indicate on the project schedule when the permit applications will be submitted to the applicable agencies and an estimate of the permit issuance date.

e. Quality Assurance Project Plan: The purpose of construction quality assurance is to ensure, with a reasonable degree of certainty, that a completed corrective measure will meet or exceed all design criteria, plans, and specifications. Sampling and monitoring activities may also be needed for

construction quality assurance/quality control and/or other construction related purposes. To ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented, Respondent shall prepare a Quality Assurance Project Plan (QAPjP) to document all monitoring procedures, sampling, field measurements, and sample analysis performed during these activities. Respondent shall use quality assurance, quality control, and chain-of-custody procedures approved by the EPA. These procedures are described in EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, December 29, 1980, or as superseded by EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5).

f. Construction Contingency Procedures:

(1) Changes to the design and/or specifications may be needed during construction to address unforeseen problems encountered in the field. Procedures to address such circumstances, including notification of EPA, shall be included in the Construction Workplan.

(2) The Construction Workplan shall specify that in the event of a construction emergency (e.g. fire, earthwork failure, etc.), Respondent shall orally notify the EPA within twenty-four (24) hours of the event, and shall notify the EPA in writing within seven (7) days of the event. The written notification shall, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment; and

(3) Procedures to be implemented if unforeseen events prevent corrective measure construction.

g. Cost Estimate

Respondent shall develop a cost estimate that includes both corrective measure construction and operation and maintenance costs. The purpose of the cost estimate is to assure that Respondent has the financial resources necessary to construct and implement the corrective measure(s).

h. Documentation Requirements

Respondent shall describe how analytical data and results will be evaluated, documented, and managed, consistent with SW-846, 3rd Edition, or as superseded.

i. Appendices, including:

(1) Design Data - Tabulations of significant data used in the design effort;

(2) Equations - List and describe the source of major equations used in the design process;

(3) Sample Calculations - Present and explain at least one example calculation for significant or unique design calculations; and

(4) Laboratory or Field Test Results.

4. Operation and Maintenance Plan

Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit an Operation and Maintenance (O&M) Plan for the Ground Water Extraction Corrective Measure to EPA for review and approval. The O&M Plan shall outline the procedures for performing operations, long term maintenance, and monitoring of the corrective measure. EPA will approve or modify the O&M Plan. The O&M Plan, as approved or modified by EPA, shall become the Final O&M Plan. The O&M plan shall, at a minimum, include the following elements:

a. Project Management: Describe the management approach, including levels of authority and responsibility (include organization chart), during the operation and management phase of the remedy implementation.

b. System Description: Describe the ground water extraction, treatment, and disposal systems, and identify and describe significant equipment (e.g., pumps, controllers, piping, wiring, treatment system parts, alarms, etc.).

c. Start-Up Procedures: Describe system start-up procedures including any operational testing.

d. Operation and Maintenance Procedures: Describe normal operation and maintenance procedures, including:

(1) Description of tasks for operation;

(2) Description of tasks for maintenance;

(3) Description of prescribed treatment or operation conditions; and

(4) Schedule showing frequency of each O&M task.

e. Replacement schedule for equipment and installed components.

f. Waste Management Practices: Describe the wastes generated by operation of the corrective measure and how they will be managed.

g. Quality Assurance Project Plan: Sampling and monitoring activities may be needed for effective operation and maintenance of the corrective measure. To ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented, Respondent shall prepare a Quality Assurance Project Plan (QAPjP) to document all monitoring procedures, sampling, field measurements, and sample analyses performed during these activities. Respondent shall use quality assurance, quality control, and chain-of-custody procedures approved by the EPA. These procedures are described in EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, December 29, 1980, or as superseded by EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5).

h. Corrective Measure Monitoring: Describe the following:

(1) monitoring objectives;
(2) the types of measurements to be made (e.g., pumping rates, hydraulic heads, contaminant concentrations, ground water chemistry, precipitation, etc.);
(3) measurement locations;
(4) measurement methods, equipment, and procedures;
(5) measurement schedules; and
(6) record-keeping and reporting requirements.

This data and information shall be used to prepare Progress Reports and the Corrective Measure Assessment and Completion Reports.

i. O&M Contingency Procedures:

(1) Procedures to address system breakdowns and operational problems, including a list of redundant and emergency back-up equipment and procedures;

(2) Alternate procedures to be implemented if the corrective measure suffers complete failure. The alternate procedures must be able to prevent release or threatened releases of hazardous wastes and/or hazardous waste constituents which may endanger human health and/or the environment or exceed media cleanup standards;

(3) The O&M Plan shall specify that in the event of a major breakdown and/or complete failure of the corrective measure (includes emergency situations), Respondent shall orally notify the EPA within twenty-four (24) hours of the event, and shall notify the EPA in writing within seven (7) days of the event. Written notification shall, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment; and

(4) Procedures to be implemented in the event that the corrective measure is experiencing major operational problems, is not performing to design specifications, and/or will not achieve the remediation goals, objectives, or cleanup levels, in the expected time frame.

j. Data Management and Documentation Requirements: The O&M Plan shall specify that Respondent collect and maintain the following information:

(1) Progress Report Information;

(2) Monitoring and laboratory data;

(3) Records of operating costs; and

(4) Maintenance and inspection records.

This data and information shall be used to prepare Progress Reports and the Corrective Measure Assessment and Completion Reports.

5. Health and Safety Plan

Within three hundred and thirty (330) days after receipt of EPA's approval and/or modification of the Ground Water Investigation Workplan, Respondent shall submit an updated Health and Safety Plan for the Ground Water Extraction Corrective Measure, as set forth in Task II, to EPA. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall be developed as a stand alone document.

6. Commencement of Construction

Upon receipt of written notification from the EPA, Respondent shall commence the construction process and implement the Construction Workplan in accordance with the schedule and provisions contained therein.

C. Construction Completion Report

Within ninety (90) days following completion of the construction of the Ground Water Extraction Corrective Measure, and/or upon written notice from EPA regarding completion of the construction of one or more components in the Ground Water Extraction Corrective Measure (e.g., containment well system, treatment system, etc.,), Respondent shall submit a Construction Completion Report to EPA for review and approval. The Construction Completion Report shall document how the completed project or component is consistent with the Final Design Plans and Specifications. EPA will approve or modify the Construction Completion Report. The Construction Completion Report, as approved or modified by EPA, shall become the Final Construction Completion Report for the project or component. The Construction Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure, design criteria, and certification that the corrective measure was constructed in accordance with the Final Design Plans and Specifications;

2. Explanation and description of any modifications to the Final Design Plans and Specifications and why these were necessary for the project;

3. Results of any operational testing and/or monitoring, indicating how initial operation of the corrective measure compares to the design criteria;

4. Summary of significant activities that occurred during construction. Include a discussion of problems encountered and how they were addressed;

5. As built drawings; and

6. Schedule indicating when any treatment systems will begin full scale operations.

D. Corrective Measure Assessment Reports

Within sixty (60) days of receipt of written notification from EPA, Respondent shall submit a Corrective Measure Assessment Report to EPA for review and approval. The Corrective Measure Assessment Report shall thereafter be submitted to EPA for review and approval annually for a period of two (2) years, and every five years thereafter until this Order is terminated pursuant to Section XXVI of this Order. The Corrective Measure Assessment Report shall contain an evaluation of the past and projected future effectiveness of the corrective measure in attaining the remedial objectives of: (1) contaminant plume containment; and (2) restoration of the contaminated ground water to the media cleanup standards set forth in the FDRTC or in this Order. The evaluation shall follow EPA guidance in evaluating the performance of the ground water extraction system in meeting these two objectives. EPA will approve or modify the Corrective Measure Assessment Report. The Corrective Measure Assessment Report, as approved or modified by EPA, shall become the Final Corrective Measure Assessment Report for the time period covered by the Report. The Corrective Measure Assessment Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure;

2. Describe the progress in attaining the remedial objectives of: (a) contaminant plume containment; and (b) restoration of the contaminated ground water.

3. Summarize data obtained during the preceding time interval of systems operation and evaluate trends in the system operating conditions indicating how operation of the corrective measure compares to the remedial objectives;

4. Summary of work accomplishments (e.g., performance levels achieved, total hours of treatment operation,

total treated and/or excavated volumes, nature and volume of wastes generated, etc.);

5. Summary of significant activities that occurred during operations. Include a discussion of problems encountered and how they were addressed;

6. Summary of inspection findings (include copies of key inspection documents in appendices);

7. Summary of total operation and maintenance costs; and

8. An evaluation of implementing post-construction refinements to the ground water extraction system such as, but not limited to:

   - adjusting the pumping rate in some or all of the ground water extraction wells;

   - installing additional extraction wells to facilitate or accelerate cleanup of the contaminant plume;

   - initiating a pulsed pumping schedule in some or all of the ground water extraction wells to eliminate flow stagnation areas, or otherwise facilitate recovery of contaminants from the aquifer;

   - discontinuing pumping at individual extraction wells where cleanup goals have been attained; monitoring of the aquifer would be continued to ensure that media cleanup goals are maintained; and

   - refining the treatment and disposal components of the system.

9. An evaluation of implementing additional source control measures to further reduce the remaining source material in the aquifer and soil beneath the facility. Such measures could include the implementation of additional measures in the aquifer where possible NAPL contaminants remain relatively unaffected by ground water extraction.

Respondent may at any time request that EPA select an alternative and/or supplemental corrective measure(s) (which may include requiring Respondent to achieve alternative clean up standards in lieu of the media cleanup standards set forth in the FDRTC or in this Order). Respondent may also at any time submit a Technical Impracticability

Demonstration to EPA. In addition to demonstrating technical impracticability, Respondent shall also submit an alternative remedial strategy that is: (1) technically practicable; (2) consistent with the overall objectives of the remedy; (3) controls the source(s) of the contamination; and (4) controls human and environmental exposure. An alternative remedial strategy shall be imposed if a determination of technical impracticability is made by EPA.

E. Corrective Measure Completion Report

Respondent shall prepare and submit a Corrective Measure Completion Report to EPA for review and approval when the Performance Standards have been achieved for the Ground Water Extraction Corrective Measure. The purpose of the Corrective Measure Completion Report is to fully document how the Performance Standards have been satisfied and to justify why the corrective measure and/or monitoring may cease. EPA will approve or modify the revised Corrective Measure Completion Report. The revised Corrective Measure Completion Report, as approved or modified by EPA, shall become the Final Corrective Measure Completion Report. The Corrective Measure Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure;

2. Demonstration that the Performance Standards have been met. Include results of testing and/or monitoring, indicating how operation of the corrective measure compares to the completion criteria;

3. Summary of work accomplishments (e.g., performance levels achieved, total hours of treatment operation, total treated and/or excavated volumes, nature and volume of wastes generated, etc.);

4. Summary of significant activities that occurred during operations. Include a discussion of problems encountered and how they were addressed;

5. Summary of inspection findings (include copies of key inspection documents in appendices); and

6. Summary of total operation and maintenance costs.

TASK VI: MONTHLY PROGRESS REPORTS

Respondent shall, at a minimum, provide EPA with signed monthly progress reports during the corrective measures design, construction, operation and maintenance. EPA may adjust the frequency of progress reporting to address site-specific needs. For example, more frequent progress reports may be needed to track critical activities such as corrective measure construction and start-up.

Progress reports shall, at a minimum, include the following elements:

A. A description of significant activities (e.g., sampling events, inspections, etc.) and work completed/work accomplishments (e.g., performance levels achieved, hours of treatment operation, treated and/or excavated volumes, concentration of contaminants in treated and/or excavated volumes, nature and volume of wastes generated, etc.) during the reporting period;

B. Summary of system effectiveness. Provide a comparison of system operation to predicted performance levels (applicable only during operation of the corrective measure);

C. Summaries of all findings (including any inspection results);

D. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period;

E. Summaries of all problems or potential problems encountered during the reporting period;

F. Actions being taken and/or planned to rectify problems;

G. Projected work for the next reporting period; and

H. The results of any sampling tests and/or other data generated during the reporting period.

EXHIBIT A

FINAL DECISION AND RESPONSE TO COMMENTS

DATED JUNE 24, 1996

FINAL DECISION
RCRA CORRECTIVE ACTION

SITE NAME AND LOCATION

Sparton Technology, Inc.
Coors Road Facility
9621 Coors Road, N.W.
Albuquerque, New Mexico 87114

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedy for the Sparton Technology, Inc., Coors Road facility, in Albuquerque, New Mexico, chosen in accordance with the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA). This decision is based on the administrative record for the site.

DESCRIPTION OF REMEDY

The selected remedy consists of an expanded ground water extraction system and soil vapor extraction system. The major components of the selected remedy include:

1. Continued operation of the existing on-site ground water extraction and treatment system;

2. Further characterization of the extent of contamination in the ground water and vadose zone;

3. Installation and operation of additional ground water extraction well(s); and

4. Installation and operation of on-site soil vapor extraction (SVE) system;

STATUTORY DETERMINATIONS

Sparton Technology, Inc., is the owner or operator of a facility which was authorized to operate under interim status pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e). Hazardous waste has been released into the environment from the facility. Corrective action is necessary to protect human health and/or the environment. The selected remedy is protective of human health and the environment.

Samuel Coleman, P.E., Director
Compliance Assurance and
Enforcement Division
U.S. Environmental Protection
Agency - Region 6
Dallas, Texas

June 24, 1996
Date

FINAL DECISION AND
RESPONSE TO COMMENTS
RCRA CORRECTIVE ACTION

SPARTON TECHNOLOGY, INC.
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

June 24, 1996

INTRODUCTION

In this Final Decision and Response to Comments (FDRTC), the U.S. Environmental Protection Agency (EPA) describes the selected remedy, as well as the other remedial alternatives evaluated for addressing the ground water and soil contamination at the Sparton Technology Coors Road facility located in Albuquerque, New Mexico. This document also explains EPA's rationale for the remedy selected to address the release of hazardous waste. EPA has also prepared a Response to Comments to provide written responses to comments submitted regarding the EPA Statement of Basis for the Coors Road facility. The Response to Comments is included as Attachment 1. The Final Decision summarizes information that can be found in greater detail in the Administrative Record. The index for the Administrative Record in support of the Final Decision is included as Attachment 2.

FACILITY BACKGROUND

A. Site Description

The Sparton Technology, Inc., Coors Road Plant (Facility), at 9621 Coors Road, NW, consists of a 64,000-square-foot building on a 12-acre parcel of land on the northwest side of Albuquerque, New Mexico (Figure 1). The Facility is located on the edge of a terrace approximately 60 feet above the adjacent Rio Grande floodplain, and approximately 0.5 mile west of the Rio Grande. The Corrales Main Canal, a man-made hydraulic structure used for irrigation, is approximately 300 feet east of the Facility, and contains flowing water eight months out of the year. The Calabacillas Arroyo is located about 1,000 feet north of the site. West of Irving Boulevard, the elevation rises some 250 feet from the terrace to form the surrounding hills.

Currently, land use in the area immediately adjacent to the Facility consists of commercial developments, and undeveloped tracts along the west side of Coors Road. Further south and west of the Facility along Irving Boulevard, residential developments

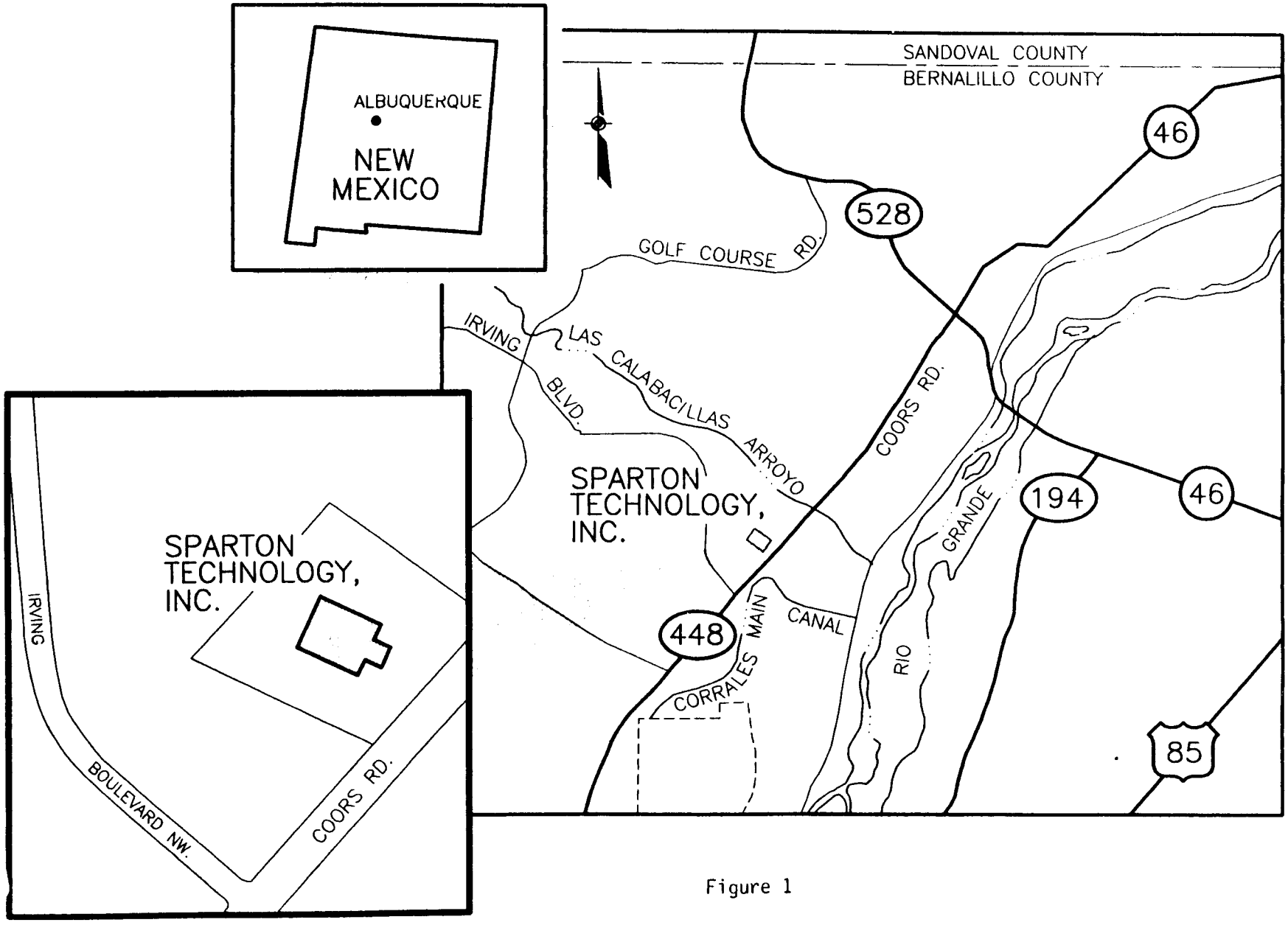

Figure 1

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are present or are being constructed. Residential developments, such as Paradise Hills, are approximately 1/4 - 3/4 mile west of the Facility. Agricultural operations are present east of the Facility and Coors Road.

The subsurface soils across the Facility consist of sandy muds, sands, and gravel. The depth to ground water varies from approximately 65 feet at the Facility to approximately 200 feet in the hills to the west. The depth to ground water can vary as much as two to three feet during the year as a result of recharge from irrigated fields and the Corrales Main Canal. Ground water flow is generally to the southwest across the Facility, changing to the west-northwest between the Facility and Irving Boulevard.

Local ground water supplies both drinking water for the City of Albuquerque as well as process water for industrial purposes. New Mexico Utilities, Inc., operates the nearest downgradient municipal water supply well (well No. 2) approximately 2.6 miles northwest of the Facility (Figure 2). There have been no identified private water supply wells immediately downgradient from the Facility.

B. Facility History

Manufacturing operations began in 1961 with commercial, industrial, and military electronic components, including printed circuit boards. As of 1994, Sparton discontinued manufacturing operations at the Facility and other than routine maintenance activities, the Facility is currently inactive.

The printed circuit board manufacturing process at the Facility generated an aqueous plating waste which was classified as hazardous waste due to heavy metals and a low pH. Waste solvents were generated primarily from cleaning of electronic components. From 1961 to 1975, the plating wastes were stored in an in-ground concrete basin. This basin was replaced by a lined surface impoundment in 1975, termed the "West Pond" and a second lined surface impoundment in 1977 termed the "East Pond" (Figure 3). The "West" and "East" ponds remained in use until 1983, when Sparton ceased discharging to either pond and removed the remaining plating wastes. The ponds are approximately 20 feet by 30 feet in surface dimension and 5 feet deep. The impoundments were constructed of concrete block or cast-walls with a natural sand base and a 30-mil, two-ply hypalon liner.

From 1961 to 1980, waste solvents were accumulated in an on-site sump (Figure 3) and allowed to evaporate. The sump was constructed of concrete blocks and measured approximately 5 feet by 5 feet in surface dimension by 2 feet deep. Sparton ceased discharging to the sump in October 1980 by removing the remaining wastes and filling the sump with sand.

Drums of hazardous waste were stored on the ground surface prior to May 1981, when a new drum storage area was constructed for storage of all drummed hazardous waste. The new drum storage area consists of a covered concrete pad and a spill collection system.

C. Regulatory History

In response to a Consent Agreement and Final Order signed by Sparton and EPA in 1983, Sparton installed a ground water monitoring system for the RCRA regulated hazardous waste management units at the Facility (East and West ponds). Analyses of the samples collected from the ground water monitoring system revealed that hazardous waste had been released to the ground water as a result of previous and ongoing hazardous waste management practices. During the period from 1983 to 1984, Sparton installed 17 ground water monitoring wells at the Facility. These monitoring wells were screened predominately across the top of the aquifer. Analyses of ground water samples collected from the monitoring wells detected the significant contaminants presented in Table 1.

TABLE 1

Chemical	Concentration (ppb)
Trichloroethylene	27 - 90,900
1,1,1-Trichloroethane	7 - 54,900
Methylene Chloride	11 - 78,400
1,1-Dichloroethylene	18 - 31,600
Tetrachloroethylene	17 - 953
Toluene	5 - 4,720
Benzene	20 - 193
Chromium	22 - 32,100

Sparton ceased discharging to the ponds in 1983, and removed the remaining plating wastes from the ponds for shipment to a permitted off-site disposal facility. On June 16, 1986, the New Mexico Environmental Improvement Division (NMEID), the predecessor agency to the New Mexico Environment Department (NMED), approved the closure plan for the "East" and "West" Ponds and Sump. The ponds and sump were certified closed by Sparton on December 18, 1986, and closure was acknowledged by NMEID on May 18, 1987. Sparton removed the solvent sump and sand backfill, and placed the wastes in the two remaining lined impoundments. The impoundments and sump area were capped by a 6-inch thick

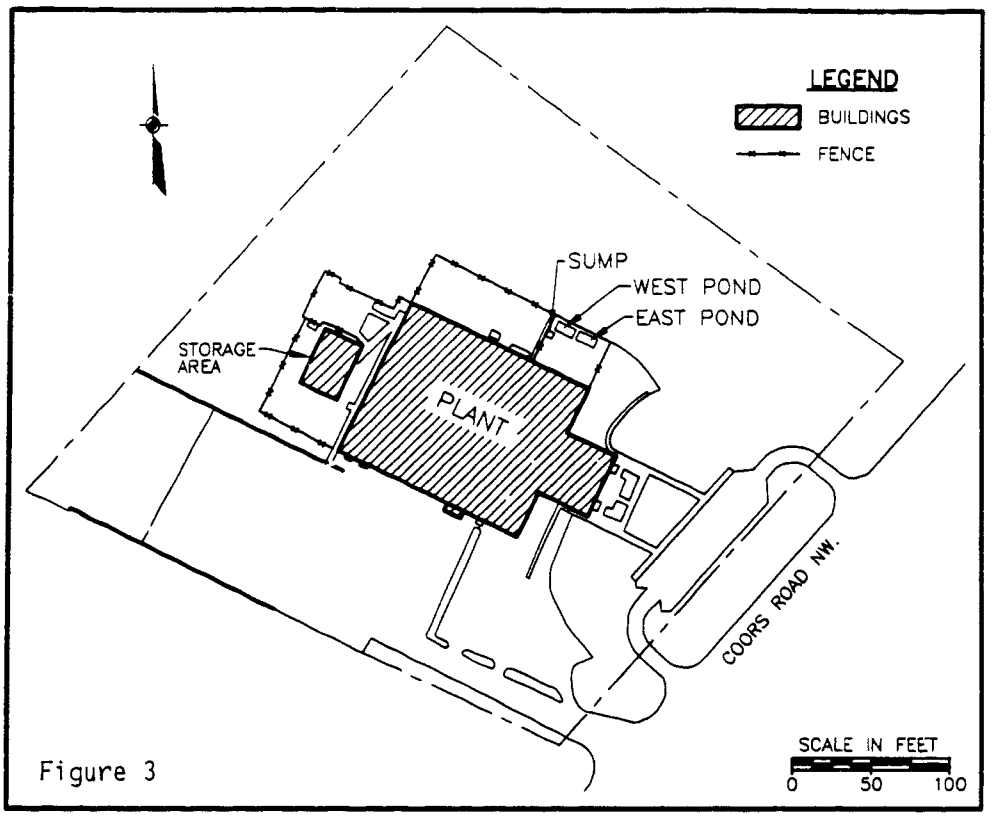


Figure 3

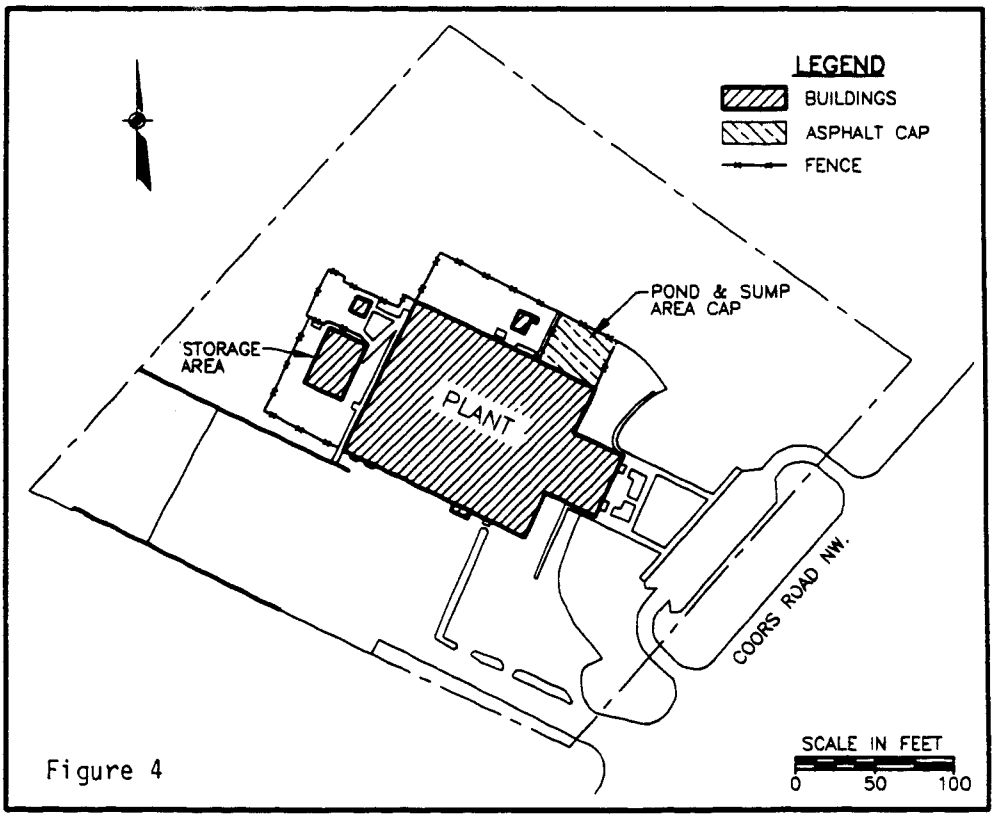


Figure 4

asphaltic base overlain by a 3-inch asphaltic concrete layer (Figure 4). The cap was sloped at 1 percent to promote drainage and reduce the potential for infiltration. The protective cap installed across the former waste management area reduces the potential for direct exposure to the contaminated material, prevents stormwater runoff from transporting contaminants away from the Facility, and reduces further downward migration of hazardous waste to the underlying ground water.

Sparton also performed a soil investigation during 1986 through 1987. Soil borings were used to evaluate the contaminant migration within the unsaturated subsurface soils as a result of past operations at the Facility. Total metals analyses indicated that chromium was the primary inorganic contaminant exceeding 3000 ppm underneath the former pond and sump area. The chromium concentration decreases to approximately 20 ppm outside of the waste management area, but is still above the background levels (2-3 ppm). Field screening conducted for the organic contaminants indicated the presence of volatile chemicals throughout the soil profile. Additional investigations included surface soil gas surveys conducted in 1984 and 1987. Trichloroethylene and trichloroethane were detected in the soil gas across the Facility and the general area of the ground water contamination.

On October 1, 1988, the EPA and Sparton Technology, Inc. (Sparton) entered into an Administrative Order on Consent (Order), Docket No. VI-004(h)-87-H, pursuant to Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6928(h). The Order specified the legal and technical requirements for Sparton to follow in performing corrective action at the Facility.

FACILITY INVESTIGATION

Under the terms of the Order, Sparton was required to complete the following three actions: 1) install and operate a ground water extraction and treatment system at the Coors Road facility as an interim measure; 2) conduct a RCRA Facility Investigation (RFI) to determine the nature and extent of contamination resulting from past Facility operations; and 3) perform a Corrective Measures Study (CMS) to evaluate the various clean-up alternatives. Sparton performed the requirements of the Order with oversight by EPA.

A. Interim Measure

In an effort to begin the recovery of contaminated ground water in 1988, Sparton was required to install and operate a ground water extraction and treatment system at the Facility. The system consists of 8 extraction wells pumping contaminated ground water from the upper 10 feet of the aquifer.

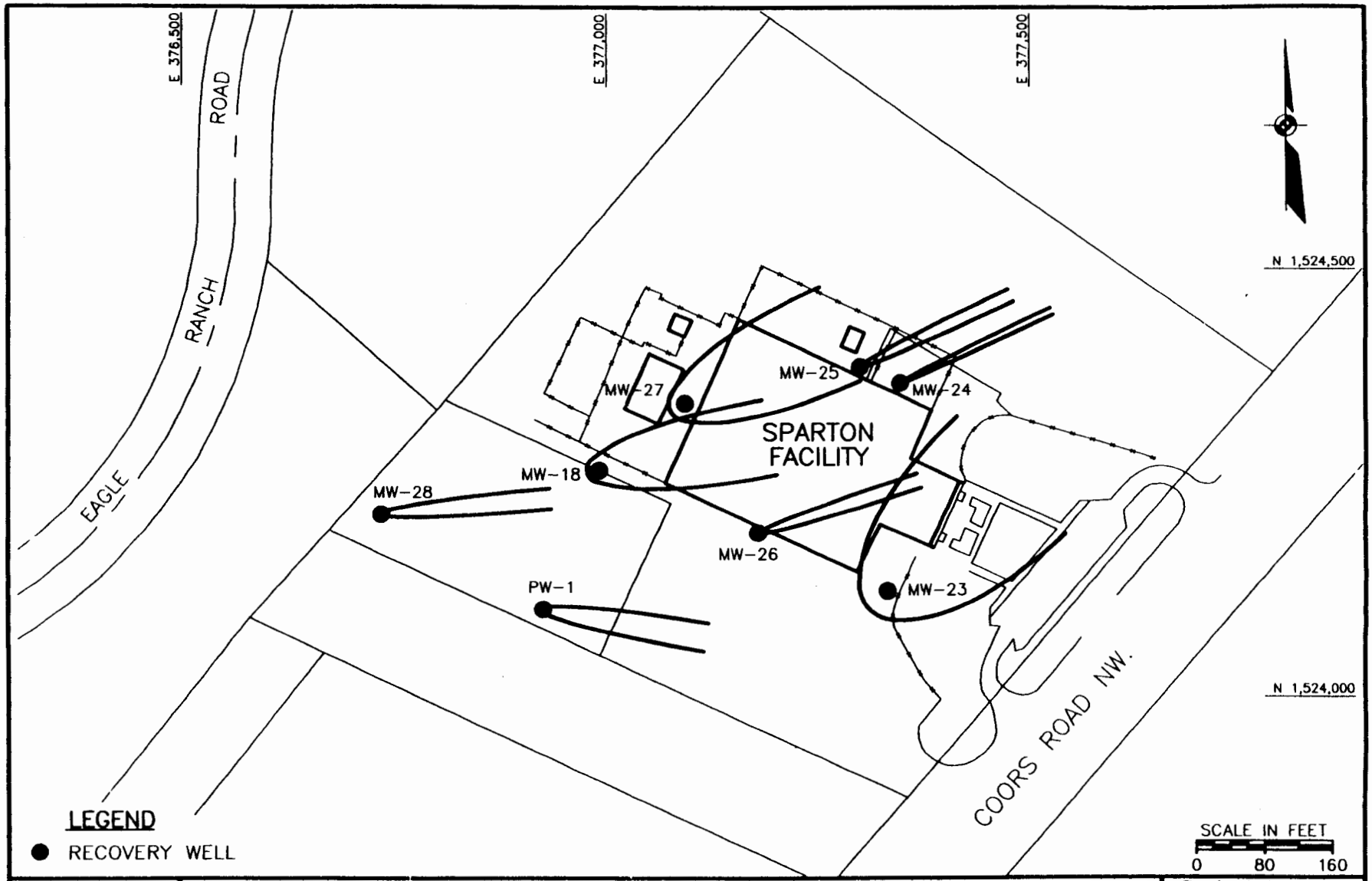
Figure 5 illustrates the well locations and approximate capture zones as estimated by EPA calculations. The total volume of recovered ground water is approximately 1300 gallons per day. The annual ground water withdrawal rate is regulated under the New Mexico State Engineer's office permit No. RG-50161 (expiration date is December 31, 1999). The recovered ground water is piped to a 550-gallon collection tank prior to treatment. The piping system consists of discharge lines encased in secondary piping to provide leak detection and containment. The collection tank is a fiberglass-coated, double wall, steel tank with a leak detection system connected to a visual and audible alarm in the control building.

Water from the collection tank is piped to the top of a 20 gallon per minute (gpm) packed tower air stripper. The air stripper operates by allowing the water to slowly flow downward across plastic balls while forcing air upward through the column to remove volatile organic compounds from the water. Approximately 3.56 million gallons of water have been recovered and treated in the air stripper. The demonstrated efficiency of the system is 99 percent for the contaminant indicators of trichloroethylene, 1,1,1-trichloroethane, methylene chloride, and 1,1-dichloroethylene. Contaminant concentrations in the treated water are in the range of 1 ppb for each contaminant. The volatile organic contaminants which are removed from the ground water in the air stripper are released to the atmosphere. The emissions are permitted by the City of Albuquerque Environmental Health Department (Air Quality Permit Number 187). The average daily air emission from the air stripper is 0.02 pounds, which is below the maximum allowable of 9.1 pounds per day in the permit.

Treated water from the air stripper is discharged to a 15,000-gallon fiberglass-coated, double wall, steel tank for storage. The tank has a leak detection system with a visual and audible alarm in the control building. During previous plant operations, treated water from the storage tank was used in the main plant building as cooling and flushing water, and eventually discharged into the sewer system. Since Facility operations have been discontinued, the treated water is utilized in the sanitary system prior to discharge into the sewer system.

B. RCRA Facility Investigation

Sparton was required to investigate the nature and extent of contaminant releases to the ground water. Monitoring wells installed in the aquifer were used to monitor the concentration and migration of contaminants in the ground water. Of these monitoring wells, 24 are located on-site at the Facility and 23 are installed off-site to a distance of approximately 1/2 mile



Metcalf & Eddy

SPARTON TECHNOLOGY, INC.

APPROXIMATE CAPTURE ZONES FOR THE UPPER FLOW ZONE RECOVERY WELLS

ALBUQUERQUE, NEW MEXICO

Project Number	
165022	
File Name	Figure
SPAR-CAP	5

009063

west-northwest of the Facility. The wells are installed to monitor discrete intervals of the aquifer from 0-10 feet (upper flow zone), 30-40 feet (upper-lower flow zone), 50-60 feet (lower-lower flow zone), and 70-80 feet (third flow zone) below the top of the water table.

Analyses of samples collected from the monitoring wells have shown both organic and inorganic contaminants (Table 1) using EPA approved methods. Trichloroethylene is the major ground water contaminant and has been used to define the extent of the contaminant plume. Concentrations of trichloroethylene in the ground water ranged from 7,600 ppb on-site to less than 5 ppb at a distance of at least 1/2 mile from the facility in 1996. Of the inorganic contaminants, hexavalent chromium has the highest frequency of occurrence with concentrations up to 500 ppb.

Trichloroethylene is a chlorinated organic compound which is denser than water, and if present as a dense, nonaqueous phase liquid (DNAPL), would sink to the bottom of the water column. While a DNAPL has not been identified in the monitoring wells, existing concentrations of trichloroethylene indicate the possible presence of a DNAPL in the upper flow zone of the aquifer on-site at the Facility. Remaining DNAPL in the soil and ground water may produce a zone of contaminant vapors above the water table, and a plume of dissolved contaminants below the water table. Both residual and migrating DNAPLs dissolve slowly, supplying potentially significant concentrations of contaminants to ground water over a long period of time.

Based on available data, the horizontal extent of the ground water contaminant plume is greatest in the upper flow zone. Contaminant concentrations are the highest on-site at the Facility, decreasing off-site to the west-northwest. As of June 1991, the contaminant plume had migrated approximately 1/2 mile west-northwest of the Facility, and the boundary of the plume had shown no significant changes between 1989 and 1991. However, during sampling activities from 1993 through April 1996, analyses of the ground water indicated that the leading edge of the contaminant plume (<5 ppb) has continued to move further northwest along Irving Boulevard. In Figures 6 through 11, the boundary and concentrations of the contaminant plume are approximate, and the maps are intended for illustration purposes only. The plume boundary and relative concentrations may be revised significantly based on additional data. For 1991, the approximate boundary and concentration profiles for trichloroethylene at three separate depths in ground water is illustrated in Figures 6 through 8. For 1996, the approximate boundary and concentration profiles for trichloroethylene at three separate depths in ground water is illustrated in Figures 9 through 11. Figures 6 through 11 were copied from the final CMS Report.

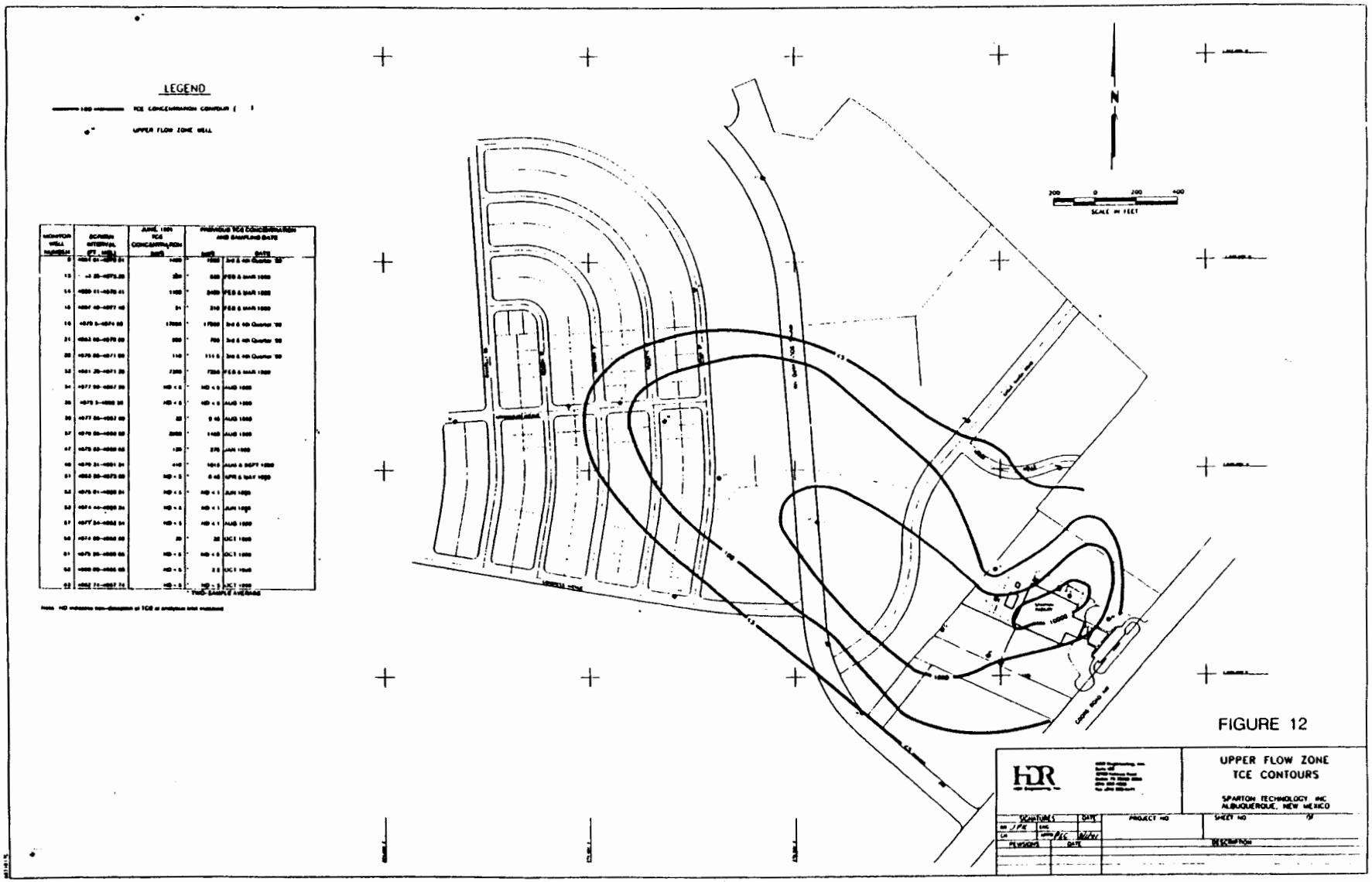


Figure 6

009065

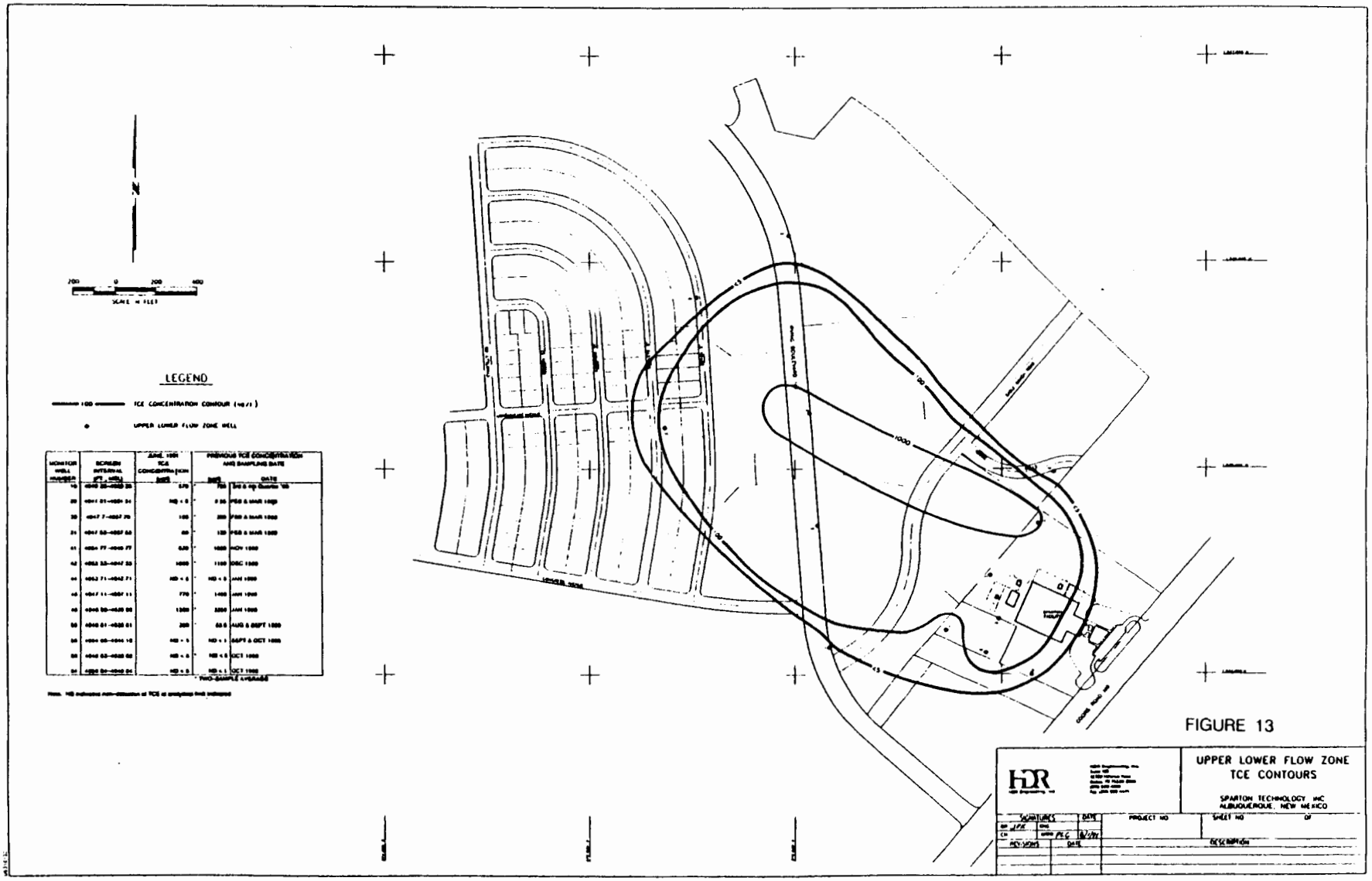


Figure 7

990600

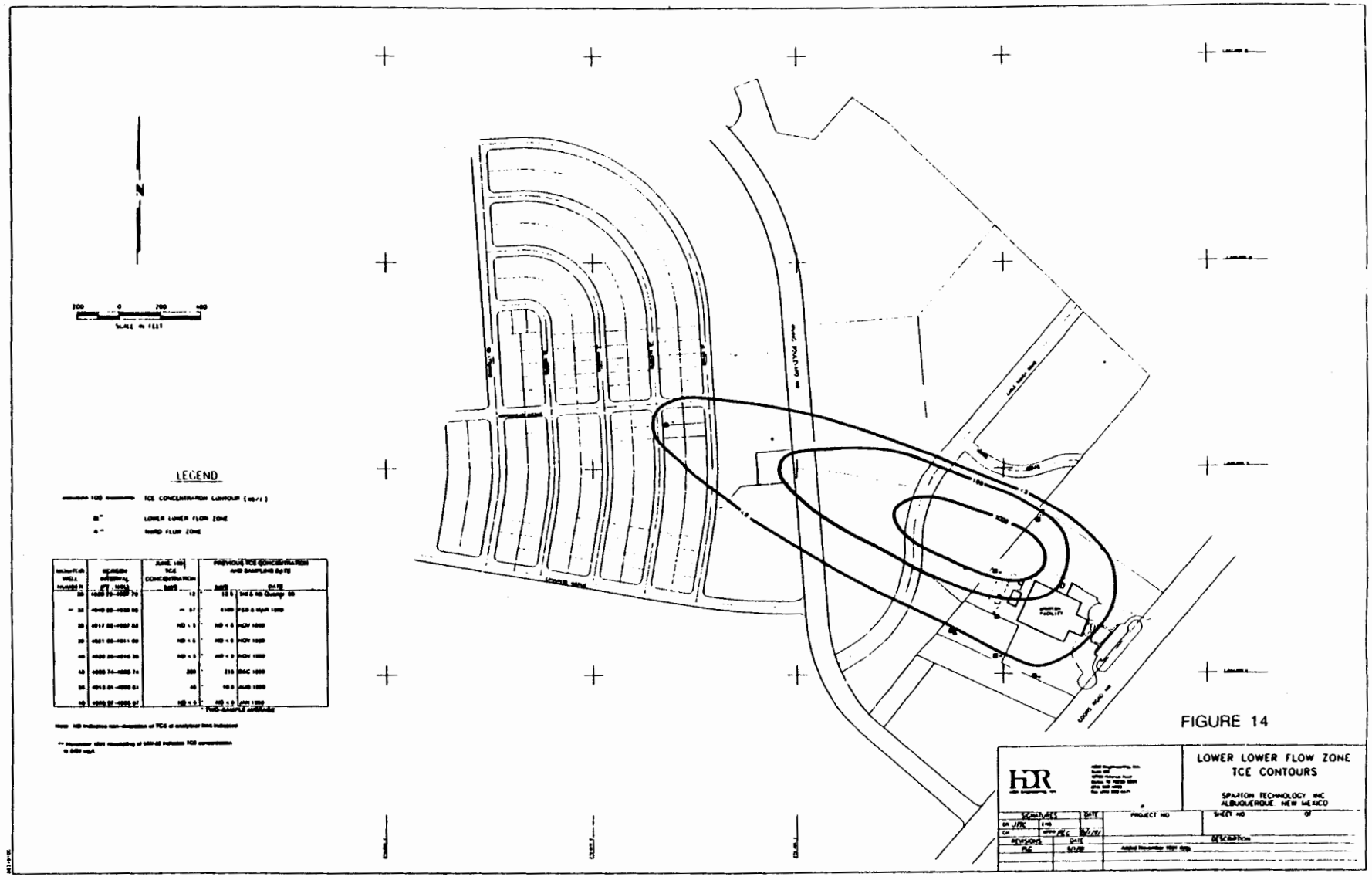

LEGEND
LOWER LOWER FLOW ZONE
FIGURE 14
LOWER LOWER FLOW ZONE
TCE CONTOURS
SPARTON TECHNOLOGY INC
ALBUQUERQUE NEW MEXICO
HDR

Figure 8

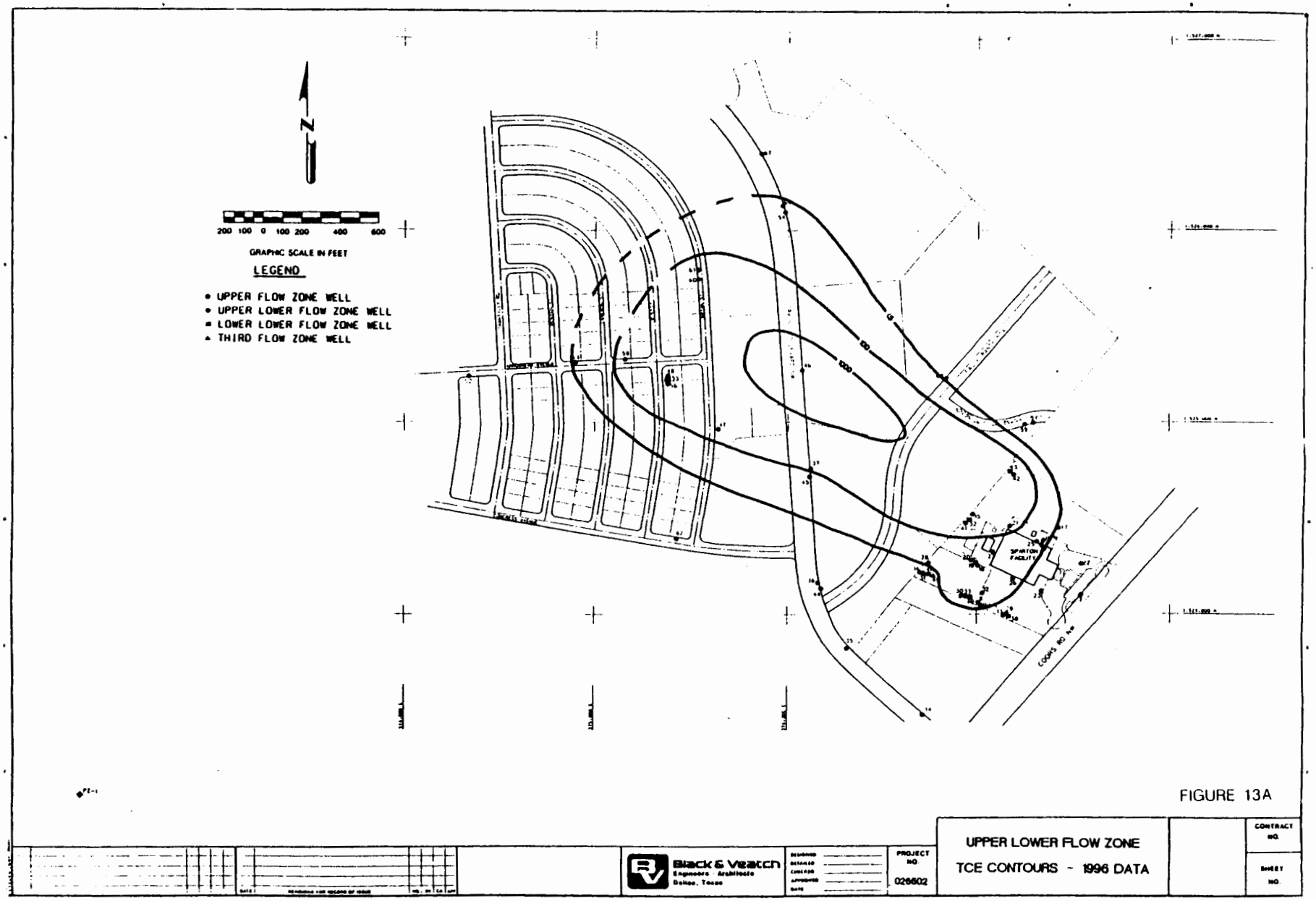
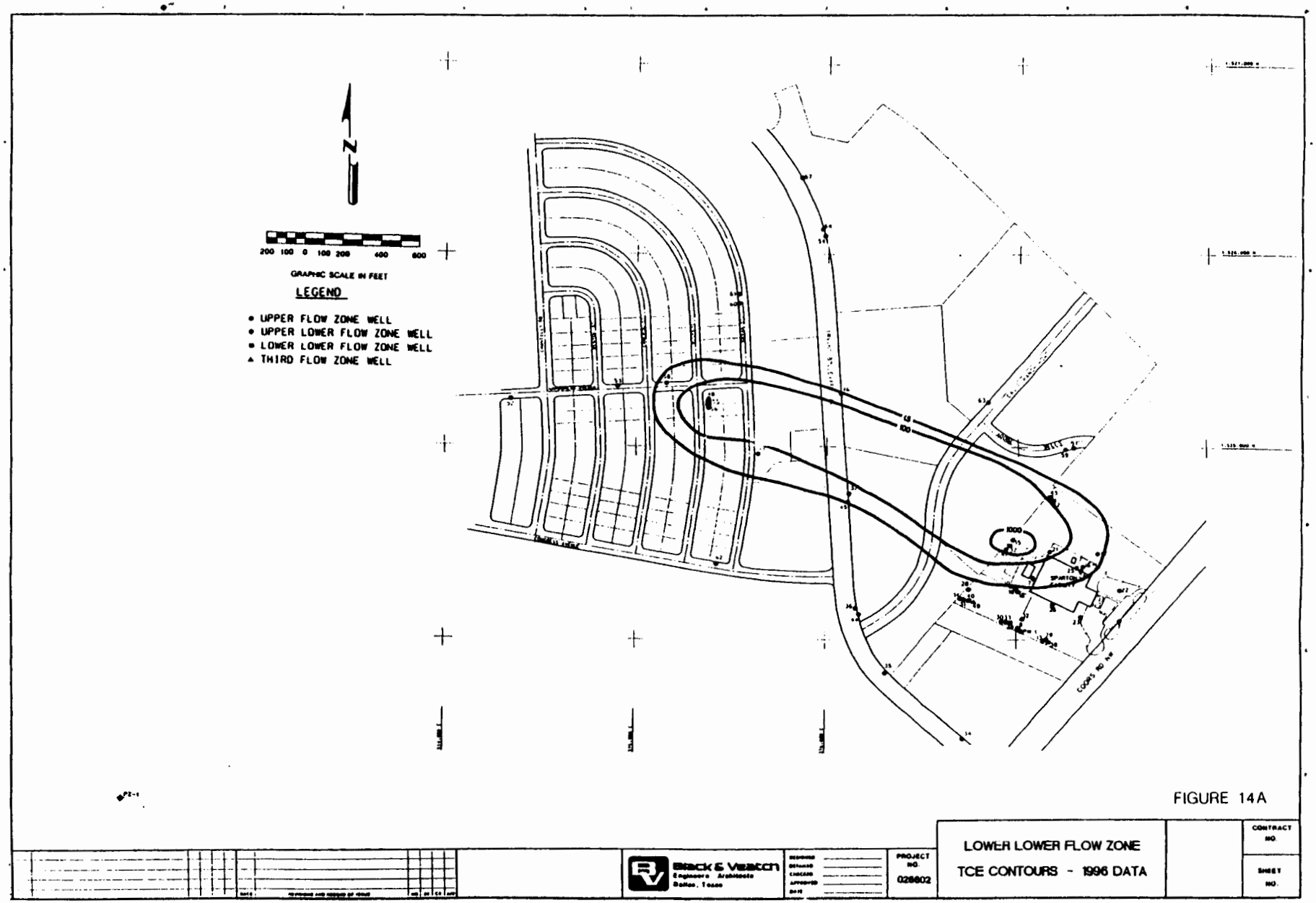

N
200 100 0 100 200 400 600
GRAPHIC SCALE IN FEET
LEGEND
UPPER FLOW ZONE WELL
UPPER LOWER FLOW ZONE WELL
LOWER LOWER FLOW ZONE WELL
THIRD FLOW ZONE WELL
COORS RD Ave
FIGURE 13A
Black & Veatch
Engineers Architects
Dallas, Texas
PROJECT NO.
026602
UPPER LOWER FLOW ZONE
TCE CONTOURS - 1996 DATA
CONTRACT NO.
SHEET NO.

Figure 10



690600

Figure 11

While the organic contaminant concentrations have decreased with time in the on-site and certain off-site monitoring wells, other off-site monitoring wells have shown an increase in organic concentrations related to the continued migration of the contaminant plume beyond the boundary defined during the RFI. Based on available data, the contamination extends at least 60 feet below the water table. However, the existing monitoring system does not completely define the horizontal and vertical extent of the contamination.

SUMMARY OF SITE RISKS

The New Mexico Environment Department, the New Mexico Office of the Natural Resources Trustee, the New Mexico Attorney General's Office, and the City of Albuquerque have all issued separate notices that an imminent and substantial endangerment to health or the environment may exist at or near the Sparton Technology, Inc., facility at 9621 Coors Road, NW, Albuquerque, New Mexico, pursuant to 42 U.S.C. §6972(a)(1)(B). These findings are the result of past waste management practices at the Sparton facility which have resulted in releases to the ground water and soil. These entities claim that the contamination from the Facility threatens the ability of the City of Albuquerque to use the ground water in this area as a source of drinking water in the future. EPA has not made a determination as of this date as to whether an imminent and substantial endangerment exists pursuant to 42 U.S.C. §6973.

Under Section 3008(h) of RCRA, 42 U.S.C. §6928(h), corrective action is required to protect human health or the environment. Ground water currently supplies the sole source of drinking water for the City of Albuquerque. At this site, the aquifer is potentially useable as a source of drinking water, and is currently used outside of the contaminant plume for this purpose. The New Mexico Utilities Inc., water supply well No. 2 is approximately 2 miles downgradient (northwest) of the leading edge of the contaminant plume. Therefore, a protective goal at this site is the restoration of potentially drinkable ground water to levels safe for drinking throughout the contaminated plume, regardless of whether the water is in fact currently being consumed. Restoration refers to the reduction of contaminant concentrations to the more stringent of either: 1) the Maximum Contaminant Levels (MCLs) for drinking water established under the Safe Drinking Water Act; or 2) the maximum allowable contaminant concentrations in ground water set by the State of New Mexico Water Quality Control Commission (WQCC). MCLs were established to reduce the risk of adverse health effects to users of public water supply systems. Protection of the ground water as a source of drinking water and as a natural resource is protected under 20 NMAC 6.2.3101. Table 2 lists the specific contaminants present in the ground water and the corresponding Federal MCL and State WQCC standard.

Other site risks are directly related to the former sump and the two waste impoundments. During closure of these units, the liquid wastes were removed and a protective cap placed across the former waste management area. The cap reduced the potential for direct exposure to the residual hazardous waste present in the units and in the surrounding soils. The cap also prevents stormwater runoff from transporting contaminants into the surrounding water bodies.

TABLE 2		
Contaminant	MCL (ppb)	WQCC (ppb)
Trichloroethylene	5	100
1,1,1-Trichloroethane	200	60
Methylene Chloride	NA*	100
1,1-Dichloroethylene	7	5
Tetrachloroethylene	5	NA*
Benzene	5	10
Toluene	1000	750
Chromium (total)	100	50

* Not Available

The following corrective action objectives have been established for this site as protective of human health and the environment: 1) prevent further migration of the contaminant plume; 2) restore the contaminated aquifer to the more stringent of Federal or State standards; and 3) reduce the quantity of source material in the soil and ground water, to the extent practicable, to minimize further release of contaminants to the surrounding ground water, and ensure no further contaminant migration to the ground water above the existing cleanup goals established for ground water.

SUMMARY OF ALTERNATIVES

The individual corrective measure alternatives in the final CMS Report have been combined and renumbered to present comprehensive alternatives for addressing the release of contaminants into the ground water and soil. The descriptions and evaluations of the corrective measure alternatives are presented in greater detail in the final CMS Report and Administrative Record. Information gathered during and after the RFI was used to develop several remedial alternatives in the final CMS Report. Sparton also conducted a screening process to eliminate those remedial

alternatives that may prove infeasible to implement, or that rely on technologies unlikely to perform satisfactorily or reliably.

The alternatives for remediation of the contaminated ground water and contaminant source areas are:

- Alternative 1: No Further Action
- Alternative 2: On-Site Ground Water Extraction and Soil Vapor Extraction
- Alternative 3: Expanded Ground Water Extraction
- Alternative 4: Expanded Ground Water Extraction and Soil Vapor Extraction
- Alternative 5: Expanded Ground Water Extraction, Soil Vapor Extraction, and Air Sparging
- Alternative 6: Expanded Ground Water Extraction and Soil Flushing
- Alternative 7: In Situ Bioremediation

Common Elements

Except for the "No Further Action" alternative, all of the alternatives that were considered for the site included a number of common elements. Each of the alternatives include long-term operation and maintenance (O&M) activities for ground water extraction and treatment, with the more conservative time frame for the O&M being 30 years. With all of the alternatives, further investigation of the horizontal and vertical extent of the ground water contamination will be required. An additional 20 or more ground water monitoring wells may be necessary to define the extent of the contaminant plume. The 20 or more wells would be in addition to the existing ground water monitoring well network. The number of additional wells may increase or decrease as the site characterization progresses. Additional monitoring wells may be needed after defining the plume as the contaminant plume continues to migrate, in response to future performance of the selected remedy, or any other changes in site conditions. Due to uncertainties in predicting the number of monitoring wells necessary for the future, no additional costs have been included beyond the initial 20 well estimate. However, Sparton has only recommended five additional wells for further characterization of the contaminant plume, and no additional wells or well costs to monitor the continued plume migration.

Each of the alternatives include a routine quarterly ground water monitoring schedule within and surrounding the contaminant plume to evaluate changes in the extent of the contaminant plume, changes in contaminant concentrations within the plume, and ensure the effectiveness of the remedy. An estimated 20 to 40 monitor wells may be required for the quarterly monitoring schedule. This estimate includes some of the existing monitoring wells installed in the on-site and off-site areas. The total number of wells for the quarterly monitoring schedule may

increase or decrease from this estimate based on the results of the site characterization, continued migration of the contaminant plume, future performance of the selected remedy, and any other changes in site conditions.

The following estimates for monitoring well construction and ground water sampling and analyses are included in Alternatives 2-7.

- Construction of 20 Monitoring Wells: $400,000
- Sampling and Analyses for 40 Monitoring Wells: $160,000/Year

The cost estimates presented for each of the following alternatives include capital costs, operation and maintenance costs, and present worth costs. The costs of several of the alternatives differ from those costs described in the EPA Statement of Basis because Sparton has revised the estimates in the final CMS Report. However, the costs are estimates and may not accurately reflect the final costs for each of the alternatives.

All costs and time required to operate the individual alternatives are estimates. For alternatives 3-7, the ability to achieve cleanup goals throughout the contaminated aquifer cannot be determined until the technologies are implemented, modified as necessary, and the plume response monitored over time. Due to the uncertainty in predicting the time necessary for restoration of the ground water to its beneficial use, all costs were based on a thirty year operational period for comparison purposes. For Alternative 2, it is assumed that the contaminant plume will remain in the ground water beyond the 30-year period. However, costs are only presented for a 30-year period for ease of comparison.

All of the alternatives can create potential impacts to the local community involving construction activities in the public right-of-ways for the off-site monitoring wells, quarterly sampling activities for the monitoring wells, and routine operation and maintenance activities for the monitoring wells.

Description of Alternatives

Alternative 1: No Further Action

Description

The "No Further Action" alternative is often evaluated to establish a baseline for the comparison with other alternatives. Under this alternative, no further remedial actions are performed by Sparton to address the existing ground water and soil contamination. In addition, Sparton's operation of the existing

ground water recovery and treatment system at the Coors Road facility would be discontinued.

Total Cost

Present Worth Cost: $0
Capital Cost: $0
Operation & Maintenance: $0

Time of Implementation

Design/Remedial Action: 0 months
Operation & Maintenance: 0 months

Alternative 2: On-Site Ground Water Extraction System and Soil Vapor Extraction

Description

Sparton has recommended Alternative 2 to address the release of contamination from the Coors Road facility. Alternative 2, as presented in EPA's Statement of Basis, was Sparton's previous recommendation in the draft CMS Report and consisted of the following: 1) continued operation of the existing ground water extraction and treatment system to remove contaminants from the ground water at the Coors Road facility; and 2) natural attenuation of the off-site contaminant plume. As part of the natural attenuation process, Sparton also proposed an annual evaluation of any changes in land use/development to determine the need for further studies as part of the routine ground water monitoring program.

Sparton has now amended Alternative 2 to include the following: 1) convert the existing monitoring well MW-32 into an extraction well; this well is located near the western fence-line of the Facility and would pump ground water from a depth of 35 feet below the water table; 2) sampling of the contaminant vapor concentrations in the soil beneath the facility and installation of a soil vapor extraction system if vapor concentrations are above a threshold value; and 3) installation of five additional ground water monitoring wells to confirm plume location and movement.

The existing ground water extraction system was previously described in the section on Interim Measures. The existing air stripper has sufficient remaining capacity to accommodate additional flow from another recovery well added to the system. Operation of the air stripper unit has confirmed the effectiveness and reliability of this technology for treating ground water contaminated with volatile organic compounds. However, the increased flow from the additional extraction well would also require disposal following treatment. Sparton did not

indicate in the final CMS Report if their proposal included continued disposal in the sanitary sewer system. It is not known at this time if the City of Albuquerque would permit continued disposal in the sewer system from the existing, or an expanded, on-site extraction system.

Since the existing on-site extraction system, or an expanded version of the on-site system, is not capable of containing or removing contaminants from the ground water outside of the facility, naturally occurring physical and biological processes would be relied upon to reduce the contaminant concentrations (natural attenuation). Since there have been no identified biological processes to transform the remaining contaminants, physical processes such as dilution and adsorption would be relied upon. As a result, the contaminant plume will continue to migrate for an indefinite period of time at concentrations exceeding the cleanup goals specified for this site.

In addition to the on-site recovery system, a soil vapor extraction (SVE) system would be installed to enhance the removal of volatile organic contaminants from source areas in the soil and ground water. Further removal of organic contaminants will assist in the attainment of the ground water cleanup goals. The SVE system does not remove inorganic compounds in the soil. SVE wells are installed in the soil above the water table to create a partial vacuum in the soil. This vacuum produces a flow of air which vaporizes the volatile organic compounds from the surrounding soil. The air and vapor mixture is then drawn into the SVE wells and collected at the surface for treatment before venting to the atmosphere. In situ air stripping processes are generally effective in removing volatile organic compounds (e.g. trichloroethylene and trichloroethane) from the soil. Since the SVE system does not result in the physical destruction or transformation of the contaminants, the organic vapors would have to be removed from the air by a granular activated carbon unit to prevent the transfer of contaminants to the atmosphere. The granular activated carbon would then be disposed of off-site or regenerated for future use.

Further sampling of the subsurface soil and contaminant vapor concentrations is necessary prior to installation of a SVE system. This data can then be used to evaluate the design and performance of a soil vapor extraction system. Preliminary remediation goals for contaminant vapors beneath the facility have been set by NMED at 10 ppmV. Further evaluation of this cleanup goal will be performed to determine if a lower cleanup goal is necessary to achieve maximum reductions in ground water contamination.

Since the highest volatile organic concentrations are expected to be associated with the source material in the on-site soil and ground water, the SVE wells would be installed on-site to remove

the maximum amount of contaminants. Performance of the SVE system can be enhanced with the addition of blowers which would force air into the soil in surrounding wells. Further enhancements to the SVE system can be achieved by lowering the water level in the upper few feet of the aquifer at the facility to allow greater volatilization of the organic contaminants in the upper flow zone. An added benefit of the SVE system is the potential for decreasing the time frame for meeting cleanup goals in the ground water by enhancing the volatilization of volatile organic compounds from the water table, thereby further reducing concentrations in the ground water.

Sparton has estimated that a 10 to 20 well SVE system will be necessary to effectively remediate the Coors Road facility. Sparton has also estimated operation of the SVE system would last approximately one to three years. Accordingly, the total O&M cost for cleanup of the site decreases after the third year in operation to reflect the discontinued operation of the SVE system. The ground water extraction system would continue to operate at the Facility and is reflected in the O&M costs for years 4-30. Also, since the five additional monitoring wells proposed by Sparton would be insufficient to monitor the contaminant plume, the capital and O&M costs for an expanded ground water monitoring system are included in the total cost estimate.

Total Cost

Present Worth Cost: $3.48 million
Total Capital Cost: $560,000
Total Operation & Maintenance: $213,000/Years 1-3;
$185,000/Years 4-30

Individual Component Cost

On-Site Ground Water Extraction System

Capital Cost: $10,000
Operation & Maintenance: $25,000/Year

Soil Vapor Extraction System - 20 Wells

Capital Cost: $150,000
Operation & Maintenance: $28,000/Years 1-3

Ground Water Monitoring

Capital Cost: $400,000
Operation & Maintenance: $160,000/Year

Time of Implementation

Design/Remedial Action: 1 year
Operation & Maintenance: 30 years

Alternative 3: Expanded Ground Water Extraction System

Description

Alternative 3 calls for the installation of ground water extraction wells to prevent further migration of the contaminant plume and restore the contaminated aquifer to its beneficial use. This alternative would require the installation of extraction wells at the Facility, and in off-site areas, preferably in existing public right-of-ways. The ground water monitoring wells installed in off-site areas are also installed in existing public right-of-ways.

This alternative can be implemented in several phases. For the contaminant plume extending off-site from the Sparton facility, an initial phase would include further characterization of the ground water contamination to determine the complete horizontal and vertical extent of the contaminant plume. As discussed in the Common Elements Section, the current estimate is that an additional 20 monitoring wells may be needed to monitor the contaminant plume.

After redefining the leading edge of the contaminant plume, ground water extraction wells would be installed near this leading edge to prevent further migration of the plume. Current estimates indicate that one to three extraction wells may be required to accomplish this goal. The appropriate number and location of the extraction wells would be determined during the design phase of the remedy. The construction and operation of two new extraction wells off-site from the Facility have been used for cost purposes. After construction of this phase of the system is completed, the extraction system and surrounding ground water monitoring wells would be carefully monitored on a regular basis to evaluate the performance of the system in meeting the containment goal. Further refinement of the extraction system may be necessary during the monitoring phase to prevent further migration of the contaminant plume. Quarterly sampling and analyses of selected monitoring wells would also continue for evaluation of the contaminant plume.

Along with the efforts to define and control migration of the leading edge of the plume, additional extraction well(s) would be installed on-site at the Coors Road facility to begin further containment and restoration of the contaminated ground water. At least one additional well would be required to achieve this goal. The appropriate number and location of the extraction wells for the on-site area would also be determined during the design phase

of the remedy. The construction and operation of one new extraction well at the Facility has been used for cost purposes. After construction of this phase of the system is completed, the extraction system and surrounding ground water monitoring wells would be carefully monitored on a regular basis to evaluate the performance of the system in meeting the containment and restoration goals. Further refinement of the extraction system may be necessary during the monitoring phase to prevent further migration of the contaminant plume. Quarterly sampling and analyses of selected monitoring wells would also continue for evaluation of the contaminant plume.

In a final phase, additional extraction wells are installed as necessary in off-site areas to restore the aquifer for use as a source of drinking water, in addition to controlling further plume migration. Due to the uncertainty in the number of extraction wells needed for the final phase, no costs have been included in the cost estimate for these wells. However, costs would be similar to costs of the extraction wells set forth above. Restoration is defined as attainment of the media standards (the more stringent of Federal MCLs or State WQCC standards) in the aquifer, over the entire contaminant plume. As additional physical data on the aquifer is collected and performance of the initial phases of the extraction system are monitored, the number of recovery wells for restoration of the contaminated aquifer would be better determined.

The extracted ground water from the off-site recovery wells would have to be transported back to the Facility via underground pipes for treatment. Since the contaminants present in the ground water include both organic and inorganic compounds, the treatment system may require two separate treatment units. For organic compounds, the treatment unit may consist of a larger air stripper to remove volatile organic compounds, and a granular activated carbon unit to reduce air emissions from the air stripper. For the inorganic compounds, the treatment unit may consist of an ion exchange unit for removal of metals from the water. Other treatment options for organic compounds include chemical and/or UV oxidation, and aerobic biological reactors. For the inorganic compounds, other available technologies include chemical precipitation and electrochemical methods. The final sequence of technologies used for the ground water treatment train would be determined during the remedial design. An air stripper and an activated carbon unit (organic compounds) and ion exchange (metals) have been used as treatment options for cost purposes. However, since there exists the possibility that metal concentrations in the recovered ground water may be below levels requiring treatment, the total costs were also presented without the costs for ion exchange. Any treatment train will need to be designed to: 1) attain the chemical-specific discharge requirements; and 2) be easily modified to treat increased flow from an expanded extraction system.

The expanded volume of recovered and treated ground water could nc longer be discharged into the sewer system. Options for disposal of the treated ground water may include reinjection back into the aquifer, reuse of the treated ground water as irrigation water, or disposal into the Rio Grande. Reinjection into the aquifer has been used for cost purposes. Any disposal option will have to be consistent with both the State regulations governing ground water usage, and the water management plan presented in the Albuquerque Water Resources Management Strategy - San Juan-Chama Diversion Project Options (July 1995), and the Albuquerque/ Bernalillo County Ground Water Protection Policy and Action Plan (1994).

The ability to achieve the ground water cleanup goals throughout the entire ground water contaminant plume with Alternative 3 cannot be realized within a few years. It is likely that many years of ground water pumping and treatment will be required in order to determine if ground water cleanup goals can be achieved. The presence of high contaminant concentrations and the possible presence of DNAPL in the ground water, as well as the process of chemical and physical desorption of contaminants in both the ground water and soil which lies below the Facility, may delay achieving the cleanup goals throughout the aquifer. A possibility exists that the ground water contaminants may show a rapid initial drop in concentration and then level out to relatively constant, or slowly declining, concentrations. This relatively constant concentration would exist regardless of the length of time ground water extraction was implemented. The equilibrium or steady-state concentration of these organic and inorganic contaminants in the ground water may be greater than the corresponding cleanup goals.

Performance of a ground water extraction system would be carefully monitored on a regular basis and adjusted as warranted by the collected data. Refinement of the system may be required, if EPA determines that such measures will be necessary in order to restore the aquifer in a reasonable time frame, or to significantly reduce the time frame or long-term cost of attaining this objective. Post-construction refinements to the alternative may include any or all of the following:

- adjusting the pumping rate in some or all of the ground water extraction wells;
- installing additional extraction wells to facilitate or accelerate cleanup of the contaminant plume;
- initiating a pulsed pumping schedule in some or all of the ground water extraction wells to eliminate flow stagnation areas, or otherwise facilitate recovery of contaminants from the aquifer;

Water Treatment Includes Ion Exchange for Metals Removal

Present Worth Cost: $26.393 million
Total Capital Cost: $2,862,500
Total Operation & Maintenance: $1,553,900/Years 1-3;
$1,525,900/Years 4-30

Individual Component Cost

Soil Vapor Extraction System - 20 Wells

Capital Cost: $150,000
Operation & Maintenance: $28,000/Years 1-3

Cost Estimate for Alternative 3

Water Treatment Without Ion Exchange for Metals Removal

Total Capital Cost: $2,125,000
Total Operation & Maintenance: $825,900/Year

Water Treatment Includes Ion Exchange for Metals Removal

Total Capital Cost: $2,712,500
Total Operation & Maintenance: $1,525,900/Year

Time of Implementation

Design/Remedial Action: 1-2 Years
Operation & Maintenance: 1-3 Years - Soil Vapor Extraction;
30 Years - Ground Water Recovery

Alternative 5: Expanded Ground Water Recovery System, Air Sparging and Soil Vapor Extraction

Description

Alternative 5 includes all of the activities outlined in Alternative 4. In addition, air sparging wells would be installed in the aquifer to remove additional source material. Air sparging utilizes wells installed in the aquifer to inject clean air directly into the ground water. Dissolved volatile organic compounds are stripped from the ground water by the rising air bubbles around the air injection wells. As the volatile organic compounds rise upward to the overlying soil, the SVE system collects the contaminants for treatment. In addition, the SVE system removes existing soil vapor from the surrounding soil. In situ air stripping/air sparging processes are generally effective in removing volatile organic compounds (e.g. trichloroethylene & trichloroethane) from the soil and ground water.

An added benefit of the combined air sparging/SVE system is the potential for decreasing the time frame for meeting cleanup goals in the ground water by enhancing the volatilization of volatile organic compounds from the water table, thereby further reducing concentrations in the ground water. Site limitations at the Facility may involve the presence of low permeability silt/clay layers which may produce lateral spreading of the volatile organic compounds in the ground water outside of the treatment zone. Performance tests would need to be conducted to determine the radius of influence created by the air injection wells in the aquifer.

Since the air sparging/air stripping technologies do not result in the physical destruction or transformation of the contaminants, the organic vapors would have to be removed from the air by a granular activated carbon unit to prevent the transfer of contaminants to the atmosphere. The granular activated carbon would then be disposed of off-site or regenerated for future use. The air stripping technologies are not useful in removing inorganic compounds in the soil or ground water.

The following cost estimates are presented for Alternative 5. Since the extracted ground water may or may not require further treatment to remove metals prior to disposal, the present worth cost along with the total capital cost and total O&M cost is presented with both ion exchange and without ion exchange.

Total Cost

Water Treatment Without Ion Exchange for Metals Removal

Present Worth Cost: $15.747 million
Total Capital Cost: $2,652,500
Total Operation & Maintenance: $972,650/Years 1-3;
$825,900/Years 4-30

Water Treatment Includes Ion Exchange for Metals Removal

Present Worth Cost: $27.094 million
Total Capital Cost: $3,240,000
Total Operation & Maintenance: $1,672,650/Years 1-3;
$1,525,900/Years 4-30

Individual Component Cost

Air Sparging

Capital Cost: $377,500
Operation & Maintenance: $118,750/Years 1-3

Cost Estimate for Alternative 4

Water Treatment Without Ion Exchange for Metals Removal

Total Capital Cost: $2,275,000
Total Operation & Maintenance: $853,900/Years 1-3
$825,900/Years 4-30

Water Treatment Includes Ion Exchange for Metals Removal

Total Capital Cost: $2,862,500
Total Operation & Maintenance: $1,553,900/Years 1-3
$1,525,900/Years 4-30

Time of Implementation

Design/Remedial Action: 1-2 Years
Operation & Maintenance: 1-3 Years - Air Sparging/SVE;
30 Years - Ground Water Recovery

Alternative 6: Expanded Ground Water Extraction and Soil Flushing

Description

Alternative 6 includes all of the activities outlined in Alternative 3. Instead of implementing a soil vapor extraction system as described in Alternatives 2 and 4, a soil flushing system is used to remove source material (both organic and inorganic contaminants) from the soil overlying the ground water. The process uses a flushing agent such as a solvent or surfactant solution to promote or enhance the mobility of the contaminants in the soil. The flushing process transports the contaminants downward to the ground water for recovery in extraction wells, and the contaminants are then pumped to the surface for treatment. The flushing agent can be applied to the soil by use of sprinkler system. Site limitations involve the presence of low permeability silt/clay layers in the soil above and within the water table which may produce lateral spreading of the flushing agent outside of the treatment zone. Performance tests would need to be conducted to determine the effectiveness of the technology under site conditions.

The following cost estimates are presented for Alternative 6. Since the extracted ground water may or may not require further treatment to remove metals prior to disposal, the present worth cost along with the total capital cost and total O&M cost is presented with both ion exchange and without ion exchange.

Total Cost

Water Treatment Without Ion Exchange for Metals Removal

Present Worth Cost: $16.005 million
Total Capital Cost: $2,875,000
Total Operation & Maintenance: $985,000/Years 1-3;
$825,900/Years 4-30

Water Treatment Includes Ion Exchange for Metals Removal

Present Worth Cost: $27.350 million
Total Capital Cost: $3,462,500
Total Operation & Maintenance: $1,685,000/Years 1-3;
$1,525,900/Years 4-30

Individual Cost Components

Soil Flushing

Capital Cost: $750,000
Operation & Maintenance: $160,000

Cost Estimate for Alternative 3

Water Treatment Without Ion Exchange for Metals Removal

Total Capital Cost: $2,125,000
Total Operation & Maintenance: $825,900/Year

Water Treatment Includes Ion Exchange for Metals Removal

Total Capital Cost: $2,712,500
Total Operation & Maintenance: $1,525,900/Year

Time of Implementation

Design/Remedial Action: 1-2 Years
Operation & Maintenance: 1-3 Years - Soil Flushing
30 Years - Ground Water Recovery

Alternative 7: In Situ Bioremediation

Description

In situ bioremediation is a process in which microorganisms completely or partially decompose organic contaminants, such as trichloroethylene, in the ground water and soil. The decomposition process can occur under either anaerobic (absence of dissolved oxygen) or aerobic (presence of dissolved oxygen) conditions. Limitations include the potential inability to produce a non-toxic degradation product due to incomplete

biodegradation and sensitivity to toxins, and changing environmental conditions resulting in limited bioremediation. The intermediate products produced by biodegradation may be more toxic than the original contaminant.

Within the contaminant plume originating from the Coors Road facility, there has been no data presented which would indicate which of the conditions exist in the plume. However, since there have been no identified by-products from anaerobic degradation, it is possible that aerobic conditions are present.

In order to enhance the bioremediation process under aerobic conditions, additional oxygen and nutrients would have to be injected into the ground water and soil. Sparton has estimated that 50 injection wells centered on a 100 ft. spacing would be required to implement an enhanced bioremediation system for the ground water and another 50 injection wells for the soil. Such a spacing would present difficulties since many of the well locations would be in non-public right-of-ways requiring access agreements in the local neighborhoods. The efficiency of the bioremediation process is limited by the ability to deliver a uniform application of nutrients and oxygen into the soil and ground water. Performance tests would need to be conducted to determine the effectiveness of the technology under site conditions.

The high contaminant concentrations beneath the Coors Road facility would probably restrict the initial application of bioremediation to less contaminated off-site areas. The on-site concentrations would have to be further reduced by continued operation of the existing or an expanded version of the on-site ground water extraction system prior to application. Therefore, all of the activities outlined in Alternative 2 would also be implemented as part of Alternative 7.

Sparton has revised the costs estimates for the bioremediation system. Capital costs have been reduced from $2,500,000 to $1,437,500 and operation and maintenance costs have been reduced from $650,000 to $393,750. Sparton did not present an explanation for the significant change in the cost estimates. Because there is no performance data to suggest the time in which bioremediation could achieve the cleanup goals, all costs were estimated for a 30-year period.

<u>Total Cost</u>

Present Worth Cost: $10.970 million
Total Capital Cost: $1,997,500
Total Operation & Maintenance: $606,750/Years 1-3;
$578,750/Years 4-30

Individual Component Costs

In Situ Bioremediation-Ground Water

Capital Cost: $875,000
Operation & Maintenance: $212,500/Year

In Situ Bioremediation-Soil

Capital Cost: $562,500
Operation & Maintenance: $181,250/Year

Cost Estimate for Alternative 2

Capital Cost: $560,000
Operation & Maintenance: $213,000/Years 1-3; $185,000/Years 4-30

Time of Implementation

Design/Remedial Action: 1 year
Operation & Maintenance: 30 Years

EVALUATION OF ALTERNATIVES

Prior to EPA's decision on a final remedy selection, the performance of all of the alternatives is evaluated against the nine criteria outlined in the Guidance on RCRA Corrective Action Decision Documents, Office of Solid Waste and Emergency Response (OSWER) Directive 9902.6 (Please see Figure 12 which discusses the criteria in more detail). In addition, there are two modifying criterion, State and Community Acceptance, which EPA considers in making its final remedy selection. The following discussion profiles how the performance of each of the alternatives compared against the four general standards, the five remedy decision factors, and the two modifying criterion.

1. **Overall Protection of Human Health and the Environment**

The first decision factor is a general mandate from the RCRA statute. Since the aquifer is potentially useable as a source of drinking water, and is currently used outside of the contaminant plume for this purpose, the final remedy selected for this site will have the goal of protecting the ground water by reducing or controlling the contamination in the soil and ground water. Alternative 1, "No Further Action", will not be considered further as a remedial alternative because it will not provide any protection to human health or the environment. Each of the remaining alternatives provide some degree of protection to human health and the environment by reducing the levels of contamination in the ground water and/or soil.

FIGURE 12

FOUR GENERAL STANDARDS FOR REMEDY SELECTION			
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	ATTAIN MEDIA CLEANUP STANDARDS	CONTROL THE SOURCES OF RELEASES	COMPLY WITH STANDARDS FOR MANAGEMENT OF WASTES
• How alternatives provide human health and environmental protection	• Ability of alternatives to achieve the media cleanup standards. Media cleanup standards are the Federal and State statutory and regulatory requirements that a selected remedy must meet.	• How alternatives reduce or eliminate to the maximum extent possible further releases	• How alternatives assure that management of wastes during corrective measures is conducted in a protective manner

FIVE SELECTION CRITERIA FOR REMEDY SELECTION				
LONG-TERM RELIABILITY AND EFFECTIVENESS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME OF WASTES	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
• Magnitude of residual risk • Adequacy and reliability of controls	• Treatment process used and materials treated • Amount of hazardous materials destroyed or treated • Degree of expected reductions in toxicity, mobility, or volume • Degree to which treatment is irreversible • Type and quantity of residuals remaining after treatment	• Protection of community during remedial actions • Protection of workers during remedial actions • Environmental impacts • Time until remedial action objectives are achieved	• Ability to construct and operate the technology • Reliability of the technology • Ease of undertaking additional corrective measures, if necessary • Ability to monitor effectiveness of remedy • Coordination with other agencies • Availability of off-site treatment, storage, and disposal services and specialists • Availability of prospective technologies	• Capital costs • Operating and maintenance costs • Present worth cost

MODIFYING CRITERIA	
STATE ACCEPTANCE	COMMUNITY ACCEPTANCE
• The State has an opportunity to review the CMS Report and the Statement of Basis and offer comments to EPA. The State may agree with, oppose, or have no comment on the EPA preferred alternative	• During the public comment period, interested persons or organizations may comment on the alternatives. EPA considers these comments in making its final remedy selection. The comments are addressed in the Final Decision and Response to Comments document.

2. Attainment of Media Cleanup Standards

The final remedy will have the goal of meeting the applicable media cleanup standards. Since the aquifer is potentially useable as a source of drinking water, and is currently used outside of the contaminant plume for this purpose, standards for exposure to the contaminants in the ground water are based upon the more stringent of either: 1) the Maximum Contaminant Levels (MCLs) for drinking water established under the Safe Drinking Water Act; or 2) the maximum allowable contaminant concentrations in ground water set by the State of New Mexico Water Quality Control Commission (WQCC). Protection of the ground water as a source of drinking water and as a natural resource is protected under 20 NMAC 6.2.3101. Table 2 lists some of the contaminants present in the ground water and the corresponding Federal MCL and State WQCC standard.

Alternatives 4-6 would best achieve the media cleanup standards by reducing the quantity of source material available for migration to the surrounding ground water, and removal of contaminants throughout the ground water to restore the ground water to its beneficial use. Alternative 3 has the potential to meet the media cleanup standards for ground water through long-term operation. However, source material would remain in the soil and ground water, providing a long-term source of additional contamination to the surrounding ground water, and potentially limiting the effectiveness of this technology. Alternatives 2 and 7 would be limited or unable to meet the media cleanup standards by continuing to recover contaminants only from beneath the Sparton facility, while the off-site plume would remain at concentrations exceeding the cleanup standards for an indefinite period of time.

3. Controlling the Sources of Releases

Each of the remedial alternatives considered for the final remedy must address the potential for any remaining source material at the Facility. The control of source material to the extent practicable is necessary in eliminating further releases, and for the long-term strategy of addressing the ground water contamination. Unless source control measures are taken, efforts to clean up the ground water may be ineffective or, at best, will involve an essentially perpetual cleanup situation.

Alternatives 2 and 4-7 would provide the most effective source control by including additional technologies along with ground water extraction for removal and treatment of the source material in the on-site soil and ground water. Alternative 3 would rely solely on ground water extraction for source control.

4. **Compliance with Waste Management Standards**

Each of the remedial alternatives considered for the final remedy must comply with the requirements for management of wastes during construction of the remedy and routine operation and maintenance activities. Standards potentially impacting the various alternatives include regulatory limits on the discharge of contaminants into the atmosphere and treated ground water, disposal of residues from the treatment of ground water, and the consumption of ground water.

Alternatives 2 through 7 would comply with all applicable waste management standards. Recovered ground water would be treated through an air stripper to remove the volatile organic contaminants. Air emissions from the air stripper and soil vapor extraction system would be treated through a granular activated carbon unit to remove volatile organic contaminants prior to discharge to the atmosphere. Additional treatment of the recovered ground water may be necessary to remove metals prior to discharge. The granular activated carbon and any residues generated from the treatment process would be disposed or treated off-site at a permitted facility. The treatment train would be designed to attain the chemical-specific discharge requirements for the treated ground water and air emissions.

5. **Long-Term Reliability and Effectiveness**

Each of the remedial alternatives were evaluated on the ability to provide adequate protection of human health and the environment over the long-term. Adequate protection includes source control technologies to ensure that environmental damage from the sources of contamination at the facility will not occur in the future. The magnitude of the residual risk and the adequacy and reliability of preventive controls were also evaluated.

Alternatives 4-6 provide the best long-term approach for protection of human health and the environment. Alternatives 4-6 include an active remedial approach for the entire contaminant plume, as well as the source material remaining in the soil beneath the facility. The combination of technologies would ensure that the maximum amount of contaminants would be recovered. While Alternative 2 includes the removal of contaminants from beneath the Facility, this remedial approach would rely on institutional controls to prevent long-term exposure to the migrating contaminant plume. The active treatment of wastes in Alternatives 4-6 is preferred to the institutional controls in Alternative 2. Alternative 3 would provide a reduction in long-term risk by reducing concentrations throughout the contaminant plume by preventing further migration and recovering contaminants from the off-site contaminant plume. However, contaminants would remain in the soil and provide a

long-term source of additional contamination to the ground water. Due to the uncertainty in whether the in situ bioremediation process would achieve any reduction in contaminant concentrations at this site, Alternative 7 does not provide adequate long-term protection.

6. **Reduction of Toxicity, Mobility, or Volume of Wastes**

Remedial alternatives are favored during the selection process that are capable of permanently reducing the overall degree of risk posed by the contamination in the ground water and soil. This criteria is directly supportive of the goal for achieving long-term reliability. Each of the alternatives were carefully evaluated for the amount of expected reductions in the toxicity, mobility, or volume of wastes, and the type and quantity of the remaining residual waste following implementation of the remedy.

Alternative 7 would involve biological processes that have the potential to permanently reduce or destroy the organic contaminants, and if successful, would achieve the maximum reduction in toxicity, mobility, and volume through treatment. However, the expected success of Alternative 7 is relatively low. Alternatives 4-6 provide the greatest practical reduction in overall toxicity, mobility, and volume of contaminants by permanently removing contaminants from all areas of the ground water contaminant plume, as well as the source material remaining in the soil beneath the facility. The combination of technologies would ensure that the maximum amount of contaminants would be recovered. Alternative 3 would also provide a reduction in volume throughout the contaminant plume, but would not recover contaminants from the remaining source area beneath the Sparton facility. While Alternative 2 includes the removal of contaminants from beneath the Facility, this remedial approach would achieve the least reduction in ground water contamination by addressing only the on-site contaminated ground water.

Since existing technologies cannot ensure a 100% removal efficiency rate, there may be some concentration of contaminants remaining above the media cleanup standards for Alternatives 2 through 7. In addition, the proposed treatment processes in Alternatives 2 through 6 do not result in the permanent destruction of the contaminants, but instead rely on the transfer of contaminants to a permanent off-site disposal site.

7. **Short-Term Effectiveness**

This decision factor directly affects the local community since Alternatives 2-7 require some amount of construction activities in areas being developed for residential and commercial purposes. Protection of the local residents in the community, as well as workers involved in construction of a remedy, must be accounted for when evaluating each of the remedial alternatives. Potential

threats to the community involve exposure to contaminants during construction activities, management of contaminated media, and routine operation and maintenance activities. A potential threat does exist to the community from inadvertent destruction or vandalism of the off-site pipeline and wellheads, resulting in a release of contaminated ground water at the surface. While this possibility will be accounted for in the design and engineering of the off-site structures, the potential threat will remain during the operational period of the preferred remedy.

8. **Implementability**

This decision factor involves the future activities which must be coordinated between the City, County, State, and Federal governments for issuance of any permits at the site. Permits which may be required for the listed alternatives include construction activities in public right-of-ways, recovery and treatment of contaminated ground water, disposal of treated ground water, and management and disposal of hazardous contaminants. The issuance of these permits may affect the time required for implementation of the selected remedy.

Alternatives 2 through 4 utilize existing technology with no exceptional technical obstacles to prevent implementation, operation, performance monitoring and future modifications to the system design. For Alternatives 3 through 7, obstacles exist in the form of permits and/or administrative approvals required for installation of off-site structures in public easements, the discharge of recovered vapors to the atmosphere, the pumping of additional ground water from the aquifer, and the possibility for reinjection of ground water back into the aquifer. An additional obstacle is the requirement for an off-site facility for the regeneration or disposal of the granular activated carbon. Alternatives 5 through 7 would also require the performance of additional testing with varying degrees of uncertainty regarding actual implementation. The success of Alternative 7 is uncertain due to the limited success in aerobic degradation of the organic contaminants.

9. **Cost**

Cost is considered when choosing among the seven alternatives that best meet the objectives at the site. Based on the previous evaluation, Alternatives 4-6 offer a relatively equivalent protection of human health and the environment. Of these, Alternative 4 provides the lowest present worth cost for addressing contamination at the site at $15.046-26.393 million. Alternatives 5 and 6 have a present worth cost of $15.747-27.094 million and $16.005-27.350 million, respectively. Due to the uncertainty in predicting the time necessary for restoration of the ground water to its beneficial use, all costs were based on a thirty year operational period for comparison purposes.

10. **State Acceptance**

State acceptance is a modifying criterion with respect to the evaluation process. The State concerns that were assessed under this criterion include the following: 1) the State's position and key concerns related to the contamination originating from the Sparton Technology site and the corrective measure alternatives; 2) the State's preferred alternative for addressing contamination at this site; and 3) the applicable State and local standards and any waiver of these standards. EPA has and will continue to coordinate actions at this site through the New Mexico Environment Department, the New Mexico Office of the Natural Resources Trustee, the City of Albuquerque Environmental Health Department and the Public Works Department, and the County of Bernallilo.

The New Mexico Environment Department (NMED) preferred remedy is Alternative No 5, as set forth in a letter from Mr. Ed Kelley, Division Director of NMED, dated February 7, 1996. This letter is included in the Administrative Record for this site.

The New Mexico Office of the Natural Resources Trustee (ONRT) preferred remedy is Alternative No. 5, as set forth in a letter from Mr. Steve Cary, Deputy Director of ONRT, dated February 8, 1996. This letter is included in the Administrative Record for this site.

The City of Albuquerque Public Works Department preferred remedy is Alternative No. 5, as set forth in a letter from Mr. A. Norman Gaume, Manager of the Water Resources Program, dated February 8, 1996. This letter is included in the Administrative Record for this site.

The New Mexico Attorney General's Office preferred remedy is either of the more comprehensive remedies described in Alternatives 3-7, as set forth in a letter from Mr. Charles de Saillan, Assistant Attorney General, dated February 8, 1996.

The County of Bernalillo in a letter from Mr. Richard Brusuelas, Environmental Health Director, dated February 8, 1996, preferred an expedited cleanup to address the ground water contamination, and concurred with the written statement from Mr. Norman Gaume, Manager of the Water Resources Program for the City of Albuquerque.

11. **Community Acceptance**

Community acceptance is a modifying criterion with respect to the evaluation process. EPA recognizes that the local community is the principal beneficiary of all remedial actions undertaken to address contamination originating from the Sparton Technology facility. As such, comments from the community are an important

consideration in the final evaluation of remedial alternatives. EPA also recognizes that it is responsible for informing interested citizens of the nature of the environmental problems and available solutions, and to learn from the community what its preferences are regarding this site.

EPA solicited input from the public on the remedial alternatives proposed to address the contamination originating from the Sparton Technology facility. A public comment period was held from December 8, 1995, to February 8, 1996. A public hearing was held on February 1, 1996, at the Cibola High School in Albuquerque, NM. All comments received from the community favored an expedited plan for restoration of the contaminated ground water. Specific recommendations were made for Alternative Nos. 4 and 5 to address the contamination. One commenter expressed concern over the location of ground water extraction wells and soil vapor extraction wells in the neighborhoods above the ground water contaminant plume. The preference for location of these wells is in the existing public right-of-ways along major streets, and in undeveloped land outside of existing neighborhoods. EPA believes that community concerns regarding the safety of these structures can be addressed through strict controls during the construction activities and the long-term operation and maintenance activities.

SELECTED REMEDY

The goal of this remedial action is to restore the contaminated ground water to its beneficial use. At this site, the aquifer is potentially useable as a source of drinking water, and is currently used outside of the contaminant plume for this purpose. The chemical-specific ground water cleanup goals for this remedial action are specified in Table 2, and are based on the more stringent of Federal MCLs established under the Safe Drinking Water Act, or the ground water standards set by the State of New Mexico under the NMWQCC regulations. Based on information and data concerning the nature and extent of contamination, the analysis of all remedial alternatives, and the information received during the public comment period, EPA believes that Alternative 4 may be able to achieve this goal. Ground water contamination may be especially persistent in the immediate vicinity of the contaminant's source, where concentrations are relatively high. The length of time and ability to achieve cleanup goals at all points throughout the contaminant plume, cannot be determined until the extraction system has been implemented, modified as necessary, and plume response monitored over time.

EPA prefers Alternative 4 to Sparton's recommendation of Alternative 2, because Alternative 4 emphasizes the containment and removal of contaminants from all areas of the ground water, not just the area immediately below the Sparton facility.

Alternative 4 is also more likely to achieve media cleanup standards, whereas under Alternative 2, the off-site plume would remain at concentrations exceeding the cleanup standards for an indefinite period of time. Alternative 4 has an active remedial approach for the entire contaminant plume, whereas Alternative 2 relies on institutional controls to prevent long-term exposure to the migrating contaminant plume. Alternative 2 also achieves the least reduction in ground water contamination by addressing only the on-site contaminated ground water.

EPA also prefers Alternative 4 to the State's recommendation of Alternative 5. While Alternatives 4 and 5 are similar, the potential technical difficulties associated with the implementation and effectiveness of air sparging at this site reduces the preference of Alternative 5. However, EPA concurs that an aggressive approach is necessary to achieve the maximum reduction in source area contamination. Therefore, contingency measures are incorporated in this selected remedy to reevaluate the technologies, including air sparging, if further source area reduction can be achieved following the implementation and performance monitoring of the soil vapor extraction system and the ground water extraction system.

A. Ground Water

Alternative 4 combines the implementation of a ground water containment and restoration system designed to address the entire contaminant plume along with a soil vapor extraction system to enhance further reduction of the remaining source material beneath the facility. The selected remedy will be implemented in a phased approach to build upon data collected at the site so that an efficient and cost-effective system is designed to address the contamination. For the off-site ground water contaminant plume, the initial phase will be to install additional monitoring wells to define the extent of the ground water contaminant plume, in particular the leading edge of the contaminant plume. While the current estimate is for 20 wells, the final number of monitoring wells will be determined during the site characterization. In addition, data on the aquifer characteristics near the leading edge of the contaminant plume will be collected. This data will then be used to design and install a ground water extraction system to prevent further migration of the contaminant plume. While the current estimate is for 1-3 wells, the final location and number of extraction wells will be determined during the remedial design phase. After construction of this ground water extraction system is completed, performance of the system will be carefully monitored on a regular basis. Further refinement of the extraction system may be necessary during the monitoring phase to prevent further migration of the contaminant plume. Quarterly sampling and analyses of selected monitoring wells will be implemented to

evaluate the design and monitor the performance of the extraction system.

For the contaminant plume beneath the Coors Road facility, the initial phase will consist of adding at least one additional ground water extraction well to the existing extraction system. Since the existing ground water extraction system removes contaminants from a limited area beneath the facility, the objectives for the additional well(s) will be to maximize contaminant removal and prevent further migration from the Facility to off-site areas. Additional monitoring wells may be necessary to further define the extent of contamination beneath the Facility and properly locate the extraction well(s). Performance of the system will be carefully monitored on a regular basis. Further refinement of the extraction system may be necessary during the monitoring phase to prevent further migration of the contaminant plume. Quarterly sampling and analyses of selected monitoring wells will be implemented to evaluate the design and monitor the performance of the extraction system.

Following these initial actions, additional extraction wells will be installed as necessary to restore the aquifer for use as a source of drinking water, in addition to controlling further plume migration. Restoration is defined as attainment of the chemical-specific interim ground water cleanup goals in the aquifer, over the entire contaminant plume. Cleanup levels for each ground water contaminant are specified in Table 2. Implementation of this phase of the ground water restoration will be expedited in order to meet the anticipated future demand on the aquifer as a water supply.

Performance of the selected remedy will be carefully monitored on a regular basis, and adjusted as warranted by the collected data. Refinement of the remedy may be required if EPA determines that such measures will be necessary in order to restore the aquifer in a reasonable time frame, or to significantly reduce the time frame or long-term cost of attaining this objective. Post-construction refinements to the proposed remedy may include any or all of the following:

- adjusting the pumping rate in some or all of the ground water extraction wells;
- installing additional extraction wells to facilitate or accelerate cleanup of the contaminant plume;
- initiating a pulsed pumping schedule in some or all of the ground water extraction wells to eliminate flow stagnation areas, or otherwise facilitate recovery of contaminants from the aquifer;

- discontinuing pumping at individual extraction wells where cleanup goals have been attained; monitoring of the aquifer would be continued to ensure that media cleanup goals are maintained; and

- refining the treatment and disposal components of the preferred remedy.

- implementing additional source control measures to further reduce the remaining source material in the aquifer and soil beneath the facility, if determined by EPA to be practicable; such measures could include the implementation of additional measures (e.g. an air sparging system) in the aquifer where possible NAPL contaminants remain relatively unaffected by ground water extraction;

B. Source Control

During the design phase of this remedial action, further soil investigation will be conducted to more fully delineate the nature and extent of contaminants in the vadose zone. This study will determine the depth and concentration of contaminants in the soil which require removal and/or treatment so as to achieve the ground water objective of restoration. At this time, installation of a soil vapor extraction system is expected to enhance the removal of volatile organic contaminants from the soil and ground water to levels which would allow attainment of the chemical-specific ground water cleanup goals. Characterization of the organic contaminants in the soil above the water table will be necessary to evaluate the design and performance of the soil vapor extraction system. A preliminary cleanup target of 10 ppmV for chlorinated organic vapors in the vadose zone has been set by NMED as a level protective of ground water at the Sparton site. Further evaluation of this cleanup goal will be performed to determine if attainment of a lower concentration is necessary to achieve the cleanup goals for the ground water.

C. Treatment and Disposal of Contaminants

Contaminated ground water brought to the surface by the ground water extraction system will require treatment prior to disposal. Treatment of the contaminated ground water will continue to be performed within the property boundary of the Coors Road facility. The existing treatment system at the Coors Road facility utilizes an air stripper to remove organic compounds, such as trichloroethylene, from the water. Since this system has been successful in removing the organic compounds, treatment of the contaminated ground water will continue to utilize an air stripper. However, since the expected volume of ground water from the new extraction system will exceed the capacity of the

existing air stripper, a new or expanded air stripper will be required to handle the increased volume of water.

Since a goal of this remedial action is to remove contaminants from the ground water, not merely transfer them to another media such as air, emissions from the air stripper will require further treatment. Utilization of a carbon adsorption system will remove organic vapors prior to release into the atmosphere. This will ensure that nearby residents and businesses are not affected by this remedial action, and ensure compliance with existing air quality standards. A carbon adsorption system will also be used to remove organic vapors from the soil vapor extraction system to ensure that there is no transfer of contaminants to the air above air quality standards.

Since the air stripper does not remove metals from the water, additional treatment may be necessary to remove metals, such as chromium, prior to disposal of the treated ground water. Since the concentration of metals in the ground water is variable throughout the contaminant plume, further study will be required to determine to what extent these technologies may be necessary. The sequence of technologies used for the ground water treatment train will be determined during the remedial design. The treatment train shall be designed to:

- Attain the chemical-specific discharge requirements; and
- Be easily modified to treat increased flow from an expanded extraction system.

The current method for disposal of the treated ground water is through the City of Albuquerque wastewater treatment system. This is currently accomplished by utilizing the sanitary sewer connections at the Coors Road facility. However, due to the increased pumpage of ground water from the aquifer after implementation of the remedy, this method of disposal is no longer practicable, and would not be permitted by the City of Albuquerque. As a result, other means for disposal of the ground water will have to be evaluated during the design phase of the ground water extraction system. The two options under consideration for the treated ground water will be reinjection back into the aquifer, or reuse at the surface.

Reinjection will require the installation of injection wells to pump the treated ground water back into the aquifer at a total rate equal to the total pumpage from the ground water extraction wells. The number of injection wells needed to accomplish this goal will likely exceed the total number of extractions wells. The number of wells necessary to accomplish this goal would be determined during the design phase of the remedy. The placement of the injection wells can be either on-site at the Coors Road facility or at some off-site location. If the injection wells

are located on-site, then additional cost savings can be achieved by reducing the distance required for additional piping to transmit the water. However, if the wells are located off-site, then a potential benefit is for further containment of the contaminant plume by reversing the flow of ground water near the leading edge of the contaminant plume. This method is currently being employed at the South Valley Superfund site in Albuquerque. Off-site placement of the injection wells would be limited to existing public right-of-ways to minimize the impact to the existing or planned neighborhoods.

For the second option for disposal of the treated ground water, surficial reuse, no potential users have been identified which can receive and utilize the volume of ground water from the expected ground water extraction system. This option will be further explored during the design phase to determine if a suitable use of the treated ground water can be found, and which would present a cost-savings over reinjection of the water. If no such receiver for the water can be identified, then reinjection would proceed as the method for disposal of the water. However, this does not preclude discontinuing the use of injection wells if such a receiver is identified in the future. Both of these options are consistent with the water management plan presented in the Albuquerque Water Resources Management Strategy - San Juan-Chama Diversion Project Options (July 1995) and the Albuquerque/ Bernalillo County Ground Water Protection Policy and Action Plan (1994).

ATTACHMENT 1

EPA RESPONSE TO COMMENTS FOR
FINAL REMEDY SELECTION AT THE
SPARTON TECHNOLOGY COORS ROAD FACILITY

The comments received by EPA during the public comment period held from December 8, 1995, to February 8, 1996, and the public hearing held on February 1, 1996, were supportive of a comprehensive remedy to address the contamination originating from the Sparton Technology Coors Road facility. In general, the community expressed support for Alternative 5 described in EPA's Statement of Basis and the Final Decision and Response to Comments documents for the Sparton Technology Coors Road facility. Additional comments and EPA's responses regarding the Sparton Technology facility, the environmental contamination, and the corrective action process are provided below:

1) **What happens if negotiations fail between Sparton and the Environmental Protection Agency (EPA) regarding the implementation of the selected remedy?**

   If the negotiation process is not successful in reaching a final agreement between EPA and Sparton, then EPA may initiate a unilateral enforcement action to compel Sparton to implement the remedy selected by EPA.

2) **Is Sparton dumping chemicals and polluting it's current location in Rio Rancho?**

   The waste management activities at Sparton's Rio Rancho facility are regulated and monitored by the New Mexico Environmental Department (NMED). NMED has conducted several inspections of the Rio Rancho facility. As a result of two of these inspections, NMED issued an enforcement action in 1991 and 1993. These monitoring and enforcement activities help to ensure the proper management of hazardous waste at the Rio Rancho facility.

3) **Has the ground water contamination from Sparton impacted the New Mexico Utilities Water Well No. 2?**

   The ground water contamination from Sparton has not impacted the New Mexico Utilities Water Well No. 2. While, the Sparton contaminant plume extends at least ½ mile west of the of the facility boundary, the available information indicates that the plume is still approximately 2 miles away from the New Mexico Utilities Water Well No. 2.

4) **How will the naturally occurring arsenic in the aquifer react with the contaminant plume in the ground water?**

The naturally occurring arsenic is not expected to react with the contaminants in the ground water. If reactions do occur, the by-products will be addressed through the ground water recovery and treatment system.

5) **Since Sparton Technology was a government contract company how does the public know that a cover up has not occurred?**

There is no cover up by the regulatory agencies involved in the investigation and evaluation of the ground water contamination. EPA has provided oversight of the investigation activities conducted by Sparton. All of the information collected as a result of this investigation is made available to the public in the Administrative Record, which will be available at several locations (Taylor Ranch Branch library, NMED office, and EPA office). Furthermore, EPA will continue to keep the local community informed of the activities at the Sparton facility.

6) **How can the public get involved?**

There have been several opportunities in the past for public involvement through the participation in open houses, public meetings, and public hearings. EPA will continue to conduct public participation activities in the future during the remedy implementation phase.

7) **Corrales residents for Clean Air and Water are concerned about the potential impacts of increased water pumping by Intel Corporation at Rio Rancho on the migration of the "Sparton Plume". Have long-term effects of this additional pumping in the area been considered in the remediation process?**

The Intel Corporation water wells are approximately 3.5 miles from the Sparton Coors Road facility. This distance significantly reduces the impact to the contaminant plume migration. However, the ground water recovery system will be designed to prevent future migration of the contaminant plume and will have to consider other impacts from increased ground water pumping in the aquifer.

8) **Intel and the City of Albuquerque have investigated the feasibility of re-injecting Intel's process wastewater into the aquifer near the Sparton Coors Road facility. If the "Sparton Plume" is not quickly remediated, will re-injection plans be precluded.**

The ground water recovery system will be designed to prevent future migration of the contaminant plume and will have to consider other actions, such as reinjection of wastewater, in the aquifer. Therefore, any re-injection which impacts the recovery of contaminated ground water will be accounted for in the design of the system.

9) **Why did Sparton not include data collected from the quarterly monitoring of 18 monitoring wells over the last four years?**

It is not known why this material was not incorporated into the investigation and evaluation material supplied by Sparton. However, the EPA did obtain this information from Sparton through a Resource Conservation and Recovery Act Section 3007 information request letter. Therefore, this information was considered in the final remedy selection and is incorporated into the Administrative Record.

10) **Several recommendations were made to choose a remedy which included air sparging.**

Although the final remedy only contains an expanded ground water recovery and soil vapor extraction system, the remedy does include a contingency to include air sparging, or some other technology, into the final remedy if appropriate. Air sparging was not included in the selected remedy due to potential site limitations. These limitations included the presence of a low permeable silt/clay layer located at the site. The use of air sparging in this geologic setting could possibly spread contamination. Therefore, EPA chose not to require air sparging at this time. However, if information is obtained during the remedy implementation phase which demonstrates that air sparging can be successfully implemented at the site, and will significantly reduce the contaminant source concentrations and time frame for meeting cleanup goals, EPA could require the implementation of air sparging for further source reduction.

11) Concerns over the location of off-site wells and the potential for tampering with these wells were raised.

The off-site monitoring wells are sited along public right-of-ways where ever possible. With regard to the tampering, all wells are and will be designed to be locked to prevent tampering and vandalism.

12) How fast is the plume spreading?

The leading edge of the plume is moving at approximately 100 to 300 feet per year.

13) Why not line the Corrales Main Canal to reduce the recharge to the aquifer in the area of contamination.

The ground water recovery system will be designed to prevent future migration of the contaminant plume and will have to consider other sinks or sources in the aquifer. The Corrales Main Canal acts as a source to the aquifer up-gradient of the Sparton facility, if it is determined that the reduction of this recharge significantly reduces the time frame for meeting cleanup goals, EPA may require the lining of the Corrales Main Canal.

UNITED STATES ENVIRONMENTAL PROTE[redacted]
REGION 6
1445 ROSS AVENUE, SUITE 1[redacted]
DALLAS, TX 75202-2733

[redacted]

September 30, 1996

MEMORANDUM

SUBJECT: Filing of Return Receipt - Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

FROM: Evan L. Pearson
Senior Attorney (6RC-C)

TO: Lorena Vaughn
Regional Hearing Clerk (6RC-HO)

Please file the attached return receipts in the above entitled case.

009103

Recycled/Recyclable
Printed with Soy/Canola Ink on paper that contains at least 50% recycled fiber

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Richard D. Mico
Vice President + General Manager
Spartan Technology, Inc.
4901 Rockaway Blvd, S.E.
Rio Rancho, NM 87124

4a. Article Number
P 435 988 347

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

7. Date of Delivery
9/12/96

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, November 1990, *U.S. GPO 1991—327-402 DOMESTIC RETURN RECEIPT

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

C.T. Corporation System
Registered Agent for Spartan
Technology, Inc.
119 East Marcy
Santa Fe, NM 87501

4a. Article Number
P 435 988 346

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

7. Date of Delivery
9 8 96

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, November 1990 ★U.S. GPO: 1991—287-088 DOMESTIC RETURN RECEIPT

CERTIFICATE OF SERVICE

I certify that on the 30th day of September, 1996, the original of the foregoing was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by first class mail:

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

1700 PACIFIC AVENUE • SUITE 3300
DALLAS, TEXAS 75201-4693
(214) 969-1700
FAX (214) 969-1751

AUSTIN
FORT WORTH
HOUSTON
MONTERREY, MEXICO

DIRECT DIAL:

(214) 969-1102

October 18, 1996

VIA HAND DELIVERY

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, TX 75202

Re: *In the Matter of Sparton Technology, Inc.*
U.S. EPA docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Enclosed in connection with the matter referenced above, please find the original and one copy of a Protective Response and Request for Hearing. Please file the original and return the additional copy, filemarked, to the messenger.

By copy of this letter, a copy of this document is being forwarded to Evan Pearson.

Thank you for your assistance.

Very truly yours,

James B. Harris

JBH/res
Enclosures

cc: Evan Pearson, Esq.

40310 00001 LERA 52469

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

REGIONAL HEARING CLERK
EPA REGION VI

IN THE MATTER OF:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 COORS ROAD NW	)	U.S. EPA DOCKET NO.
ALBUQUERQUE, NM 87114	)	RCRA-VI-001(h)-96-H
	)	
EPA I.D. NO. NMD083212332	)	
	)	
RESPONDENT	)	

PROTECTIVE RESPONSE AND REQUEST FOR HEARING

This response to an initial administrative order (the "Order") (purportedly issued under § 3008(h) of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6928(h)) and protective request for hearing, is submitted by Sparton Technology, Inc. ("Sparton" or "Respondent"), which received the Order on or about September 18, 1996.

Respondent is supposed to specify each factual or legal determination, or relief provision in the Order that it disputes, and briefly describe the basis upon which it disputes such determination or provision. As Respondent understands the Order, the only factual or legal determinations are found in Section I -- "Jurisdiction," Section IV -- "Findings of Fact," and Section V -- "Conclusions of Law and Determinations." All remaining portions of the Order involve "relief provisions."

This Response and Request for Hearing is described as "protective" because it is being filed subject to and without waiving any of Respondent's claims in a pending lawsuit against the Environmental Protection Agency ("EPA") challenging the agency's authority to issue the Order, and its decision to select the relief provisions set forth in the Order.

I.

Jurisdiction

1. The Order purports to be issued pursuant to authority granted to the EPA by § 3008(h) of RCRA. Respondent does not dispute that the EPA purports to have issued the Order in accordance with that authority, but does dispute that impacts to the environment associated with Respondent's plant located at 9621 Coors Road, NW, Albuquerque, New Mexico 87114 (the "Plant") present a threat to human health or the environment authorizing issuance of the Order. As set forth in the Corrective Measures Study ("CMS"), the impacts to the environment do not present a risk to public health nor do they interfere with any current or reasonably foreseeable use of the environment. Respondent also disputes EPA's authority to issue the Order because the Plant is not and was not an interim status facility, a jurisdictional prerequisite for issuing an Order under § 3008(h). Respondent also disputes that the Director of the Compliance Assurance and Enforcement Division, Region 6, has the authority to issue the Order. Section 3008(h) of RCRA provides the administrator of the EPA with the authority to issue an Order. Respondent believes that Congress did not intend that such authority was to be delegated to any subordinates or, in the alternative, that if such authority could be delegated, then only to the regional administrators, and not to any lower level employees.

2. EPA asserts that the Order is based on an administrative record compiled by the agency. Respondent disputes that assertion for two reasons. First, the administrative record does not support the relief the EPA is ordering. Secondly, the administrative record is neither complete nor accurate. The EPA's decision to issue this Order and request the relief specified was based on political and not technical factors, and was decided upon before the administrative record was developed.

II.

Findings of Fact

3. Respondent disputes that it is the owner and operator of a hazardous waste management facility at 9621 Coors Road NW, Albuquerque, Bernalino County, New Mexico 87114, because it is not currently treating, storing or disposing of hazardous waste at the plant.

4. Respondent disputes that it is a generator of hazardous waste, and engaged in the treatment, storage or disposal of hazardous at the Plant because it is not currently engaged in such activities.

5. Respondent disputes that it owned and operated the Plant as a hazardous waste management facility on or after November 19, 1980, because it has no record of hazardous waste being accumulated at the Plant for longer than ninety days after November 19, 1980.

6. Respondent does not dispute that in the notification it provided to the EPA it identified itself as the owner/operator of a hazardous waste treatment, storage or disposal facility at the Plant, but it does dispute that such characterization accurately describes activities at the Plant.

7. Respondent does not dispute that in its Part A Permit Application it indicated certain hazardous waste were treated, stored or disposed of at the Plant, but it does dispute the accuracy of that statement, because no treatment, disposal or accumulation for more than ninety days took place after November 19, 1980 at the Plant.

8. Respondent disputes that from 1983 to 1988 any hazardous waste were detected in groundwater monitoring wells at the Plant, because the material detected was not a "waste," but constituents of hazardous wastes.

9. Respondent disputes that the trichloroethylene ("TCE") found in groundwater samples collected in January of 1996 results exclusively from operations at the Plant, because

other commercial/industrial activities in the area also used TCE and the location of those operations, when compared with groundwater flow patterns, suggests there may be other contributors to the TCE found in groundwater in the vicinity of the Plant.

10. Respondent disputes that any groundwater containment plume originating from the facility is in an aquifer utilized by the city of Albuquerque and New Mexico Utilities as a public drinking water supply, because the impact to groundwater is not in an area where the city of Albuquerque is authorized to complete water supply wells, and the impacted groundwater is not at a depth that is utilized by either the city of Albuquerque or New Mexico Utilities for public drinking supply.

11. Respondent disputes that EPA approved the final CMS report with concerns on June 24, 1996, because the EPA, under the terms of the administrative order on consent ("AOC") entered into by Respondent and EPA on October 1, 1988, only had the authority to approve the submittal or request modifications. By approving it without a request for modifications, the EPA accepted the CMS as submitted and the concerns are not part of the CMS. Nor were they submitted during the comment period. Therefore, they cannot be used in evaluating an appropriate remedy, if any, for the impacted groundwater.

12. Respondent disputes that under Section IV.A.3 and task 9 of the corrective action plan of the AOC, EPA is to unilaterally select a remedy to deal with impacted groundwater, because that document, when read in its entirety, requires the EPA to adopt the remedy identified in the CMS.

13. Respondent disputes that the FDRTC identifies the selected remedy, because it did not adopt the remedy identified in the CMS.

14. Respondent disputes that there has been a release of hazardous waste into the environment, because at most, there has been a release of constituents of hazardous waste, and

disputes that the corrective action selected by the EPA is necessary to protect human health and the environment, because the current impacts to the environment do not present a risk to human health nor do they interfere with any existing or reasonably foreseeable use of the environment. Respondent also disputes that in the FDRTC EPA undertook any analysis of why a corrective action was necessary to protect human health or the environment. The EPA's conclusion on this point is unsupported in the FDRTC, factually and legally. The only "facts" advanced by the EPA for the relief provisions of the Order are the following conclusions: (1) that the impacted groundwater is a potential source of drinking water; and (2) that groundwater outside of any impacted areas is currently used as a drinking water supply source. Neither of these "facts," which are in truth unsupported conclusions, explain why the EPA decided the relief provisions of the Order are necessary to protect human health or the environment.

III.

Conclusions of Law and Determinations

15. Respondent disputes that it is the owner and operator of an "existing hazardous waste management facility" because it does not currently treat, store or dispose of hazardous waste at the Plant.

16. Respondent disputes that it was authorized to operate under interim status at the Plant, because the information available to Respondent is that hazardous wastes were neither treated, stored nor disposed of at the Plant after November 19, 1980.

17. Respondent disputes that hazardous wastes are currently found at the Plant, because all that is present are constituents of hazardous waste.

18. Respondent disputes that hazardous wastes were released into the environment from the Plant, because all that was released were constituents of hazardous waste.

19. Respondent disputes that the actions required by the order are consistent with RCRA or that they are necessary to protect human health or the environment, because the EPA has failed to identify how and why such actions are consistent with RCRA or how and why they are necessary to protect human health or the environment. As discussed in the CMS, what the EPA has proposed is neither consistent with RCRA nor necessary to protect human health or the environment.

IV.

Relief Provisions

20. Respondent disputes that the operation of the existing on-site groundwater extraction system and treatment system and continued monitoring of existing groundwater monitoring wells needs to be modified, except as set-forth in the CMS, because the system that has been in place for several years has been found to be effective in preventing the release of constituents of concern from on-site and in identifying characteristics of the impacted groundwater.

21. Respondent disputes that a new health and safety plan is required because the health and safety plan already in effect has been found to be effective and appropriate for activities both on and off the site.

22. Respondent disputes that a soil vapor extraction corrective measure, as envisioned by the EPA, should be implemented, because EPA's proposal involves numerous steps, studies, and reports that are unnecessary, that will only delay implementation of a soil vapor extraction system, and that will substantially increase the cost of that project, without providing any additional protection to human health or the environment, compared to what has been proposed by the Respondent.

23. Respondent objects to the groundwater extraction corrective measure because: (1) it requires further plume delineation, where none is necessary; (2) it requires installation of additional monitor wells that are unnecessary; (3) it requires studies and reports that will delay efforts to contain the movement of constituents of concern and unnecessarily increase the cost of remediation without providing any additional protection to human health or the environment; (4) it envisions a recovery system that will not achieve its objectives materially faster than taking no action, while generating new waste streams that have a greater likelihood of impacting human health or the environment than the constituents of concern currently found in the impacted groundwater; and (5) it will result in greater impacts to groundwater resulting from the continued movement of constituents of concern in the groundwater during the lengthy period in which studies will be undertaken and reports prepared before authorization is provided to remediate impacts to groundwater.

24. Respondent disputes the following relief provisions of the Order as being unnecessary to protect human health or the environment, and, therefore, outside the statutory authority of the EPA:

Section III.2-.5	Section XII
Section VI	Section XIII.6,.7
Section VII.5	Section XIV
Section VIII.3,.6,.7	Section XV
Section IX.1-2,.5	Section XXI
Section X.1,.4	Section XXIII
Section XI	Section XXIV

25. Respondent disputes the following relief provisions of the Order because they deprive it of any meaningful hearing and/or judicial review in connection with the agency's modification of the relief provisions:

Section VIII.4,.5,.8	Section XX.1
Section XII	Section XXVI.1
Section XIII.7	

V.

Exhibit "A"

26. Exhibit "A" to the Order is a "final decision," for a RCRA corrective action at the Plant. It contains no formal factual or legal determinations, nor does it order any specific relief. Therefore, it is not a document that Respondent is obligated to address. It does, however, contain a number of misstatements, and much with which Respondent disagrees. Therefore, out of any abundance of caution, and with the expectation that identifying major areas of disagreement between EPA and the Respondent over the content of Exhibit "A" will help narrow the issues in dispute, Respondent will identify on an page-by-page basis, the more significant statements with which it disagrees. Failure of Respondent to address a particular statement cannot be taken as accepting what EPA has written.

27. Cover page -- Respondent disputes the decision is based on the administrative record for the site, for two reasons. First, the administrative record does not support the decision EPA made. Secondly, the administrative record is neither complete nor accurate. The EPA's decision was based on political and not technical factors, and was decided upon before the administrative record was developed.

28. Page three -- Respondent disagrees that residential developments are one quarter of a mile west of the facility, they are more distant. Respondent disagrees that the subsurface soils consist of sandy muds, sands and gravel, because in fact the subsurface soils are better described as clays and sandy muds interbedded with gravely sands. Respondent disagrees that "local groundwater," if that means groundwater in the immediate area of impact, supplies drinking water to the city of Albuquerque as well as process water for industrial purposes. The impacted groundwater is in a service area for New Mexico Utilities, Inc., in which the city of Albuquerque is not authorized to complete wells. Local groundwater, as understood by

Respondent does not supply drinking water for New Mexico Utilities, Inc. Respondent is unaware of any process water wells in the immediate vicinity of the impacted groundwater. Respondent did not discontinue manufacturing operations in 1994; it continues to operate a machine shop at the Plant and the Plant is currently active.

29. Page Five -- Respondent disagrees that hazardous waste were released to groundwater, because of constituents of hazardous waste were released. Respondent disagrees that drums of hazardous waste were stored on the ground surface prior to May 1981, because a new drum storage area was in place by November 19, 1980.

30. Page Seven -- Respondent disagrees that the chromium concentration in the soil decreases to approximately twenty parts per million outside of the waste management area, because sampling results show that it actually is less than ten parts per million in that area. Respondent disagrees that surface soil gas surveys were conducted in only 1984 and 1987, because a similar survey was conducted in 1991.

31. Page Eight -- Respondent disagrees that Figure 5 illustrates the approximate capture zones for the on-site wells, because those capture zones are based upon flawed calculations and ignore actual field demonstration of larger capture zones. Respondent disagrees that Plant operations have been discontinued, because the machine shop continues to operate at the Plant. Respondent disagrees that there are only forty-seven monitor wells that have been installed as part of investigative activities. At the time of the RFI, fifty-seven wells were in place, and currently there are 62.

32. Page Ten -- Respondent disagrees with the description of intervals monitered in the groundwater. The interval for the upper - lower flow zone is twenty-five to thirty-five feet not thirty to forty feet. The interval for the lower lower flow zone is fifty-five to sixty-five feet, not fifty to sixty feet. Respondent also disagrees with the implication that each of these flow

zones represents some discontinuous groundwater. All of the zones are part of a single groundwater structure. Respondent disagrees that the inorganic contaminant with highest frequency of occurrence is chromium, because sampling has established arsenic occurs more frequently. Respondent disagrees that DNAPL's are not identified in any monitoring well, because well 16 has exhibited concentrations above one per cent of the solubility of TCE.

33. Page Seventeen -- Respondent disagrees that the existing monitoring system does not completely define the horizontal and vertical extent of the contamination, because completion of five additional monitor wells has allowed the plume to be defined both horizontally and vertically. Respondent disagrees that there are any "findings" in the imminent and substantial endangerment letters involving the Plant. These self-serving letters did not result from any type of administrative, legislative or judicial proceeding, and the validity of any assumptions or conclusions reached in those letters are untested and not sufficiently documented to allow a critical analysis. Respondent would note that the only entity that currently has the legal authority to make use of water in the impacted area, New Mexico Utilities, Inc., has not sent an imminent and substantial endangerment letter to EPA. Respondent disagrees with the statement that the impacted groundwater is potentially usable as a source of drinking water, if by "potentially" EPA means there is some reasonable likelihood that impacted groundwater would be used for such purposes. The depth of the impacted groundwater, its location, the availability of utility supplied water, deed restrictions prohibiting completion of individual wells, institutional constraints preventing development of large public supply wells in the area, lack of demand, absence of supporting infrastructure, lack of any plans to develop this impacted groundwater in the future, and other factors all make its use highly unlikely. Respondent disagrees that a protective goal is restoration of impacted groundwater to levels safe for drinking, because such action is not necessary to "protect" either human health or the environment. Respondent also

disagrees that protection of groundwater as a source of drinking water, and as a natural resource under New Mexico regulations means restoration.

34. Page Eighteen -- Respondent disagrees with the corrective action objectives set forth by EPA. Those objectives are not from the CMS, and are not consistent with the requirements of RCRA and EPA's regulations.

35. Page Nineteen -- Respondent disagrees that further investigation of the horizontal and vertical extent of groundwater contamination is required, because five recently completed monitor wells provide both vertical and horizontal control. Respondent also disagrees with the monitoring frequency, because the July 1996 sampling confirms the conclusions of the CMS that annual monitoring is adequate.

36. Page Twenty -- Respondent disagrees with the construction of twenty monitor wells would cost $400,000.00, because its recent experience suggests the cost will be more in the range of $600,000.00.

37. Page Twenty Two -- Respondent disagrees that biological processes have not been identified at the site as transforming contaminants. The CMS at page VII - 63, showed that the University of New Mexico has identified organisms in similar groundwater that did cause a transformation, and site specific analysis indicates natural attenuation is proceeding. Respondent disagrees that if no action is taken the contaminant plume will continue to migrate for an indefinite period at concentrations exceeding MCLs. A model submitted in the CMS, at Appendix 3, establishes that before reaching the closest New Mexico Utilities, Inc. well, the plume will dissipate to concentrations below MCLs.

38. Page Twenty Three -- Respondent disagrees that SVE can be enhanced by lowering the water level, because such action is impractical. Respondent has revised its estimate of the number of wells necessary to operate an effective SVE system, the number is no longer

ten to twenty. Respondent disagrees that monitor wells currently in place are insufficient to monitor the contaminants, because the installation and sampling of those wells has demonstrated to the contrary. Respondent also disagrees with the present worth cost of alternative because two it should be 3.68 million dollars, with a total capital cost of $760,000.00. The capital cost of groundwater monitoring should be $600,000.00 not $400,000.00.

40. Page Twenty Four -- Respondent disagrees that further plume definition is necessary before any alternative can be implemented. Respondent also disagrees that quarterly sampling is necessary, because the most recent sampling establishes annual monitoring is sufficient. Respondent also disagrees further analysis is necessary to enhance the on-site extraction and treatment system, because the CMS and more recent discussions with the state of New Mexico establishes one additional well will be sufficient.

41. Page Twenty Five -- Respondent disagrees that groundwater from any off-site recovery well would have to be transported back to the facility, because a more cost effective and viable option is discharged through a storm sewer to a Calabacillas Arroyo.

42. Page Twenty Six -- Respondent disagrees that any disposal option will have to be consistent with any requirement other than state of federal law, because the other documents identified have no legal force or effect. Respondent disagrees that the groundwater cleanup goals can even be achieved in the impacted area, because of the subsurface geology, the nature of the contaminants, and the experience of other entities in trying to address similar problems at other sites across the country.

43. Page Twenty Seven -- Respondent disagrees that EPA has described all of the potential impacts to the local community, because it has left off the generation of solid waste and the release of materials into the air. Respondent also disagrees with the cost estimates, because its analysis demonstrates that the present worth cost for water treatment without ion exchange

metals removal is 15.021 million dollars, with a total capital cost of $2,325,000.00, and that the cost of water treatment with ion exchange for metals removal, which all current analysis suggest will not be needed, has a present worth cost of 57.268 million dollars, with a total capital cost of $2,912,500.00, and annual operation and maintenance cost of $3,535,900.00.

44. Page Twenty Eight -- Respondent disagrees with the cost estimates for treatment system-ion exchange for metals because its analysis is that annual operation and maintenance costs will be $2,710,000.00 a year, which 2 million involving disposal of residue. Respondent also disagrees with the present worth cost for water treatment with ion exchange for metals removal under alternative four, because Respondent's analysis shows the present worth cost is 15.247 million dollars, the total capital cost is $2,475,000.00.

45. Page Twenty Nine -- Respondent disagrees with the present worth cost for water treatment including ion exchange for metals removal, because Respondent's analysis shows that that number is 57.494 million dollars, that the total capital cost is $3,062,500.00, and that the annual operation and maintenance cost for years one through three is $3,563,900.00 and years four through thirty is $3,535,900.00. Respondent also disagrees with the cost estimate for alternative three water treatment without ion exchange for metals removal. The total capital cost should be $2,325,900.00. Respondent disagrees with the cost estimate for alternative three water treatment including ion exchange for metals removal as the total capital cost should be $2,912,500.00, and the annual operation of maintenance should be $3,535,900.00. Respondent disagrees that air stripping/air sparging would be effective at this site, as Battelle has reviewed this issue and concluded site conditions are such that air sparging would not work.

46. Page Thirty -- Respondent disagrees with the total cost for water treatment without ion exchange for metals removal in that the present worth cost is 15.948 million dollars, with a capital cost of $2,852,500.00. Respondent also disagrees with the total cost for water

treatment including ion exchange for metals removal, as the present worth cost should be 58.195 million dollars, the total capital cost is $3,440,000.00, the annual operating and maintenance cost for years one through three is $3,682,650.00, and for years four through thirty $3,535,900.00.

47. Page Thirty One -- Respondent disagrees with the cost estimates for alternative four water treatment without ion exchange for metals removal as the total capital cost should be $2,475,000.00. Respondent disagrees with the cost estimate for alternative four water treatment including ion exchange for metals removals as the total capital cost should $3,620,500.00, and the annual operation and maintenance cost for years one through thirty should be $3,535,900.00. Respondent disagrees that soil flushing will work at this site, because Battelle has reviewed that subject and concluded site specific conditions will prevent it from being effective.

48. Page Thirty Two -- Respondent disagrees with the total cost estimate for water treatment without ion exchange for metals removal because the present worth cost should be 16.207 million dollars with a total capital cost $3,075,000.00. Respondent disagrees with the total cost for water treatment including ion exchange for metals removal because the present worth cost should be 58.454 million dollars with a total capital cost of $3,662,500.00, and annual operation and maintenance cost for years one through three is $3,695,900.00, and for years four through thirty $3,535,900.00. Respondent disagrees with the cost estimate for alternative three water treatment without ion exchange for metals removal as the total capital cost should be $2,325,000.00. Respondent disagrees with the cost estimate for alternative three water treatment including ion exchange for metals removal. The total capital cost should be $2,912,500.00, and the annual operation and maintenance should be $3,535,900.00.

49. Page Thirty Three -- Respondent disagrees with the total cost for alternative because the present worth cost is 11.525 million dollars, with a total capital cost of

$2,197,500.00, and an annual operation and maintenance cost for years one through thirty of $606,750,000.00.

50. Page Thirty Four -- Respondent disagrees that the first decision factor is protection of human health and the environment, as that is the only statutory factor EPA is authorized to consider. Respondent disagrees that the final remedy selected for this site must reduce or control contamination in the soil and groundwater, because such action is only required if necessary to protect human health or the environment, and EPA has yet to establish why such action is necessary to achieve either of those goals. Respondent disagrees that merely reducing the levels of contamination in groundwater or soil protects human health or the environment any more than taking no action.

51. Page Thirty Six -- Respondent disagrees that any final remedy at the site has to have a goal of meeting applicable media cleanup standards, because EPA has failed to explain why such action is necessary to protect human health or the environment. Respondent could be more specific as to the basis for its disagreement if EPA had provided something other than a conclusion. Respondent disagrees that alternatives four though six would best achieve the media cleanup standards, because those actions will not attain those standards any more quickly than no action. If EPA had been more specific about why those alternatives would "best" achieve the standards, instead of simply providing conclusions, Respondent could have been more specific. Respondent disagrees with the negative implication that if source control measures are taken, cleanup of groundwater to MCLs will result and will not involve an essentially perpetual cleanup situation. Respondent believes that even with source control, restoration will be ineffective and essentially involve perpetual cleanup. Respondent disagrees that alternative four through seven provide the most effective source control, because the existing system has been

demonstrated to be highly effective, and can be enhanced by the addition of a single well without all of the delays and analysis EPA has proposed.

52. Page Thirty Seven -- Respondent disagrees that recovered groundwater would have to be treated to remove metals, because all analysis suggests that the concentration of metals in groundwater recovered at a rate of more than 50 gpm would be below MCLs. Respondent disagrees that EPA evaluated the remedial alternatives on the ability to provide adequate protection of human health and the environment over the long term, because no such critical analysis appears in the Order, Exhibit "A" or the administrative record. Instead, EPA's decision involved unsupported conclusions. Respondent disagrees with EPA's unsupported conclusions that alternatives four through six would be preferable to the institutional controls in alternative two, but is unable to be more specific because the basis of EPA's position is not provided. Respondent also disagrees that alternative three provides a reduction in long term risks, but is unable to be more specific because EPA has not explained the basis for its conclusion.

53. Page Thirty Eight -- Respondent is unable to determine whether remedial alternatives capable of permanently reducing the overall degree of risk, were favored in the selection process because EPA has yet to identify the risk to human health or the environment for which protection is needed.

54. Page Thirty Nine -- Respondent disagrees that EPA properly considered cost in evaluating the alternatives, because it did not include realistic time periods, nor did it use appropriate numbers in evaluating the cost of removing metals, nor did it undertake any type of balancing between the additional marginal benefits to human health or the environment as compared to the marginal cost of the various alternatives.

55. Page Forty One -- Respondent disagrees that a goal of the remedial action is to restore the contaminated groundwater to its beneficial use, because such action is not necessary to protect human health and the environment. Respondent would like to be more specific, but EPA has failed to provide any explanation for the conclusion it reached. Respondent disagrees that alternative four is an appropriate remedy, because it believes that protection of human health and the environment can be achieved with what it proposed in the CMS. Respondent would like to more specific, but EPA has failed to provide the basis and reasoning for its conclusion.

56. Page Forty Two -- Respondents disagrees that alternative four is more likely to achieve media cleanup standards, because it will be no more affected than what is proposed in the CMS. Respondent would like to be more specific, but EPA has failed to include the basis or reasoning for its conclusion. Respondent as previously stated, also disagrees with the need for additional monitoring and plume delineation and believes that sufficient data exists to demonstrate that restoration is not practicable at this site, and therefore, further expenditure of funds to establish this point is unnecessary.

57, Page Forty Five -- Respondent disagrees that disposing of recovered groundwater through the city sewer system is not practicable, because Intel is currently disposing of water of very similar quality at the rate of over three million gallons per day. Respondent also disagrees that there are only two options for dealing with recovered groundwater, reinjection, or reuse, because a third option, discharge to the Calabacillas Arroyo is available.

58. Page Four of Response to Comments -- Respondent disagrees that the leading edge of the plume is moving approximately one hundred to three hundred feet per year, as the latest results from the new monitoring well establish the movement is less than one hundred feet per year. Respondent also disagrees that lining the Corrales main canal would reduce recharge

in the impacted groundwater, because such practice would be both ineffective and counterproductive as discussed in the CMS at page VIII-16, Figure 23.

VI.

Affirmative Defenses

59. The Order is unenforceable because the procedures for challenging it are unconstitutional.

60. The Order is unenforceable because the process for challenging is biased to the extent an administrative law judge is not appointed to handle it.

61. The Order is unenforceable because the process for challenging it violates due process by denying Respondent the right to engage in meaningful discovery and to confront witnesses.

62. The Order must be dismissed because the EPA has failed to adequately describe the factual and legal basis for the relief provisions.

63. The Order must be dismissed because it contains relief provisions inconsistent with the CMS.

64. The Order must be dismissed because the relief provisions are inconsistent with the requirements of the AOC.

65. The Order must be dismissed because the relief provisions were preselected by the EPA prior to the completion of the CMS and the development of the administrative record.

66. The Order must be dismissed because it was issued in bad faith with an improper motive.

67. Any further proceedings involving this order must be stayed pending the outcome of a lawsuit brought by the Respondent challenging the FDRTC, upon which this Order is based, and the issuance of this Order.

68. The order must be dismissed because the relief provisions are not necessary to protect human health or the environment.

69. The Order must be dismissed because it is based on an administrative record and not the CMS, therefore, its issuance is a breach of the AOC.

70. The Order must be dismissed if it is based on an administrative record, because that record does not contain all of the information EPA considered.

VII.

Request for Hearing

71. Respondent requests a Subpart C hearing.

Respectfully submitted,

THOMPSON & KNIGHT,
A Professional Corporation

By: _____
James B. Harris

1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201
Telephone: (214) 969-1700
Facsimile: (214) 969-1751

ATTORNEYS FOR
SPARTON TECHNOLOGY, INC.

CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing Respondent's Protective Response and Request for Hearing was as served on Evan Pearson, senior counsel, Environmental Protection Agency, Region 6, 1445 Ross Avenue, Dallas, Texas 75202-2733 via first class mail on October 18, 1996.

James B. Harris

40310 00001 LERA 52430

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

October 21, 1996

HAND DELIVERED

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Please file the enclosed Motion to Set Schedule for Prehearing Submissions and Hearing Date in the above-entitled matter.

Sincerely,

Evan L. Pearson
Senior Attorney

Enclosure

cc: James B. Harris

009130

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EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

MOTION TO SET SCHEDULE FOR
PREHEARING SUBMISSIONS AND HEARING DATE

The U.S. Environmental Protection Agency, Region 6 (EPA), by and through its attorney, Evan Pearson, hereby moves this Court to immediately schedule a conference call with the attorneys for the purpose of setting a schedule for the filing of prehearing submissions and scheduling a hearing in this matter.

Dated this 21st day of October, 1996.

Respectfully submitted,

Evan L Pearson

Evan L. Pearson
Senior Attorney
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX - (214) 665-2182

CERTIFICATE OF SERVICE

I hereby certify that on the 21st day of October, 1996, the original of the foregoing Motion to Set Schedule for Prehearing Submissions and Hearing Date was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by first class mail:

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

Eva L Pea

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

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1996 NOV -6 PM 1:07
REGIONAL HEARING CLERK
EPA REGION VI

November 6, 1996

Mr. James B. Harris, Esq.
THOMPSON & KNIGHT
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

RE: Sparton Technology, Inc., Docket No. RCRA-VI-001(h)-96-H

Dear Mr. Harris:

In the referenced action, Sparton Technology has requested a public hearing. Under the regulations governing the proceedings at 40 C.F.R. 22, Subpart C, the Regional Administrator is required to designate as Presiding Officer either the Regional Judicial Officer or another attorney with no prior connection with the case.

My only prior connection with this case is as the Presiding Officer at the public hearing in Albuquerque, New Mexico, on February 1, 1996. My duties there were limited to obtaining a hearing record. I made no recommendations, findings or other substantive actions.

Enclosed is a copy of the memorandum from the Regional Administrator designated me, the standing Regional Judicial Officer, as the Presiding Officer for this proceedings. As such, I will contact you and Mr. Pearson soon to arrange a teleconference with the purpose of establishing a schedule of actions leading toward a hearing early next year.

Should you have any questions or comments, please call me at 214-665-2137.

Sincerely,

Mark E. Chandler

Mark E. Chandler
Regional Judicial Officer

cc: Mr. E. Pearson, Esq.

009133

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
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1996 NOV -6 AM 9:26
REGIONAL HEARING CLERK
EPA REGION VI

October 31, 1996

MEMORANDUM

SUBJECT: Designation of Presiding Officer in RCRA Docket No. VI-901(h)-96-H

FROM: Jane N. Saginaw
Regional Administrator (6A)

TO: Mark E. Chandler
Regional Judicial Officer (6RC-HO)

The Director of the Compliance Assurance and Enforcement Division isuued a RCRA 3008(h) Initial Corrective Action Order against Sparton Technology, Inc., in Albuquerque, New Mexico, on September 16, 1996.

Sparton Technology responded to the order timely on October 18, 1996, disputing the order and requesting a 40 C.F.R. 24, Part C public hearing. Section 24.06 of Part 24 provides that:

> Upon a receipt of a request for the hearing, the Regional Administrator shall designate a Presiding Officer to conduct the hearing and preside over the proceedings.

Further, Section 24.13 provides that the "Presiding Officer shall be either the Regional Judicial Officer" or another agency attorney not previously connected with the case.

Accordingly, I hereby designate Mark E. Chandler, the standing Regional Judicial Officer as the Presiding Officer in this case. All pleadings and other proceedings shall be directed to him or the Regional Hearing Clerk.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
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DALLAS, TX 75202-2733

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EPA REGION VI

October 31, 1996

MEMORANDUM

SUBJECT: Designation of Presiding Officer in RCRA Docket No. VI-001(h)-96-H

FROM: for Jane N. Saginaw
Regional Administrator (6A)

TO: Mark E. Chandler
Regional Judicial Officer (6RC-HO)

The Director of the Compliance Assurance and Enforcement Division isuued a RCRA 3008(h) Initial Corrective Action Order against Sparton Technology, Inc., in Albuquerque, New Mexico, on September 16, 1996.

Sparton Technology responded to the order timely on October 18, 1996, disputing the order and requesting a 40 C.F.R. 24, Part C public hearing. Section 24.06 of Part 24 provides that:

> Upon a receipt of a request for the hearing, the Regional Administrator shall designate a Presiding Officer to conduct the hearing and preside over the proceedings.

Further, Section 24.13 provides that the "Presiding Officer shall be either the Regional Judicial Officer" or another agency attorney not previously connected with the case.

Accordingly, I hereby designate Mark E. Chandler, the standing Regional Judicial Officer as the Presiding Officer in this case. All pleadings and other proceedings shall be directed to him or the Regional Hearing Clerk.

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October 31, 1996

MEMORANDUM

SUBJECT: Designation of Presiding Officer in
RCRA Docket No. VI-001(h)-96-H

FROM: Jane N. Saginaw /S/ Jerry Clifford
Regional Administrator (6A)

TO: Mark E. Chandler
Regional Judicial Officer (6RC-HO)

The Director of the Compliance Assurance and Enforcement Division isuued a RCRA 3008(h) Initial Corrective Action Order against Sparton Technology, Inc., in Albuquerque, New Mexico, on September 16, 1996.

Sparton Technology responded to the order timely on October 18, 1996, disputing the order and requesting a 40 C.F.R. 24, Part C public hearing. Section 24.06 of Part 24 provides that:

> Upon a receipt of a request for the hearing, the Regional Administrator shall designate a Presiding Officer to conduct the hearing and preside over the proceedings.

Further, Section 24.13 provides that the "Presiding Officer shall be either the Regional Judicial Officer" or another agency attorney not previously connected with the case.

Accordingly, I hereby designate Mark E. Chandler, the standing Regional Judicial Officer as the Presiding Officer in this case. All pleadings and other proceedings shall be directed to him or the Regional Hearing Clerk.

MEC

6RC-HO/10-31-96;5-2137/MCHANDLER/DISK6:A:sparton.des

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

November 6, 1996

HAND DELIVERED

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Please file the enclosed Motion to Expeditiously Set Schedule for Prehearing Submissions and Hearing Date in the above-entitled matter.

Sincerely,

Evan L. Pearson
Senior Attorney

Enclosure

cc: James B. Harris

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

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IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

MOTION TO EXPEDITIOUSLY SET SCHEDULE
FOR PREHEARING SUBMISSIONS AND HEARING DATE

On October 21, 1996, the U.S. Environmental Protection Agency, Region 6 (EPA), by and through its attorney, Evan Pearson, filed a motion with the Court to schedule a conference call with the respective attorneys for the purpose of scheduling the filing of prehearing submissions and a hearing in this matter. To date, there has been no formal response to this motion. However, pursuant to 40 C.F.R. § 24.14(a), EPA is entitled an expeditious schedule for prehearing submissions and a hearing date. Therefore, the EPA moves this Court to issue an Order requiring the Respondent to submit a proposed schedule within five (5) days of the Court's order, or in the alternative, issue a scheduling order sua sponte.[1]

The EPA hereby submits the following proposed schedule for the Court's consideration:

[1]There is no requirement in 40 C.F.R. Part 24 for input from the Parties concerning scheduling. It is within the discretion of the Presiding Officer. 40 C.F.R. § 24.01(d).

1. Within thirty (30) days from the date of the Scheduling Order, Respondent shall file a Memorandum as contemplated by 40 C.F.R. § 24.14(a)(1) and (c).

2. Within forty (40) days from the date of the Scheduling Order, Respondent, at its discretion, may file a request to submit written questions to EPA pursuant to 40 C.F.R. § 24.14(d). If the Respondent fails to meet this deadline, the Respondent has waived its right to submit written questions.

3. Within fifty (50) days from the date of the Scheduling Order, Complainant shall file its memorandum in opposition to the Respondent's request to submit written questions.

4. Within sixty (60) days from the date of the Scheduling Order, Complainant shall file its response to the memorandum submitted by the Respondent in Item 1 above.

5. Within fourteen (14) days after service of the decision by the Presiding Officer, Complainant shall file its response to the questions forwarded to it by the Presiding Officer (40 C.F.R. § 24.14(d)(2) establishes this time frame).

6. A hearing date to be set no later than ninety (90) days from the date of the Scheduling Order.

Dated this 6th day of November, 1996.

Respectfully submitted,

Evan L. Pearson
Senior Attorney
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX - (214) 665-2182

CERTIFICATE OF SERVICE

I hereby certify that on the 6th day of November, 1996, the original of the foregoing Motion to Expeditiously Set Schedule for Prehearing Submissions and Hearing Date was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by first class mail:

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

Eva L Pear

THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

1700 PACIFIC AVENUE • SUITE 3300
DALLAS, TEXAS 75201-4693
(214) 969-1700
FAX (214) 969-1751

AUSTIN
FORT WORTH
HOUSTON
MONTERREY, MEXICO

DIRECT DIAL:

(214) 969-1102

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1996 NOV 13 AM 10: 50
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EPA REGION VI

November 13, 1996

VIA HAND DELIVERY

Mark E. Chandler
Regional Judicial Officer
United States Environmental
Protection Agency
Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: *Sparton Technology, Inc.*; Docket No. RCRA-VI-001(h)-96-H

Dear Mr. Chandler:

Last week I received a letter from you dated November 6, 1996, in which you stated you had enclosed a copy of a memorandum from the regional administrator designating you as the presiding officer for the above-referenced proceeding. The letter I received from you did not include a copy of the memorandum. I would appreciate your forwarding to me a copy of that memorandum, as soon as possible, so I can review it.

I am also in receipt of a motion from Evan Pearson to set a schedule for this matter. EPA's regulations do not appear to specify a time for responding to that motion. I would appreciate your advising me what authority, if any, you have to act on that motion, and where I can look to find a description of how and when I am to respond, and what happens if I do not respond.

Yours very truly,

James B. Harris

JBH:bgp

cc: Evan Pearson (via first class mail)
Regional Hearings Clerk

54008 09964 LERA 53305

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2. CONSIGNEE SIGNATURE

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ATTORNEYS AND COUNSELORS
1700 PACIFIC AVENUE • SUITE 3300
DALLAS, TEXAS 75201-4693

Mark E. Chandler
Regional Judicial Officer
United States Environmental
Protection Agency
Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

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REGIONAL HEARING CLERK
EPA REGION VI

November 15, 1996

Mr. James B. Harris, Esq.
THOMPSON & KNIGHT
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

RE: Sparton Technology, Inc. - Docket RCRA-VI-001(h)-96-H

Dear Mr. Harris:

I have received your letter of November 13, 1996, concerning the referenced RCRA action by the EPA. Our apologies for not enclosing the memorandum from the Regional Administrator; I do not know how that happened.

I am enclosing it this time around. I am also FAXing it. Mr. Pearson has indeed filed a motion to set a schedule for the matter, based somewhat on the schedules suggested in 40 C.F.R. 24.14. Experience has shown that the setting of a hearing date within 45 days of a scheduling order as contemplated by 24.14 is not sufficient time for Respondent to pursue its other rights, such as the submission of questions to the EPA. The 90-day period suggested in the motion would appear to be more realistic.

It is also my belief that the motion was as much concerned with vacation and holiday schedules as it was in keeping the docket moving. Part 24 is silent on motions *per se*, but I view the instant motion, as with all motions in administrative or federal procedure, to require a response. I would note, however, that Part 24.04(e) states that service of all other pleadings (not an initial or final administrative order) is complete upon mailing. Most of the EPA procedural regulations require a response within 10 days of receipt of a motion [see, for instance, Part 22.16(b)]. My authority to act on the motion and any other proceeding is contained in the enclosed memorandum, as contemplated by Part 24.06. I can in this case provide more time for response (see 24.14(b).

Accordingly, I would expect to receive a response to the motion by the close of business November 26, 1996. The motion by Mr. Pearson does not suggest calendar dates, but instead only a schedule of time intervals. If you agree with the time periods, you need not respond. If you want to suggest other time intervals, you should respond.

If you do not respond to the motion, I will set a schedule of prehearing proceedings that adhere to the regulations and perhaps

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the motion, leading to a hearing late in the first quarter of 1997. A response would probably trigger a conference call to establish a schedule satisfactory to your client and the EPA.

Sincerely,

Mark Chandler

Mark E. Chandler
Regional Judicial Officer

Enclosure: a/s

cc: E. Pearson, Esq.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

1996 NOV -6 AM 9:26

REGIONAL HEARING CLERK
EPA REGION VI

October 31, 1996

MEMORANDUM

SUBJECT: Designation of Presiding Officer in RCRA Docket No. VI-001(h)-96-H

FROM: Jane N. Saginaw
Regional Administrator (6A)

TO: Mark E. Chandler
Regional Judicial Officer (6RC-HO)

The Director of the Compliance Assurance and Enforcement Division isuued a RCRA 3008(h) Initial Corrective Action Order against Sparton Technology, Inc., in Albuquerque, New Mexico, on September 16, 1996.

Sparton Technology responded to the order timely on October 18, 1996, disputing the order and requesting a 40 C.F.R. 24, Part C public hearing. Section 24.06 of Part 24 provides that:

> Upon a receipt of a request for the hearing, the Regional Administrator shall designate a Presiding Officer to conduct the hearing and preside over the proceedings.

Further, Section 24.13 provides that the "Presiding Officer shall be either the Regional Judicial Officer" or another agency attorney not previously connected with the case.

Accordingly, I hereby designate Mark E. Chandler, the standing Regional Judicial Officer as the Presiding Officer in this case. All pleadings and other proceedings shall be directed to him or the Regional Hearing Clerk.

009146

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THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

1700 PACIFIC AVENUE • SUITE 3300
DALLAS, TEXAS 75201-4693
(214) 969-1700
FAX (214) 969-1751

AUSTIN
FORT WORTH
HOUSTON
MONTERREY MEXICO

DIRECT DIAL:

(214) 969-1102

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1996 NOV 27 AM 8:32
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EPA REGION VI

November 26, 1996

Mark E. Chandler
Regional Judicial Officer
United States Environmental
Protection Agency, Region 6
1445 Ross Avenue
Suite 1200
Dallas, Texas 75202-2733

Re: *Sparton Technology, Inc., Docket RCRA-VI-001(h)-96-H*

Dear Mr. Chandler:

I am in receipt of your November 15, 1996, letter that transmitted a copy of the memorandum from the Regional Administrator appointing you the presiding officer, and that discusses Evan Pearson's scheduling motion.

My client objects to the entry of any scheduling order in this matter. We believe that the current litigation over EPA's breach of an administrative order on consent prevents the agency from moving forward with this administrative proceeding. We also believe that the procedures for challenging the initial administrative order violate due process and other constitutional protections. It is our view the EPA is constitutionally prohibited from resolving the type of dispute presented in this matter. Finally, in issuing an order in this case, EPA did not follow its own regulations. By entering a scheduling order, you are effectively stating you are unwilling to consider these issues and that you are rejecting them.

Without waiving any of Sparton's legal objections to this administrative proceeding, and recognizing you have said that if Sparton does not respond, you will proceed to enter an order consistent with the regulations and perhaps Evan Pearson's motion, Sparton offers the following thoughts.

We question the proposal that Sparton and EPA have the same period of time in which to prepare memorandums of the type described in 40 C.F.R. § 24.14. If a scheduling order is in fact entered in the next two weeks, a large portion of Sparton's time for preparing a memorandum would include the Christmas and New Year's holidays. Your letter recognizes how Christmas and New Year's interferes with finalizing projects, especially one where numerous parties, spread all of the country, will be involved. Secondly, most time schedules I am familiar with allow the party preparing the initial pleading greater preparation time than

the responding party. This arrangement follows from our experiences as lawyers that it is always more difficult to develop an initial position than to respond to what somebody else has said. To address only these concerns it would be entirely appropriate to make any memorandum that might be required from Sparton due at the earliest in late January. Of course, because the regulations fail to specify the completeness required in a memorandum, it is impossible to know exactly how much time will be required.

I also question whether EPA has a right, under the procedural regulations, to object to any discovery requests Sparton might file, in the unlikely event this proceeding continues. I also believe it is important that any scheduling order that might be entered provide Sparton with an appropriate opportunity to evaluate EPA's discovery responses for incorporation into a submittal or presentation at any hearing that may be held. If a hearing happens to be held ninety days from the date of the scheduling order, you take two weeks in deciding what discovery EPA is required to answer, and EPA responds within fourteen days, twelve days would be left before a hearing. That time is far too short for proper consideration of EPA's responses and incorporation into any submission or presentation that might be made. I would note, for instance, that under the regulations, a respondent can only request to be allowed to submit additional information in this process if that request is received five business days before a hearing. If a hearing was on a Monday and EPA's discovery responses were received twelve days before that date, only two days would be left to request that whatever information was identified be considered at any hearing that might be held.

Yours very truly,

James B. Harris

JBH:bgp

cc: Lorena Vaughn, Regional Hearings Clerk (via hand delivery)
Evan Pearson (via hand delivery)

40310 00001 LERA 53697

THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS
1700 PACIFIC AVENUE • SUITE 3300
DALLAS, TEXAS 75201-4693

Lorena Vaughn,
Regional Hearings Clerk
United States Environmental
Protection Agency, Region 6
1445 Ross Avenue
Suite 1200
Dallas, Texas 75202-2733

009149

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY 1996 DEC 16 AM 10: 56
REGION 6
DALLAS, TEXAS

REGIONAL HEARING CLERK
EPA REGION VI

IN THE MATTER OF:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	U.S. EPA DOCKET NO.
9621 COORS ROAD NW	)	RCRA-VI-001(h)-96-H
	)	
EPA I.D. NMD083212332	)	ORDER ESTABLISHING HEARING SCHEDULE
	)	
RESPONDENT	)	

The Complainant, the Director of the Compliance Assurance and Enforcement Division of the Region 6 office of the Environmental Protection Agency, filed an Initial Administrative Order against the Respondent here(hereinafter, the "Complainant" or the "EPA"). The Complainant filed under the authority of Section 3008(h) of the Resource Conservation and Recovery Act (the "RCRA"), 42 U.S.C. 6928(h), which provides for the issuance of such an order requiring corrective action at a RCRA interim status facility to protect human health and the environment.

Proceedings under the corrective action provision of the Section 3008(h) are governed by the EPA regulations at 40 C.F.R. 24, the Rules Governing Issuance of and Administrative Hearings on Interim Status Corrective Action Orders. Section 24.06 provides that upon receipt of a request for a hearing, the Regional Administrator shall designate a Presiding Officer to conduct the hearing and preside over the proceedings. The Respondent requested a hearing in its timely filing of Protective Response and Request for Hearing, and the Regional Administrator designated the undersigned, the standing Regional Judicial Officer, as the Presiding Officer for the proceedings. The parties agree, as do I, that Subpart C of Part 24 is appropriate for the proceeding.

Subpart C contemplates a public hearing after certain procedural actions have taken place. Normally, the Presiding Officer would hold a prehearing conference to establish schedules for those actions. In this case, however, Respondent objects to the entry of any scheduling order, stating that the current litigation, filed in the federal district court by Respondent, prevents the EPA from going forward with this instant order. Further, the Respondent believes that this administrative order proceeding violates due process and "other constitutional protections."

Nevertheless, the EPA has selected a remedy for the corrective action, which the EPA says the Respondent has not accepted or implemented. The agency has the authority unilaterraly to select a remedy in these circumstances. In addition, the rules and procedures at Part 24 provide adequate due process for Respondent.

Accordingly, I will proceed to establish a scheduling order for this order, with due regard for the holiday period, as both sides have reminded me. I will accept their pleas as motions for a relaxed schedule and an extended date for the hearing, and act under the authority of the Presiding Officer in Part 24.14(b).

- No later than January 31, 1997, Respondent shall file a memorandum as contemplated by Part 24.14(a)(1) and (c), complete with affidavits and exhibits as necessary. The Respondent shall therein identify the facts it will contest and the law as it sees it, and may suggest any modifications to the order it believes is required. Respondent shall file the memorandum with the Regional Hearing Clerk and serve the EPA.

- No later than February 10, 1997, Respondent, pursuant to Part 24.14(d) and in its discretion, shall file with the Presiding Officer a request to submit written questions to the EPA.

- No later than February 17, 1997, the Presiding Officer shall transmit to the EPA all questions which, in his discretion, are relevant and material, not subject to internal communication and that may provide some additional help in resolution of the facts. The rules limit the number of questions to 25.

- No later than February 21, 1997, the EPA shall file a response to the memorandum filed by the Respondent, with a copy served on Respondent.

- No later than March 3, 1997, the EPA shall file a response to the questions forwarded to it by the Presiding Officer and shall serve the Respondent with such response.

- No later than March 14, 1997, the Respondent shall file any additional information in support of its claims.

- A hearing date of March 27, 1997, is herein established. The hearing will be held in Dallas, Texas, in the offices of the EPA, beginning at 9:30 a.m., in the Regional Hearing Room on the 13th floor. Respondent is requested to obtain a visitor's pass or passes from the receptionist on the 7th floor (who will in turn call the Presiding Officer).

IT IS SO ORDERED this 16th day of December 1996.

Mark E. Chandler

Mark E. Chandler
Regional Judicial Officer
Telephone: 214-665-2137

Z 049 667 675

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PS Form 3800, March 1993

009152

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3. Article Addressed to:

Mr. James B. Harris, Esq.
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4683

4a. Article Number

Z 049 667 675

4b. Service Type

☐ Registered ☐ Insured
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12-20-96

5. Signature (Addressee)

6. Signature (Agent)

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PS Form 3811, December 1994 *U.S. GPO: 1995—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

009153

CERTIFICATE OF SERVICE

I, Lorena S. Vaughn, the Regional Hearing Clerk for the Region 6 office of the U. S. Environmental Protection Agency in Dallas, Texas, hereby certify that I served TRUE AND CORRECT copies of the foregoing ORDER ESTABLISHING HEARING SCHEDULE, re In the Matter of: Sparton Technology, Inc., Docket No. RCRA-VI-001(h)-96-H, on the persons listed below, on the date and in the manner indicated:

Mr. James B. Harris, Esq. THOMPSON & KNIGHT 1700 Pacific Avenue, Suite 3300 Dallas, Texas 75201-4683	U.S. CERTIFIED MAIL - RETURN RECEIPT REQUESTED
Mr. Evan Pearson, Esq. Senior Attorney Office of Regional Counsel (6RC-C) Environmental Protection Agency 1445 Ross Avenue, Suite 1200 Dallas, Texas 75202-2733	HAND DELIVERY

Date: 12-16-96

Lorena S. Vaughn

Lorena S. Vaughn
Regional Hearing Clerk

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

January 6, 1997

MEMORANDUM

SUBJECT: Designation of Presiding Officer in Spartan Technology, Inc.
RCRA Docket No. VI-001(h)-96-H

FROM: Jane N. Saginaw
Regional Administrator (6RA)

TO: George Malone, III
Acting Regional Judicial Officer (6RC-HO)

The Director of the Compliance Assurance and Enforcement Division issued a RCRA Section 3008(h) Initial Administrative Order (Order) against Spartan Technology, Inc. (Spartan) on September 16, 1996. Spartan filed a timely response to the Order on October 18, 1996, and requested a Subpart C public hearing pursuant to 40 C.F.R. § 24.05. Consistent with 40 C.F.R. §§ 24.06 and 24.13, I designated Mark E. Chandler, the standing Regional Judicial Officer at that time, as the Presiding Officer for the case.

Unfortunately, the services of Mr. Chandler are no longer available to this Agency, as he retired on January 3, 1997. As such, I hereby designate you, the Acting Regional Judicial Officer, as the Presiding Officer in this case. Because you will conduct the hearing and preside over the proceedings, please inform counsel for the parties that all pleadings shall be directed to you or the Regional Hearing Clerk, Lorena S. Vaughn.

009156

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
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FILED
JAN 14 1997
EPA REGION VI
HEARING CLERK

January 14, 1997

Mr. James B. Harris, Esq.
THOMPSON & KNIGHT
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

Evan L. Pearson, Senior Esq.
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Subject: Spartan Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Counsel:

Pursuant to existing regulations at 40 C.F.R. Part 24, the Regional Administrator designated a Presiding Officer to conduct the public hearing and proceedings for this action on October 31, 1996. Because the originally assigned Presiding Officer retired in early January 1997, the Regional Administrator designated me, the newly appointed, Acting Regional Judicial Officer, as the current Presiding Officer to conduct the Subpart C public hearing and proceedings for this case. The qualifications for a Presiding Officer requires that person to either be the Regional Judicial Officer or an attorney employed by the Agency. In addition, the Presiding Officer shall not have any prior connections with the case.

I am employed by the Agency as an attorney with Regional Judicial Officer responsibility, and did not participate in this case until my assignment as Presiding Officer. For your information, enclosed is a copy of the memorandum from the Regional Administrator designating me as the Presiding Officer for this case. I look forward to working with each of you in

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accordance with the December 16, 1996, scheduling order established for the public hearing and proceedings.

Sincerely yours,

George Malone, III
Acting Regional Judicial Officer
Telephone: 214-665-8030
E-Mail: malone.george@epamail.epa.gov

Enclosure

Z 049 567 688

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PS Form 3800, March 1993

009159

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Mr. James B. Harris, Esq.
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-1267

4a. Article Number: Z 049 647 488

4b. Service Type
☐ Registered ☐ Insured
☐ Certified ☐ COD
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7. Date of Delivery: JAN 16 1987

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form 3811, December 1985 DOMESTIC RETURN RECEIPT

009160

In the Matter of Spartan Technology, Inc., Respondent
Docket No. RCRA-VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Lorena S. Vaughn, Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing letter dated January 14 , 1997, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. THOMPSON & KNIGHT 1700 Pacific Avenue, Suite 3300 Dallas, Texas 75201-4683	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED
Mr. Evan Pearson, Senior Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Lorena S. Vaughn
Regional Hearing Clerk

Date: 1-14-97

THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

1700 PACIFIC AVENUE • SUITE 3300
DALLAS, TEXAS 75201-4693
(214) 969-1700
FAX (214) 969-1751

AUSTIN
FORT WORTH
HOUSTON
MONTERREY, MEXICO

DIRECT DIAL:

(214) 969-1102

FILED
97 JAN 30 PM 1:53
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EPA REGION VI

January 30, 1997

VIA HAND-DELIVERY

George Malone, III
Acting Regional Judicial Officer
U.S. Environmental Protection
Agency
1445 Ross Avenue
Suite 1200
Dallas, TX 75202-2733

Re: Sparton Initial Administrative Order

Dear Mr. Malone:

As a result of a death in my family, I will be out of my office all day attending the funeral in Oakland.

I have discussed this matter with Evan Pearson and requested that the January 31, 1997, deadline for Sparton be extended to Tuesday, February 4, 1997.

Mr. Pearson has very graciously agreed to that extension and we would appreciate it if you would issue an amended order reflecting that change, as well as adding corresponding additional time for EPA's response and Sparton's deadline for further information. These changes should not effect when Sparton's discovery requests are due or the hearing date.

Yours very truly,

James B. Harris

James B. Harris

JBH/eshd
cc: Evan L. Pearson, Esq. (VIA HAND-DELIVERY)
00001 FLR37 LERA 55555

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Company THUMPSON & KNIGHT
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Suite 3300 City DALLAS
Contact Eunice Hamilton-Demus x1170

DELIVER TO

Company U.S. EPA
Address 1445 Ross Avenue
Suite 1200 City Dallas
Contact George Malone, III, Esq.

1. CONSIGNOR SIGNATURE

2. CONSIGNEE SIGNATURE

REFERENCE NUMBER	DESCRIPTION
40310.00001	2 envs.

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LBS MIN	557500	0300709			
$	12 20 97	1145 AM PM	$		
CHARGES	MO DAY YR	TIME DELIVERED	TOTAL CHARGE		

009164

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ATTORNEYS AND COUNSELORS
1700 PACIFIC AVENUE • SUITE 3300
DALLAS, TEXAS 75201-4693

VIA HAND-DELIVERY
George Malone, III
Acting Regional Judicial Officer
U.S. Environmental Protection
Agency
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Rec. 1-30-97
11:46

009165

FILED

97 JAN 30 PM 5:00

REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)	
	)	U.S. EPA DOCKET NO.
SPARTAN TECHNOLOGY, INC.	)	RCRA VI-001(h)-96-H
ALBUQUERQUE, NEW MEXICO	)	
	)	
EPA I.D. NO. NMD083212332	)	ORDER AMENDING THE
	)	ESTABLISHED HEARING
	)	SCHEDULE
RESPONDENT	)	

This action before me involves an unopposed request, in part, by Spartan Technology, Inc., the Respondent, to extend the deadline for filing its memorandum supporting the requested relief in the Respondent's October 18, 1996, request for a hearing.[1] The Respondent's October 18, 1996, hearing request was in response to the EPA's issuance of a September 16, 1996, Unilateral Administrative Order directing the Respondent to conduct corrective action pursuant to Section 3008(h) of the Resource Conservation and Recovery Act, 42 U.S.C. § 6928(h).

The unopposed portion of the request would allow the Respondent to file its memorandum on February 4, 1997, in lieu of January 31, 1997, while the EPA would file its responsive

---

[1] On January 30, 1997, the Respondent hand-delivered a letter dated January 30, 1997, which indicated that the Environmental Protection Agency (EPA) counsel agreed to extending the dates for filing: 1) Respondent's memorandum; 2) EPA's responsive memorandum; and 3) Respondent's submission of additional information. The EPA counsel indicated via telephone that he did not agree to extending any dates except the submission of the Respondent's memorandum and the EPA's responsive memorandum.

memorandum on February 25, 1997, instead of February 21, 1997. Additionally, the Respondent seeks to extend the March 14, 1997, deadline for submitting additional information, which is opposed by the EPA. As it concerns the opposed portion of the Respondent's request, the Respondent counsel of record did not elaborate on why counsel needed additional time to extend the March 14, 1997, deadline.

The proceedings under the Section 3008(h) corrective action program are governed by the EPA regulations at 40 C.F.R. Part 24, the Rules Governing Issuance of and Administrative Hearings on Interim Status Corrective Action Orders. Because the September 16, 1996, Unilateral Administrative Order requires specified corrective measures, Subpart C of 40 C.F.R. Part 24 sets forth the specific procedures allowed in the proceedings for this case.

More specifically, 40 C.F.R. § 24.14(b) provides the Presiding Officer with authority to grant an extension of time for filing any document other than a request for a hearing under 40 C.F.R. § 24.05(a). Here, the Respondent's counsel provided a compelling reason involving a family matter, which made the filing of the Respondent's memorandum next to impossible.[2] In addition, the EPA counsel does not oppose extending the January 31, 1997, deadline to February 4, 1997. Likewise, the Respondent's counsel does not oppose extending the EPA's

---

[2] The January 30, 1997, letter indicates that counsel of record is attending a funeral which requires counsel to be out of the office on January 31, 1997. The Respondent's memorandum is due the day counsel is out of the office.

responsive memorandum deadline of February 21, 1997, to February 25, 1997.

On the other hand, the EPA counsel does oppose extending the March 14, 1997, deadline requiring the Respondent to submit additional information to support its claim pursuant to 40 C.F.R. § 24.14(e). The Respondent's counsel did not specifically address how the January 31, 1997, absence from the office adversely impacted counsel's ability to satisfy the May 14, 1997, deadline, in its January 30, 1997, letter. Without further information, the Presiding Officer believes that the March 14, 1997, deadline will not be affected by the Respondent's January 31, 1997, absence from the office.

For the reasons set out above, I find that good cause is shown for extending the January 31, 1997, deadline to February 4, 1997, and the February 21, 1997, deadline to February 25, 1997. However, at this time, I believe it is inappropriate to amend any other deadline set forth in the December 16, 1996, scheduling order. The December 16, 1996, scheduling order is hereby amended accordingly.

IT IS SO ORDERED this 30th day of January 1996.

GEORGE MALONE, III
REGIONAL JUDICIAL OFFICER, ACTING

Z 049 667 592

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PS Form 3800, March 1993

009169

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I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
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Consult postmaster for fee.

3. Article Addressed to:

Mr. James B. Harris Esq
Thompson & Knight P.C.
1700 Pacific Ave
Suite 3300
Dallas, Texas 75201

4a. Article Number

4b. Service Type

☐ COD
☐ Return Receipt for Merchandise
☐ Insured

7. Date of Delivery

FEB 14 1992

8. Addressee's Address (Only if requested and fee is paid)

5. Signature (Addressee)

6. Signature (Agent)

PS Form 3811, December 1991 *U.S.G.P.O. 1992-307-865 DOMESTIC RETURN RECEIPT

In the Matter of Spartan Technology, Inc., Respondent
Docket No. RCRA VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Lorena S. Vaughn, Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing Order dated January 30, 1997, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. Thompson & Knight 1700 Pacific Avenue Suite 3300 Dallas, Texas 75201	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED
Mr. Evan Pearson, Senior Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Lorena S. Vaughn
Lorena S. Vaughn
Regional Hearing Clerk

THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

1700 PACIFIC AVENUE • SUITE 3300
DALLAS, TEXAS 75201-4693
(214) 969-1700
FAX (214) 969-1751

AUSTIN
FORT WORTH
HOUSTON
MONTERREY, MEXICO

DIRECT DIAL:

(214) 969-1102

February 4, 1997

Via Hand Delivery
Ms. Lorena Vaughn, Clerk
Office of the Regional Hearings Examiner
U.S.E.P.A.
1445 Ross Avenue
Dallas, Texas 75202

Re: *In the Matter of Spartan Technology, Inc.*; U.S. EPA Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Enclosed is an original and one (1) copy of the Memorandum Regarding Spartan Technology, Inc.'s Position on the Facts, The Law, and the Relief Sought by EPA. Please accept the original for filing and return the file-marked copy to the courier delivering this information to you. You instructed my legal assistant by telephone today that you want only the original for filing and do not require a copy.

Your assistance is appreciated.

Yours very truly,

James B. Harris

JBH:lmi
Enclosures

cc: Mr. Evan Pearson, U.S.E.P.A
40310 00001 LERA 55770

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

FILED
-4 PM 4 48
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EPA REGION VI

IN THE MATTER OF:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 COORS ROAD NW	)	U.S. EPA DOCKET NO.
ALBUQUERQUE, NM 87114	)	RCRA-VI-001(h)-96-H
	)	
EPA I.D. NO. NMD083212332	)	
	)	
RESPONDENT	)	

MEMORANDUM REGARDING SPARTON TECHNOLOGY, INC.'S POSITION ON THE FACTS, THE LAW, AND THE RELIEF SOUGHT BY EPA

INTRODUCTORY STATEMENT

Sparton Technology, Inc. ("Sparton") was directed in an order dated December 16, 1996, to file no later than January 31, 1997, a memorandum as contemplated by Part 24.14(a)(1) and (c). That date was extended, through agreement of the parties, until February 4, 1997.

This memorandum is being filed subject to and without waiving any of Sparton's claims in a pending lawsuit against the Environmental Protection Agency ("EPA"), challenging the agency's authority to issue the Initial Administrative Order ("Order") that began this proceeding, and its decision to select the relief provisions set forth in the Order.

Sparton's position in its lawsuit is that under the terms of an administrative order on consent ("AOC") entered into between EPA and Sparton, EPA was required to accept the remedy described in the final version of a corrective measure study ("CMS"), conducted by Sparton in accordance with the requirements of the AOC. EPA has selected a remedy different than the one set forth in the approved CMS, and in doing so has violated the terms of the AOC.

It is also Sparton's position that the procedures for challenging the Order as applied to this specific situation are unconstitutional.

EPA rejected Sparton's construction of the AOC when it issued its final decision in response to comments on June 24, 1996. It has rejected Sparton's position a second time in seeking to dismiss the lawsuit in which Sparton asks that EPA comply with its obligations under the AOC. It rejected Sparton's position for a third time in the order establishing a hearing schedule for this proceeding when the regional judicial office stated "the agency has the authority unilaterally to select a remedy." It would be futile for Sparton to seek any further relief on this issue in this proceeding.

Likewise, Sparton's constitutional claims, which it is not required to raise in this proceeding, have already been summarily rejected by the regional judicial officer in the order establishing a hearing schedule for this proceeding. According to the regional judicial office "the rules and procedures of Part 24 provide adequate due process for respondent." It would be futile to continue with the constitutional claims in this proceeding, even if Sparton was required to do so.

Solely as a protective measure, pending the outcome of Sparton's judicial action, this memorandum is being filed. It will address two principal points. First that EPA has failed to establish the statutory prerequisite for the issuance of the Order, namely the existence of a reasonably likely threat to human health or the environment. Secondly, even if such a threat existed, which it does not, the relief ordered by EPA is unnecessary.[1]

---

[1] Sparton has already identified in its Protective Response and Request for Hearing "all factual allegations and all issues regarding the appropriateness of the terms of the relief that respondent contests," and that document also states Sparton's position on those issues. That document is incorporated by reference. This pleading provides a more focused analysis of many of the issues raised in the earlier submission

FACTUAL BACKGROUND

As described in the CMS, Sparton operated a manufacturing plant (the "Coors Road Plant") on the northeast side of Albuquerque approximately 0.75 miles north of the intersection of Coors Road and Paseo del Norte. CMS at II-1.

Operations at the site began in 1961, and involved the manufacture of electric components until 1994. Since 1994, a machine shop has been operated by Sparton at the Coors Road Plant in support of another Sparton manufacturing activity.

Spent chlorinated solvents associated with the manufacture of electric components were accumulated on-site. It is thought that there may have been releases of these solvents to the environment, which have impacted groundwater in the immediate vicinity of the Coors Road Plant. CMS at II-1-6.

Sparton and EPA disagree about what should be done to address the impacted groundwater. In the CMS, Sparton identified a soil vapor extraction system and enhancement of an on-going system to contain solvents found in groundwater under Sparton property as the "necessary" response. Since submission of the CMS, Sparton has proposed, solely in an effort to compromise and settle differences between the parties, the development of a system to prevent further off-site movement of solvents above drinking water limits beyond the leading edge of the plume.

PROCEDURAL BACKGROUND

On October 21, 1988, EPA and Sparton entered into an AOC. The terms of the AOC were satisfied by Sparton. Its final submission under the AOC was the CMS submitted to EPA on May 13, 1996, and approved with "concerns" on June 24, 1996.

On June 24, 1996, in violation of the AOC, the EPA issued a final decision and response to comments selecting a remedy other than the one identified in the approved CMS.

On August 7, 1996, Sparton sued EPA alleging that the agency had violated the AOC.

On September 16, 1996, EPA issued the Order, purportedly pursuant to the authority of § 3008(h) of RCRA, 42 U.S.C. § 6928(h).

On or about October 16, 1996, Sparton filed a protective response and request for hearing.

On December 16, 1996, a hearing schedule was established for this proceeding.

BURDEN OF PROOF

EPA bears the burden of establishing by a preponderance of the evidence that the relief it seeks is necessary to protect human health or the environment. 5 U.S.C. § 556(d); 40 C.F.R. § 24.17(a).

ARGUMENT AND AUTHORITIES

A. EPA has no factual basis for finding any threat to human health or the environment, and the issued Order must be withdrawn.

1. Section 3008(h) of RCRA only allows issuance of an order where there is a threat to human health or the environment.

The language of § 3008(h) makes very plain the circumstances in which an order may be issued under that section:

> . . . the administrator may issue an order requiring corrective action or such other response measures as he deems necessary to protect human health or the environment.

42 U.S.C. § 6928(h).

Clearly if there is no threat to human health or the environment there is nothing to protect. Therefore, the first step the agency is statutorily required to undertake in deciding whether to

issue an order under § 3008(h) is identification of the threats presented to human health or the environment as a result of a release of hazardous waste.

As EPA has stated: "EPA's strategy for corrective action implementation incorporates risk-based decision-making throughout the corrective action process." 61 Fed. Reg. 19432, 19450 (May 1, 1996). According to EPA at some sites "a site specific risk assessment will be desirable," but at all sites some risk assessment is necessary. Id. at 19450-19451. The clear message from EPA is that before an order is issued under § 3008(h), there must be an identification of a threat and a determination as to the remedy "necessary" to deal with that threat. Id.

If a threat is not presented there is nothing to protect and no order may be issued under Section 3008(h). If a threat is present then only the remedy "necessary" to address that threat can be ordered. If the remedy does more then relieve the threat it, by definition, is not "necessary" and cannot be ordered by EPA.

2. The unchallenged risk analysis in the CMS establishes there is no threat to human health or the environment from the impacted groundwater; therefore no corrective action is necessary and the Order must be withdrawn.

Pages III-62 through III-75 of the CMS describe the potential receptors and exposure pathways by which human health might be threatened by the impacted groundwater. As concluded in the CMS, the impact to groundwater does not present a risk of injury to potential receptors and will not cause a loss of any reasonably foreseeable use of the aquifer. CMS VIII-9. The reports of Pierce Chandler and W. Peter Balleau, attached to this memorandum as Exhibits "A" and "B" respectively, and incorporated herein by reference, restate this conclusion in slightly different terms.

Nor is an impact to the groundwater itself sufficient to justify the issuance of a § 3008(h) order. EPA has recently indicated that impacts to a portion of the environment do not necessarily require a response unless that impact alters an ecological system. 61 Fed. R. 47552, 47557 (Sept. 9, 1996). Stated slightly differently, from an ecological risk assessment standpoint, impacts to the groundwater are of concern only if they stress ecologically relevant end-points. Id. at 47567. Examples of "end-points" given by EPA include a food base, a habitat, or a portion of an ecosystem that regenerates critical resources. Id. Making such a determination requires the identification of a "valued ecological entity," such as a species, a group of species, an ecosystem function or characteristic, a specific valued habitat, or a unique place. Id. at 47568. After the "valued ecological entity," is identified, there must be a determination of what characteristic about that entity is important to protect and that is potentially at risk.

Here there has been no identification of any "valued ecological entity." The groundwater by itself does not fall into that category. The value of that resource, at least in the area impacted by Sparton's activities, is wholly dependent upon human contact. Stated another way, the only potential users of the specific part of the resource impacted by Sparton are humans. In the absence of such human use, there can be no significant adverse effect on any non-human connected ecosystem in the area. Because the only possible use of the impacted resource is human, the need for any corrective action is governed only by threats to human health. Therefore, not only is groundwater not a "valued ecological entity," in the specific area impacted, it does not have a characteristic, from an environmental perspective, that is important to protect and potentially at risk. It was unnecessary then to conduct any type of ecological risk assessment in connection with the impacts to groundwater associated with Sparton's prior activities at the Coors Road Plant.

3. EPA in neither its final decision and response to comments nor in the initial administrative order has challenged the findings of the CMS.

The only findings of fact and conclusions of law even marginally related to the requirement of § 3008(h) of RCRA that an identified corrective action be necessary to protect human health and the environment, are findings that there have been releases of hazardous waste into the environment. Finding of Fact 18, Conclusion of Law 6.

There is not a single finding of fact nor conclusion of law inconsistent with the determination made in the CMS, and the reports of Chandler and Balleau that: (1) the impacted groundwater is not, and prior to remediation will not be used for drinking purposes; or (2) there is no significant risk to human health presented by the impacted groundwater. For instance, EPA found that the impacted groundwater is "part" of an aquifer utilized by the city of Albuquerque and New Mexico Utilities. But EPA does not identify that the specifically impacted groundwater is currently used or that in the future that specifically impacted groundwater will be used by either of those entities.[2] EPA also suggests that there is a public drinking water supply well approximately two miles down gradient from the leading edge of the groundwater plume, but fails to identify whether there is any likelihood that such well could ever be affected by the impacted groundwater. In fact, as set forth in the CMS and further explained in Pierce Chandler's report, that well cannot and will not be adversely effected, even if there is no containment of the off-site solvents.

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[2] As described in the CMS, the specifically impacted groundwater that is the subject of the Order is outside of the city of Albuquerque's service area, and not available for use unless the city, through an extended administrative process, makes a number of very difficult showings. The president of New Mexico Utilities has confirmed that utility has no plans to use the impacted groundwater. See Exhibit "D."

As noted above, EPA has made clear that releases of hazardous waste into the environment, by themselves, are not sufficient to justify the issuance of a Section 3008(h) order. Rather, there must be some unreasonable risk associated with that release. No such risk has been identified by EPA here, which is not surprising given that the CMS concluded no risk exists.

B. Even if there was an unreasonable risk to human health (which there is not) in connection with the impacted groundwater, the relief ordered by EPA is unnecessary.

1. What is EPA proposing?

As Sparton understands the Order, EPA is asking two actions be undertaken -- soil vapor extraction and groundwater extraction.

EPA has provided Sparton with 255 days to develop a plan to study the presence of soil vapor on property it owns, associated with releases from its Coors Road Plant, and develop a report of that investigation and the design of a corrective measure. Implementation of that corrective measure will occur at some point beyond the 255 days, depending upon how long it takes EPA to review all of the reports that must be developed by Sparton.

EPA has provided Sparton with 375 days to study and develop a plan for "restoring" the impacted groundwater. As part of the study, EPA is directing that Sparton install at least 20 additional monitor wells. EPA is also directing that Sparton install as part of the "restoration" effort up to three containment wells and an indeterminate number of recovery wells. EPA is also requiring that all recovered water be treated to below drinking water standards and reinjected into the aquifer from which it was taken, on the basis of one reinjection well for each containment or recovery well.

Initiation of actual "restoration" activity will occur sometime after the 375 days provided to Sparton for completing studies and preparing reports. Any delay being solely the result of the

length of time it takes EPA to review and act upon Sparton's submissions. Based upon Sparton's past experience with EPA, it is expected that no remedial or restoration activity would occur for at least two years from the time, if ever, the Order becomes effective.

Sparton, on the other hand is already engaged in activities that it believes will result in the implementation of a soil vapor extraction system if one is necessary, by July 10, 1997.

Additionally, Sparton believes that in the absence of the Order, and if authorization to discharge recovered and treated groundwater to the Calabacillas Arroyo is granted by June 1997, it could be operating a containment well to prevent movement of solvents beyond the leading edge of the plume in concentrations greater than drinking water standards no later than January 1, 1998.

2. It is unnecessary to install twenty additional monitor wells, as EPA is ordering, because the plume is already adequately defined.

As set forth in the attached report of Pierce Chandler, the vertical and horizontal extent of solvents associated with Sparton's Coors Road Plant have been sufficiently described to allow for an assessment of any risks that may be present, and to design a remedy. Further study only delays implementation of activities to prevent movement of solvents above drinking water limits into unimpacted groundwater. Therefore such action is not "necessary" to protect human health, but will instead result in an expansion of impacts while the studies the EPA has requested are under way.[3]

[3] EPA's decision to require 20 more monitor wells was made before Sparton installed 5 new monitor wells, which as Pierce Chandler's report makes clear confirm the understanding of the plume set forth in the CMS. Sparton would hope that EPA now shares Sparton's position that further monitor wells are unnecessary for plume delineation.

3. The impacted groundwater is not a current source of drinking water, and is not expected to be a future source of drinking water before it would be remediated.

As described in the attached report of W. Peter Balleau, in a letter from Robert Swartout, president of New Mexico Utilities, and in the CMS, the currently impacted groundwater is not being used as a source of drinking water nor are there any current plans to use that resource for public drinking water supply. As Balleau concludes, "the future amount and cost of water produced from the groundwater resource for public water supply for the foreseeable future in the Albuquerque Basin will be the same with or without the TCE plume at the Sparton site." Balleau also notes that "the background water quality [in the impacted groundwater] is undesirable for public water supply with or without the TCE contamination."

The simple reality, which EPA refuses to acknowledge, is that no one has any current or reasonably foreseeable plan to complete drinking water supply wells in the impacted groundwater that is specifically addressed by the Order. Moreover, the unavailability of that groundwater, while remediation is ongoing, will not adversely impact any community in the area. There is, therefore, no need to expedite remedial activity at this site.

EPA itself has suggested that if: (1) threats to human health are not present; (2) technical practicality problems exist in removing impacts; and (3) there is little likelihood the impacted groundwater will be used, that restoration to drinking water standards is not necessary. 61 Fed Reg. 19432, 19450 (May 1, 1996). Instead, EPA has indicated containment is perfectly acceptable, especially, where as here, the impacts pose no threat, containment is reliable, or restoration is impracticable. Id. at 19448.

Stated plainly, EPA's proposed remedy is inconsistent with the agency's current thinking about remediating impacted groundwater of the type associated with the Coors Road Plant.

4. If restoration is possible, Sparton's proposed remedy will achieve that result within the same time period and at a much lower cost than EPA's proposed remedy.

As the attached report of Pierce Chandler makes clear and as set forth in the CMS, restoration of groundwater (defined as insuring that the concentration of solvents throughout the impacted area are at or below drinking water standards) cannot be achieved in the near term. But, if restoration is possible, then Sparton's proposal to contain the leading edge of the plume, enhance containment of solvents in on-site groundwater, and recover remaining solvents in the soil at the plant site (if necessary), should achieve restoration within the same time frame as what EPA has proposed, at a much lower cost, and be initiated sooner.

5. Reinjection wells are not an appropriate means for dealing with recovered and treated groundwater.

EPA has proposed that recovered and treated groundwater be reinjected into the aquifer from which it was taken. As the report of Gary Richardson, attached as Exhibit "C" and incorporated herein, makes clear it has yet to be demonstrated that reinjection wells are a cost effective mechanism for dealing with recovered groundwater in the Albuquerque area in general and at this site in particular.

The costs of such wells are is significant. EPA has estimated three reinjection wells at this site would cost almost $1.3 million. Richardson has estimated the cost for a single 200 gpm reinjection well would be $500,000. EPA's estimated operation and maintenance cost is approximately $200,000. Richardson likewise estimates that a single 200 gpm reinjection well will cost $200,000 per year to operate and maintain. These high costs are directly related to the difficult operational problems presented by reinjection wells, and the fact that minor changes in the quality of the water to be reinjected or in conditions in the reinjection well can create

enormous problems. Richardson identified the numerous variables that impact operation of such wells and concludes that all those conditions exist at this site.

Sparton's proposal is to discharge recovered and treated groundwater to the Calabacillas Arroyo. That approach does not present any of the engineering problems associated with reinjection wells. The cost for such discharge would be less than $10,000, obviously much less than reinjection wells.

Moreover, based on field work conducted by Richardson it appears that water discharged to the arroyo, when flow is not already present, would move down through the vadose zone and back into the aquifer, thereby serving the same function as reinjection wells, at a fraction of the cost and without operational problems.

C. Under 3008(h) of RCRA, EPA can only order Sparton to take actions that directly involve activities in the field.

The Order is replete with requirements that are not necessary to protect human health or the environment. These are Section III.2-.5; Section VI; Section VII.5; Section VIII.3,.6,.7; Section IX.1-2,.5; Section X.1,.4; Section XI; Section XII; Section XIII.6,.7; Section XIV; Section XV; Section XXI; Section XXIII; Section XXIV; Section VIII.4,.5,.8; Section XII; Section XIII.7; Section XX.1; Section XXVI.1. EPA has provided absolutely no statutory or regulatory authority for the inclusion of such provisions and they must be removed.

D. EPA cannot unilaterally impose specific activities on Sparton without giving it a chance to challenge those decisions.

The initial administrative order requires Sparton to prepare and submit numerous reports and plans to EPA. EPA reserves to itself the unilateral discretion to modify those reports and plans in whatever fashion it sees fit, and without providing Sparton any meaningful review process. The Order does include a dispute resolution provisions that improperly shifts the burden

of proof to Sparton, and makes EPA the judge for determining disputes. The section also appears to prohibit any judicial review of the outcome of the dispute resolution process. Such action violates the requirement of Section 3008(b) that specifies a respondent is entitled to a hearing on any requirement imposed upon it, and Sparton's right to judicial review under RCRA. Moreover, the failure of EPA to provide such relief would violate Sparton's constitutional rights. Under EPA's paradigm, the agency could issue an order that requires a respondent to address a release, without providing any specificity on what remedy will be required, other than submission of a plan. EPA could then modify the plan in whatever way it saw fit and impose that obligation on the respondent without even the limited procedures described in Part 24, and without any judicial review. Congress could not have and did not intend such a result under § 3008(h).

CONCLUSION

Sparton requests that the initial administrative order be withdrawn. Nevertheless, if EPA chooses to issue an order, Sparton requests that it be the form of Exhibit "E".

Respectfully submitted,

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ATTORNEYS FOR SPARTON TECHNOLOGY, INC.

CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing Position on the Facts, the Law and Relief Sought by EPA was served on Evan Pearson, senior counsel, Environmental Protection Agency, Region 6, 1445 Ross Avenue, Dallas, Texas 75202-2733 via hand-delivery on February 4, 1997.

_____
James B. Harris

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IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-VI-001 (H)-96-H

REPORT OF PIERCE L. CHANDLER, JR., ON GEOLOGY/HYDROGEOLOGY CHARACTERIZATION, CONTAMINANT PLUME CHARACTERIZATION, RISK ASSESSMENT, AND AQUIFER RESTORATION SPARTON TECHNOLOGY COORS ROAD FACILITY ALBUQUERQUE, NEW MEXICO

February 4, 1997

The following report is my analysis and conclusions on the characterization of subsurface conditions and a "contaminant plume" and the resulting assessment of risk/threat posed to human health. The potential for aquifer restoration is also evaluated with respect to site-specific conditions, risk/threat, and technical practicability.

My report is based on my training, education, and experience as a professional engineer and hydrogeologist with particular emphasis on water resource and solid/ hazardous waste projects. A copy of my curriculum vitae is attached.

A significant portion of my previous work has been on sites regulated under the Resource Conservation and Recovery Act (RCRA) of 1976 and subsequent amendments. With respect to the Sparton site, I was the principal investigator and author of the RCRA Facility Investigation (RFI) Report (Sparton, 1992), the Corrective Measures Study (CMS) Report (Sparton, 1996), and the Effectiveness of the Groundwater Recovery Well System in the Upper Flow Zone (Effectiveness) Report (Sparton, 1995).

On the basis of education, training, general experience, and specific experience at the Sparton Coors Road Facility, I am qualified to make the conclusions and statements expressed in the following report.

GEOLOGY/HYDROGEOLOGY CHARACTERIZATION

The geology/hydrogeology of the Albuquerque area is well understood and well documented. The Sparton facility is located within the most extensively studied and modelled part of the Albuquerque area. Figure 1 is a map of the Albuquerque Basin and its relative location with respect to the City.

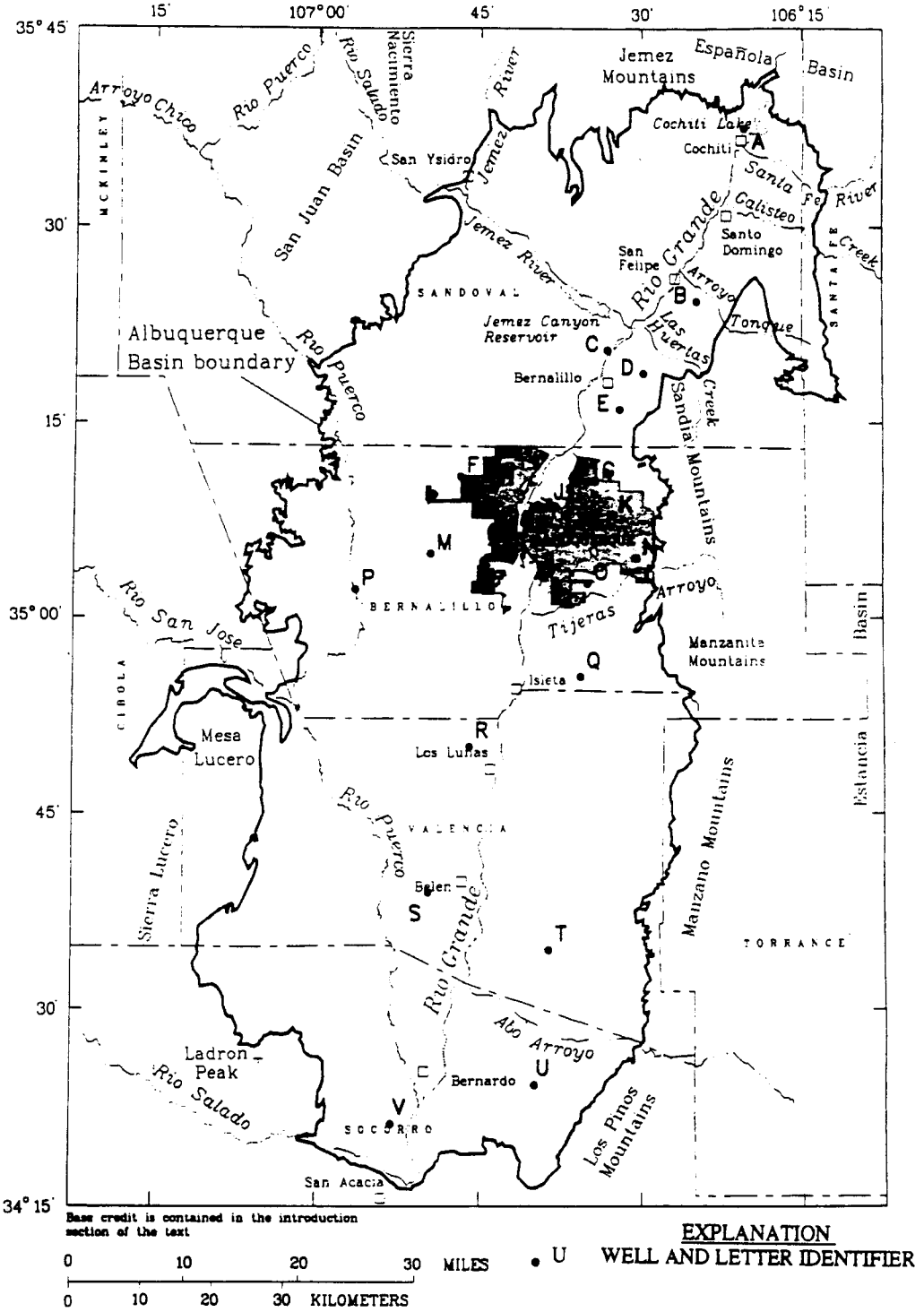
A detailed discussion of geologic/hydrogeologic characterization with supporting maps and references can be found in the 1992 RCRA Facility Investigation (RFI) Report submitted by Sparton. The RFI information was updated in Sparton's 1996 Corrective Measures Study (CMS) Report to include the most recent information developed by USGS, USBR, New Mexico Water Resources Research Institute (NMWRRI) and others. The 1996 CMS Report also contains an extensive bibliography arranged by subject.

Regional. The geology and hydrogeology of the Albuquerque Basin in central New Mexico has been extensively studied, modelled, and documented since at least 1930. This wealth of information has been used to assemble both a conceptual model (USGS, 1993 and USBR, 1996) and a three-dimensional finite-difference groundwater flow model of the Albuquerque Basin (USGS, 1995). These models are the essential tools used in all water resource planning and management in the Albuquerque Basin. However, as Peter Balleau (NMWRRI, 1995) points out, the current understanding of the Basin is remarkably consistent with the historic understanding of the Basin.

The aquifer consists of complex, layered, and interbedded sedimentary basin and valley filling of five deep structural depressions in the Rio Grande Rift. The resulting geology is characterized by heterogeneous and anisotropic conditions throughout the aquifer and includes gravels, sands, silts, and clays.

With respect to hydrogeology, the main source of groundwater (recharge) is from the Rio Grande and adjacent irrigated agriculture. Horizontal hydraulic

Figure 1



--Location of selected wells in the Albuquerque Basin, Central New Mexico.

conductivity ranges from 0.15 feet/day to 70 feet/day with the higher hydraulic conductivities on the east side of the river. Due to the substantial anisotropy, vertical hydraulic conductivities are 1/200 to 1/1000 of horizontal values. Hydraulic gradients range from approximately 0.001 to 0.007 with the higher gradients along the mountain front east of the river and/or associated with heavily pumped well fields. However, the great variation in hydraulic conductivity is the most significant influence on the direction and rate of groundwater movement.

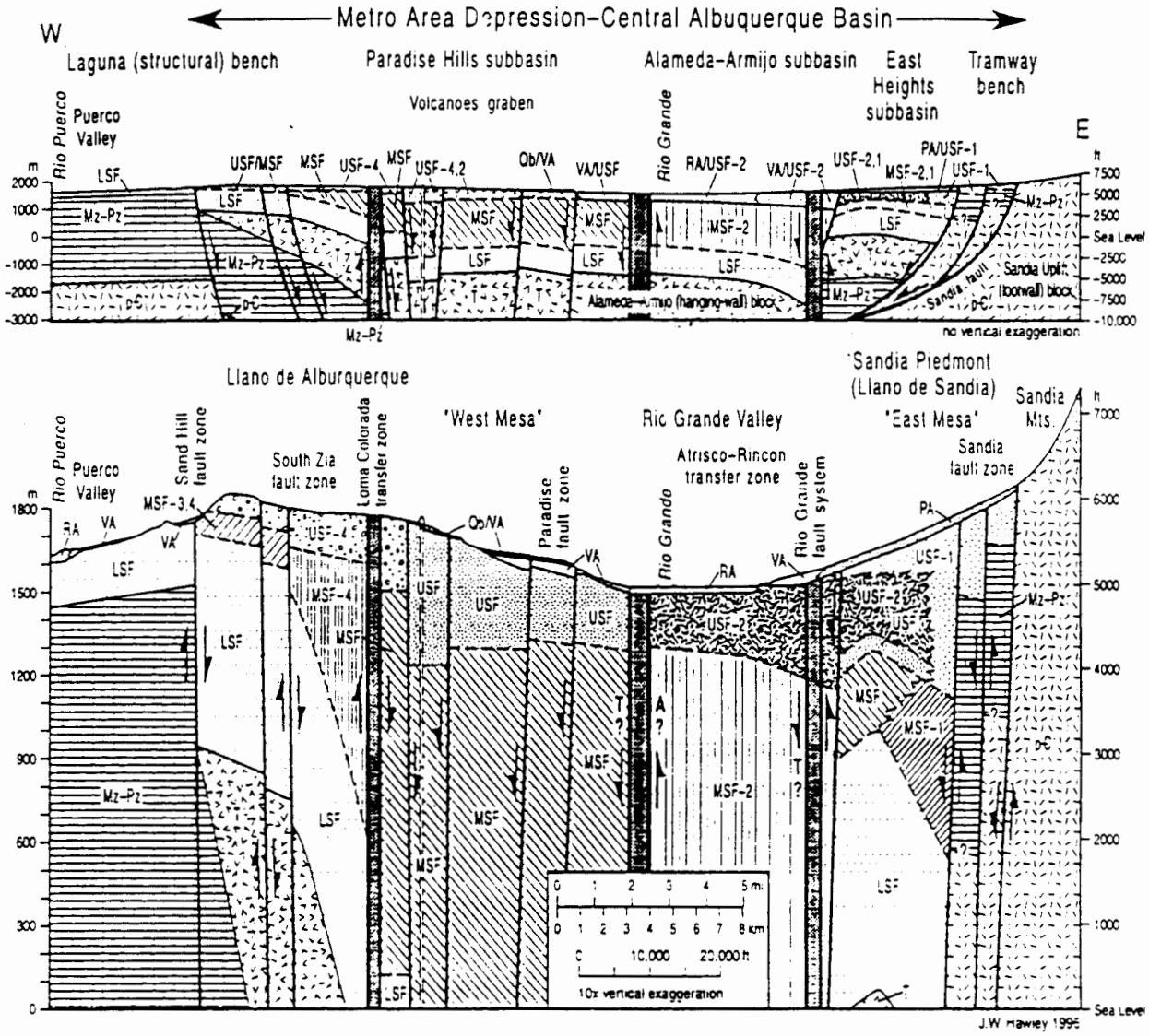
Regional conditions have been determined through the large number of groundwater investigations (and wells) that have been conducted throughout the basin. There are also numerous exposures created by both erosional forces and by man-made construction. In addition, the flow model has been sufficiently calibrated to serve as a predictive tool.

Local Conditions. West of the river, sediments are generally finer, hydraulic conductivities are lower, and hydraulic gradients are flatter (USGS, 1995). An excellent depiction of local conditions is shown in the west-east cross-section along Paseo de Norte Boulevard (USBR, 1996) included as Figure 2.

Local conditions west of the river and to the north of Paseo de Norte have been documented by: municipal production well records; private well installations; pump testing (Intel Shomaker & Assoc., 1995, 1996); exposures along the Calabacillas Arroyo; and the numerous monitoring wells installed by Sparton. Dr. John Hawley, of the Middle Rio Grande Water Assessment Team, believes that the Sparton plume characterization is the best groundwater tracer test conducted in the Albuquerque area and defines the local groundwater flow rate and direction.

Site-Specific. Site geologic/hydrogeologic conditions are remarkably similar to regional and local characterization. Subsurface conditions are extremely heterogeneous and anisotropic as clearly shown by comparison of boring logs for wells completed at different locations and particularly by comparison of boring logs at cluster well locations where several wells are installed in very close proximity. An excellent example is well cluster 9. Using boring logs for

Figure 2



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—A cross section of the Metro Area Depression in the central Albuquerque Basin showing relative thickness and discontinuity of the Upper, Middle, and Lower Santa Fe Group and valley fill aquifer systems.

groundwater monitoring wells MW-48, MW-55, and MW-56 (RFI Report, 1992) it is obvious that subsurface conditions vary significantly over short horizontal and vertical distances. Other logs and/or clusters show similar variation.

Hydraulic conductivity has been defined by multiple-well pump testing and the resulting range of 21 to 32 feet/day matches regional values. Documentation and detailed analyses of the pump testing are given in Attachment 10 of the 1992 RFI Report. Hydraulic gradients (and the impact of season, precipitation and irrigation of adjacent fields) have been determined from an extensive, long-term data base of water level readings from numerous groundwater monitoring wells. Water level data through June 1991 is summarized in the RFI Report. Post-RFI water level data and summarizing information is contained in the 1996 CMS Report. Current water level contours are shown on Figure 3. Average gradient is approximately 0.002 which matches well with regional characterization.

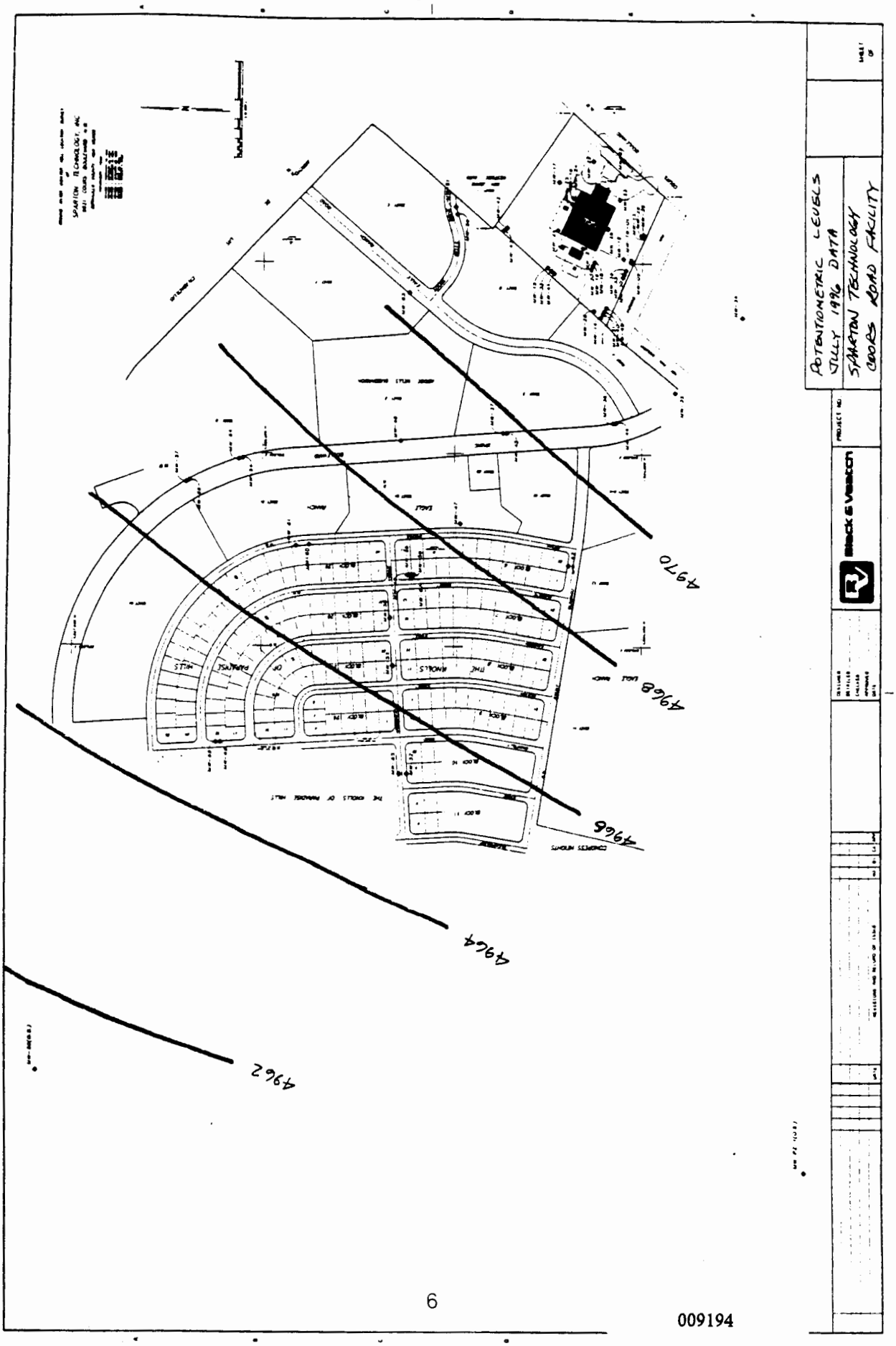
Flow direction has been determined to be to the west-northwest at a rate of less than 100 feet per year based on the hydraulic parameters. The plume "tracer" confirms this assessment. Regionally, flow was predicted to be more westerly to southwesterly in the area. This difference is the result of much higher density well spacing on the Sparton site (hundreds of feet) as compared to the regional well spacing (miles).

Irrigation of the adjacent farmland to the east of the site has a seasonal 2- to 3-foot impact on groundwater levels in wells close to the fields. However, to the west of the Sparton property, water levels are unaffected. Over the last five or six years, overall water levels have dropped one to two feet; however, gradients and direction are relatively unchanged.

Site conditions have been verified by extensive site investigations conducted since 1983. These investigations include:

1. Seventy-two groundwater monitoring well installations;
2. Eleven soil boring installations;
3. Multiple pumping tests (multi-well and single well);
4. Geophysical logging;

Figure 3



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5. Geotechnical classification;
6. Extended monitoring of water levels and contaminant concentrations;
7. Extensive research of published literature and anecdotal information; and
8. Observation of geologic exposures in immediate area.

Need For Additional Site-Specific Study

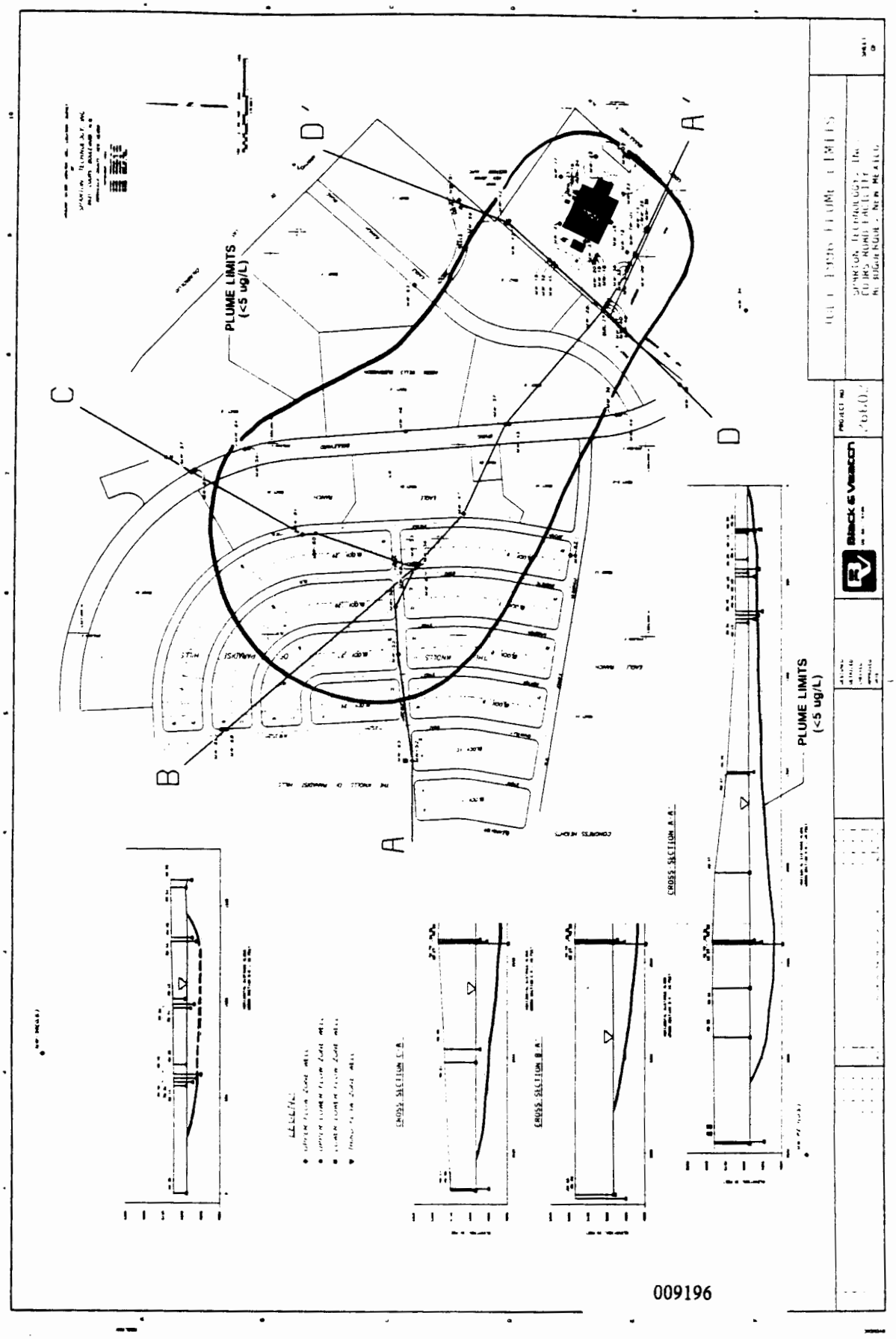
The Albuquerque Basin has been extensively studied and characterization has been developed to the point that long-range projections and modifying impacts can be modelled with confidence. Characterization of the Sparton site is even more detailed and serves as a microscopic view of the upper part of the Basin.
Additional investigation is not needed to fill information/data gaps. The existing characterization is more than sufficient to define, with reasonable certainty, geologic and hydrogeologic conditions at the site. The existing information is also more than adequate for design purposes. Additional investigation would only generate more confirming data at a cost premium.

CONTAMINANT PLUME CHARACTERIZATION

The chlorinated solvent plume at the Sparton facility is well-characterized and understood. Plume constituents are primarily Trichlorethylene (TCE) with lesser concentrations of 1,1,1 - Trichloroethane (TCA), 1,1 - Dichloroethylene (DCE), and Dichloromethane (DMA). Concentration and/or presence of TCE is most appropriate for describing the plume. TCE is the most consistently and commonly detected constituent and also is found at the highest concentration. During preparation of the RFI Report; TCE also had the lowest drinking water MCL of 0.005 mg/l.

The current extent of the plume (July 1996 sampling and analysis) is clearly shown on Figure 4. As discussed in subsequent paragraphs of this section, plume mechanics have been confirmed by extensive investigation and comparison to detailed hydrogeologic characterization for the area. The plume definition is more than adequate to assess potential risk/threat and for any needed remedial design purposes.

Figure 4


PLUME LIMITS
(<5 ug/L)
A
A'
B
C
D
D'
CROSS SECTION A-A'
CROSS SECTION B-B'
CROSS SECTION C-C'
CROSS SECTION D-D'
PLUME LIMITS
(<5 ug/L)
Black & Veatch
009196

A detailed discussion of the plume characterization is contained in the 1992 RFI Report. Updated plume information covering the period from June 1991 through early 1996 is detailed in the 1996 CMS Report.

In subsequent investigation in summer of 1996, the CMS report conclusions on plume extent and rate of migration were confirmed by installing five groundwater monitoring wells (MW-65, MW-66, MW-67, MW-68, and MW-69). Well locations were chosen to show that the plume limits presented in the CMS Report were realistic and that direction and rate of migration conclusions were valid. The five wells were installed outside and/or below the leading edge of the plume defined in the CMS Report. Not surprisingly, all five wells were non-detect.

The ability to predict results in advance of installation demonstrates the comprehensive understanding of the plume. Further, as discussed in subsequent sections, the five new wells, together with the updated data base, effectively address and answer EPA's concerns on plume characterization numbered 3, 5, 7, and 9 in their June 20, 1996, Technical Review of the CMS Report.

Extent. Consistent with the documented vertical anisotropy and dominance of horizontal groundwater flow, the plume horizontal extent (approximately 2,600 feet downgradient and 3300 feet overall) is much greater than plume depth (nominally 50 to 125 feet). Plume width is significant (approximately 1,650 feet) due to the low groundwater flow rates and to the heterogeneous subsurface conditions. Plume currently covers about 90 acres.

A total of 72 groundwater monitoring wells have been installed at the site since 1983. There are currently 57 active wells including 8 on-site wells converted to recovery well operation. The 49 monitoring wells have been installed at horizontal locations as shown on Figure 4. Wells have also been installed at various penetration depths into the aquifer. Well depth is shown by legend symbol on the Figure. The nomenclature is as follows:

1. Upper flow zone (UFZ) indicates well is screened across the top of the aquifer.

2. Upper lower flow zone (ULFZ) indicates well is approximately 30 feet below the top of the aquifer.

3. Lower lower flow zone (LLFZ) indicates well is approximately 60 feet below the top of the aquifer.

4. Third flow zone (TFZ) indicates well is 75 to 175 feet into the aquifer.

A summary of all wells including flow zone identification and completion intervals is included as Table 1.

The use of flow zones is for vertical location purposes only. At 13 locations, wells completed in different flow zones have been clustered together to provide vertical definition.

The extent of the plume is defined by detection wells (TCE concentration greater than 5 µg/l) inside the plume and by non-detection wells outside and/or below the plume. TCE concentration histories for each of the monitoring wells are given in Table 2. In 1996, 23 of the 49 wells were below 5 µg/l. These non-detect wells have been circled on Figure 5 to show their relationship to the defined plume limits.

The detect vs non-detect delineation of the plume is further confirmed by the approximately normal or Gaussian distribution of TCE concentration across any given cross-section of the plume. For example:

1. Transverse UFZ section across the leading edge of the plume (wells MW-62, MW-48, MW-61 and MW-57) shows range from non-detect to 1900 µg/l and back to non-detect.

2. Transverse UFZ section at mid-plume (wells MW-62, MW-37, MW-63) shows range from non-detect to 720 µg/l to non-detect.

Table 1

WELL SUMMARY

WELL NUMBER	ZONE *	MEASURING POINT ELEVATION	DEPTH TO TOP OF SCREEN (FT.)	DEPTH TO BOTTOM OF SCREEN (FT.)	ELEVATION AT TOP OF SCREEN (FT.,MSL)	ELEVATION AT BOTTOM OF SCREEN (FT.,MSL)	LENGTH OF SCREEN (FT.)
PW-1	UPZ	5044.54	60.0	70.0	4984.54	4974.54	10.0
7	UPZ	5044.80	63.5	68.5	4981.30	4976.30	5.0
9	UPZ	5044.11	62.5	67.5	4981.61	4976.61	5.0
12	UPZ	5042.58	64.0	74.0	4978.58	4968.58	10.0
13	UPZ	5043.25	60.0	70.0	4983.25	4973.25	10.0
14	UPZ	5041.91	61.5	71.5	4980.41	4970.41	10.0
15	UPZ	5047.49	60.0	70.0	4987.49	4977.49	10.0
16	UPZ	5047.50	68.0	73.0	4979.50	4974.50	5.0
17	UPZ	5049.28	67.0	72.0	4982.28	4977.28	5.0
18	UPZ	5045.58	68.0	78.0	4977.58	4967.58	10.0
19	ULPZ	5046.25	97.0	107.0	4949.25	4939.25	10.0
20	LLPZ	5045.79	125.0	138.0	4920.79	4907.79	13.0
21	UPZ	5048.36	64.5	69.5	4983.86	4978.86	5.0
22	UPZ	5048.06	72.0	77.0	4976.06	4971.06	5.0
23	UPZ	5048.51	72.0	77.0	4976.51	4971.51	5.0
24	UPZ	5048.70	68.4	73.4	4980.30	4975.30	5.0
25	UPZ	5049.00	67.7	72.7	4981.30	4976.30	5.0
26	UPZ	5045.71	73.0	78.0	4972.71	4967.71	5.0
27	UPZ	5045.50	67.0	72.0	4978.50	4973.50	5.0
28	UPZ	5042.69	65.0	70.0	4977.69	4972.69	5.0
29	ULPZ	5044.51	103.0	113.0	4941.51	4931.51	10.0
30	ULPZ	5044.70	97.0	107.0	4947.70	4937.70	10.0
31	ULPZ	5043.53	96.0	106.0	4947.53	4937.53	10.0
32	LLPZ	5048.05	108.0	118.0	4940.05	4930.05	10.0
33	UPZ	5044.29	63.0	73.0	4981.29	4971.29	10.0
34	UPZ	5034.49	56.5	66.5	4977.99	4967.99	10.0
35	UPZ	5042.50	63.2	73.2	4979.30	4969.30	10.0
36	UPZ	5059.35	82.3	92.3	4977.05	4967.05	10.0
37	UPZ	5091.66	115.0	125.0	4976.66	4966.66	10.0
38	LLPZ	5044.32	126.5	136.5	4917.82	4907.82	10.0
39	LLPZ	5044.06	123.0	133.0	4921.06	4911.06	10.0
40	LLPZ	5043.35	117.0	127.0	4926.35	4916.35	10.0
41	ULPZ	5046.77	92.0	97.0	4954.77	4949.77	5.0
42	ULPZ	5057.33	105.0	115.0	4952.33	4942.33	10.0
43	LLPZ	5057.74	127.0	137.0	4930.74	4920.74	10.0
44	ULPZ	5058.71	106.0	116.0	4952.71	4942.71	10.0
45	ULPZ	5090.11	143.0	153.0	4947.11	4937.11	10.0
46	ULPZ	5118.98	170.0	180.0	4948.98	4938.98	10.0
47	UPZ	5155.83	180.0	195.0	4975.83	4960.83	15.0
48	UPZ	5168.31	192.0	207.0	4976.31	4961.31	15.0
49	3rdPZ	5043.67	137.7	147.7	4905.97	4895.97	10.0
50	UPZ	5211.51	235.0	250.0	4976.51	4961.51	15.0
51	UPZ	5058.86	75.0	85.0	4983.86	4973.86	10.0
52	UPZ	5156.79	181.8	197.0	4975.01	4959.81	15.2
53	UPZ	5164.24	189.8	204.0	4974.44	4960.24	14.2
(**) 54	UPZ	5097.64	117.0	132.0	4980.64	4965.64	15.0
55	LLPZ	5168.61	255.0	265.0	4913.61	4903.61	10.0
56	ULPZ	5168.61	220.0	230.0	4948.61	4938.61	10.0
57	UPZ	5103.54	126.0	141.0	4977.54	4962.54	15.0
58	UPZ	5168.89	194.0	209.0	4974.89	4959.89	15.0

Table 1 (cont.)

WELL NUMBER	ZONE *	MEASURING POINT ELEVATION	DEPTH TO TOP OF SCREEN (FT.)	DEPTH TO BOTTOM OF SCREEN (FT.)	ELEVATION AT TOP OF SCREEN (FT.,MSL)	ELEVATION AT BOTTOM OF SCREEN (FT.,MSL)	LENGTH OF SCREEN (FT.)
59	ULFZ	5059.18	104.5	115.0	4954.68	4944.18	10.5
60	ULFZ	5134.72	185.0	195.0	4949.72	4939.72	10.0
61	UFZ	5133.98	158.0	173.0	4975.98	4960.98	15.0
62	UFZ	5075.00	95.0	110.0	4980.00	4965.00	15.0
63	UFZ	5065.74	83.0	98.0	4982.74	4967.74	15.0
64	ULFZ	5097.84	138.8	149.0	4959.04	4948.84	10.2
PZ-1	UFZ	5142.17	182.7	198.0	4959.47	4944.17	15.3
65	LLFZ	5156.45	260.0	270.0	4896.45	4886.45	10.0
66	LLFZ	5103.03	200.0	210.0	4903.03	4893.03	10.0
67	3rd FZ	5169.21	370.0	380.0	4799.21	4789.21	10.0
68	UFZ	5165.53	194.0	214.0	4971.53	4951.53	20.0
69	LLFZ	5165.46	260.0	270.0	4905.46	4895.46	10.0

(*) UFZ = UPPER FLOW ZONE
ULFZ = UPPER LOWER FLOW ZONE
LLFZ = LOWER LOWER FLOW ZONE
3rdFZ = THIRD FLOW ZONE

(**) WELL # 54 IS NONFUNCTIONAL

THE FOLLOWING WELLS HAVE BEEN MODIFIED OR COMPLETELY PLUGGED:

Well Number	Status
PW-1	Plugged back to upper flow zone+ - Converted to recovery well
P-1	Plugged
1	Plugged
2	Plugged
3	Plugged
4	Plugged
5	Plugged
6	Plugged
8	Plugged
10	Plugged
11	Plugged
12	Plugged back to upper flow zone+
13	Plugged back to upper flow zone+
14	Plugged back to upper flow zone+
15	Plugged back to upper flow zone+
18	Converted to recovery well
23	Converted to recovery well
24	Converted to recovery well
25	Converted to recovery well
26	Converted to recovery well
27	Converted to recovery well
28	Converted to recovery well
54	Used only for water level measurements

+ ORIGINALLY OPEN TO UFZ, ULFZ, AND LLFZ

Table 2

Sparton Monitoring Results
TCE Concentrations

Date	Year	Qtr.	Qtr. #	MW-9 UFZ	MW-13 UFZ	MW-14 UFZ	MW-15 UFZ	MW-16 UFZ	MW-19 ULFZ	MW-20 LLFZ	MW-21 UFZ	MW-22 UFZ	MW-29 ULFZ	MW-30 ULFZ	MW-31 ULFZ	MW-32 LLFZ
Oct-83	1983	4		21000												
Oct-84	1984	4		9600		12000	4400	37000								
Jul-85	1985	3		7300												
Jan-86	1986	1	10	6100												
Apr-86		2	11	8300												
Jul-86		3	12	5000				20000								
Oct-86		4	13	5000		4900	940	36000	3600	17	2300	230				
Jan-87	1987	1	14	4500		5000	630	21000	2700	12	1700	170				
Apr-87		2	15	3600		1800	580	23000	2900	32	1400	270				
Jul-87		3	16	6400		2100	650	25000	4600	35	2100	370				
Oct-87		4	17	7100		2700	480	28000	3400	25	2000	240				
Jan-88	1988	1	18	5500		6200	370	26000	2900	10	1800	150				
Apr-88		2	19	4800		5000	10	25000	5	28	1100	230				
Jul-88		3	20	3300		5200	380	26000	1800	19	1200	63				
Oct-88		4	21	4200		5600	250	22000	3600	15	1300	120				
Jan-89	1989	1	22	4000		3300	180	16000	3200	12	900	110				
Feb-89		1	22		610	1100	210						5.7	320	120	4800
Mar-89		1	22		650	3700	210						5.4	320	120	3400
Apr-89		2	23	4400		4900	200	14000	3700	14	520	150				
Aug-89		3	24	2500		3000	200	13000	2400	20	460	120				
Aug-89		3	24													
Nov-89		4	25	2300		2200	260	16000	1500	5	1100	91				
Nov-89		4	25													
Jan-90	1990	1	26	2800		2100	190	13000	880	17	1000	110				
Jan-90		1	26													
Apr-90		2	27	2400		1800	160	20000	1000	21	400	130				
Apr-90		2	27													
Jun-90		2	27													
Aug-90		3	28	2200		2100	230	19000	850	15	670	140				
Aug-90		3	28													
Sep-90		3	28													
Oct-90		4	29	1600		1500	140	16000	590	10	850	83				
Oct-90		4	29													
Oct-90		4	29													
Jan-91	1991	1	30	1700		1700	110	16000	680	28	910	75				
Apr-91		2	31	1600		1400	5	12000	690	5.4	400	92				
Jun-91		2	31	1400		1100	91	17000	570	12	500	110	<5	180	60	57
Jul-91		3	32	1300	330	1400	110	16000	190	12	440	110				
Oct-91		4	33	1000		1100	80	12000	170	16	880	93				5100
Nov-91		4	33													2400
Dec-91		4	33													2400
Jan-92	1992	1	34	1200		1300	64	13000	130	5	680	65				5100
Apr-92		2	35	1400		1400	54	12000	230	5	360	90				6000
Jul-92		3	36	930		860	49	15000	140	5	390	72				7500
Sep-92		4	37	1000		1100	66	14000	120	30	460	48				2600
Jan-93	1993	1	38	690		850	52	13000	57	3	430	51				830
Apr-93		2	39	820		850	1.9	12000	110	31	240	55				1500
Jul-93		3	40	730		720	56	11000	62	7	350	47				4400
Oct-93		4	41	680		700	44	13000	45	23	480	41				780
Dec-93		4	41	680	330	640	39	13000	39	6	490	41	1	47	10	490
Jan-94	1994	1	42	790		680	36	12000	48	1.1	380	50				580
Apr-94		2	43	740		730		11000	81	0.2	280	62				1700
Jul-94		3	44	750		730	52	11000	61	8	210	44				400
Oct-94		4	45	750		700	31	11000	47	44	360	45				1700
Oct-94		4	45													
Feb-95	1995	1	46	850		690	45	8700	72	5	270	72				2000
Apr-95		2	47	790		1000		7100	92	0.2	160	100				1600
Aug-95		3	48	490		470	21	9100	39	11	200	32				4200
Oct-95		4	49	650		470	15	7400	48	26	280	34				2800
Jan-96	1996	1	50	570	380	290		7600	24	1.3	220	46	0.9	19	2.7	760
Apr-96		2	51	710		420		9700	88	0.4	140	81				2400
Jul-96		3	52	460		300		7400	11	<1	180	43				400

Cluster #1 = 13,29,38	Cluster #6 = 36,44	Cluster #11 = 57,66
Cluster #2 = 33,30,39	Cluster #7 = 37,45	Cluster #12 = 68,69
Cluster #3 = 14,31,40,4	Cluster #8 = 51,59	Cluster #13= 52,65
Cluster #4 = 15,41,32	Cluster #9 = 48,55,56,67	
Cluster #5 = 42,43	Cluster #10 = 61,60	

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NOTES :
1.) ND = None Detected
2.) J value indicates an estimation by lab

Table 2 (cont.)

Sparton Monitoring Results
TCE Concentrations

Date	Year	Qtr.	Qtr. #	MW-33 UFZ	MW-34 UFZ	MW-35 UFZ	MW-36 UFZ	MW-37 UFZ	MW-38 LLFZ	MW-39 LLFZ	MW-40 LLFZ	MW-41 ULFZ	MW-42 ULFZ	MW-43 LLFZ	MW-44 ULFZ	MW-45 ULFZ
Oct-83	1983	4														
Oct-84	1984	4														
Jul-85	1985	3														
Jan-86	1986	1	10													
Apr-86		2	11													
Jul-86		3	12													
Oct-86		4	13													
Jan-87	1987	1	14													
Apr-87		2	15													
Jul-87		3	16													
Oct-87		4	17													
Jan-88	1988	1	18													
Apr-88		2	19													
Jul-88		3	20													
Oct-88		4	21													
Jan-89	1989	1	22													
Feb-89		1	22	7500												
Mar-89		1	22	7000												
Apr-89		2	23													
Aug-89		3	24		<5	<5	7.9	1100								
Aug-89		3	24		<5	<5	11	1800								
Nov-89		4	25						<5	<5	<5	1100	1100	270		
Nov-89		4	25						<5	<5	<5	960	1200	160		
Jan-90	1990	1	26												<5	1400
Jan-90		1	26												<5	1400
Apr-90		2	27													
Apr-90		2	27													
Jun-90		2	27													
Aug-90		3	28													
Aug-90		3	28													
Sep-90		3	28													
Oct-90		4	29													
Oct-90		4	29													
Oct-90		4	29													
Jan-91	1991	1	30													
Apr-91		2	31													
Jun-91		2	31	7300	<5	<5	22	2000	<5	<5	<5	620	1000	280	<5	770
Jul-91		3	32													
Oct-91		4	33			<5	19	1400					930	440		
Nov-91		4	33													
Dec-91		4	33													
Jan-92	1992	1	34			<5	15	1200					740	260		
Apr-92		2	35			<5	14	960					690	340		
Jul-92		3	36			<5	10	800					640	200		
Sep-92		4	37			<5	8.3	810				510	600	180		
Jan-93	1993	1	38			<1	7	510					680	200		
Apr-93		2	39			<1	4	340					320	130		
Jul-93		3	40			<1	25	800				370	620	850	<1	
Oct-93		4	41			<1	3	600					600	160		
Dec-93		4	41		<1	<1	3	980	<1	<1	<1	350	620	150	<1	160
Jan-94	1994	1	42			<1	3	860					570	150		
Apr-94		2	43			<1	2	850					490	120		
Jul-94		3	44			<1	3	370					530	160		
Oct-94		4	45			ND	2	940				420	510	110		
Oct-94		4	45													
Feb-95	1995	1	46			<5	3	770					340	79		
Apr-95		2	47			<5	3	750					340	98		
Aug-95		3	48				2	750					340	100		
Oct-95		4	49				2	750					350	110		
Jan-96	1996	1	50	2000	<0.3	<0.3	1.9	720	<0.3	<0.3	<0.3	290	470	95	<0.3	59
Apr-96		2	51				<5	600					250	87		
Jul-96		3	52				2.4	560					330	73		

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Table 2 (cont.)

Sparton Monitoring Results
TCE Concentrations

Date	Year	Qtr.	Qtr. #	MW-46 ULFZ	MW-47 UFZ	MW-48 UFZ	MW-49 3rd FZ	MW-50 UFZ	MW-51 UFZ	MW-52 UFZ	MW-53 UFZ	MW-55 LLFZ	MW-56 ULFZ	MW-57 UFZ	MW-58 UFZ	MW-59 ULFZ	MW-60 ULFZ
Oct-83	1983	4															
Oct-84	1984	4															
Jul-85	1985	3															
Jan-86	1986	1	10														
Apr-86		2	11														
Jul-86		3	12														
Oct-86		4	13														
Jan-87	1987	1	14														
Apr-87		2	15														
Jul-87		3	16														
Oct-87		4	17														
Jan-88	1988	1	18														
Apr-88		2	19														
Jul-88		3	20														
Oct-88		4	21														
Jan-89	1989	1	22														
Feb-89		1	22														
Mar-89		1	22														
Apr-89		2	23														
Aug-89		3	24														
Aug-89		3	24														
Nov-89		4	25														
Nov-89		4	25														
Jan-90	1990	1	26	4200	310	820	<5										
Jan-90		1	26	2300	330	830	<5										
Apr-90		2	27						8.5								
Apr-90		2	27					<1	6.2								
Jun-90		2	27		220	820			6.7	<1	<1						
Aug-90		3	28			600						13	50				
Aug-90		3	28			1100						9.2	29				
Sep-90		3	28			930						12	98	<1	20	<1	
Oct-90		4	29													<5	<1
Oct-90		4	29												22		<5
Oct-90		4	29												22		<5
Jan-91	1991	1	30														
Apr-91		2	31														
Jun-91		2	31	1300	120	410	<5		<5	<5	<5	45	200	<5	29	<5	<5
Jul-91		3	32														
Oct-91		4	33	5200		220			<5	<5		74	210		31	<5	<5
Nov-91		4	33	2600													
Dec-91		4	33														
Jan-92	1992	1	34	2300		280			11	6.8		96	260		34		<5
Apr-92		2	35	1300		290			<5	9.8		120	290		37		<5
Jul-92		3	36	960		340			<5	14		130	290		37		<5
Sep-92		4	37	4200		240			<5	16		120	240		39		<5
Jan-93	1993	1	38	1200		360			<1		21	190	370		48		1
Apr-93		2	39	1200		310			<1		23	110	230		43		<1
Jul-93		3	40	1400		330			<1		33	240	320		62		4
Oct-93		4	41	2100		420			1		30	310	430		64		2
Dec-93		4	41	1800	93	350	<1		2	<1	32	380	410	<1	74	<1	7
Jan-94	1994	1	42	2500		350			<1		38	370	430		85		3
Apr-94		2	43	2700		340			0.6		34	390	370		93		6
Jul-94		3	44	3200		370			<1		43	550	370		110		9
Oct-94		4	45	2100		300			<5	<5	40	580	420	<5	97		24
Oct-94		4	45								38						
Feb-95	1995	1	46	2600		253			<5		21	580	340		100		16
Apr-95		2	47	2400		300			1		41	640	370		120		44
Aug-95		3	48	3000		250			<5		42	680	360	<5	130		66
Oct-95		4	49	3300		270			<1		48	130	350	<1	140		100
Jan-96	1996	1	50	3200	36	350	<0.3		<0.3	<0.3	100	940	430	<0.3	270	<0.3	170
Apr-96		2	51	2300		150		<5	<5		36	790	330	<1	110		150
Jul-96		3	52	1900		130			<1		36	510	240	<1	130		130

Table 2 (cont.)

Sparton Monitoring Results
TCE Concentrations

Date	Year	Qtr.	Qtr. #	MW-61 UFZ	MW-62 UFZ	MW-63 UFZ	MW-64 ULFZ	MW-65 LLFZ	MW-66 LLFZ	MW-67 3rdFZ	MW-68 UFZ	MW-69 LLFZ	Comments
Oct-83	1983	4											
Oct-84	1984	4											
Jul-85	1985	3											
Jan-86	1986	1	10										
Apr-86		2	11										
Jul-86		3	12										
Oct-86		4	13										
Jan-87	1987	1	14										
Apr-87		2	15										
Jul-87		3	16										
Oct-87		4	17										
Jan-88	1988	1	18										
Apr-88		2	19										
Jul-88		3	20										
Oct-88		4	21										
Jan-89	1989	1	22										
Feb-89		1	22										
Mar-89		1	22										
Apr-89		2	23										
Aug-89		3	24										
Aug-89		3	24										
Nov-89		4	25										#42&43 actual 12-12-89
Nov-89		4	25										#42&43 actual 12-21-89
Jan-90	1990	1	26										#49 - actual 01-25-90
Jan-90		1	26										#49 - actual 01-31-90
Apr-90		2	27										
Apr-90		2	27										
Jun-90		2	27										#51 - actual 05-07-90
Aug-90		3	28										
Aug-90		3	28										
Sep-90		3	28										
Oct-90		4	29	<1	<5	<1	<5						
Oct-90		4	29	<5	2.2	<5	<1						
Oct-90		4	29	<5	<5	<5	<5						
Jan-91	1991	1	30										
Apr-91		2	31										
Jun-91		2	31	<5	<5	<5	<5						EPA split sample
Jul-91		3	32										
Oct-91		4	33		<5								
Nov-91		4	33										
Dec-91		4	33										
Jan-92	1992	1	34		<5								
Apr-92		2	35		<5								
Jul-92		3	36		<5								
Sep-92		4	37		<5								
Jan-93	1993	1	38		2								
Apr-93		2	39		2								
Jul-93		3	40	490	3								
Oct-93		4	41	500	3								#61 - actual 09-03-93
Dec-93		4	41	610	3	<1	<1						EPA split sample
Jan-94	1994	1	42	530	2								
Apr-94		2	43		2								#51 = J value
Jul-94		3	44	800	3								
Oct-94		4	45	870	2		10						#62,36 = J value, EPA split sample
Oct-94		4	45										#53 duplicate sample
Feb-95	1995	1	46	960	2		11						#36 & 62 = J values
Apr-95		2	47	1400	2		18						#36, 51 & 62 = J values
Aug-95		3	48	1700	3		17						#36 & 62 = J values
Oct-95		4	49	2000	2		8						
Jan-96	1996	1	50	1900	1.8	<0.3	15						EPA split sample
Apr-96		2	51	1100	<5		25						EPA split sample
Jul-96		3	52	760	1.7		32	1.5	<1	<1	<1	<1	#66 sampled 6/27/96 & 7/18/96

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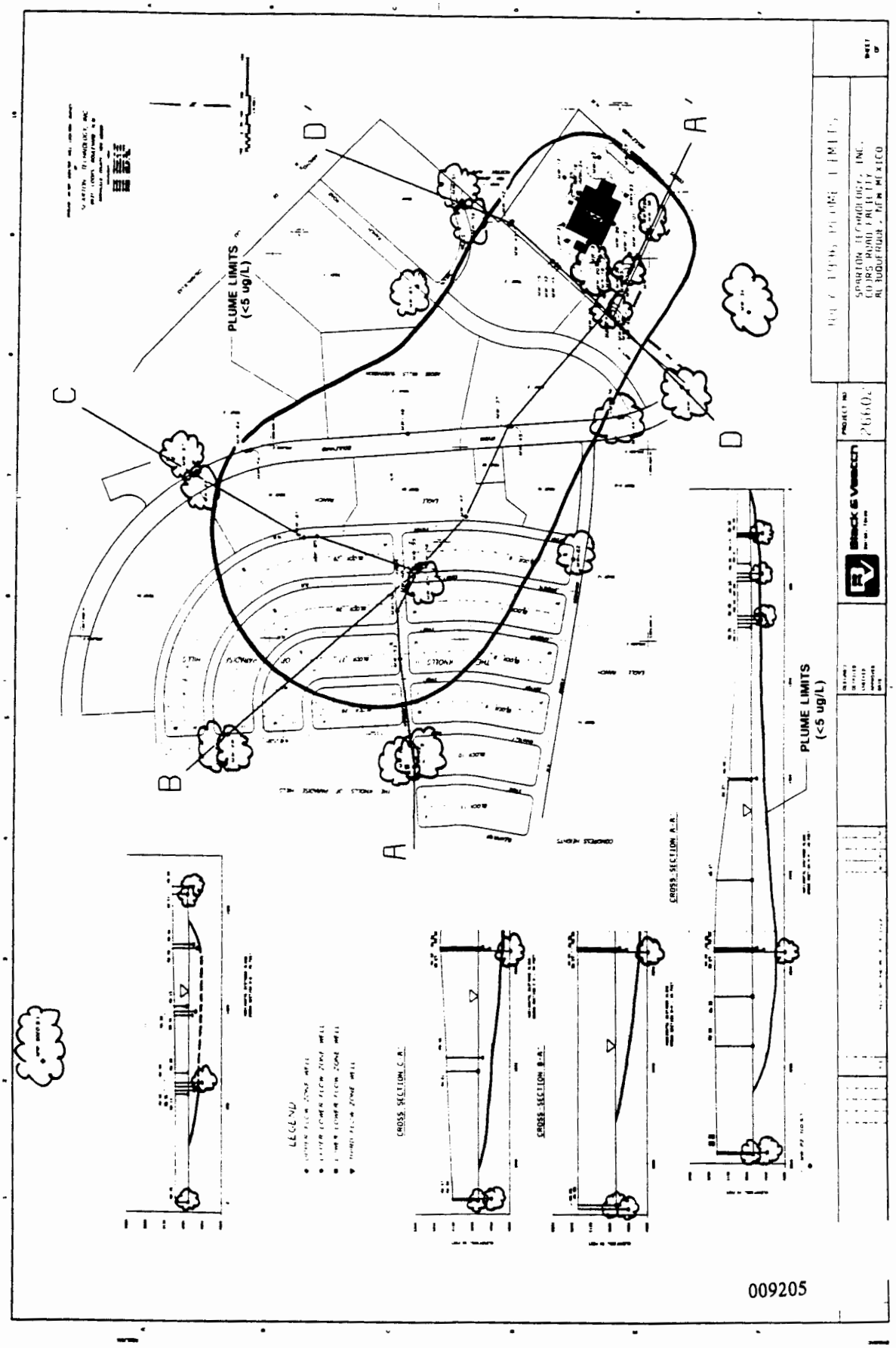
Figure 5


PLUME LIMITS
(<5 ug/L)
A
A'
B
C
D
D'
CROSS SECTION A-A'
CROSS SECTION B-B'
CROSS SECTION C-C'
LEGEND
Black & Veatch
009205

3. Transverse UFZ section along west side of Sparton facility (MW-35, MW-14, MW-21, MW-51) shows range from non-detect to 420 µg/l to non-detect.

4. ULFZ section along Irving Boulevard (wells MW-44, MW-45, MW-46, MW-64) shows range from non-detect to 3200 µg/l to 32 µg/l.

Plume delineation is also confirmed by the decreasing TCE concentration with depth at all but one of the 13 vertical cluster wells. In the one increasing cluster consisting of MW-15, MW-41 and MW-32 the bottom LLFZ well MW-32 is not as deep as bottom wells in adjacent clusters. The terminology decreasing with depth means that the bottom well in a vertical cluster shows lower concentration (usually non-detect) than the other wells in the cluster.

Monitor well installation and sampling began in 1983. Through continued well installation and sampling through July 1996, it has been possible to track the development or evolution of the plume to its present form. The shape, both horizontally and vertically, is shown on previous Figure 5.

In the early stages of monitoring, both onsite and near offsite investigation utilized a high density (close-spaced) network of monitoring wells to characterize the plume and subsurface conditions. However, as confidence in the understanding of the plume and subsurface conditions increased, continuing investigations began using greater well spacings to primarily confirm the understanding and to fill, if needed, any data gaps. As the investigations moved further offsite, no anomalous conditions were encountered which would have required more intensive study. The most recent investigation (consisting of the five wells installed in summer 1996) successfully addressed concerns and questions raised since the last previous intrusive investigation in 1990. The number and locations of current non-detect wells, as shown on Figure 5, are more than adequate to define the plume limits. Further, the number and distribution of wells inside the plume provides excellent areal and vertical definition of concentration.

Rate of Migration. The TCE plume is migrating in a west-northwest direction at a current rate of less than 100 feet/year. The rate of migration and direction is consistent with the site-specific hydrogeologic characterization. This consistency was expected. Groundwater flow rates are low and relatively uniform based on hydraulic gradient information shown on previous Figure 3. The dissolved, aqueous phase of TCE is relatively mobile and should travel at the same rate (and in the same direction) as groundwater flow. As previously noted, Dr. John Hawley has opined that the TCE plume definition provides an excellent tracer to show groundwater flow rate and direction.

The rate of plume migration can be verified from a consensus of independent analyses:

1. Dividing the horizontal downgradient length of the plume (2,800 feet) by the estimated age of the release (30 years) provides an average migration rate of approximately 100 feet/year.

2. The prevailing site-specific groundwater flow rate is less than 100 feet/year using site-specific hydraulic gradients obtained from site monitoring wells and site-specific hydraulic conductivity values. Note that the site-specific parameters (and groundwater flow rate) are remarkably consistent with regional hydrogeologic characterization and modelling.

3. By comparing TCE plume extent defined by June 1991 sampling with the current plume extent (July 1996), a migration rate of less than 100 feet/year can be clearly demonstrated.

Contaminant Concentrations in Groundwater. Monitoring wells have been sampled since 1983. Continued installation of wells and sampling has determined that the primary constituent of concern is TCE (1992 RFI Report). TCA is also present at approximately one third of the TCE concentration. DCE and DMA are found less frequently. Of the 49 wells sampled in July 1996, 26 had TCE concentrations above 5 µg/l. Maximum TCE concentration was observed in MW-16, a shallow onsite well near the original source area. Highest offsite TCE concentrations were observed in

wells MW-46 and MW-61 in the plume interior. TCE concentration data is given in previous Table 1. Well locations can be obtained from previous Figures 4 and 5.

Plume concentration is decreasing at a much faster rate than that resulting from expansion of the plume. This concentration decrease is the result of previous source material removal, the ongoing, onsite groundwater recovery and treatment implemented in December 1988, and natural attenuation processes. With respect to the TCE concentration data given in previous Table 4, the following trends are readily apparent from the 43 wells with extended time histories:

1. Of the 22 UFZ wells, 5 offsite wells (MW-34, MW-35, MW-57, MW-63, MW-62) have non-detection histories. Of the remaining 17 wells, only 3 offsite wells (MW-53, MW-58, MW-61) have increasing concentration histories. The remaining 14 wells (including all on-site UFZ wells) all show decreasing concentration histories.
2. Of the 13 ULFZ wells, 2 off-site wells (MW-44, MW-59) have non-detection histories. Three off-site wells (MW-56, MW-60, MW-64) have increasing concentration histories. A single well (MW-46) has an erratic history. The remaining 7 wells (including all on-site ULFZ wells) show decreasing concentration histories.
3. Of the 7 LLFZ wells, 3 on-site wells (MW-38, MW-39, and MW-40) have non-detection histories. Only a single off-site well (MW-55) shows an increasing concentration history. The remaining 3 wells have decreasing concentration histories.
4. There is only a single on-site TFZ well (MW-49) and this well has a non-detection history.

The TCE concentration database also shows that of the 13 vertical well clusters shown on previous Figures 4 and 5, only a single well cluster (cluster No. 4 consisting of MW-15, MW-41, and MW-32) shows increasing concentration with depth; however all wells in this cluster have decreasing concentration time histories. Increase in concentration with depth means that the bottom well in a vertical cluster shows higher concentration than the other wells in the cluster. Time-history plots of the 10 vertical clusters with extended time history data are shown on Figures 6 through 15.

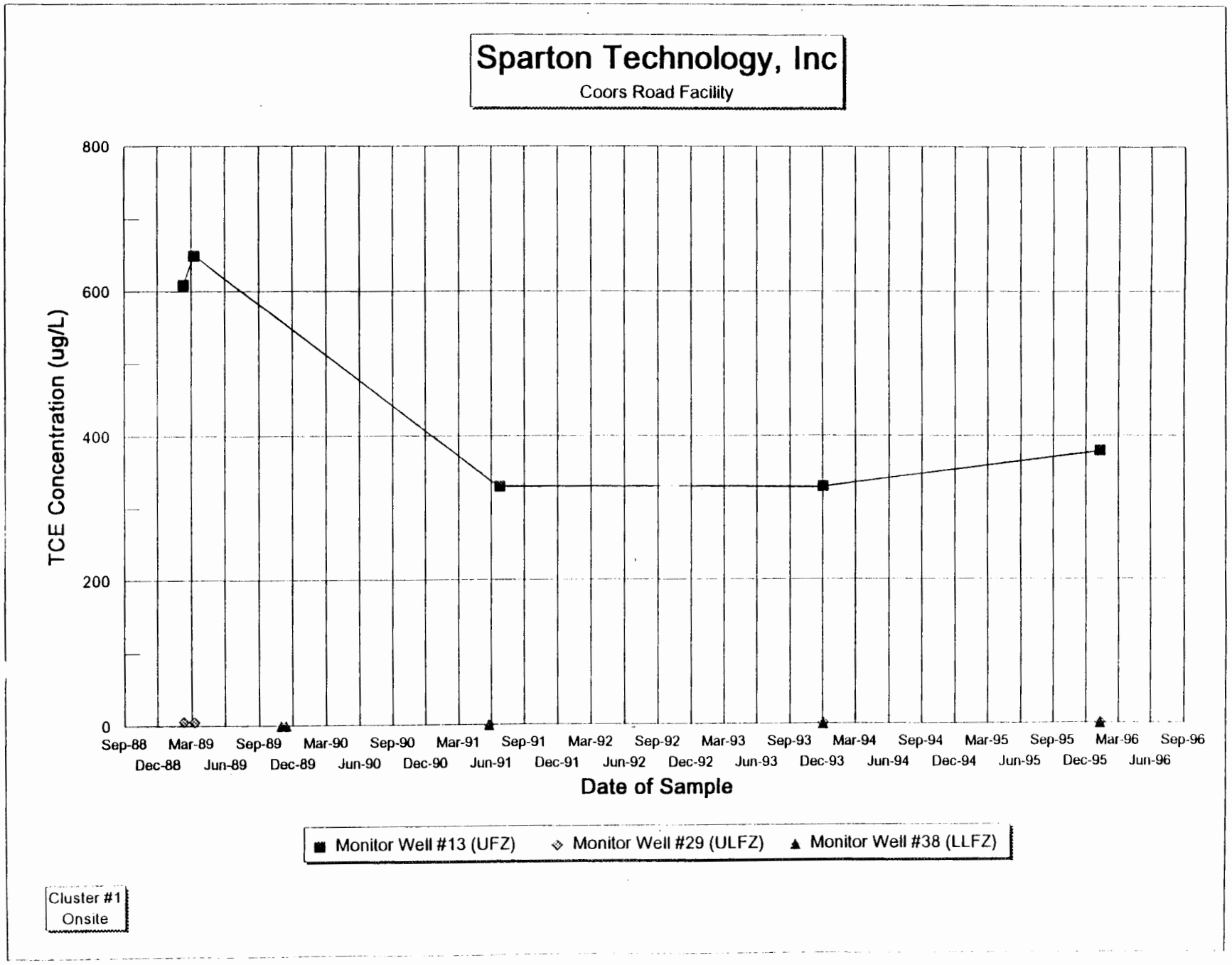


Figure 6

009209

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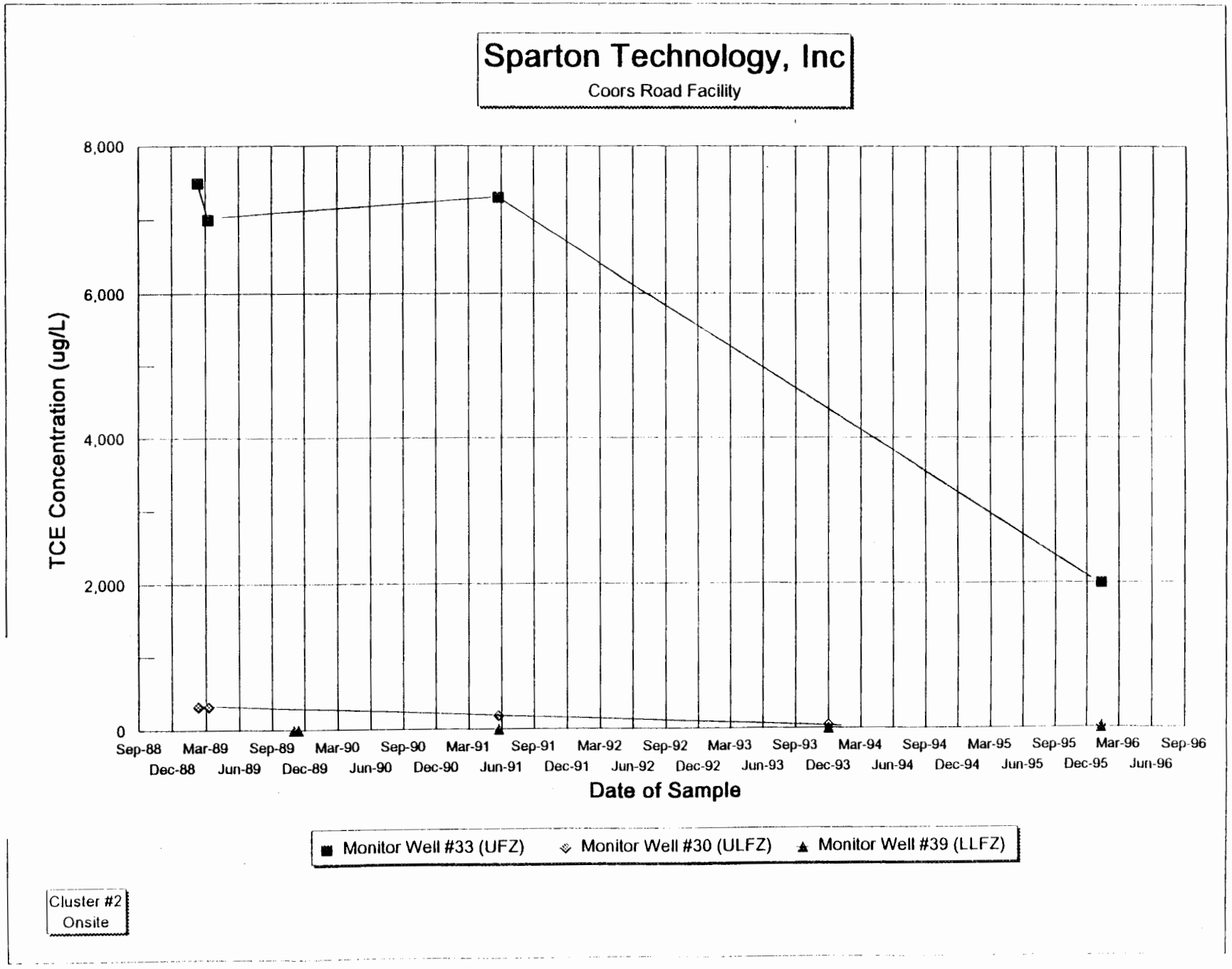
Sparton Technology, Inc
Coors Road Facility
TCE Concentration (ug/L)
8,000
6,000
4,000
2,000
0
Sep-88
Dec-88
Mar-89
Jun-89
Sep-89
Dec-89
Mar-90
Jun-90
Sep-90
Dec-90
Mar-91
Jun-91
Sep-91
Dec-91
Mar-92
Jun-92
Sep-92
Dec-92
Mar-93
Jun-93
Sep-93
Dec-93
Mar-94
Jun-94
Sep-94
Dec-94
Mar-95
Jun-95
Sep-95
Dec-95
Mar-96
Jun-96
Sep-96
Date of Sample
Monitor Well #33 (UFZ)
Monitor Well #30 (ULFZ)
Monitor Well #39 (LLFZ)
Cluster #2
Onsite

Figure 7

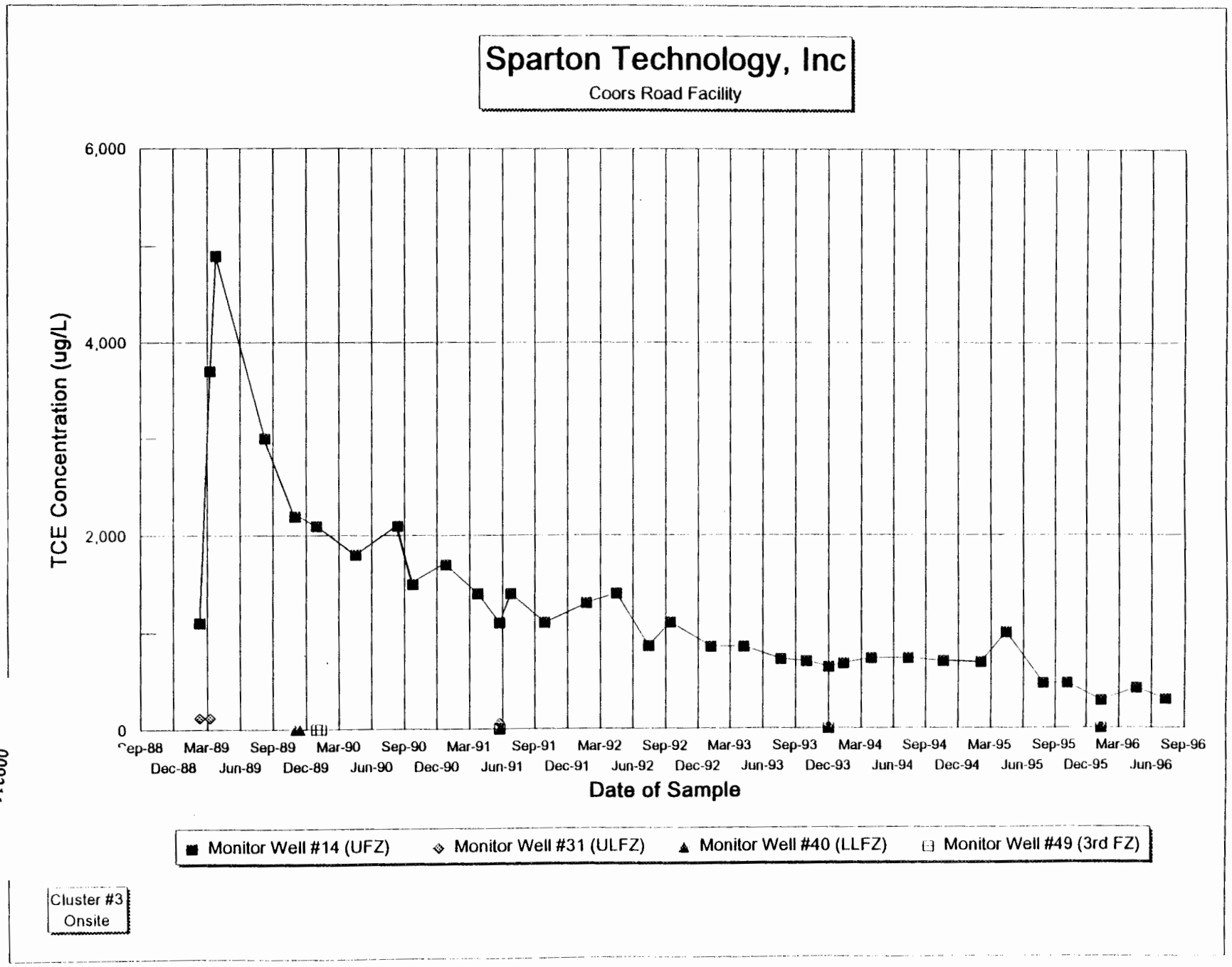

Figure 8

009211

B&V Project : 026602 0100 File smpl7-96 wk4 Printed 09/23/96 10 14 AM

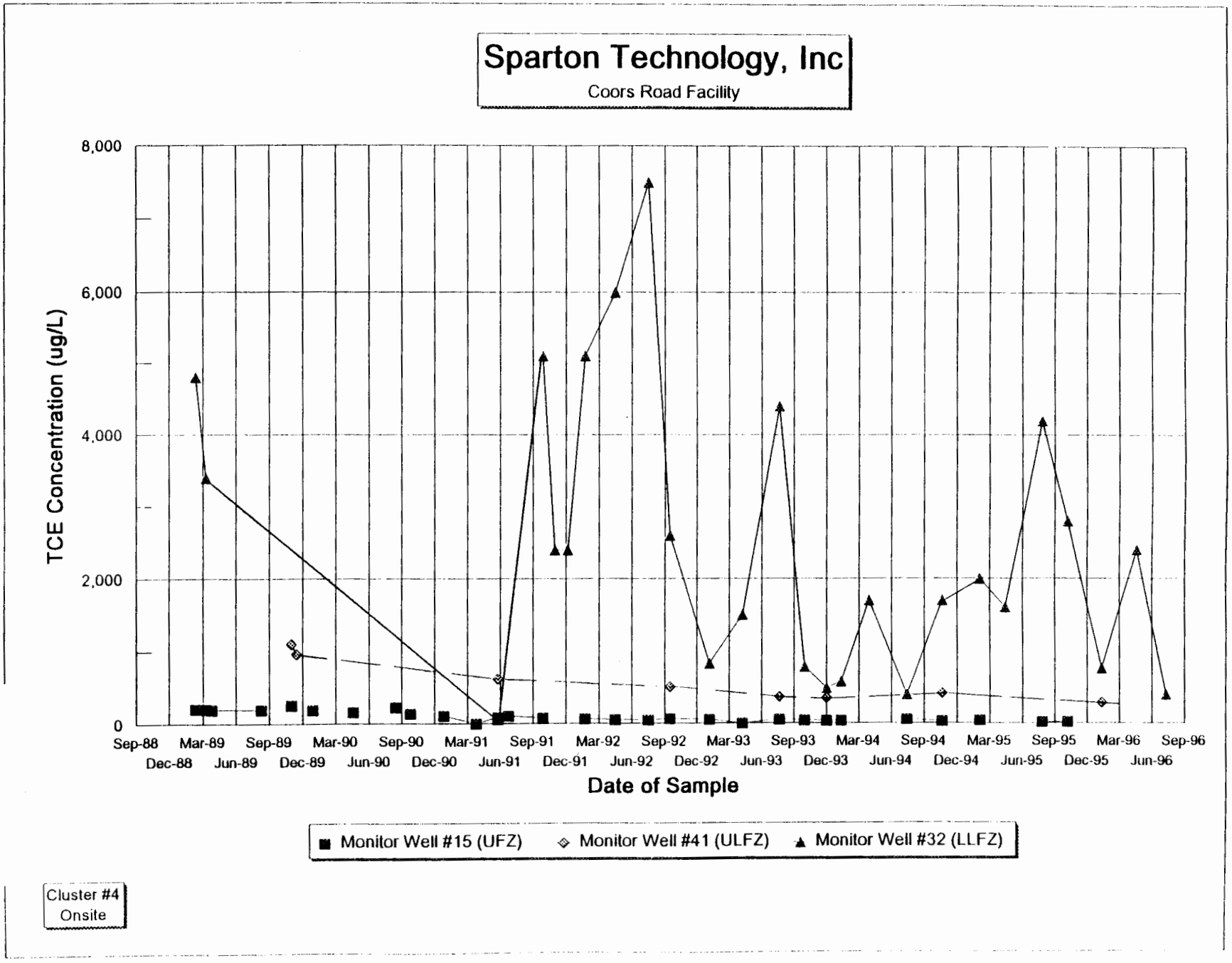
Sparton Technology, Inc
Coors Road Facility
TCE Concentration (ug/L)
8,000
6,000
4,000
2,000
0
Sep-88
Dec-88
Mar-89
Jun-89
Sep-89
Dec-89
Mar-90
Jun-90
Sep-90
Dec-90
Mar-91
Jun-91
Sep-91
Dec-91
Mar-92
Jun-92
Sep-92
Dec-92
Mar-93
Jun-93
Sep-93
Dec-93
Mar-94
Jun-94
Sep-94
Dec-94
Mar-95
Jun-95
Sep-95
Dec-95
Mar-96
Jun-96
Sep-96
Date of Sample
Monitor Well #15 (UFZ)
Monitor Well #41 (ULFZ)
Monitor Well #32 (LLFZ)
Cluster #4
Onsite

Figure 9

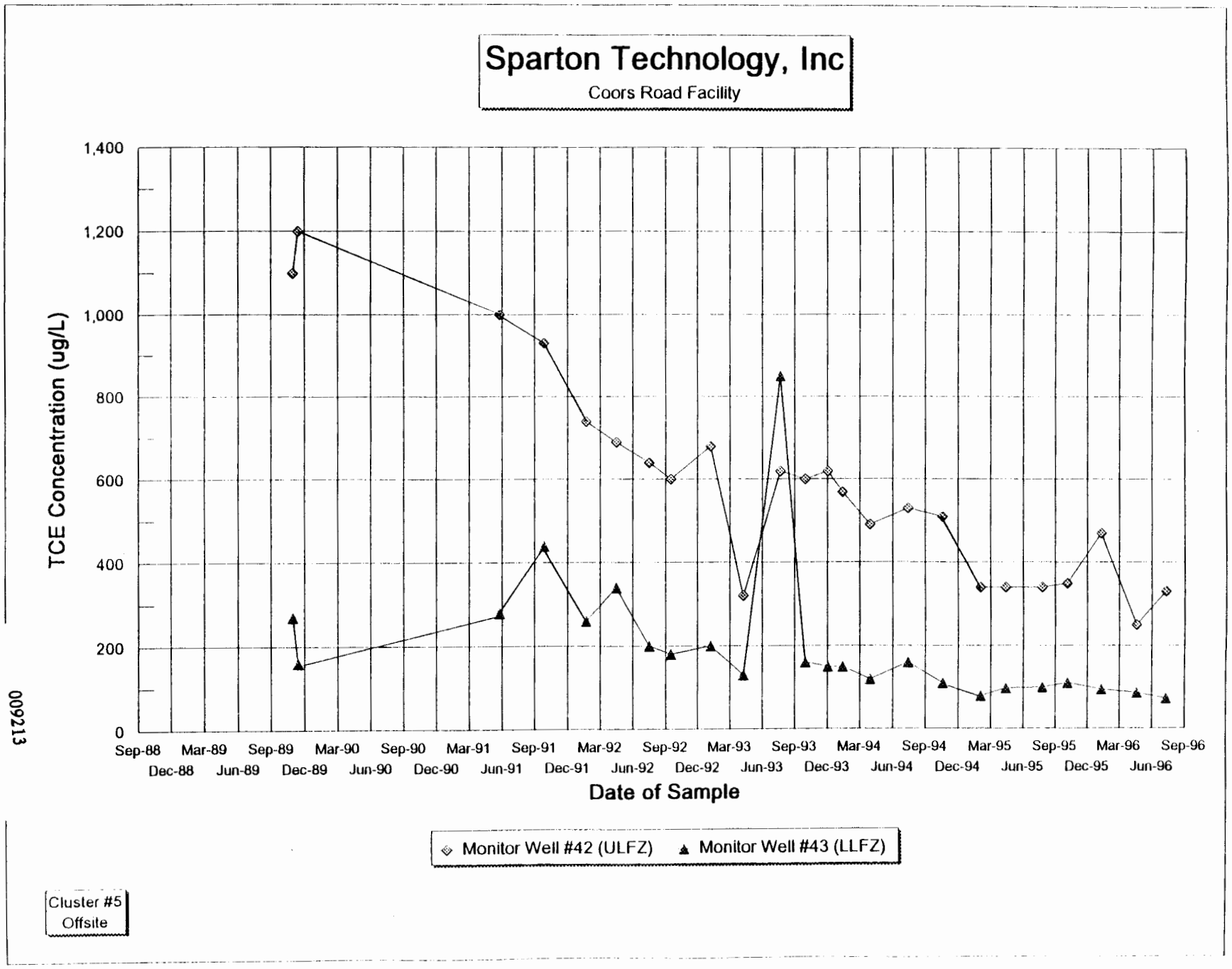

Figure 10

009213

B&V Project 026602 0100 File smpl7-96 wk4 Printed 09/23/96 07 59 AM

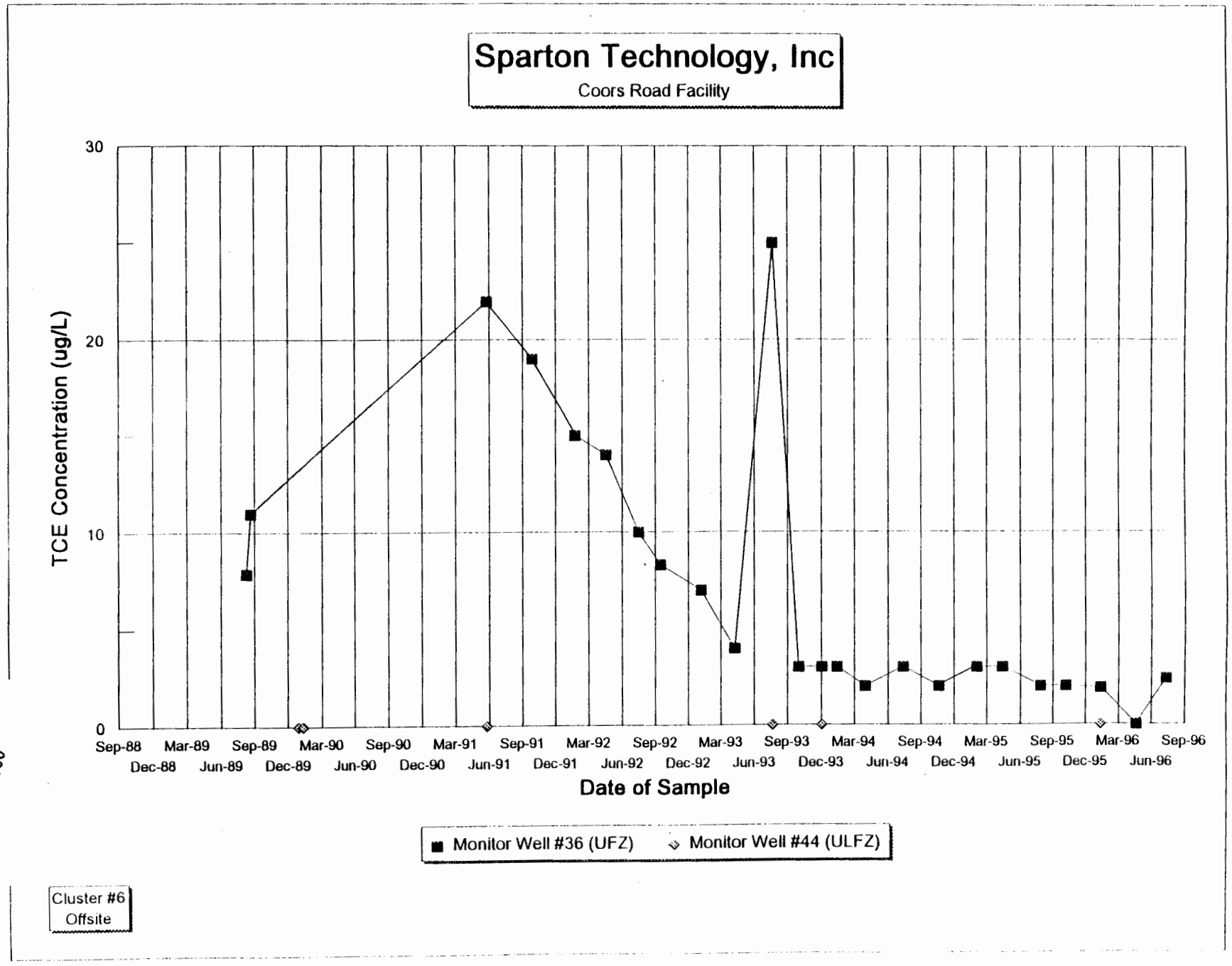

Figure 11

009214

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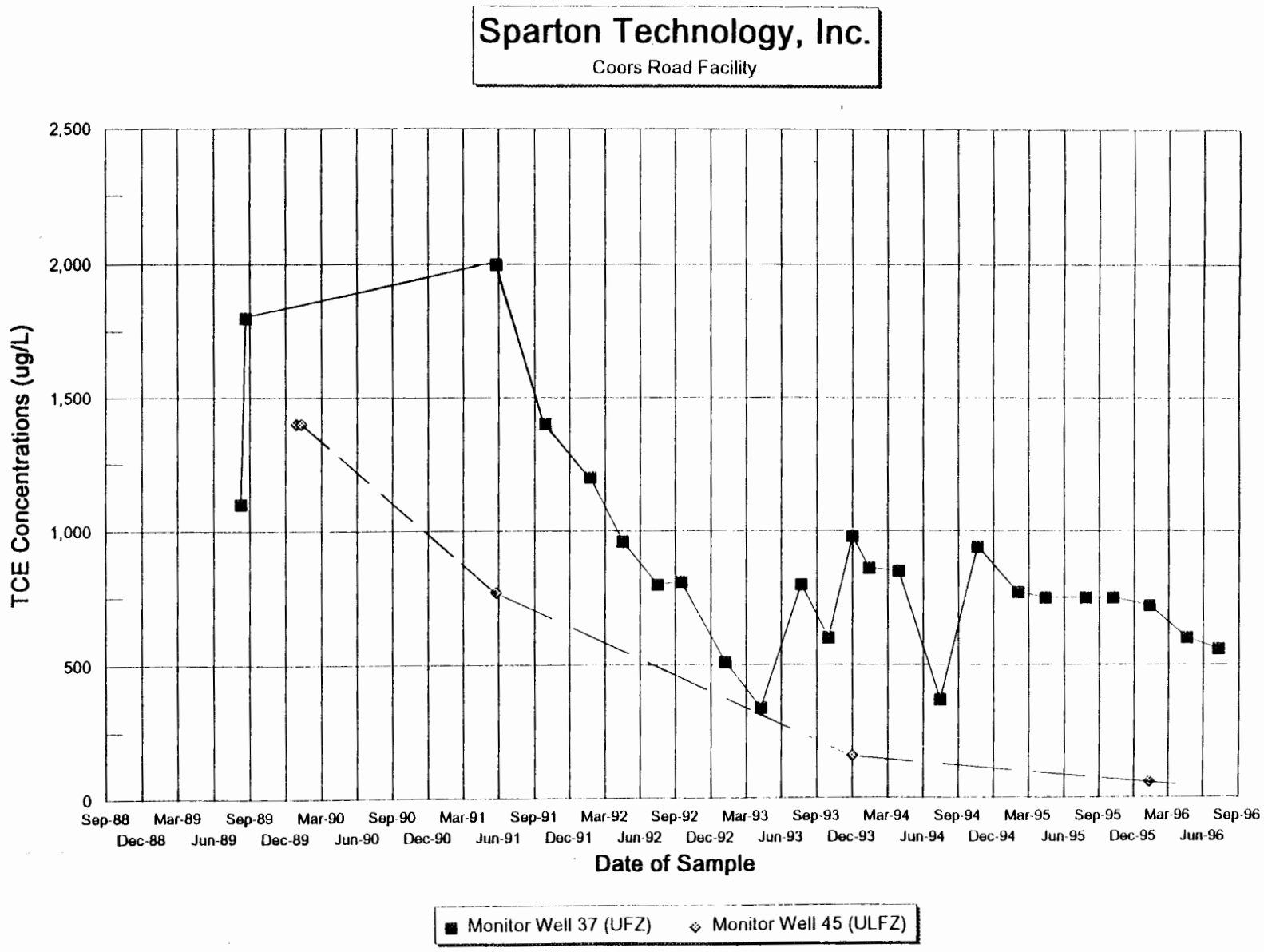


Cluster #7
Offsite

Figure 12

B&V Project. 026802 0100 File: smpl7 96 wk4 Printed: 09/23/96 07 59 AM

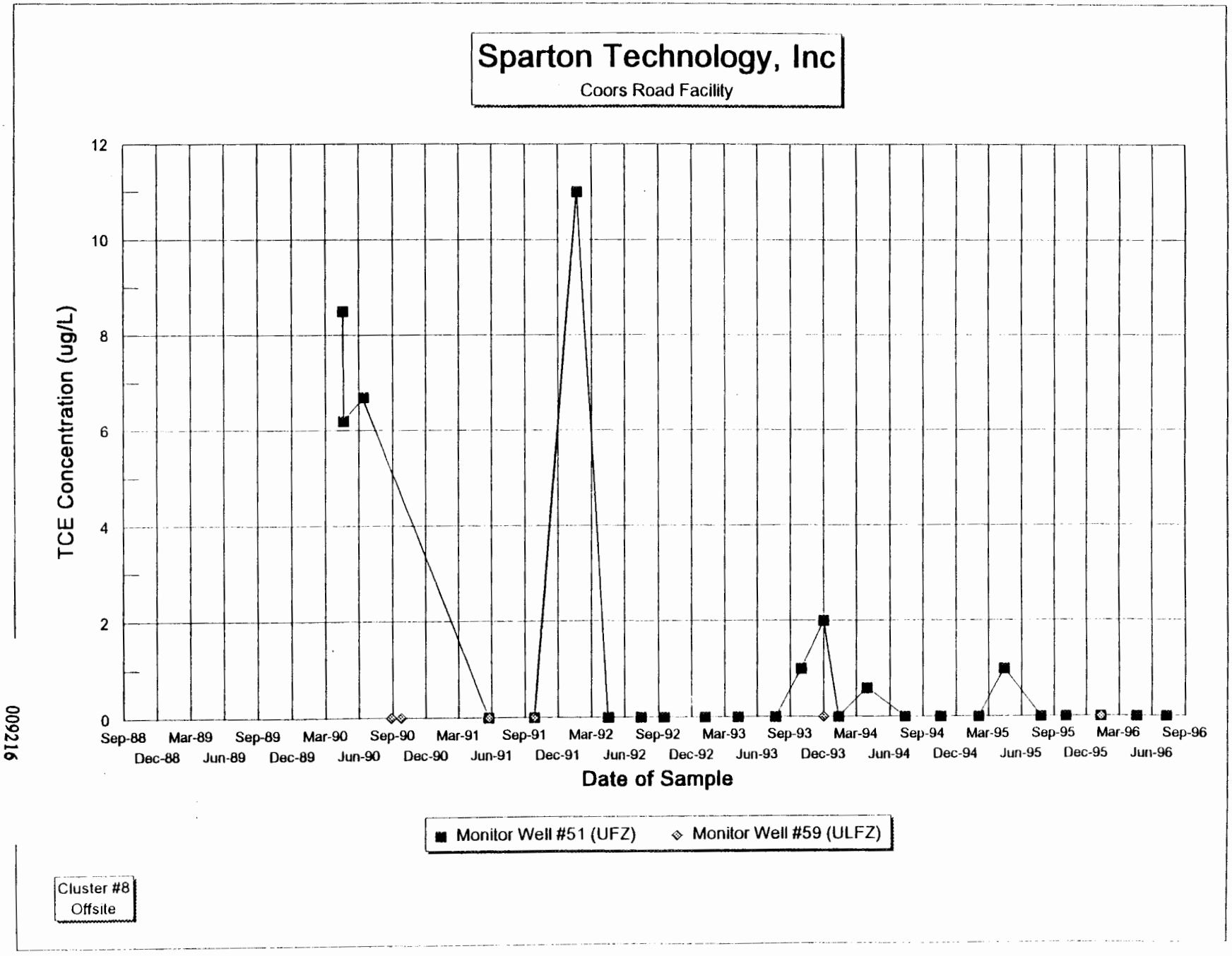

Sparton Technology, Inc
Coors Road Facility
TCE Concentration (ug/L)
12
10
8
6
4
2
0
Sep-88
Dec-88
Mar-89
Jun-89
Sep-89
Dec-89
Mar-90
Jun-90
Sep-90
Dec-90
Mar-91
Jun-91
Sep-91
Dec-91
Mar-92
Jun-92
Sep-92
Dec-92
Mar-93
Jun-93
Sep-93
Dec-93
Mar-94
Jun-94
Sep-94
Dec-94
Mar-95
Jun-95
Sep-95
Dec-95
Mar-96
Jun-96
Sep-96
Date of Sample
Monitor Well #51 (UFZ)
Monitor Well #59 (ULFZ)
Cluster #8
Offsite

Figure 13

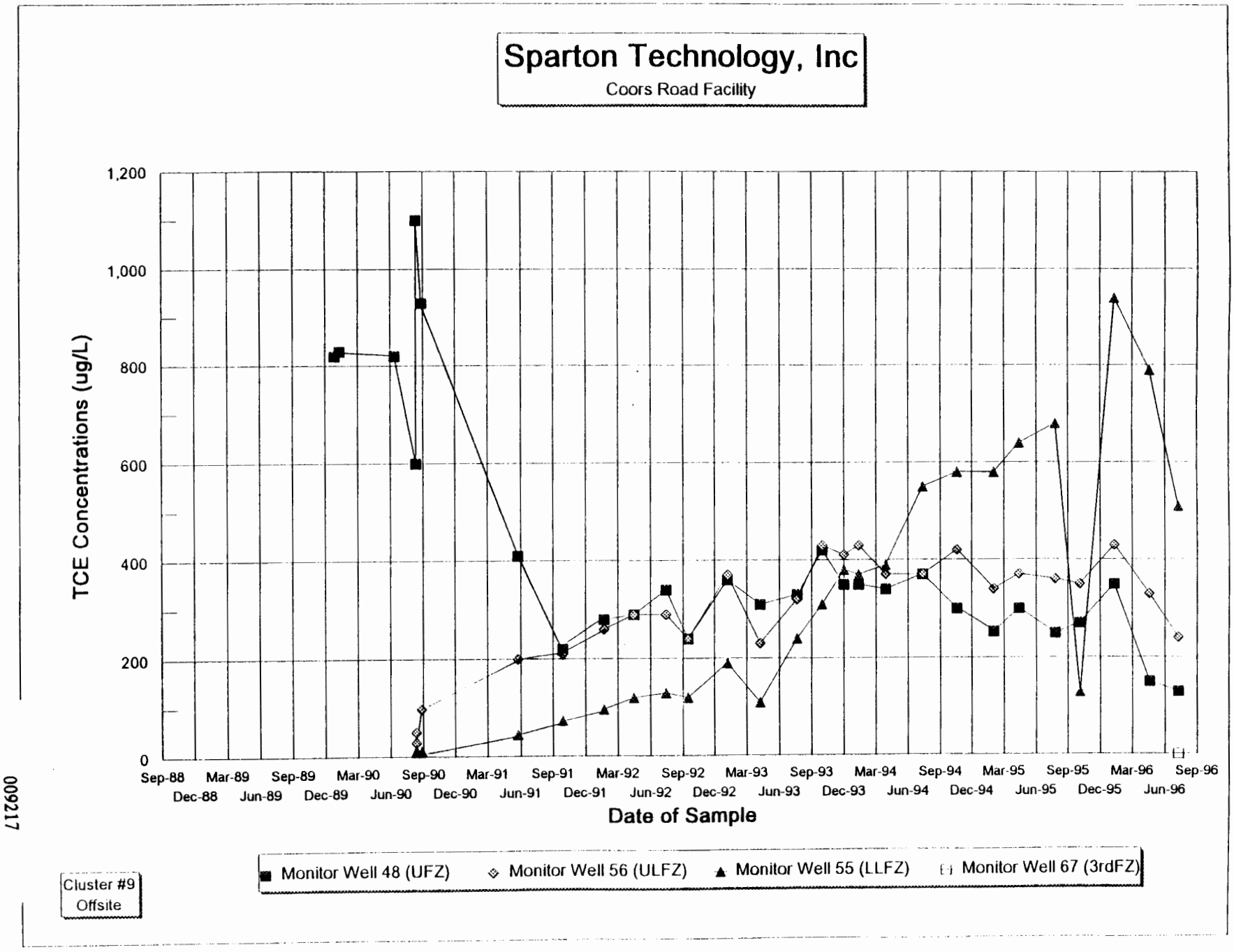
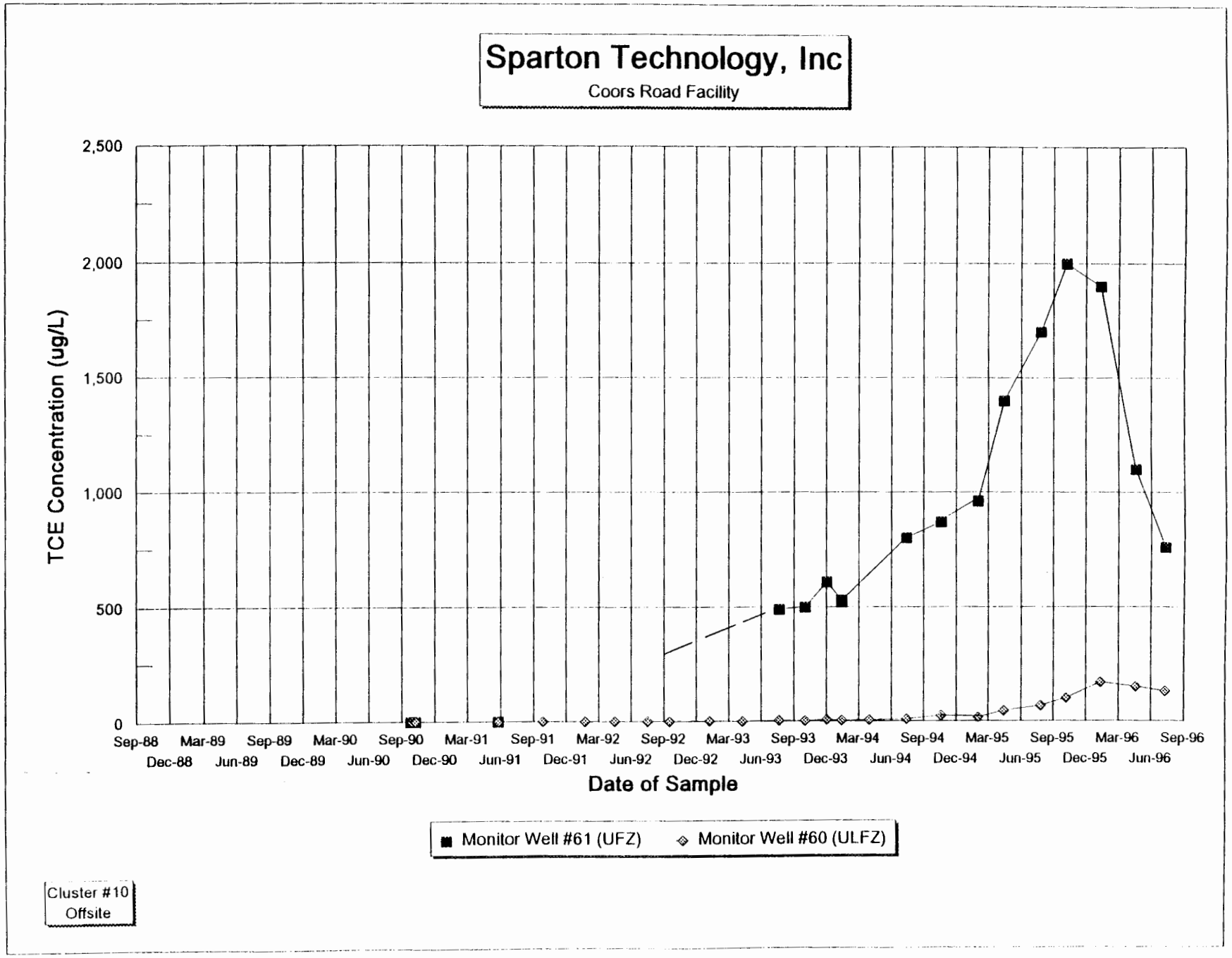


Figure 14

B&V Project : 026602 0100 File : smpl7-96 wk4 Printed 09/23/96 07 59 AM


Sparton Technology, Inc
Coors Road Facility
TCE Concentration (ug/L)
2,500
2,000
1,500
1,000
500
0
Sep-88
Mar-89
Sep-89
Mar-90
Sep-90
Mar-91
Sep-91
Mar-92
Sep-92
Mar-93
Sep-93
Mar-94
Sep-94
Mar-95
Sep-95
Mar-96
Sep-96
Dec-88
Jun-89
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Jun-90
Dec-90
Jun-91
Dec-91
Jun-92
Dec-92
Jun-93
Dec-93
Jun-94
Dec-94
Jun-95
Dec-95
Jun-96
Date of Sample
Monitor Well #61 (UFZ)
Monitor Well #60 (ULFZ)
Cluster #10
Offsite

Figure 15

Decrease in plume concentration is also demonstrated by mapping and contouring of specific volatile organic constituent (VOC) analytical results obtained from a series of surface soil-gas surveys conducted in 1984, 1987, and 1991. Reports detailing each survey are included in the 1992 RFI Report attachments. Survey information is also summarized in the 1996 CMS Report. A comparison of the plotted results shows a significantly progressive decrease in surface soil-gas VOC concentrations including TCE and TCA.

Comparison of soil gas concentrations indicates a fifty-fold decrease in TCE and thirty-fold decrease in TCA concentration in the period 1984 to 1991. In the 1987 and 1991 surveys, TCE and TCA were detected over approximately the same area; however, TCE concentration dropped almost an order of magnitude and TCA concentration dropped 30 to 50 percent.

Need for Additional Contaminant Characterization Study. Additional site investigation beyond continued groundwater monitoring would only confirm current characterization of the plume. Additional investigation will not fundamentally change understanding or definition of the plume relative to assessing risk/threat or remedial design.

Continued monitoring consisting of semi-annual to annual monitoring of selected, representative wells for VOC is more than adequate based on the following:

1) Plume limits and direction and rate of movement are defined and understood.

2) Plume poses no risk/threat and there are no significant exposure pathways/potential receptors.

3) There is an adequate network of groundwater wells around and under (as well as inside) the plume - particularly near the leading edge.

4) There is an extended history of quarterly results since 1992 and slightly less frequent results dating back into the 1980's as given in previous Table 2.

5) Specific VOC (TCE, TCA, DCE, DMA) are constituents of concern for plume definition and risk/threat assessment. Any degradation products will also be VOC.

6) Standard groundwater monitoring practice is to decrease monitoring frequency, decrease number of wells sampled, and to limit analyses to constituents of concern as plume (and risk/threat) becomes defined and understood.

RISK ASSESSMENT

The defined contaminant plume poses no risk or threat to human health. Contaminant concentrations within the plume exceed drinking water standards; however, there is no foreseeable exposure pathway to current (and future planned) drinking water use from the aquifer in the impacted area.

Potential Receptors/Exposure Pathways. The nearest potential receptor/ exposure pathway is the New Mexico Utilities (NMU) municipal supply well some 2.1 miles downgradient from the leading edge of the plume. In addition to the horizontal and vertical separation of the NMU well intake from the plume, modelling conducted in 1996 showed that the plume's continued migration would not affect drinking water quality at the NMU well. The model was intended to represent a "worst-case" relative to risk posed to the NMU well. Model used the high range of hydraulic conductivity, low range of effective porosity, and assumed the site-specific hydraulic gradient extended all the way to the NMU well. Further, it was assumed that no retardation or degradation of TCE was occurring. The model was calibrated to the plume limits (and age) given in the 1992 RFI Report and then run for elapsed times up to several hundred years. The model was never intended to be an exact simulation, but rather was intended to show the non-impact to the NMU well under conservative modelling.

In concern No. 13 of the Technical Review of the CMS Report dated June 20, 1996, EPA was critical of the groundwater modelling and related conclusions without making any effort to understand the assumptions, input parameters, and calibration efforts. EPA also apparently failed to review requested additional supplemental data on the model furnished by Sparton on June 3, 1996.

The model was run using site-specific hydraulic gradient and hydraulic conductivity values included in both the RFI and CMS Reports. Although challenged by EPA, these parameters are remarkably consistent with regional characterization. The model was then calibrated to the RFI Report plume limits by varying longitudinal and transverse dispersivity values to obtain a good match to plume shape. Vertical matching was also checked. In spite of EPA's erroneous assertion, vertical dispersivity was constant at 0.01 which calculates to approximately 0.2 to 2 percent of the calibrated horizontal values. This value for vertical dispersivity is very close to the value EPA claims should have been used in the absence of site-specific data. EPA further challenged Sparton's decision to model the plume migration toward the nearest potential receptor -- the NMU municipal supply well some 2.1 miles distant.

In spite of EPA's strenuous criticism, the calibrated model appears to match the plume shape and rate of migration very well. Predictions based on that model were readily confirmed by the additional groundwater monitoring wells installed in summer 1996.

Threat. Concentrations of TCE, TCA, DCE, and DMA within the plume exceed drinking water standards; however, due to the lack of any realistic exposure pathways and/or potential receptors, the plume poses no current (or reasonably foreseeable) risk/threat to human health. The impacted ground water is not used by any water system and does not pose an ingestion risk to human health. In addition, homes located over the plume are not at risk from soil gas emanating from the plume. Repeated surface soil gas surveys did not detect any VOC in or near the residential area at a detection limit of 0.00022 ppm_v. Further, deep soil gas surveys conducted at the top of the saturated zone and reported in the CMS Report, did not detect any significant (<1 ppm_v) VOC concentration offsite. Thus, there is no risk by inhalation.

AQUIFER RESTORATION

Restoration is defined as the removal of contaminants to achieve drinking water standards. It is very doubtful that the impacted aquifer can be restored by any "Technically Practicable" methodology(ies) in any reasonable time frame. This conclusion is based on the following site-specific information:

1. The heterogeneous and anisotropic nature of the subsurface will not allow simplistic "broad brush" solutions. "Real world" solutions will have to deal with discrete, isolated contaminant concentrations in attaining restoration.

2. Restoration will require removal of both dissolved phase contamination from groundwater and sorbed-phase (residual DNAPL) contamination from saturated fine-grained clays and silts. Sorbed-phase (residual DNAPL) removal will require long-term activity.

   Sorbed-phase contamination is the result of constituents being adsorbed onto or bound up by capillary forces within the soil pore structure. Sorption of constituents such as TCE is enhanced by the presence of fine-grained silts and clays and/or organic material. It has been reported by Piwani & Keeley (EPA, 1990) that "a few percent of silts and clays can result in a substantial increase in the sorptive behavior of the aquifer material'. These silts and clays are the sorptive sites to contaminants in groundwater moving through the subsurface matrix. Increasing percentages of silts and clays will result in significant sorbed-phase contamination.

   Both regional characterization and site-specific investigation show that silts and clays are significantly present and heterogeneously and anisotropically distributed throughout the aquifer. These silts and clays not only restrict vertical migration, but also readily adsorb contaminants from the ground water.

   John Hawley summarized properties for the lithofacies (sedimentary geologic units) that make up the Albuquerque Basin (USGS, 1993). Hawley indicates that the ratio of sand plus gravel to silt plus clay will range from a high in excess of two to a low of less than 0.5 for the typical geologic materials in the subsurface. Converted to a percent, these ratios would range from less than 30 percent to over 70 percent silt and clay. A review of boring logs from deeper well installations (LLFZ and TFZ wells) at the Sparton facility indicates that approximately 40 percent of the saturated depth interval is comprised of clay, clayey, or silty stratigraphic units. The remaining units also contain clay/silt seams and lenses; however, the use

of bentonite as a drilling fluid additive makes identification of minor silt/clay very difficult. Actual amount of silt/clay is estimated in the 20 percent range. Recent investigation north of the Calabacillas Arroyo (USBR, 1996) showed that, in the upper 300 feet of the saturated zone: silt/clay was present in 45 of the 60 five-foot logged intervals; silt/clay content ranged from 0 to 85 percent; and average clay content was approximately 15 percent over the total 300 feet. However, the USBR indicated that drilling fluid precluded a complete evaluation of silt/clay fraction.

3. Hydraulic conductivity and groundwater flow rates are low. As a result, groundwater extraction and treatment will require a very long time frame because of the extremely large volume of water to be treated and the rate at which the water can be removed by wells.

4. The plume is relatively large in horizontal extent due to migration from a long-duration release; however, the plume is relatively thin (in depth) due to the significant vertical anisotropy. The plume dimensions and contaminant distributions will not allow efficient, high-rate groundwater extraction. Highest TCE concentrations are found near the top of the aquifer. Large drawdowns associated with high pumping rates will pull contamination down into lower portions of the aquifer. High pumping rates will also result in more water being removed from the zones with higher hydraulic conductivities (and probably from areas outside the plume) with little effect on either dissolved-phase or sorbed-phase contamination in the less water-transmissive zones. Aggressive pumping will thus result in the removal and treatment of very large volumes of relatively uncontaminated water without achieving significant remediation.

5. Attempts to restore the aquifer will require numerous wells pumping at low rates because of the plume size, drawdown limitations, pumping rate limitations, and resultant influence limitations. Because of the time requirements resulting from pumping rate limitations and the difficulty of removal of sorbed-phase contamination, attempts at restoration will be extremely inefficient.

6. The plume is located under a developing residential area. There will be little room for numerous recovery wells. In addition, bringing large quantities of contaminated water to the surface at numerous locations will greatly increase risk/threat to human health.

7. EPA Region 6 and NMED have been unable to provide any successful case-history documentation to support restoration under similar conditions/contaminants.

Site characteristics and contamination were also analyzed in the context of EPA's Guidance for Evaluating the Technical Impracticability of Groundwater Restoration (EPA, 1993). Procedures in this guidance lead to the conclusion that aquifer restoration is "Technically Impracticable." Application of the guidance procedures is detailed in both text and table form in the 1996 CMS Report.

In their Technical Review of the CMS Report dated June 20, 1996, EPA questioned technical impracticability in concern No. 11. EPA appears to differentiate between dissolved-phase and residual-phase VOC (referred to as "entrained DNAPL" in the concern). EPA agrees that entrained DNAPL would prevent practicable restoration, but argues that entrained DNAPL is found only near the source. It is interesting to note that EPA quotes out of context its own technical guidance (EPA, 1993) page 8, and seems to misuse a second quote from page 12 of the guidance. In light of the numerous studies and case histories reported in the literature, and recognizing the conditions at the Sparton facility, it is surprising that EPA does not believe that sorbed-phase VOC or residual DNAPL is not present throughout the plume. Further, EPA seems unwilling to acknowledge the difficulty of residual DNAPL remediation.

The infeasibility of aquifer restoration at this site is further confirmed by the 24 case histories contained in Evaluation of Ground-Water Extraction Remedies: Phase II (EPA, 1992). This report was used by EPA as a "report card" in response to Congressional inquiry. The report was intended to be a summary of the state-of-

practice for groundwater remediation. The following summary of the reported case histories is extremely relevant to the Sparton facility:

1. Contamination - 12 of the 24 sites had TCE contamination; 19 of the 24 sites had chlorinated solvent contamination.

2. Geology - all 12 of the TCE - contaminated sites had fluvial clay, silt, sand, and gravel geology; 18 of the 19 chlorinated solvent sites had same geology.

3. Extent of Plume - the horizontal extent of the plumes was <u>much</u>, <u>much</u> larger than the vertical depth or thickness; the 12 TCE sites ranged from 9 to 760 acres in sizes with depths ranging from 20 to 250 feet; the 19 chlorinated sites ranged from 0.7 to 7,600 acres with depths from 20 to 250 feet.

4. Regulatory Program - the TCE sites included three RCRA, four Superfund, and five state; the chlorinated sites were three RCRA, six Superfund, and 10 state.

5. Containment - containment was achieved at eight of the 12 TCE sites; containment was achieved at 13 of the 19 chlorinated solvent sites.

6. Restoration - restoration was not being achieved, nor had been achieved, at any of the 24 sites.

To-date, EPA has not provided any meaningful case-history data to support the feasibility of restoration. In fact, EPA's Office of Emergency and Remedial Response (OERR) is currently involved in the evaluation of containment as an alternative to restoration because of EPA's dismal experience with restoration and resultant Congressional and technical pressure.

Technical impracticability of restoration at Sparton's site is also confirmed by the additional case history information contained in <u>Alternatives for Groundwater Cleanup</u> (National Research Council, 1994). The above discussions and references are not

intended to show that groundwater extraction or "pump and treat" is bad; but rather to show that extraction is more appropriate for containment and contaminant reduction as contrasted to restoration.

Although aquifer restoration is technically impracticable, aquifer remediation is realistic and practicable. Sparton's currently proposed remediation activities will produce comparable results to EPA's proposed Alternative 4 over the same 30-year time frame at substantially less cost. Sparton capital costs are approximately $0.5 million, operation and maintenance costs are approximately $0.2 million/year. EPA's capital cost is approximately $2.5 to $3.1 million with an operations and maintenance cost of approximately $0.85 to $3.6 million annually, depending on extent of water treatment. Costs for additional extraction wells were not quantified in the EPA Final Decision (EPA, 1996); however, additional extraction wells were discussed in the context of final-phase restoration. Each additional extraction well (200 gpm nominal pumping), together with its water treatment and reinjection requirements, would have capital costs in the range of $0.58M to $0.77M and annual O&M of $0.2M to $1.2M, depending on level of treatment.

Sparton's most recent proposed remediation would provide for containment of the leading edge of the plume. This containment would control further plume migration and ultimately capture existing contamination moving downgradient in offsite areas of the plume. Sparton's containment proposal was conditioned to the economical treatment and disposal of extracted groundwater.

In the 1996 CMS Report, Sparton has also proposed expansion of the existing onsite groundwater extraction system to enhance both onsite containment and removal of source material from areas with elevated contaminant concentration. Over eight years of successful operation of this system demonstrate its feasibility.

In their Final Decision Document, EPA provided erroneous and misleading depictions of capture zones for the existing onsite recovery well system. These capture zones are significantly different from, and much smaller than, capture zones and/or radius of influence given in Sparton's Effectiveness Report and in EPA's previous Statement of Basis. In the Final Decision, EPA decided to ignore demonstrations of the actual pumping radius of influence obtained from multiple, multi-well pumping tests

conducted on several of the recovery wells. These demonstrations were used to confirm Sparton's calculations for all the recovery wells. EPA elaborated on their calculations under concern No. 1 of their June 20, 1996, Technical Review of the Effectiveness Report. Their comments reflect a basic misunderstanding of the Hvorslev methodology to require "an instantaneous change in the water level" when, in fact, Hvorslev methodology can be applied (and often is) to constant rate or equilibrium conditions (USACOE, 1951). Secondly, EPA averaged well-location-specific hydraulic conductivities ranging two orders of magnitude and hydraulic gradients ranging over an order of magnitude to obtain single values for calculations at all well locations. Such an approach ignores the significant heterogeneity and anisotropy observed and documented on site. EPA also chose to ignore actual field demonstrations of capture determined from long-duration, multiple-well pump tests included in Appendix 2 of Sparton's Effectiveness Report. For example, for two wells in the original source area, MW-24 and MW-25, EPA calculated maximum capture zone widths of 8.88 and 16.00 feet respectively, yet actual pump test results showed that pumping of either MW-24 or MW-25 impacted the drawdown in the other well over a horizontal distance of 32.82 feet. This demonstration would indicate capture zone widths are at least 66 feet wide at the wells and would be somewhat larger upgradient. Obviously, inter-well comparisons of influence obtained under actual field conditions are far superior to any theoretical calculations.

In the 1996 CMS Report, Sparton has also proposed installation of a soil vapor extraction (SVE) system to remove source material from the unsaturated zone in the vicinity of the original contamination source area.

Based on the current rate of plume migration, it will take 25 to 30 years for the majority of contamination to be captured by the leading edge containment; however, natural attenuation including biotic and abiotic processes will be taking place based on site observations to date and recent New Mexico Water Resources Research Institute studies in the Albuquerque Basin (NMWRRI, 1992).

SUMMARY

- Subsurface conditions and plume characterization are more than adequately defined and understood; plume behavior is predictable.

- Potential receptor/exposure pathways are identified and there is no risk/threat to human health.

- There is more than sufficient information to assess risk/threat and/or to design any additional remediation; further study or investigation is not needed.

- Sparton's proposed remediation will accomplish the same objectives as EPA's proposal in the same time-frame at significantly less cost.

I state, under penalty of perjury, that the foregoing is true and correct.

Executed on February 4, 1997.

Black & Veatch

Pierce L. Chandler, Jr.
Project Manager

cs

Attachments:
Curriculum Vitae - Pierce Chandler
Bibliography

CURRICULUM VITAE

Pierce L. Chandler, Jr.
Senior Project Manager
Black & Veatch, Dallas, TX

Professional Registration: Texas Registered Professional Engineer since 1972

Education: B.S., Aerospace Engineering, University of Texas at Arlington, 1967
M.S., Civil Engineering, Texas A&M University, 1971

Experience Summary:

Mr. Chandler has over 20 years of solid/hazardous waste engineering experience. His experience covers both investigation and remediation of soil, soil gas, and groundwater contamination at existing facilities and siting, design, permitting, and construction of new disposal/treatment facilities.

Mr. Chandler also has over 20 years' experience as a principal professional in hydrogeologic investigation, characterization, reporting, and expert testimony. This experience has covered: investigative work plan development; intrusive exploration; geophysical exploration; in situ testing; pump testing; laboratory testing; evaluation and analysis of hydrogeologic data; design of groundwater control, protection, and monitoring systems; construction and operation of these systems; groundwater modeling, and groundwater remediation. In addition to this extensive experience, Mr. Chandler has been an Adjunct Professor for Environmental Hydrogeology in the Geoscience Graduate School at the University of Texas at Dallas since 1987. He has also taught hydrogeology at Brookhaven College and in Texas-Department-of-Health-sponsored short courses at Texas Tech and the University of Texas at Arlington. He is a recognized authority on hydrogeology and regularly consults with industry and regulatory agencies in a QA/QC capacity.

Relevant Project Experience:

Project, Client, Location	Position	Responsibilities
RCRA Corrective Action for Sparton Technologies, Inc., Albuquerque, New Mexico	Principal Author and Project Manager	Provided in-field supervision of field investigation. Responsible for detailed hydrogeologic/contamination characterization including fate and transport in the RFI report approved by EPA. Principal author of subsequent Corrective Measures Study and Interim Measures Reports approved by EPA.
RCRA Corrective Action at chemical distribution facility Van Waters and Rogers Spokane, Washington	Project Manager and Principal Investigator	Facility is located over a "sole-source aquifer". Technical negotiation for 3013 and 3008 (h) Consent Orders. Designed and negotiated EPA-approved investigative work plans, conducted extensive investigation of soil and ground water contamination including in-field supervision. Principal author for hydrogeologic characterizations approved by EPA. Designed and implemented corrective measures that successfully remediated solvent contamination of soil and groundwater to allow clean closure.
RCRA Facilities Investigation (RFI) for eighteen potentially contaminated solid waste management units (SWMU's) at NAS Cecil Field, Florida	Project Manager and Principal Investigator	Managed RFI including site reconnaissance; surface geophysical surveys; soil borings; monitor well installation; soil, sediment, and groundwater sampling; and laboratory analysis. Provided hydrogeologic and contaminant characterization for each SWMU and evaluated contaminant mitigation, fate and transport. Principal author of RFI report approved by EPA and State of Florida.
Geotechnical and hydrogeologic investigation for Texas Utilities Services, Inc.'s Hazardous Waste Facility at Monticello Steam Electric Station	Project Manager and Principal Investigator	Site is located adjacent to a public water supply reservoir. Prepared investigative plan and provided detailed hydrogeologic characterization of project site. Designed groundwater monitoring and protection system including soil-bentonite slurry wall. Supervised construction and sub-sequent groundwater monitoring.
Hydrogeologic and geotechnical investigation for Southside Sludge Management Facility, Dallas, Texas	Project Manager and Principal Investigator	This facility processes entire Dallas wastewater sludge production. Designed investigation, supervised field and laboratory studies, and characterized site hydrogeology. Utilized characterization to design groundwater protection system consisting of multiple soil-bentonite slurry trenches.
U.S. versus Marine Shale Processors, Federal District Court, Louisiana	Expert Witness	Expert witness for USDOJ/EPA on site characterization during penalty phase of enforcement trial.

Project, Client, Location	Position	Responsibilities
Technical review and technical support for U.S. EPA for corrective action at various RCRA/ CERCLA Facilities.	Senior Consultant	Facilities include five industrial manufacturing plants, two hazardous waste disposal sites, and five military bases.
Dye Tracer Study, March AFB, California	Technical Consultant	Designed and implemented a dye tracer study that successfully demonstrated the performance of the Underdruck-Vendampfer-Bannon (UVB) in situ ground-water treatment system. The UVB was installed at March AFB, California, as part of the U.S. EPA Superfund Innovative Technology Evaluation (SITE) program. The dye tracer study used multiple dyes in both converging and diverging tests to demonstrate the radius of influence and recirculation produced by the UVB.
Study reviewing current practices and conditions at construction/demolition landfills, Kansas Department of Health and Environment	Principal Investigator	Designed and conducted study which included site reconnaissance, records review, and summary report/ evaluation of 12 operating sites.
Hydrogeologic and contaminant characterization for a major chemical manufacturing facility near Houston, Texas	Project Manager and Co-Author	Prepared characterization covering three recognized aquifers underlying the project site and including analysis of multiple pumping tests.
Conceptual design and permit application for a 670-acre municipal solid waste landfill expansion, Waste Management of Texas, Ferris, Texas	Project Manager and Principal Investigator	Expansion will have a solid waste capacity of 26 million tons and includes a composite liner, leachate collection system, and gas recovery system. Determined scope of investigation, participated in and supervised field and laboratory work, evaluated results with particular emphasis on hydrogeologic characterization, prepared landfill design and authored permit application. Represented Applicant in contested public hearings which resulted in permit issuance. Project began operation June 1, 1995.
Design and permit application for a 170-acre landfill redevelopment, North Texas Municipal Water District, McKinney, Texas	Project Manager and Principal Investigator	Redevelopment will have a capacity of 5 million tons and includes a constructed clay liner as part of a performance-based design. Designed investigation, participated in, and supervised field and laboratory investigation, characterized and reported site hydro-geology, and designed groundwater protection system. Represented applicant in contested public hearing resulting in a permit grant. Project began operation June 2, 1995.

Project, Client, Location	Position	Responsibilities
Study of a regional landfill, Gulf Coast Waste Disposal Authority, Chambers County, Texas	Project Manager	Conducted study including evaluation of current operation and recommendations for increasing landfill efficiency and complying with Subtitle "D" requirements. Further, the study included assessment of the potential for a regional landfill operation, recommendations for method of financing solid waste disposal, and evaluation of an incinerator alternative.
USEPA OERR	Principal Co-Author	Co-Author of in-depth evaluation of subsurface barriers (in progress). Report will be a companion volume to EPA's previous Evaluation of Groundwater Extraction Remedies.

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IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-VI-001 (h)-96-H

REPORT OF W. PETER BALLEAU, CPG, P.Hg., ON SPARTON TECHNOLOGY, INC. SITE IMPACT ON GROUNDWATER-RESOURCE AVAILABILITY

February 3, 1997

The following is my assessment of the effect on the availability for public water supply of the groundwater resource near the Sparton Technology, Inc. (Sparton) Coors Road facility in Albuquerque caused by the presence of a plume of trichloroethene (TCE) in the shallow groundwater beneath the facility.

My comments are based on experience as a professional hydrogeologist and as President of Balleau Groundwater, Inc. where my work involves providing advisory services on the management of water-supply and water-quality issues. Attached is a copy of my CV. I draw in part on my work in Albuquerque for the past 20 years. A portion of my work is on sites regulated under Superfund, the Resource Conservation and Recovery Act and the New Mexico Water Quality Act authorities, including sites in the Rio Grande Valley in Albuquerque. I hold professional certification and registration as a hydrogeologist and geologist, and have testified as an expert witness on groundwater-development planning and corrective action in administrative hearings, and in Federal and State court.

I evaluated hydrogeologic conditions at the Sparton site, and have reviewed the reference material listed in Attachment 1. The information available is adequate to arrive at conclusions on questions involving:

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1. The volume of water and radial distance from Sparton that the resource is unavailable for public water supply as a result of site conditions at Sparton.

2. The prospect that the affected resource will be needed for public water supply in the foreseeable future.

The hydraulic situation of the plume at the Sparton site is outlined in Reference 4 using 1993 and 1994 data and Reference 6 for 1996 data. I interpret the data to imply a plume with the general character summarized below.

	Approximate Plume Dimensions	Approximate Annual Rate of Change
Length	2,500 - 3,300 feet	50 - 200 feet/year
Width	500 - 1,700 feet	tens of feet/year
Depth	60 - 125 feet	3 feet/year
Area	30 - 90 acres	3 to 9 acres/year
Volume (@15 percent specific yield)	300 - 800 acre feet	30 - 80 acre feet per year
TCE Concentration	Peak 10,000 microgram/liter onsite	Declining
	5 - 3,200 microgram/liter offsite	Declining

The plume movement is northwest and downward in accordance with the prevailing hydraulic gradient and anisotropic hydraulic conductivity. Horizontal hydraulic gradients are from the Rio Grande and the Corrales Main Canal toward the New Mexico Utility (NMU) wellfields about three miles northwest. Vertical downward gradients are prevalent in the deeper well nests at the Sparton site and near the river valley throughout the Albuquerque Basin as a result of large-capacity public-supply wells depressurizing the deeper aquifer in the zone 500 to 2,000 feet below the water table. The product of horizontal and vertical hydraulic gradients with horizontal and vertical hydraulic conductivity accounts for a 30:1 horizontal versus vertical rate of plume movement as observed.

To illustrate the layout of the aquifer cross section and a poor water-quality zone in the Rio Grande alluvium below the floodplain relative to the larger aquifer system, I have

attached Figure 1, modified from a published section in Hawley and Haase (Reference 14). The line of section passes east-west about one mile south of the Sparton site. The water-quality zones are my delineation. The Sparton Site is in the expected zone of poor water quality. The nearest public-supply well, NMU RG-4462-S, is indicated 2.5 miles distant. The abundant water resource is available in the regional good-quality aquifer zones in the Upper Santa Fe Group marked on the figure.

TCE concentrations are reported by Sparton to be declining, although the plume front is expanding. I interpret the reported concentration pattern to be largely the result of dilution as the TCE annually mixes with about a ten percent larger volume of aquifer at the periphery of the contaminated water body. Processes other than dilution also may be acting to reduce concentration. The plume growth currently affects approximately an additional 50 acre feet per year (AFY) of water (6 acres per year x 60 feet thickness x 0.15 specific yield = 54 AFY).

Questions 1 and 2 are affected by whether or not the impacted water body is contained by hydraulic capture in an active control system, or is uncontained and allowed to passively expand and dilute with background waters. I assume that the future condition of the site will include active control and containment.

Hydraulic control and containment can be maintained at the site with practical capture-well layout and pumping rates. Question 1 reduces to determining a three-dimensional buffer zone around the contained water body. My reasoning is that a buffer zone somewhat larger than the impacted water body would be prudent to provide a factor of safety for locating public water-supply wells. The relative impact of a new water-supply well is related to its distance from Sparton capture wells, depth and pumping rate. In my opinion, the contiguous area where wells reasonably should not be completed for public water-supply purposes need not be greater than the half-width of the plume area, i.e., approximately one quarter mile (125 acres) around the plume center. Such wells reasonably should not be constructed with the top of perforations shallower than 500 feet below the water table. At greater distance and depth, large-capacity wells for any purpose would not be expected to cause the Sparton containment system to fail.

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The standard of evaluation for the New Mexico State Engineer Office (SEO) permitting of any new well is that the new well not impair existing wells or be contrary to conservation of water or detrimental to public welfare. A new well application that caused failure of a TCE recovery and containment system might not be approved administratively because of effects on impairment, conservation and public welfare.

An adjustment in terms of Sparton capture-well placement and pumping rate might be required to prevent excursions of TCE induced by other wells at the one-quarter mile distance, but the Sparton system could be managed to securely maintain capture. For example, it can be shown that for any pumping rate introduced outside a capture zone, the groundwater divide enclosing the capture zone can be maintained by an adjustment in the capture wellfield pumping. Superposition of ambient gradients and drawdowns for the capture zone well and outside well give the relationship

$$Q_c = 2\pi\ TJd + Q_w\left(\frac{d}{D-d}\right)$$

where the capture well pumping rate (Q_c) can be determined from the transmissivity (T), ambient gradient (J), distance from capture well to capture zone divide (d), external well-pumping rate of (Q_w), and distance to the outside well from the capture zone well (D) for wells in the same depth interval.

The hydrologic principle is that the disturbance from any introduced pumping at any distance greater than the capture zone can be offset by adjusting the capture zone well-pumping rate to maintain the capture zone groundwater divide. The adjustment is smaller if new wells are placed at greater distance.

Wells screened in the deeper aquifer layers below 500 feet are protected by the resistance to vertical flow created by anisotropy in the aquifer. Particle tracking models show that vertical transport to the Albuquerque (the City) wellfields typically is less than 300 feet in 40 years.

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Therefore, a reasonable public supply buffer zone around the impacted water body at Sparton is about 125 acres in area and 500 feet thick below the water table. Only a fraction of the water in the buffer zone, about 300 to 800 AFY, would be impacted by TCE. The majority of the water in the buffer zone would be of background water quality.

There would be some practical management risk of inducing an excursion of TCE out of the containment area if a large-capacity production well were placed in the unimpacted buffer zone. If containment were lost in such a case, the water produced by a well in the buffer zone would be of lower concentration in TCE than the concentration in the water induced to move from the containment zone. Water produced by a well in the buffer zone would be diluted by a ratio of fresh water depending on the specific geometry of the well screen in the buffer zone. The result may or may not be above Safe Drinking Water Act (SWDA) secondary Maximum Contaminant Levels (MCLs). Production wells outside the buffer zone would not be expected to induce any excursion of TCE, because hydraulic containment could be maintained.

The background water quality of the buffer zone water body is derived from the irrigated alluvial floodplain of the Rio Grande which is commonly high in total dissolved solids, hardness, iron, manganese and sulfides. SWDA secondary MCLs recommend such constituents be avoided where alternatives are available in public water supplies. Monitoring-well data at the Sparton site indicate that specific conductance values reach 1,100 micromhos per centimeter, and nitrite-nitrate nitrogen reaches 9.6 milligrams per liter (mg/l). Manganese reaches values up to 0.41 mg/l at background Well MW-51, which is above the SDWA secondary MCL of 0.05 mg/l. Monitoring-well data for October 1996 show that 21 wells tested for hardness exhibited values ranging from 180 to 285 mg/l as $CaCO^3$. The value of hardness in background Well MW-51 was 180 mg/l as $CaCO^3$. Water with hardness values above 180 mg/l as $CaCO^3$ is considered very hard (Hem, 1992) and is undesirable where alternatives are available. Hardness and manganese in background water and possible other constituents make the buffer zone water body described above not a desirable source for public water supply with or without TCE impacts.

009250

Regarding the second question on the need for the affected resource to be available for public supply purposes in the foreseeable future, I have reviewed the resource base, history and planning for use of the groundwater in Albuquerque. My 1994 New Mexico Water Conference paper (Reference 3) on the subject is quoted below for perspective on the volume of the resource.

> *"I calculate the volume of stored groundwater to a depth of 600 feet below the water table in 2,100 square miles of the middle basin, using an assumed specific yield of 10 percent, to be 80 million a-f. That is equivalent to a 600-year supply at current pumping rates. Hawley and Haase (1992) identified the most productive part of the aquifer as the Upper Santa Fe unit of the Santa Fe Group. They mapped a 4 mile x 10 mile area near the City having a saturated thickness of 600 feet as the most productive aquifer zone. At an assumed 20 percent specific yield, the water volume in this most productive part of the aquifer is 3 million a-f. The City has produced an equivalent volume from the aquifer: 2.7 million a-f 1960-1992 (Thorn et al., 1993), or 3.14 million a-f since 1993 (City of Albuquerque, written communication, June 6, 1994). By contouring the cone of depression created by withdrawing 2.7 million a-f in 32 years, Thorn and others (1993) estimated that 0.99 million a-f (37 percent of withdrawals) to 0.50 million a-f (18 percent of withdrawals) had been derived from aquifer storage. Thus, most of the City's historic production (82 to 63 percent) has been derived from the surface-water sources."*

In my opinion, the stored groundwater remaining in the City wellfield totals about three million acre feet (AF) of high-quality resource. About one million AF has been depleted from that source in the past 40 years.

The 1982 City Wellfield Plan (Reference 13) called for 239 additional wells. In fact, the number of City wells (92) in operation in 1996 was fewer than in 1982 (96). The 1982 City Wellfield Plan is not an appropriate basis for projecting developments. A 1995-2004 Albuquerque City Council Decade Plan for Capital Improvements (Reference 1) includes funding in the decade for five new wells plus equal funding for replacement wells. The City-planned wells are four miles or more from Sparton's site and could not be affected by Sparton-site TCE impacts.

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The Sparton site is near a proposed critical management area (CMA) where the SEO is considering a moratorium on new well permits (Reference 20). A map of proposed CMAs in the Albuquerque area with the Sparton site delineated is provided as Figure 2. There are administrative barriers that may make it difficult to permit new wells in or near CMAs in the future.

The City strategy for future development is to hold steady or reduce the groundwater withdrawals and to provide for growth of demand from renewable surface-water sources (References 7 and 9). Holding steady at the recent groundwater-depletion rate of 70,000 AFY means there is a 40-year supply from the local, high-quality City wellfield resource base. The NMU and the Rio Rancho Utilities rely on groundwater outside the City wellfield area where an equal or larger volume of stored groundwater is available. The entire 2,100 square mile Albuquerque Basin is estimated to have about 80 million AF of potable water. I consider that neither the impacted plume volume nor the buffer-zone clean water will be needed by the major public water supplies until after the site is remediated.

CONCLUSIONS

In my opinion, the following conclusions are warranted:

1. Up to 800 AF of the groundwater resource in 30 to 90 acres of surface area in the Albuquerque Basin is unsuitable for public water supply due to TCE impacts at the Sparton site. That volume of water is planned to be contained from further migration.

2. Due to practical uncertainties in controlling induced excursions of impacted water, public-supply wells reasonably should not be placed within a buffer zone of one quarter mile radius of the impacted water body and should not be constructed with a screened interval shallower than 500 feet below the plume.

3. The background water quality in the shallow buffer zone is undesirable for public water supply with or without the TCE contamination.

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4. The future amount and cost of water produced from the groundwater resource for public water supply for the foreseeable future in the Albuquerque Basin will be the same with or without the TCE plume at the Sparton site.

I state under penalty of perjury that the foregoing is true and correct.

Executed on February 3, 1997.

BALLEAU GROUNDWATER, INC.

W. Peter Balleau, CPG, P.H.
President

AMERICAN INSTITUTE OF HYDROLOGY
Certificate Number 238
W. PETER BALLEAU
Professional Hydrogeologist

Attachments: Reference List
Balleau Resume
2 Figures

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ATTACHMENT 1

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10. City of Albuquerque, 1996, "Water Resources Planning Citizens Briefing."

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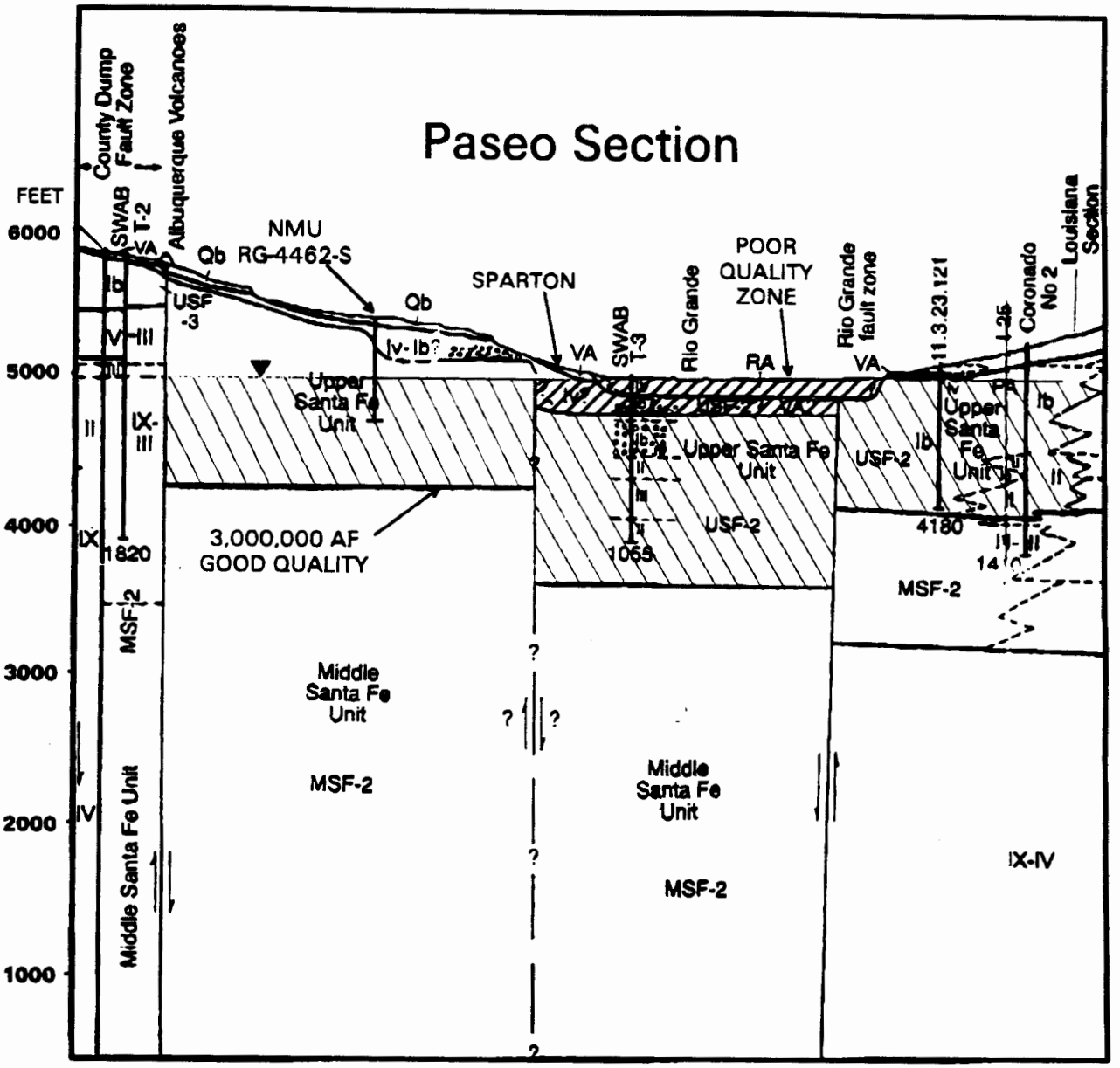


10x vertical exaggeration

Paseo del Norte Hydrogeologic Section

MODIFIED FROM HAWLEY AND HAASE, 1992

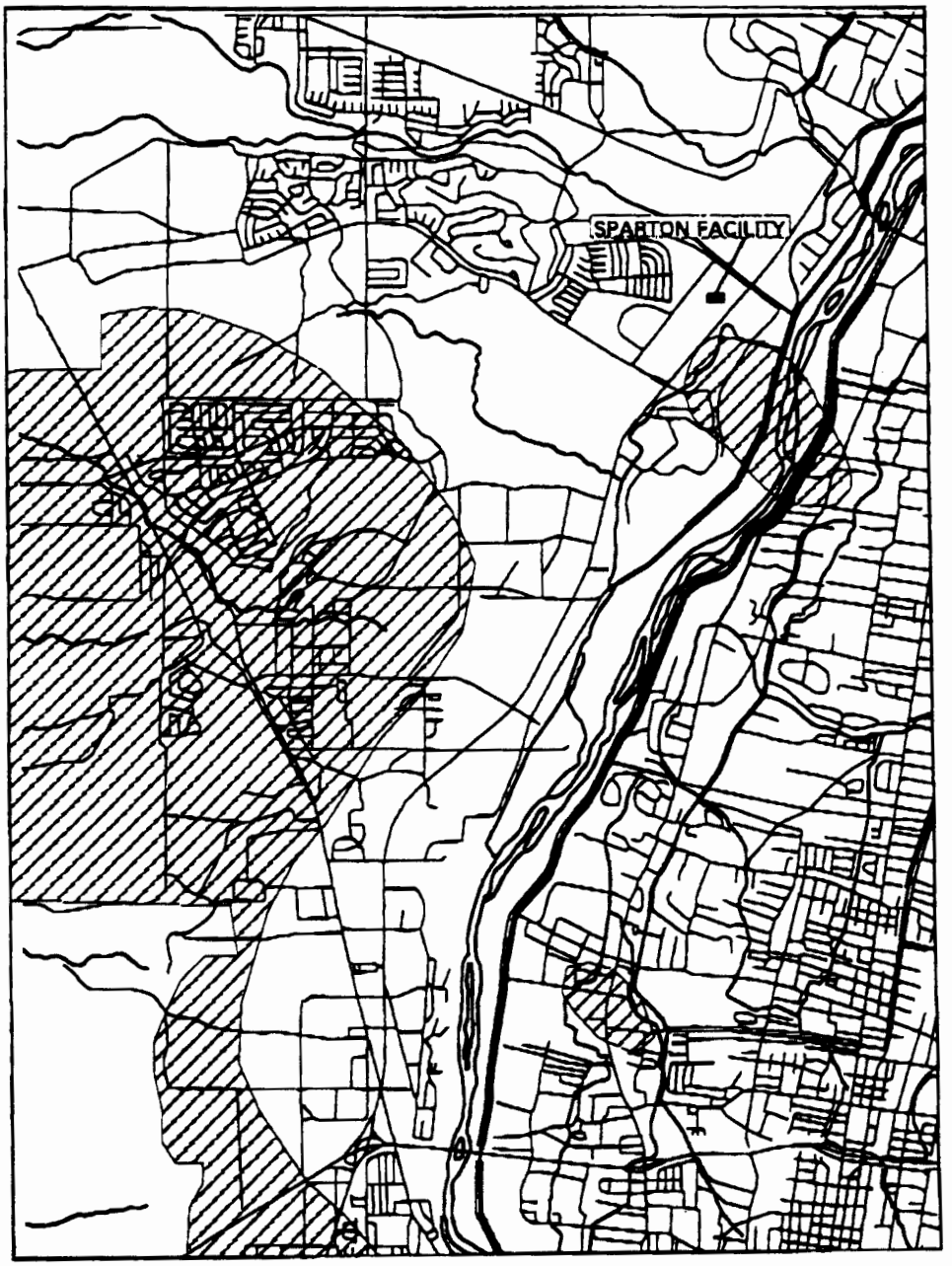
009256

SHEEHAN, SHEEHAN & STELZNER, P.A. / SPARTON

SPARTON REGIONAL GEOLOGIC UNITS AND WATER QUALITY ZONES

Date 2/1/97	**FIGURE 1**
Drawn By SKS	
File Name PASEO1.DWG	

BALLEAU GROUNDWATER, INC.



APPROXIMATE LOCATION OF CRITICAL MANAGEMENT AREAS

N
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S

1 0 1 2 Miles

SHEEHAN, SHEEHAN & STELZNER, P.A./SPARTON

SEO PROPOSED CRITICAL MANAGEMENT AREAS NEAR SPARTON SITE

FIGURE 2

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BALLEAU GROUNDWATER, INC.

901 RIO GRANDE BLVD. NW, SUITE F-242
ALBUQUERQUE, NEW MEXICO 87104

W. PETER BALLEAU, CPG, P. Hg.
Hydrogeologist

EDUCATION: Bachelor of Arts in Geology, 1968, University of New Mexico

REGISTRATION: Certified Professional Geologist (#2716) by the American Institute of Professional Geologists (1975)
Registered Geologist (#18432) in the State of Arizona (1985)
Certified Professional Hydrogeologist (#238) by the American Institute of Hydrology (1984)

PROFESSIONAL SOCIETIES:
American Association for the Advancement of Science
American Geophysical Union
American Institute of Hydrology
American Institute of Physics
American Institute of Professional Geologists
American Water Resources Association
Association of Ground-Water Scientists and Engineers (National Ground Water Association)
Geological Society of America
Geological Society of Australia
New Mexico Geological Society
Albuquerque Geological Society

CAREER EXPERIENCE:

1992 to date:	President and Hydrogeologist, Balleau Groundwater, Inc.
1991 to 1992:	Vice-President and Director of Leggette, Brashears & Graham, Inc.
1985 to 1991:	Associate and Senior Associate with Leggette, Brashears & Graham, Inc. and Manager of Albuquerque Regional Office
1977 to 1985:	Supervisory Hydrologist, Bureau of Indian Affairs, Albuquerque, New Mexico
1975 to 1977:	Senior Hydrogeologist with Leggette, Brashears & Graham, Inc.
1973 to 1975:	Hydrogeologist with the firm of Leggette, Brashears & Graham, Inc.
1971 to 1973:	Groundwater Geologist with the Geological Survey of Western Australia
1968 to 1970:	Geologist with Water Development Division, Government of Kenya

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SUMMARY OF PROFESSIONAL EXPERIENCE:

Career experience in major aspects of hydrogeology, with particular emphasis on arid-zone hydrology, mine dewatering, water-rights litigation support, and computer modeling of regional aquifer systems. Water-supply planning and wellfield layout for municipal, industrial and governmental projects also have been major activities. Contamination and water-quality projects include assessment of NPDES effects and groundwater discharge effects on surface-water standards, landfill leachate ion-balance work, evaluation of groundwater discharge permits, UIC and UST projects, geothermal project effects, salt-water intrusion, and detailed characterization and three-dimensional aquifer modeling of uranium mine and Superfund sites.

Government employment in East Africa, Western Australia and in New Mexico included water-supply development in remote areas, regional aquifer studies, management of water-resources programs, and acquisition and protection of groundwater rights. Consulting experience is in the northeast and western United States, the Gulf Coast, and in northern Alberta, the Yemen Arab Republic, Ireland, Peru, Chile, Mexico and Honduras. Major consulting projects have included wellfield development for the World Bank and USAID in the middle east; litigation support for the United States in several basin-wide adjudications; dewatering design and environmental assessment for major mines in Nevada, Alberta and Ireland; dam and reservoir seepage modeling studies on the Rio Grande; regional water planning in seven New Mexico counties and for the State of Mississippi; and permitting for municipal and agricultural water in southwest Florida.

Formal testimony has been presented as an expert witness in hydrology and hydrogeology in Federal and State Courts, and in administrative hearings on more than 25 cases.

PUBLICATIONS:

"Surface Water and Groundwater for Growth in the Albuquerque Basin," in The Water Future of Albuquerque and Middle Rio Grande Basin, Proceedings of the 39th Annual New Mexico Water Conference, 1994.

"Demonstrating Impairment of a Water Right," New Mexico Natural Resources Law Reporter, 1993.

"The Use of Consultants in Water Rights Matters," Cambridge Institute Seminar Proceedings, Understanding and Protecting Your Water Rights in New Mexico, 1992.

"The Transition from Ground-Water Mining to Induced Recharge in Generalized Hydrogeologic Systems," Proceedings Focus Conference on Southwestern Ground Water Issues, 1988 (with A.B. Mayer).

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"Flow-through of Water and Chloride Ion in a Water Table Aquifer of the Bassendean Sands, Perth Basin," Institution of Engineers, Australia, Hydrology Symposium, 1973.

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"Outline of Ground Water at the Fortescue River Basin," Western Australia Geological Survey Record, 1973.

"North Gnangara Sand Beds Aquifer - Tentative Water Balance and Yield Analysis," Western Australia Geological Survey Record, 1972/14.

"Saturated Sands at Yenart Soak," Western Australia Geological Survey Annual Report, 1971.

"Summary of Aquifer and Bore Characteristics of North Gnangara Borefield," Western Australia Geological Survey Annual Report, 1971.

PROJECT EXPERIENCE IN WATER MANAGEMENT:

- Carlin, Nevada: Assessment of dewatering requirement and layout of structures for water control in slope of mine highwall. Interpretation of aquifer tests.

- Sandia Mountains, New Mexico: Hydrologic evaluation of subdivision development effects on San Pedro and La Madera Creeks.

- Chihuahua, Mexico: Field investigations and evaluation of effects of Etapa II wellfield expansion on El Sauz agricultural developments.

- Sangre de Cristo Mountains, Santa Fe County, New Mexico: Evaluate hydrologic effect and water supply availability for subdivision development.

- Las Vegas Valley, Nevada: Hydrologic representation for negotiation of water rights between Nevada, U.S. agencies and Tribe. Apply models of basin to appraise hydrologic impacts of new water right at levels of 7,500 to 15,000 AFY including drawdown, basin water balance, water quality and subsidence effects.

- Tesuque Creek, New Mexico: Hydrologic evaluation of groundwater effects of hotel development and return flow quantities for lease of water.

- Bosque del Apache, New Mexico: Documentation of water-right administrative history and quantification of consumptive use on 6,000-acre wildlife refuge.

- Rio Elqui, Chile: Inspection and interpretation of underground mine water situation with projection of dewatering performance and flow in mine workings at elevation 3800 meters in Andes.

- Tonque Arroyo, New Mexico: Hydrologic opinion on administrative record of water rights for use in development of destination resort on Indian Pueblo lands.

- Rio Chama and Rio Santa Cruz, New Mexico: Hydrologic support for Indian Pueblo water claims based on availability of surface water and groundwater, historic uses and future demands.

- Pojoaque River Basin, New Mexico: Hydrological support for negotiation of groundwater and surface-water rights among Federal, State and private water claims.

- Jemez River Basin, New Mexico: Water resource and hydrologic support. Water claim in negotiation. Preparation of hydrologic factbook and advisory services and representation.

- Rio San Jose, New Mexico: Comprehensive basin assessment of historic natural water supply, water uses, future demands and groundwater sources.

- Carlin, Nevada: Plan for injection of mine dewatering water in foothills of Tuscarora Mountains as hydrologic barrier controlling influence of mine activities.

- Harris Creek, Catron County, New Mexico: Evaluation of sources and yield of streams and springs and develop settlement of water-right claims.

- Boulder Basin, Nevada: Hydrologic support for litigation of mine-water disposal effects.

- San Juan River, New Mexico: Evaluation of effects of generating station water use on Navajo Reservoir contract water demands and on prior rights and shortages.

- City of Santa Fe, New Mexico: Subdivision lot-size assessment based on availability of water.

- San Miguel County, New Mexico: Inventory of wells, water use, future sources of groundwater, aquifer tests to quantify yields, and evaluation of hydrologic effects of commingling wells on extensive ranch lands.

- Middle Rio Grande, New Mexico: Evaluate effects of Albuquerque municipal wellfield expansion on irrigation canal and diversion supplies based on application of Albuquerque Basin hydrogeologic model.

- Northern Sangre de Cristo Mountains, New Mexico: Evaluation of water resource and administrative status of water rights on extensive ranch lands.

- Doña Ana County, New Mexico: Specification and hydrologic supervision of drilling 1,000-gpm capacity public supply well for regional water system. Hydrologic support for water-rights transfer to wells.

- Animas River, New Mexico: Hydrologic evidence on effects of an application to appropriate 30,000 AFY of surface water for municipal use.

- Farmington, New Mexico: Aerial photographic interpretation and quantification of historical use of water for irrigation on County fairgrounds properties. Presentation of testimony.

- Rio Rancho, New Mexico: Hydrologic effects on surface water and groundwater of microchip manufacturing plant wellfield in Rio Grande basin-fill aquifer. Presentation of testimony.

- Santa Fe County, New Mexico: Ranch well and water-right review of resource and administrative status of lands west of City of Santa Fe.

- Seboyeta, New Mexico: Inspection and plan for watershed management in extensive ranch lands in Rio Puerco basin for control of erosion and restoration of perennial baseflow.

- Las Cruces, New Mexico: Numerical model calculation of University wellfield capacity for 40 and 100-year term, and identification of sources of water, capture zone delineation, and water-quality projections.

- Manzano Mountains, New Mexico: Subdivision water availability and effect on prior water wells.

- Tularosa Basin, New Mexico: Ranch water inventory with geologic, well history, aerial photograph interpretation, irrigated acreage delineation, and conclusions on administrative standing of water rights.

- Gila River Basin, Arizona: Hydrologic evaluation of Federal Court findings on interrelationship of groundwater and surface water under Arizona and Federal law.

- Changkeng, China: Hydrologic assessment of a planned open-pit gold mine in karst geology on tributary of river Xi. Analyze available data on groundwater and surface water resources, including borehole, pump test, spring flow, precipitation and gaging data. Assess feasibility of dewatering operations and prepared preliminary cost estimates.

- Cañada Ancha, Santa Fe County, New Mexico: Field testing and model evaluation of the hydraulic connection between the Rio Grande and a shallow alluvial aquifer.

- Santa Fe, New Mexico: Development of a water-supply plan for western Santa Fe County for use in County-wide development.

- Galisteo Creek, New Mexico: Evaluation of water availability and hydrologic effects of a proposed residential subdivision. Ensure regulatory compliance with County land development code regarding development water supplies.

- Carlin Trend, Nevada: Development of a numerical model (MODFLOW) for evaluation of an open-pit mine dewatering project. Analysis of extensive pump test, monitoring well and streamflow data for hydrogeologic site characterization and model calibration.

- Albuquerque, New Mexico: Investigation and declaration with the State Engineer Office of the historic water rights associated with a 45-acre school parcel in urban area.

- Albuquerque, New Mexico: Hydrologic investigation and characterization of the origin and extent of saturated soils at a residential subdivision.

- Lake DeSmet, Wyoming: Advisory services in preparation for litigation on the hydrologic effect of a change in reservoir stage on coal reserves, the efficacy of a slurry trench for protection of coal reserves, the delineation of wetlands, and the water quality of a reclaimed coal mine site.

- Crownpoint, New Mexico: Analysis of hydrologic and water-quality effects of a proposed in-situ uranium solution mining project in response to a Draft Environmental Impact Statement. Evaluate restorability of aquifer, excursion control, exemption from Underground Injection Control standards and brine disposal alternatives.

- Morenci, Arizona: Yield analysis for wellfield in tributary of Gila basin for use in mine and mill water supply.

- Cajamarca, Peru: Mine hydrology study for feasibility reports involving dewatering, water supply and hydrologic effects.

- Kelley Creek Basin, Nevada: Review and commentary on three-dimensional groundwater flow model focusing on water-balance for the pre-mining basin for water-rights purposes.

- Battle Mountain, Nevada: Assessment of hydrologic effects of mine development in the Shoshone Range, including geothermal response at Beowawe area.

- Albuquerque, New Mexico: Field tests and water-balance study to determine the source of water in soils in a residential subdivision involving an inverted water table.

- Maggie Creek Basin, Nevada: Evaluate hydrologic effects of mine dewatering on fisheries resources of Tuscarora Mountains.

- Kilkenny, Ireland: Evaluate dewatering requirements and hydrologic effects, including those on fisheries, of dewatering an underground mine.

- Albuquerque, New Mexico, South Valley: Hydrology effect of 100,000 acre-foot superfund remediation system. Assess depletion of Rio Grande and conservation of stored aquifer resource.

- Animas River, New Mexico and Colorado: Yield analysis of surface-water system and downstream-depletion impacts on existing water users due to operation of Animas-La Plata Project.

- State of Mississippi: Water-planning advisor to State legislative task force on groundwater plan for Mississippi.

- Taos Plateau, New Mexico: Preparation of basin-wide groundwater development plan and three-dimensional groundwater flow model of regional aquifer system.

- Colfax County, New Mexico: Regional water plan, groundwater inventory and impacts of 40-year demands.

- Baton Rouge, Louisiana: Yield analysis and wellfield design for aquifers at industrial site requiring 40 million gallons per day.

- Boulder Valley, Nevada: Reservoir seepage investigation for 500-acre surface storage reservoir.

- Grant, Luna, Hidalgo and Catron Counties, New Mexico: Regional water plan for four counties in southwestern New Mexico.

- Carlin Trend, Nevada: EIS hydrology report for mine-dewatering impacts at Carlin.

- Sarasota, Florida: Simulation of agricultural wellfield effect on municipal wells with salt-water transport impacts.

- Cochiti Dam, New Mexico: Development of dewatering plan and three-dimensional surface- and groundwater flow model to correct waterlogged lands below Cochiti Dam.

- Elko, Carlin Trend, Nevada: Preparation of mine-dewatering model for use in mine planning in north-central Nevada.

- Jemez River, New Mexico: Preparation of a three-dimensional model to display the effects of development of wellfields in the Jemez River alluvium in terms of aquifer drawdown and surface-water depletion.

- Santa Fe, New Mexico: Simulation of effects of new withdrawals of groundwater in Santa Fe Group aquifers at the municipal wells.

- Grants, New Mexico: Aquifer and stream simulation three-dimensional model of the Rio San Jose, New Mexico.

- Jemez Mountains, Baca Location, New Mexico: Study of geothermal hydrology, ion-balance and potential flow depletion at the Jemez Mountains, New Mexico.

- Grants, New Mexico: Quantitative studies of hydrological impacts of development of the Rio San Jose, New Mexico.

- Roswell Basin, Otero County, New Mexico: Preparation of three-dimensional digital model of flow systems in Permian rocks of the Pecos River Basin.

- Santa Fe County, New Mexico: Review and parameter specification for U.S. Geological Survey three-dimensional model of groundwater flow in Rio Pojoaque Basin, a tributary of the Rio Grande.

- Sanaa and Taiz, Yemen Arab Republic: Field review of Sanaa, Yemen wellfield for World Bank. Site selection and feasibility tests for aquifers for municipal supply near Taiz, Yemen for U.S. Agency for International Development.

- Ft. McMurray, Alberta, Canada: Design and supervision of depressurization for Athabaska tar sand open-pit mine. Parameter estimation and geotechnical review of three-dimensional digital model of gas-driven aquifer.

- Perth, Western Australia: Quantitative flow system studies of coastal aquifers of the Perth Basin, including feasibility studies for a 20-MGD (91,000 meters^3/day) municipal wellfield.

- Pilbara District, Western Australia: A regional inventory of groundwater in the West Australian Hammersley-Pilbara Iron Ore Province.

- Northeastern Province, Republic of Kenya: Resource surveys for the Water Development Division of the Government of Kenya.

PROJECT EXPERIENCE IN WATER QUALITY:

- Santa Fe County, New Mexico: Hydrologic evaluation of an application for landfill permit.

- Choloma, Honduras: Assessment of hydrologic and water-quality impact of regional wellfield water-supply development.

- Seboyeta, New Mexico: Uranium mine tailings hydrologic characterization and management plan. Field work, data interpretation, and modeling of groundwater conditions and migration.

- Santa Fe County, New Mexico: Subdivision report on projected 100-year effects of septic tank effluent on groundwater and wells.

- Rio Grande, Rio Arriba County, New Mexico: Development and hydrologic support for water-quality standards on water of Indian Tribe treated as a State under Clean Water Act.

- Las Cruces, New Mexico: Numerical model calculation of University wellfield yield-capacity for 40 to 100-year term, and identification of sources of water, capture zone delineation, and water-quality projections.

- Albuquerque Airport: Assessment of sources of volatile organic contamination of commercial property west of airport.

- Albuquerque South Valley: Field sampling for toxic soils at site of demolition of chemical storage facilities.

- Seboyeta, New Mexico: Review of dewatering and water quality control studies of a closed uranium mill tailings pile. Assess tailings hydraulics and water balance and drainage and pumping systems. Evaluated groundwater quality to determine impact from tailings water. Review interpretation of data from field testing characterization program (test borings, laboratory analysis, pump testing, and cone penetrometer testing). Examine alternatives to enhance drainage. Assist with regulatory representation with the New Mexico Environment Department, the New Mexico State Engineer Office and the U.S. Nuclear Regulatory Agency.

- Crownpoint, New Mexico: Analysis of potential hydrologic and water-quality effects of a proposed in-situ uranium solution mining project for use in response to a Draft Environmental Impact Statement. Evaluate restorability of aquifer, excursion control, exemption from Underground Injection Control standards and brine disposal alternatives.

- Albuquerque, New Mexico: Investigate the groundwater hydrology of a light industrial site. Performed site inspection, review of historical references and analyzed historic gradients. Review State regulatory agency files to determine the potential for nearby contaminated groundwater to impact the subject site.

- Albuquerque, New Mexico: Site inspection and regulatory review of a site investigated by the New Mexico Environment Department for potential inclusion to the National Priorities List of Superfund.

- Albuquerque, New Mexico: Investigate the potential contamination impacts of a closed municipal solid waste landfill on a nearby planned water-supply well.

- Rio Grande, New Mexico: Develop water-quality standards for a reach of the Rio Grande and adjacent surface-water bodies in north-central New Mexico. Evaluate upstream water quality and hydraulic data and effects on Clean Water Act jurisdictional waters. Perform analyses of the scientific basis of specific criteria and resulting effects on upstream permitted discharges.

- Albuquerque South Valley, New Mexico: Identify flow-pattern in groundwater at industrial site to indicate offsite sources of potential contamination.

- Albuquerque South Valley, New Mexico: Compile historical land- and water-use information and evaluate use of environmental tracers for active Superfund site.

- Albuquerque Downtown site, New Mexico: Advise on Hazardous Ranking System status of site proposed for listing.

- Rio Grande, New Mexico: Assess impacts on water-quality standards from City of Albuquerque water treatment plant discharges including arsenic effects on fish consumption.

- Rio Grande Valley, New Mexico: Evaluate the timing and extent of contamination in soil and water from an underground storage tank site. Testimony presented in U.S. District Court.

- Rio Grande, New Mexico: Development of Water Quality Standards for reaches of the Rio Grande on three Pueblos treated as States under the Clean Water Act.

- State of Mississippi: Water-planning advisor to State legislative task force on groundwater plan for Mississippi.

- Colfax County, New Mexico: Regional water plan, groundwater inventory and impacts of 40-year demands.

- Grant, Luna, Hidalgo and Catron Counties, New Mexico: Regional water plan for four counties in southwestern New Mexico.

- Carlin Trend, Nevada: EIS hydrology report for mine-dewatering impacts at Carlin.

- Sarasota, Florida: Simulation of agricultural wellfield effect on municipal wells with salt-water transport impacts.

- Jemez Mountains, Baca Location, New Mexico: Study of geothermal hydrology, ion-balance and potential flow depletion at the Jemez Mountains, New Mexico.

- El Paso, Texas: Hydrologic assessment of soil and groundwater contamination conditions at a casting-foundry site in the Rio Grande Valley.

- Albuquerque, New Mexico: Hydrologic investigation and remediation design and operation for UST site.

- Corrales, New Mexico: Hydrologic investigation and remediation design and operation for UST site.

- Tatum, New Mexico: Hydrologic investigation and UST site characterization on behalf of the State of New Mexico.

- Barelas, New Mexico: Hydrologic investigation and UST site characterization on behalf of the State of New Mexico.

- Albuquerque, New Mexico: Investigation of 1,500-gallon tanker spill on I-25 and associated contamination.

- Taos, New Mexico: Nitrate contamination source and mitigation study for municipal effluent and sludge in the Rio Pueblo de Taos, a tributary of the Rio Grande.

- Acoma, New Mexico: Water-quality impacts of municipal sewage effluent transported via groundwater to springs in Rio San Jose, New Mexico.

- Laguna, New Mexico: Environmental assessment of groundwater levels and water quality associated with reclamation of the Jackpile open-pit uranium mine.

- Woodbridge, Connecticut: Landfill leachate ion-balance studies for Connecticut Department of Environmental Protection.

EXPERT TESTIMONY:

NM State Engineer Office (August 4, 1995) - on the aerial photograph interpretation of historical use of water on San Juan County Fairgrounds property.

NM State Engineer Office (April, 19, 1994) - on the hydrologic effects of an application to appropriate groundwater for Intel microchip manufacturing at Rio Rancho, New Mexico.

U.S. District Court for New Mexico (February 16, 1993) - on the hydrologic characteristics of the Tesuque Formation, basin yield, water balance, and water quality (NM v. Aamodt).

U.S. District Court for New Mexico (June 1-4, 1992) - on the timing and characteristics of a gasoline release at a site in the middle Rio Grande valley (Ever Ready v. Ranger, et al.).

NM State Engineer Office (December 13, 1991) - on an application to transfer water rights to Mountain Ranch Subdivision in the Sandia Underground Water Basin.

NM District Court for Taos County (February 6, 1990) - on the water-quality impacts of municipal sewage effluent and sludge disposal in a case for condemnation of property.

FL Division of Administrative Hearings (August 25, 1989) - on an application to the Southwest Florida Water Management District for an agricultural consumptive use permit and the effects on a City of Sarasota wellfield.

NM State Engineer Office (August 4, 1987) - on an application to change points of diversion and to enlarge the place of use of water from wells at La Madera, New Mexico.

NM State Engineer Office (June 23-24, 1987) - on an application to combine and commingle wells in Bluewater Basin.

NM State Engineer Office (April 14, 1987) - on an application to appropriate groundwater for public supply in Magic Valley, Bernalillo County, New Mexico.

NM State Engineer Office (December 10, 1986) - on an application to commingle and combine wells in Bluewater Basin.

NM State Engineer Office (August 20, 1986) - on an application for transfer of water rights to wells in Canon Alegré, Sandoval County, New Mexico.

NM State Engineer Office (June 18, 1986) - on an application for enlarged place of use of wells under RG-26816 for La Madera Water Users Association.

NM District Court for Cibola County (January 13-14, 1986) - appeal of State Engineer decisions, presented assessment of effects using applicant's three-dimensional computer model of Bluewater Basin.

NM Environmental Improvement Division (August 20, 1985) - on the effects of City of Grants sewage sludge Discharge Plan DP-60.

NM State Engineer Office (March 21, 1984; October 30, 1984; December 4, 1984; February 5, 1985; May 1, 1985; and November 21, 1985) - a series of hearings on permits to transfer groundwater to Plains Electric Escalanté Generating Station.

NM State Engineer Office (January 26, 1983) - on the permit and plan of replacement for Plains Electric Escalanté Generating Station.

U.S. District Court for New Mexico (January 28, 1981) - aquifer tests and hydrologic simulation of a groundwater development plan for four Pojoaque River Pueblos in NM v. Aamodt.

NM Public Service Commission (October 2, 1980) - hydrologic constraints on development and longevity of Public Service Company of New Mexico's Baca Unit 1 Geothermal project.

NM State Engineer Office (April 11, 1980) - on the groundwater permit for Union Geothermal Company's Baca Project.

NM Water Quality Control Commission (February 7, 1980 and December 3, 1981) - on the reclassification of designated uses and stream standards for the Rio San Jose.

NM Environmental Improvement Division (January 14-15, 1980) - regarding Bokum Marquez Mine Ground Water Discharge Application.

Fina Station Site

This site is located south of Rio Bravo and west of Isleta in Albuquerque. The groundwater at the site was contaminated with petroleum hydrocarbons. Several driven injection wells were installed at this site. In less than 6 months, it was necessary to pull the wells to remove mineral deposits from the well screens. The inside of the wells were also filled with mineral deposits having the consistency of corn meal.

In addition to the local problems that have been experienced with injection wells, many shortcomings and problems are reported in the literature.

Numerous technical papers identify problems associated with operation of injection wells. Injection wells are much more likely to fail than are typical water wells (Driscoll, 1986). According to Olsthoorn (1982), clogging of screens is the serious problem in injection well operation. Signor (1976) adds that recharge through injection wells usually requires stringent water quality considerations, and recharge operations are generally less successful than in spreading basins because suspended sediment in the recharge water clogs the formation near the well. Once the formation is clogged, it is difficult to remove enough sediment to completely rejuvenate the well.

The principal causes of clogging mentioned in reports concerning recharge through wells are:

1) Suspended particles in the recharge water.

   In an injection well, fine sediment contained in the injection water will continuously collect in the formation or filter pack outside the well screen. Over time the formation slowly becomes clogged, reducing the capacity of the aquifer to receive water (Driscoll, 1986). Smith (1980) indicates that sand, even in concentrations of one part per million, can be sufficient to clog injection wells in a relatively short time.

2) Bacterial contamination of the aquifer by the recharge water and subsequent clogging by bacterial growths.

   Bacterial growth can be promoted by the change in temperature caused by injection, especially when warmer water is added to a cool aquifer (Smith, 1980).

3) Chemical reactions between the groundwater and recharge water of different quality causing precipitation of insoluble products.

4) Mechanical jamming of the aquifer, caused by particle rearrangement when the direction of water movement through the aquifer is reversed.

5) Swelling of clay colloids in the aquifer.

IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-V1-001 (h)-96-H

REPORT OF GARY L. RICHARDSON, P.E.
ON THE USE OF INJECTION WELLS AT
GROUNDWATER REMEDIATION SITES

February 3, 1997

I am outlining the information which I have concerning the performance of injection wells at groundwater remediation sites in New Mexico. This information is based on the literature, my own experience, and on conversations I have had with employees of Rodgers & Co., Inc., a local drilling contractor which has had involvement in construction and maintenance at these sites. There are three sites in the Albuquerque, New Mexico area for which I have information.

General Electric Superfund Site

The G.E. Superfund site is located in Albuquerque's south valley near Rio Bravo and I-25. The groundwater at that site is contaminated with chlorinated solvents. There are 1 - 6" x 400'± and 9 - 8" x 400'± injection wells at the site.

The 6" well was first constructed to dispose of development and test water at the site. It is my understanding that it was necessary to redevelop the well after 2 - 3 million gallons of water was reinjected. It was determined that bacterial fowling was mostly responsible for the problems.

The additional 9 - 8" injection wells were constructed to dispose of treated groundwater from the remediation system. The total injection capacity of the ten wells is reported to be around 820 gpm. Since the wells were placed into operation in April 1996, reinjection has averaged about 560 gpm or about 2/3 of capacity. Even at this reduced capacity, one well is showing signs of plugging and is scheduled for redevelopment.

Chevron Site

The Chevron site is located adjacent to the G.E. site. The groundwater at that site is contaminated with petroleum hydrocarbons. There are 4 - 8" x 120'± injection wells at the site constructed to dispose of treated groundwater. The total injection capacity is about 160 gpm, which is about 84 million gallons per year. The injection wells have been completed for about one year. During that time only 5 million gallons of water have been injected. This represents about 6% of the annual capacity. No problems have been reported with the injection wells, however, they have received only very limited use. The wells have not been used enough to determine if problems will develop.

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6) Incrustation created by injection water which is high in mineral content.

7) Ion exchange reactions that could result in clay-particle dispersal.

8) Precipitation of iron in the recharge water as a result of aeration.

9) Injection tubing corrosion.

Owens (1975) reports that differential oxygen cell corrosion occurs in carbon steel injection tubing. For stainless steel, stress cracking is a problem. For fiberglass plastics, softening by sorption of fluids can occur.

10) Biochemical changes in the recharge water and groundwater involving iron reducing bacteria or sulfate-splitting organisms.

11) Gas binding or air entrainment in the aquifer.

Smith (1980) explains that when air is entrained with injection water, serious interference with permeability and transmissivity can be expected because air molecules can effectively block the passage of water by plugging pore space within the aquifer.

12) Change in viscosity of recovered groundwater due to temperature difference between recovered groundwater to be reinjected and receiving groundwater.

Based on the cited literature (see enclosed references) and the experiences in Albuquerque's south valley, we can expect to have to overcome all 12 problems listed above if we choose to use injection well(s) at Sparton's Coors Road Plant.

Assuming one 8" x 400' injection well with pretreatment including filtration, pH control, air removal and chlorination, could be used to reinject 200 gpm at the Sparton site, I believe that optimistically the anticipated capital cost would be $500,000 and the operation and maintenance cost would be $200,000 per year. These costs are high because the injected water chemistry must be controlled very carefully and the injection wells must be redeveloped and replaced periodically. If additional problems were encountered, the cost could be several times the anticipated costs.

Based on the potential for problems and anticipated high costs, I recommend that injection wells not be used at the Sparton site. Rather, I recommend that the water be discharged to the Calabacillas Arroyo via the storm sewer. The cost to discharge to storm sewer would be less than $10,000.

Based on an infiltration test conducted in the Calabacillas Arroyo by METRIC Corporation in November 1996, I estimate that 97% to 99% of the water discharged to the arroyo will infiltrate back into the normally dry arroyo bottom and ultimately back

into the aquifer. The remaining 1% to 3% will evaporate from the arroyo bottom.

I state under penalty of perjury that the foregoing is true and correct.

Executed on February 4, 1997.

METRIC Corporation

Gary L. Richardson, P.E.
Executive Vice President

GLR/rkh
Enclosure

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REFERENCES

Bouwer, Herman. 1995. Groundwater and Recharge Principles. Proceedings of American Society of Civil Engineers Continuing Education Seminar on Artificial Recharge of Groundwater, Tempe, Arizona, May 16, 1995.

Driscoll, Fletcher G. 1986. Groundwater and Wells. Second Edition. Johnson Division, St. Paul, Minnesota.

Olsthoorn, T.N. 1982. The Clogging of Recharge Wells. Netherlands Water Works Testing and Research Institute. Communications No. 72, Rijswijk, Netherlands, 131 p.

Owens, S.R. 1975. Corrosion in Disposal Wells. Water and Sewer Works, Ref. No. 10.

Pettyjohn, Wayne A. Introduction to Artificial Ground Water Recharge. USEPA, Robert S. Kerr Environmental Research Laboratory, Office of Research and Development, Ada, Oklahoma, EPA-600/2-81-236.

Signor, D.C. April 8-9, 1976. Recent Advances in Artificial Recharge. Proceedings of the Conference of the Great Plains Resources Council, Denver, Colorado, 17p.

Smith, A.J. October 1980. Design is the Key to a Good Recharge Well. Public Works, Volume III, No. 10, pp 66-67.

Sniegocki, R.T. 1963. Problems in Artificial Recharge Through Wells in the Grand Prairie Region, Arkansas. US Geological Survey Water Supply Paper 1615-F.

Warner, D.L. and Lehr, Jay H. December 1977. An Introduction to the Technology of Subsurface Wastewater Injection. EPA-600/2-77-240.

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QUALIFICATIONS OF GARY L. RICHARDSON, P.E.
CIVIL ENGINEER/HYDROLOGIST

New Mexico State University, M.S. in Civil Engineering, 1972

New Mexico State University, B.S. in Civil Engineering, 1970

New Mexico Registered Professional Engineer (cert. no. 6436)

Texas Registered Professional Engineer (cert. no. 73867)

Arizona Registered Professional Engineer (cert. no. 26091)

Sigma Tau Engineering Honorary Fraternity

Chi Epsilon Civil Engineering Honorary Fraternity

New Mexico Water Well Drillers License No. WD-1088

Texas Water Well Drillers License No. 2610W

Gary L. Richardson serves as Director, Executive Vice President, and Hydrologist/Civil Engineer for METRIC Corporation from 1980 to present. His technical responsibilities are in conducting ground and surface water hydrology studies, hydraulic design, erosion and sedimentation investigations, supervision, drilling, and installation of water wells, aquifer testing, and dewatering system design. Mr. Richardson serves as project manager for all hydrology projects. In particular, he provided well design, drilling and completion supervision, aquifer testing, and hydrologic analysis for production wells at Santa Ana and Zia Pueblos for the Bureau of Indian Affairs, Tijeras Land Estates, Tesuque Pueblo, Sandoval County Regional Soccer Park, Reeves Generating Station, and American RV Park. He has designed dewatering plans for ponds at San Juan Generating Station and Plains Escalante Generating Station. Mr. Richardson has conducted bedrock and water table delineation using borehole and well drilling techniques in the McDermott Arroyo vicinity at La Plata Mine, and along the Shumway Arroyo near San Juan Mine and San Juan Generating Station in San Juan County. He has prepared diversion, flood control, and haul road designs for industrial facilities, conducted proceedings for groundwater acquisition, prepared mine discharge plans and permit applications, and prepared air quality analyses for permit applications and for PSD exemption.

Mr. Richardson has provided expert witness testimony regarding ground and surface water analyses at mine permit hearings for the Lee Ranch Mine, La Ventana Mine, Black Diamond Mine, South Hospah Mine, Gateway Mine, Bisti Mine, De-Na-Zin Mine, and La Plata Mine. He was a primary witness for Sunbelt Mining Company at the unsuitability

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petition hearing for the Gateway Mine. Mr. Richardson also provided expert witness testimony for Arco Pipeline Company in U.S. District Court.

Mr. Richardson served as project engineer for Earth Environmental Consultants, Inc., Albuquerque, New Mexico, from 1978 to 1980, conducting investigations in groundwater hydrology, supervision of water well installation, aquifer testing, hydraulic design, surface water hydrology, discharge analyses, erosion control and sedimentation, and water resources management in New Mexico. In particular, he conducted ground and/or surface water analyses at the Lee Ranch Mine, Amcoal Mine, Mentmore Mine, San Juan Mine, La Ventana Mine, La Plata Mine, Black Lake Mine, Black Diamond Mine, Star Lake Mine, South Hospah Mine, Arroyo No. 1 Mine, Gateway Mine, De-Na-Zin Mine, in northwestern New Mexico. He installed wells, piezometers, stream gauges, and sediment samplers, and prepared water monitoring plans for a number of coal project areas.

From 1972 to 1978, Mr. Richardson served as hydrologic engineer with the Soil Conservation Service, Albuquerque, New Mexico. Among his project responsibilities, he was involved in locating water sources and securing water rights in Anthony, Espanola, and Santa Cruz areas for use in the construction of floodwater retarding dams. As an SCS engineer, Mr. Richardson also performed surface water hydrology and hydraulics for small watershed projects, river basin studies, and hydraulic designs, drawings, and specifications for irrigation structures, erosion and sediment control structures, floodwater retarding dams, and floodwater diversion structures.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 COORS ROAD NW	)	U.S. EPA DOCKET NO.
ALBUQUERQUE, NM 87114	)	RCRA-VI-001(h)-96-H
	)	
EPA I.D. NO. NMD083212332	)	
	)	
RESPONDENT	)	
	)	

INITIAL ADMINISTRATIVE

ORDER UNDER SECTION

3008(H) OF THE RESOURCE

CONSERVATION AND RECOVERY

ACT, AS AMENDED

42 U.S.C. § 6928(H)

I. JURISDICTION

1. This Initial Administrative Order (Order) is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency (EPA) by Section 3008(h) of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, (RCRA), and further amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. § 6928(h). The authority to issue this Order has been delegated to the Regional Administrator by EPA Delegation Nos. 8-31 and 8-32, dated April 16, 1985, and further delegated to the Director of the Compliance Assurance and Enforcement Division, Region 6 (Director).

2. This Order is issued to Sparton Technology, Inc. (Respondent), the owner and operator of the facility located at 9621 Coors Road NW, Albuquerque, New Mexico 87114 (Facility).

II. PARTIES BOUND

1. This Order is issued to Sparton Technology, Inc. (Respondent), the owner and operator of the Facility located at 9621 Coors Road NW, Albuquerque, New Mexico 87114.

2. No change in ownership, corporate, or partnership status relating to the Facility will in any way alter the status or responsibility of Respondent under this Order. Any conveyance of title, easement, or other interest in Respondent's Facility or a portion of Respondent's Facility shall not affect Respondent's obligation. under this Order. Respondent shall be responsible for and liable for any failure to carry out all activities required of Respondent by this Order, irrespective of its use of employees, agents, contractors, or consultants to perform any such tasks.

III. FINDINGS OF FACT

1. Sparton Technology, Inc. (Respondent), is a corporation incorporated under the laws of the State of New Mexico.

2. Respondent is the owner and operator of a hazardous waste management facility (Facility) located at 9621 Coors Road NW, Albuquerque, Bernalillo County, New Mexico 87114.

3. Respondent is a generator of hazardous waste, and engaged in the treatment, storage, or disposal of hazardous waste at the Facility subject to the interim status requirements of 40 C.F.R. Part 265, and New Mexico's authorized RCRA program.

4. Respondent owned and operated the Facility as a hazardous waste management facility on or after November 19, 1980, the applicable date which renders facilities subject to the interim status requirements, or the requirement to have a

permit, under Sections 3004 and 3005 of RCRA, 42 U.S.C. §§ 6924 and 6925.

5. Pursuant to Section 3010(a) of RCRA, 42 U.S.C. § 6930(a), Sparton Southwest, Inc. (the predecessor corporation to the Respondent) notified EPA of its hazardous waste activity. In its Notification dated August 12, 1980, Sparton Southwest, Inc. identified itself as a generator of hazardous waste, and a. an owner and operator of a hazardous waste treatment, storage, or disposal facility located at 9621 Coors Road NW, Albuquerque, New Mexico.

6. In its Notification, Sparton Southwest, Inc. notified EPA that it handled the following hazardous waste:

   a. Characteristic hazardous wastes identified at 40 C.F.R. Part 261, Subpart C: ignitable, corrosive, reactive, and toxic;

   b. Hazardous wastes from non-specific sources identified at 40 C.F.R. § 261.31: F001, F002, F003, F005, F006, F007, F008, and F009; and

   c. Commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products identified at 40 C.F.R. § 261.33(f): P030, P098, U002, U057, U108, U122, U134, U154, U159, U162, U220, U226, U228, U238, and U239.

7. Pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e), on or about November 17, 1980, Sparton Southwest, Inc. submitted its RCRA Part A permit application, and identified itself as a Facility generating and treating, storing, or disposing of the following hazardous wastes:

   a. Hazardous wastes from non-specific sources identified at 40 C.F.R. § 261.31: F001, F002, F003, F005, F006, F007, F008, and F009; and

   b. Commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products identified at 40 C.F.R. § 261.33(f): U002, U122, U134, U159, U226, and U228.

8. On or about June 30, 1987, the Facility's interim status was terminated by the New Mexico Health and Environment Department.

9. From 1983 - 1988, one or more of the following hazardous wastes and/or hazardous waste constituents were detected in ground water monitoring wells at the Facility: trichloroethylene, 1,1,1-trichloroethane, 1,1-dichloroethylene, methylene chloride, tetrachloroethylene, toluene, benzene, and chromium.

10. On October 1, 1988, EPA and Respondent entered into a corrective action Consent Order (RFI/CMS Order), U.S. EPA Docket No. VI-004 (h)-87-H, pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h). The RFI/CNS Order required Respondent to conduct interim measures, a RCRA Facility Investigation (RFI), and a Corrective Measures Study (CMS) for the Facility.

11. On or about May 21, 1992, Respondent submitted a Final RFI Report to EPA for approval. EPA approved the Final RFI Report on July 1, 1992.

12. On or about May 13, 1996, Respondent submitted a Final CMS Report to EPA for approval. EPA approved the Final CMS Report with concerns on June 24, 1996.

13. On June 24, 1996, EPA terminated the RFI/CMS Order.

IV. CONCLUSIONS OF LAW AND DETERMINATION

1. Respondent is a "person" as that term is defined at Section 1004(15) of RCRA, 42 U.S.C. § 6903(15), and 40 C.F.R. § 260.10.

2. Respondent is the owner and operator of an "existing hazardous waste management facility" as that term is defined at 40 C.F.R. § 260.10.

3. Respondent was authorized to operate under interim status pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e).

4. Certain wastes and constituents found at the Facility are "hazardous wastes" or "hazardous waste constituents" as those terms are defined or set forth by Section 1004(5) and 3001 of RCRA, 42 U.S.C. §§ 6903(5) and 6921, and 40 C.F.R. Part 261.

5. "Hazardous waste" or "hazardous waste constituents", as those terms are defined or set forth by Sections 1004(5) and 3001 of RCRA, 42 U.S.C. SS 6903(15) and 6921, and 40 C.F.R. Part 261, were released into the environment from the Facility.

6. Based on the foregoing, it is hereby ORDERED that Respondent perform the actions set forth in this Order in the manner and by the dates specified therein.

V. PROJECT MANAGER

1. Within ten (10) days of the effective date of this Order, EPA and Respondent shall each designate a Project Manager, and notify each other and the New Mexico Environment Department (NMED) in writing of the Project Manager it has selected. Each Project Manager shall be responsible for overseeing the implementation of this Order. The EPA Project

Manager will be EPA's designated representative for the Facility. Except as otherwise provided in this Order, all communications between Respondent and EPA, including all documents, reports, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the Project Managers, or counsel.

2. The Parties shall provide written notice within five (5) days after changing Project Managers.

3. The absence of the EPA Project Manager from the Facility shall not be cause for the stoppage or delay of work.

VI. WORK TO BE PERFORMED

Respondent shall undertake, continue to take, and complete each of the following actions in accordance with the terms of this order.

TASK I: SOIL VAPOR EXTRACTION SYSTEM

Within 150 days of the effective date of this order, Respondent shall submit a proposal for reducing the soil vapor concentration of chlorinated solvents below 10 ppmv for those areas at the Sparton facility impacted by releases of chlorinated solvents from the sump, west pond and east pond area.

Sparton shall implement the work set forth in the proposal as agreed to by Sparton and EPA.

TASK II: ON-SITE CONTAINMENT

Upon receipt of authorization from NMED and EPA for the discharge of recovered and treated groundwater to the Calabacillas Arroyo, Sparton shall within 90 days submit a plan for enhancing the on-site containment program so that it is recovering and treating 20 gallons per minute of water.

Sparton shall implement the work set forth in the proposal as agreed to by Sparton and EPA.

TASK III: OFF-SITE CONTAINMENT

After receipt of authorization from NMED and EPA for the discharge of recovered and treated groundwater to the Calabacillas Arroyo, Sparton shall submit within 180 days a proposal for the installation of a well or wells necessary to prevent the further migration of solvents above drinking water limits beyond the leading edge of the plume.

Sparton shall implement the work set forth in the proposal as agreed to by Sparton and EPA.

TASK IV. HEALTH AND SAFETY PLAN

Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Health and Safety Plan to EPA for all field activity associated with the Vadose Zone Investigation Workplan and the Ground Water Investigation Workplan. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence.

VII. SUBMISSIONS / AGENCY APPROVAL / ADDITIONAL WORK

1. Within thirty (30) days of receipt of approval or modification by EPA of any submissions, Respondent shall commence work and implement the tasks required by the submission, in accordance with the standards, specifications, and schedule stated in the submission, as approved by EPA.

2. Beginning with the month following the effective date of this Order, Respondent shall provide EPA with the progress reports every month, due on the tenth (10th) day of the following month.

3. EPA will review all reports, workplans, or other submittals required under this Order, and notify Respondent in writing of EPA's approval. Upon EPA approval, the submittal shall be deemed incorporated into and part of this Order.

   Notwithstanding the foregoing, EPA reserves the right to disapprove of, or provide comments on, any deliverable or any part thereof. Within thirty (30) days after receipt of EPA's disapproval or comments on any deliverable, Respondent shall address the deficiencies and submit a revised submittal. Upon EPA approval, the submittal shall be deemed incorporated into and part of this Order.

4. One copy of all deliverables shall be sent to the EPA Project Manager. An additional one (1) copy shall be sent to NMED, addressed to the following:

   Ed Kelly, Director
   Water and Waste Management Division
   New Mexico Environment Department
   P.O. Box 26110
   Santa Fe, New Mexico 87502-6110

   Unless otherwise specified in this Order, or otherwise notified in writing by EPA, all notifications to NMED shall be made to the aforementioned person.

VIII. ACCESS TO OFF-SITE PROPERTY

1. To the extent that work being performed pursuant to this Order must be done beyond the Facility property boundary, Respondent shall use its best efforts to obtain site access

agreements from the present owners to perform work pursuant to this Order no later than thirty (30) days from the date that the need for such access becomes known to Respondent. Access agreements shall provide access to Respondent, its contractor(s), the United States, EPA, the State of New Mexico, NMED, and their representatives, including contractors. Any such access agreements shall be submitted to the Project Manager and incorporated by reference into this Order. In the event that site access agreements are not obtained within thirty (30) days of approval of any workplan for which access is required, or of the date that the need for access became known to Respondent, Respondent shall notify EPA by telephone within twenty-four (24) hours after expiration of the above thirty (30) day period, and shall within seven (7) days of the oral notification, submit a complete report to EPA in writing regarding its efforts to obtain access agreements, including the names, dates, addresses, and phone numbers of the person(s) it contacted in order to obtain access. If EPA is able to obtain access, Respondent shall perform work described in this Order.

2. Nothing in this subsection is intended to limit, affect or otherwise constrain EPA's or NMED's right of access to property pursuant to applicable law.

IX. SAMPLING AND DATA/DOCUMENT AVAILABILITY

1. Respondent shall submit to EPA and NMED the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants which in any way relates to the Facility and/or off-site contamination, regardless of whether such sampling or testing is required by this Order. Data which has not yet undergone QA/QC, shall be submitted with the monthly progress reports stamped "Subject to Revision".

2. Respondent shall submit these results in monthly progress reports as described in Task VI of the CAP, and Section VIII.2 of this Order, or upon request of the Project Manager.

3. Respondent shall specify the name and address of the laboratory to be used for sample analysis. EPA reserves the right to conduct a performance and QA/QC audit of the above specified laboratory. If the audit reveals deficiencies in lab performance or QA/QC, resampling and analysis shall be required.

4. At the request of EPA, Respondent shall allow split or duplicate samples to be collected by EPA, and/or its authorized representatives, of any samples collected by Respondent. Respondent shall notify EPA not less than fourteen (14) days in advance of any field sampling or installation activity.

X. QUALITY ASSURANCE

Throughout all sample collections and analysis activities, Respondent shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures, which shall be part of proposed and approved plans. In addition, Respondent shall:

1. Follow all EPA guidance for sampling and analysis unless determined by EPA not to be applicable;

2. Ensure that EPA and NMED receive written notification not less than seven (7) days in advance of any field sampling or installation activity;

3. Ensure that EPA receives written notification not less than seven (7) days in advance which laboratories will be used by Respondent, and use its best efforts to ensure that EPA personnel and EPA authorized representatives have reasonable access to the laboratories and personnel used for analysis;

4. Ensure that laboratories used by Respondent for analyses perform such analyses according to EPA methods (SW-846, 3rd Edition or as superseded) or other methods deemed satisfactory to EPA. If methods other than EPA methods are to be used, Respondent shall submit all protocols to be used for analyses to EPA for approval at least thirty (30) days prior to the commencement of analyses; and

5. Ensure that laboratories used by Respondent for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA. As part of such a program, and upon request by EPA, such laboratories shall perform analysis on known samples provided by EPA to demonstrate the quality of the analytical data.

XI. REPORTING AND PUBLIC ACCESS TO DOCUMENTS AND SAMPLING DATA

1. Respondent may assert a business confidentiality claim covering all or part of any information submitted to EPA pursuant to this Order. Analytical data generated pursuant to this Order shall not be claimed as confidential. Confidentiality claims shall be submitted to EPA in accordance with the procedures outlined in 40 C.F.R. Part 2 [originally published in the Federal Register at 41 Fed. Reg. 36902 (September 1, 1976)], in particular, 40 C.F.R. § 2.203(b), and shall include a written statement explaining how the information claimed to be confidential meets the substantive criteria for use in confidentiality determinations found in 40 C.F.R. § 2.208, or such claim shall be deemed waived. If EPA approves the claim, EPA will afford the information confidential status, as specified in 40 C.F.R. Part 2, Subpart B. Information determined not to be confidential may be made available to the public without further notice to Respondent. If Respondent makes no claim of confidentiality for information submitted pursuant to

this Order, EPA may make the information available without further notice to Respondent.

2. If Respondent asserts a business confidentiality claim, it shall clearly mark each page of each document included in its claim with the term "Confidential", and shall provide a redacted version of the information with all confidential business information deleted.

3. The information requested by EPA by this Order ia not subject to the Paperwork Reduction Act of 1980, as amended, 44 U.S.C. § 3501 et seq.

XII. SUBSEQUENT MODIFICATION OF ORDER

1. This Order may be modified by EPA to ensure protection of human health and/or the environment. Such amendments shall be in writing, and shall be effective and incorporated into this Order thirty (30) days after service of the amendment on Respondent, unless Respondent files an objection to the modification with EPA and the Regional Hearing Clerk. 40 C.F.R. Part 24 shall govern the proceedings under this Section, and the hearing shall be limited to the scope of the proposed amendment.

2. This Order may also be modified by mutual agreement of EPA and Respondent. Any agreed modifications shall be in writing, signed by both parties, shall have as their effective date the date on which they are signed by EPA, and shall be incorporated into this Order. Upon rect of Respondent, EPA may extend the X set forth in this Order.

XIII. COSTS

Each party shall bear its own costs and attorneys' fees.

XIV. TERMINATION AND SATISFACTION

This Order terminates when Respondent complies with all requirements of this Order.

XV. EFFECTIVE DATE

This Order shall become effective as provided in Section 3008(b) of RCRA, 42 U.S.C. § 6928(b), and 40 C.F.R. Part 24.

IT IS SO ORDERED:

Dated:_____ By:_____

Samuel Coleman, P.E.
Director
Compliance Assurance and
Enforcement Division
U.S. Environmental Protection
Agency Region 6
1445 Ross Avenue
Dallas Texas 75202-2733

THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

1700 PACIFIC AVENUE • SUITE 3300
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(214) 969-1700
FAX (214) 969-1751

AUSTIN
FORT WORTH
HOUSTON
MONTERREY, MEXICO

DIRECT DIAL:

(214) 969-1102

February 10, 1997

Via Hand Delivery
Ms. Lorena Vaughn, Clerk
Office of the Regional Hearings Examiner
U.S.E.P.A.
1445 Ross Avenue
Dallas, Texas 75202

Re: *In the Matter of Spartan Technology, Inc.*; U.S. EPA Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Enclosed is an original and one (1) copy of Spartan Technology, Inc.'s Request to Submit Written Questions to EPA. Please accept the original for filing and return the file-marked copy to the courier delivering this information to you. It is my understanding that you require only the original for filing.

Your assistance is appreciated.

Yours very truly,

James B. Harris

JBH:lmi
Enclosures

cc: Mr. Evan Pearson, U.S.E.P.A
40310 00001 LERA 55960

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

FILED
FEB 10 1997
EPA REGION VI
HEARING CLERK

IN THE MATTER OF:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 COORS ROAD NW	)	U.S. EPA DOCKET NO.
ALBUQUERQUE, NM 87114	)	RCRA-VI-001(h)-96-H
	)	
EPA I.D. NO. NMD083212332	)	
	)	
RESPONDENT	)	

REQUEST TO SUBMIT WRITTEN QUESTIONS TO EPA

Sparton Technology, Inc. ("Sparton") pursuant to 40 C.F.R. § 24.14(d) and the Order Establishing Hearing Schedule, dated December 16, 1996, hereby requests that the presiding officer direct EPA to respond to the following questions. All of these question elicit information related to material facts disputed by Sparton in its Protective Response and Request for Hearing. They specifically seek information relating to whether the administrative record is complete, the consistency of EPA's decision in this matter with other sites, the cost of reinjection wells, the difficulties of dealing with removal of chlorinated solvents from groundwater, the impact, if any, of arsenic in the groundwater, alternatives to reinjecting recovered and treated groundwater, the likelihood that restoration will succeed at this Site, the existence of biological and chemical forces causing natural attenuation at this Site, and the number of monitoring wells necessary to properly characterize the nature and extent of groundwater contamination.

I.
INSTRUCTIONS

1. To the extent that you believe that any of these Questions calls for information subject to a privilege, answer so much of each Question as does not, in your view, request allegedly privileged information and set forth the basis of your claim of privilege with respect to the specific information you refuse to give.

2. Unless otherwise indicated, all words are to be given their broadest meaning consistent with ordinary usage.

3. Where an individual Question calls for an answer that involves more than one part, each part of the answer shall be clearly set forth so as to be understandable.

II.
DEFINITIONS

The following definitions should be used for purposes of responding to these Questions:

1. "Administrative Record" means the compilation of documents referenced by EPA in the Initial Administrative Order.

2. "Any" means "each and every" as well as "any one."

3. "Communication" means any transmission of any sort whatsoever, by one or more persons to one or more persons and/or between two or more persons, by any means whatsoever, including but not limited to: telephone conversations, letters, telegrams, teletypes, telecopies, written memoranda and face-to-face conversations or any other document concerning the communication.

4. The "Coors Road Plant" means or refers to a manufacturing operation on the northeast side of Albuquerque approximately 0.75 miles north of the intersection of Coors Road and Paseo del Norte in Bernalillo County, New Mexico, and which is the subject of this proceeding.

5. "Document(s)" shall mean any kind of written, recorded, or graphic matter, however produced or reproduced of any kind or description, whether sent or received or neither, including originals, non-identical copies, (whether different from the originals because of marginal notes, or other material inserted therein or attached thereto or otherwise), and drafts and both sides thereof, and including, but not limited to all written and graphic matter of every kind and description, whether printed or reproduced by any process, or written and/or produced by hand, whether final draft, original or reproduction, whether or not claimed to be privileged or otherwise excludable from discovery, whether in the actual or constructive possession, custody, or control of Plaintiffs, including: letters, correspondence, memoranda, notes, transcripts, contracts, agreements, licenses, memoranda of telephone or personal conversations, microfilm, microfiche, telegrams, books, magazines, newspapers, advertisements, periodicals, bulletins, circulars, brochures, pamphlets, statements, notices, advertising layouts, trade letters, press releases, reports, rules, regulations, directives, teletypes, or telefax messages, telexes, minutes, or records of meetings, interoffice communications, financial statements, ledgers, books or accounts proposals, prospectuses, offers, orders, receipts, working papers, desk calendars, appointment books, diaries, routing slips, time sheets, logs, movies, tapes (or visual or audio reproductions), recordings, plans, graphs, charts, shipping papers, purchase orders, data processing paper results, data printouts and computations (both in existence and stored in memory components), transcripts of oral

statements or testimony, reports and/or summaries of interviews, reports and/or summaries of investigations, opinions or reports of consultants, forecasts, opinions of counsel, court papers and any and all other data compilations or information resources from which information can be obtained or translated, if necessary, through detection devices and to reasonably usable form or material similar to any "document" as used herein. 6. "Sparton" refers to Sparton Technology, Inc. or Sparton Corporation, and each of their respective agents, attorneys, employees, representatives, successors, assigns, and any other persons acting or purporting to act on their behalf.

7. To "identify" or "describe" a document shall mean to state with respect thereto:

A. The identity of the person who prepared it;

B. The identity of the person who signed it or over whose signature it was or is issued;

C. The identity of each person to whom it was addressed or distributed;

D. The nature and substance of the document with sufficient particularity to enable it to be identified;

E. The date, if any, which the document bears, and

F. The present location of the document, including the identity of its custodian or custodians; or in lieu thereof, attach a copy of said document to your response to these Interrogatories.

8. To "identify" or to state the "identity of" a person shall mean to state with respect thereto:

A. The person's full name, address, and day and evening telephone numbers;

B. The person's title and business or professional affiliation, if any, as of the time to which the answer relates;

C. The person's present title and business and residence addresses.

9. To "identify" or "describe" a firm or corporation shall mean to state with respect thereto its full name, the place where it was incorporated, and its principal place of business.

10. To "identify" or "describe" a communication shall mean to state with respect thereto the form of communication, *e.g.*, telephone conversation, letter, telegram, teletype, telecopy, written memorandum, face-to-face conversation, or any other form; the date of the communication or the date on which the communication was sent and/or received, if not the same; the person(s) to whom the communication was made, the person(s) who initiated it, and the person(s) present during any part of the communication; the substance of the communication; the present location and the name and address of the custodian if the communication was written or memorialized in written form.

11. To "identify" or "describe" an act or meeting shall mean to state with respect thereto a description of the substance of the event or events constituting such act or meeting; the date when such act or meeting occurred; the identity of all persons present when such act or meeting occurred and whether any writing exists documenting such act or meeting, whether made in preparation for, during, or after each such act or meeting, and the identity of each document embodying such writing.

12. "Or" means and/or.

13. "Person" means the plural as well as the singular and includes any natural person, corporation, association, firm, partnership, or other business or legal entity, and the

officers, employees, agents, servants, attorneys, or representatives of such entities, as the context requires.

14. "Plume" means that portion of the saturated zone in the vicinity of the Coors Road Plant that EPA alleges has been impacted by operations at the Coors Road Plant.

15. "RCRA or CERCLA Facility" means a facility where releases of hazardous waste, hazardous waste constituents, or hazardous substances either are, have been, or will be studied by either public or private entities and about which EPA Region VI has knowledge.

16. "Relating," as used herein, means referring to, alluding to, responding to, connected with, commenting on, in respect of, about, regarding, discussing, showing, describing, mentioning, reflecting, analyzing, constituting, evidencing, or pertaining to.

17. The "Site" means or refers to the Coors Road Plant and that portion of the environment EPA alleges has been impacted by operations at the Coors Road Plant.

18. "Statement" includes any written or graphic statement, signed or otherwise adopted, or approved by the person making it, and any stenographic, mechanical, electrical, or other record, or a transcription thereof, which is a substantially verbatim recital of an oral statement by the person making it and which was contemporaneously recorded.

19. The singular includes the plural, and the plural includes the singular where appropriate to the sense of these Questions.

III.
QUESTIONS

1. Identify each and every communication between any representative of EPA and/or any representative of the city of Albuquerque, or any representative of the state of New Mexico, or any representative of any other Federal Agency, or any representative of Congress

between October 1, 1988, and the present, relating to Sparton or the Site, which is not included in the Administrative Record.

2. Identify each and every communication between any representatives of EPA relating to the positions or comments of the city of Albuquerque or the state of New Mexico from October 1, 1988 to the present, relating to Sparton or the Site, which is not part of the Administrative Record.

3. Identify each and every communication from the Regional Administrator for EPA Region VI to any other representative of EPA from October 1, 1988, through the present, involving in any way Sparton or the Site.

4. Identify each and every person (other than EPA employees) under contract with EPA who have provided from October 1, 1988, to the present any advice, criticism, input, or have had other involvement in reviewing or responding to any submission by Sparton to EPA Region VI relating in any way to environmental impacts associated with the Coors Road Plant, the characterization of such impacts, or a response to such impacts, if any, and describe their communication.

5. Identify the persons that were involved in preparing the Administrative Record, describing when they began that task, what instruction, if any, they were given, who reviewed their work product, and what documents selected by those individuals to be included in the Administrative Record were removed.

6. Identify each and every person who had any involvement in the development of the "Final Decision RCRA Corrective Action" for the Coors Road plant dated June 24, 1996, and specify for each such individual which education, training and work experience they have in geology, hydrogeology, water resource planning, modeling and simulation of contaminant

movement through aquifers, hydrology, or treatment and disposal of recovered groundwater, and describe the nature and extent of their involvement, and their communications relating to their involvement.

7. Identify each and every person who had any involvement in the development of the "Technical Review Final Corrective Measure Study Report RCRA Corrective Action" for the Coors Road Plant dated June 20, 1996, specifying for each such individual what education, training or work experience they have in geology, hydrogeology, water resource planning, modeling and simulation of contaminant movement through aquifers, hydrology, or treatment and disposal of recovered groundwater, and describe the nature and extent of their involvement, and their communications relating to their involvement.

8. Identify each and every individual who had any involvement in the "Technical Review Report on the Effectiveness of the Groundwater Recovery Well System in the Upper Flow Zone RCRA Corrective Action" for the Coors Road Plant dated June 20, 1996, and specify for each such individual what education, training or work experience they have in geology, hydrogeology, water resource planning, modeling and simulation of contaminant movement through aquifers, hydrology, or treatment and disposal of recovered groundwater, and describe the nature and extent of their involvement, and their communications relating to their involvement.

9. For the current and previous Regional Judicial Officer assigned to this matter, provide the following information:

(a) how long they have worked for EPA and all positions they have held;

(b) each and every matter in which they have worked directly with any of the persons identified in response to Questions 6, 7, 8, or Evan Pearson;

(c) the location of their office and the location of that office in relation to the offices of any of the persons identified in response to Questions 6, 7, 8, or Evan Pearson;

(d) any matter in which they are working jointly with Evan Pearson;

(e) each and every communication they have had with any of the persons in response to Questions 6, 7, 8, or Evan Pearson regarding Sparton or the Site;

(f) each and every communication they have had with any representative of any governmental entity, other than EPA regarding Sparton or the Site;

(g) each and every RCRA enforcement action about which they have provided legal advice to EPA Region VI personnel;

(h) their immediate supervisor and each subsequent supervisor through the Regional Administrator;

(i) identify every document they have been provided regarding Sparton or the Site that is not part of the Administrative Record.

(j) each and every meeting they have attended since appointment as Regional Judicial Officer in which Sparton or the Site has been discussed, in any way.

10. Identify and provide copies of any results of testing of the water quality of the Plume that indicate that any arsenic exists in the Plume in concentrations above applicable drinking water standards or that water recovered from the Plume and treated for chlorinated solvents through air stripping will contain arsenic in concentrations above applicable drinking water standards.

11. Identify every RCRA or CERCLA facility in Region VI where recovered groundwater is being treated and reinjected into the formation from which it was withdrawn,

specifying for each such reinjection well; the date the decision was made to use reinjection wells and the date reinjection commenced, the size of the well, the rate at which water is being reinjected, the total capital costs associated with such well through the present, the annual operation and maintenance costs associated with such well (both total and by year), the percent of time such well has operated (from initiation of reinjection activities to the present), the total amount of water reinjected through such well (from initiation of activities to the present), the causes of any non-operation of the reinjection well, what was done to address the problems causing the well not to operate, and the cost of correcting the problems that caused the well not to operate as designed.

12. For each and every RCRA or CERCLA facility in EPA Region VI where recovered groundwater is treated and discharged at the surface, identify what permits or other authorizations allow such discharge, specify what limits, if any, are placed on the quality of the water that is discharged, describe the technical or legal basis for such limits, identify the length of time required to obtain such authorization or permits, specify the capital costs associated with the structure used to discharge the water after treatment, specify the operation and maintenance costs associated with maintaining those structures, identify any instances in which discharge to the surface has been discontinued, and explain the reason for such discontinuance.

13. Identify what action EPA, either nationally or at any region, is taking to develop a general permit or similar process to authorize the discharge of recovered and treated groundwater associated with RCRA (including leaking petroleum storage tanks) and CERCLA facilities to waters of the United States.

14. Identify each and every RCRA and CERCLA facility in Region VI with geology and hydrogeology similar to the Site, and with chlorinated solvents present, where restoration (defined as removal of contaminants to achieve drinking water standards) has been achieved and maintained for four consecutive quarters.

15. Identify each and every RCRA or CERCLA facility in Region VI at which the Agency has accepted containment as an appropriate remedy.

16. Identify each and every RCRA or CERCLA facility in EPA Region VI where the Agency has concluded that it is technically impracticable to restore groundwater to achieve drinking water standards.

17. Identify each and every report or study in the possession of EPA Region VI that discusses the difficulties of removing from groundwater "residual-phase VOC" (that is non-dissolved yet dispersed constituent that adsorbs to soil in the saturated zone), sometimes also referred to as "entrained DNAPL," or the effect the presence of such material has in achieving restoration.

18. Identify each and every RCRA or CERCLA facility in EPA Region VI where reinjection of recovered and treated groundwater was considered as an option and rejected.

19. Identify each and every study or report in the possession of EPA Region VI that discusses how "natural attenuation" or "intrinsic bioremediation" can transform chlorinated solvents into materials whose presence in groundwater would not be of concern to regulatory agencies.

20. Identify all EPA policy or guidance documents discussing the agency position concerning the selection of remedies at RCRA or CERCLA facilities where removing constituents of concern, hazardous wastes, hazardous waste constituents, or hazardous

substances, associated with releases from prior industrial or commercial activities, will still leave materials in the groundwater above drinking water limits, and such remaining materials are not associated with releases from prior industrial or commercial activities.

21. Identify for each and every RCRA or CERCLA facility in EPA Region VI the rationale used by the Agency to determine the nature and extent of groundwater contamination at such sites was adequately characterized for purposes of designing a remedy.

22. Identify each and every NPDES permit issued by EPA Region VI authorizing the discharge of recovered groundwater, and specify the pollutants that can be discharged under such permit, what limits are imposed on such pollutants, and how those limits were arrived at.

23. Identify each and every RCRA or CERCLA facility in EPA Region VI where groundwater that could be used for public drinking water supply has been impacted and describe the date this condition was first identified and what remediation, if any, is currently constructed and operating as designed.

Respectfully submitted,

THOMPSON & KNIGHT
A Professional Corporation

By: _____
James B. Harris
Attorney
State Bar No. 09065400

1700 Pacific Avenue, Suite 3300
Dallas, Texas 75201
(214) 969-1700
FAX (214) 969-1751

ATTORNEYS FOR SPARTON TECHNOLOGY, INC.

CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing Request To Submit Written Questions To EPA was served on Evan Pearson, senior counsel, Environmental Protection Agency, Region 6, 1445 Ross Avenue, Dallas, Texas 75202-2733 via hand-delivery on February 10, 1997.

_____
James B. Harris

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

February 13, 1997

HAND DELIVERED

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: Sparton Technology, Inc.
U.S. EPA Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Please file the enclosed EPA's Response to Respondent's Request to Submit Written Questions to EPA in the above entitled case.

Sincerely,

Evan L. Pearson

Evan L. Pearson
Senior Enforcement Counsel

Enclosure

cc: Honorable George Malone, III
James B. Harris

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 100% Recycled Paper (40% Postconsumer)

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

FILED
FEB 13 1997
EPA REGION VI
HEARING CLERK

IN THE MATTER OF:	)	
SPARTON TECHNOLOGY, INC.	)	
9621 COORS ROAD NW ALBUQUERQUE, NM 87114	)	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H
EPA I.D. NO. NMD083212332	)	
RESPONDENT	)	

EPA'S RESPONSE TO RESPONDENT'S
REQUEST TO SUBMIT WRITTEN QUESTIONS TO EPA

I. INTRODUCTION

The United States Environmental Protection Agency, Region 6 (EPA), by and through its attorney, Evan Pearson, hereby files this Response to Respondent's Request for Permission to Submit Written Questions to EPA.

Pursuant to 40 C.F.R. § 24.14(d), the Respondent has filed a request for permission to submit written questions to EPA. EPA objects to the Respondent's questions on the following grounds: (1) The questions seek information that is not related to issues of material fact in the Initial Administrative Order; (2) the questions are either irrelevant, redundant, unnecessary, or place an undue burden on EPA; and (3) more than twenty-five (25) questions, including subquestions and subparts, have been proposed by the Respondent. These objections are set forth in detail below.

II. STANDARD OF REVIEW

The standard of review for the Presiding Officer in deciding whether to direct EPA to respond to the written questions is "whether such responses are required for full disclosure and adequate resolution of the facts. No questions shall be allowed regarding privileged internal communications." 40 C.F.R. § 24.14(d)(2) (emphasis added). 40 C.F.R. § 24.14(d) limits the questions to issues of material fact in the order (emphasis added). Furthermore,

> If a request is granted, the Presiding Officer may revise questions and may limit the number or scope of the questions. Questions may be deleted or revised in the discretion of the Presiding Officer for reasons, which may include the fact that he finds the questions to be irrelevant, redundant, unnecessary, or an undue burden on the Agency.

40 C.F.R. § 24.14(d)(2).

III. GENERAL OBJECTIONS TO THE RESPONDENT'S PROPOSED QUESTIONS

A. THE RESPONDENT IS PROPOSING EXCESSIVE AND BURDENSOME DISCOVERY REQUESTS IN AN ATTEMPT TO CHALLENGE THE DISCOVERY PROVISIONS OF 40 C.F.R. PART 24

In its Protective Response and Request for Hearing dated October 18, 1996 (Protective Response), the Respondent alleged that "[t]he Order is unenforceable because the process for challenging it violates due process by denying Respondent the right to engage in meaningful discovery and to confront witnesses." However, in Chemical Waste Management, Inc. v. U.S. Environmental Protection Agency, 873 F.2d 1477 (D.C. Cir. 1989), the Court held that the discovery procedures of Part 24 on their face do not violate due process. As shown in this memorandum, it

is clear that the Respondent is trying to build a record for appeal to show that the discovery procedures violate due process.

B. THE REQUEST SEEKS ANSWERS TO MORE THAN 25 QUESTIONS

40 C.F.R. § 24.14(d)(1) limits the questions to "no more than twenty-five (25) questions, <u>including subquestions and subparts</u>." (emphasis added). On the surface, the Respondent only submitted 23 numbered questions. However, many of the questions contain either designated subquestions or subparts [identified by "(a)" or "(b)"] or undesignated subquestions or subparts [not identified by "(a)" or "(b)"]. The questions that contain undesignated subquestions or subparts are as follows: Four (2 subparts), Five (5 subparts), Six (4 subparts), Seven (4 subparts), Eight (4 subparts), Eleven (12 subparts), Twelve (8 subparts), Fourteen (2 subparts), Twenty-two (4 subparts), and Twenty-three (3 subparts). Only Question Nine (10 subparts) has the subparts clearly designated as (a) - (j). The Respondent's numbered questions have been broken down into their respective subquestions or subparts in Section IV below.

A comparison of Question Nine (with designated subquestions or subparts) to Question Eleven (with undesignated subquestions or subparts) reveals a number of items requesting information. Because each of the subquestions or subparts request separate information, each subquestion or subpart of the aforementioned questions must be counted separately (e.g., Question Nine actually consists of 10 questions, Question Eleven actually consists of 12 questions). In fact, Item Three of the

Respondent's Instructions implies that many questions will call for an answer that involves more than one part. If you count all of the questions, subquestions or subparts in the Respondent's request, there are a total of 70 questions, instead of the maximum of 25 questions. Therefore, after counting the first 25 questions, subquestions and subparts, the Court should strike the remaining questions, subquestions and subparts, and only rule on whether to pose the first 25 questions to EPA.

C. THE RESPONDENT FAILED TO MEET ITS BURDEN OF PROOF THAT EACH QUESTION WAS RELATED TO AN ISSUE OF MATERIAL FACT

The rules provide that questions posed to EPA must be related to issues of material fact in the Order. The Respondent listed a number of so-called issues in the beginning of its request, but failed to show how these issues related to each question. Therefore, EPA was left to guess as to the justification for the information. The Respondent, as the movant in this matter, bears the burden of proof to show that the questions relate to issues of material fact. See 56 Am.Jur. 2d, Motions, Rules, and Orders, § 24. The Respondent failed to meet this burden.

D. DEFINITIONS

EPA specifically objects to the following definitions. EPA reserves the right to object to any other definitions if any questions are posed to EPA by the Court.

1. EPA objects to the definition of "communication" as being overbroad and burdensome because "communication" is defined as including telephone calls for which documentation for the call

does not exist. Under the Respondent's definition, a person would have to identify a phone call made to another person even when no written record of the substance of the call was made.

2. EPA objects to the definition of "document(s)" as being overbroad and burdensome. The Respondent's definition includes documents that are in actual or constructive possession of EPA. Under the Respondent's definition, this would include all documents that are off EPA's premises in long term storage. EPA also objects to this definition because it seeks information (e.g., opinions or reports of consultants, opinions of counsel, etc.) that are protected under the attorney-client, attorney work product, deliberative process, and other governmental privileges.

3. EPA objects to the definition of "identify" or "describe" as pertaining to documents as being overbroad and burdensome. If this definition is used, each question that seeks to have EPA identify a document should be considered as having six subparts, because there are six subparts to this definition.

4. EPA objects to the definition of "identify" or "identity of" as it relates to a person. This definition includes the person's home address and phone number, which is an invasion of privacy. Furthermore, if this definition is used, each question that seeks to ask EPA to identify a person should be considered as having three subparts, because there are three subparts to this definition.

5. EPA objects to the definition of "RCRA or CERCLA facility" as being overbroad and unduly burdensome. In order to

determine what facilities come under this definition, EPA would have to potentially review thousands of RCRA and CERCLA files.

IV. SPECIFIC OBJECTIONS TO QUESTIONS

A. QUESTION 1

See General Objections set forth in Section III above. EPA also objects to the Question to the extent that it seeks information that is protected under the attorney-client, attorney work product, deliberative process, or other governmental privilege.

In addition, EPA objects to this question on the grounds that it is irrelevant, unnecessary, unduly burdensome, and not related to issues of material fact in the Order. Communications between EPA and other governmental agencies concerning the Sparton site are not required to be in the administrative record if EPA did not consider them in the process of developing and issuing the Order. 40 C.F.R. § 24.03(b). This subsection provides the following:

> On . . . the date the initial order is served on respondent, the EPA office issuing the order shall deliver to the Clerk (a copy of) the administrative record supporting the findings of fact, determinations of law, and relief sought in the initial administrative order. This record shall include all relevant documents and oral information (which has been reduced to writing), which the Agency considered in the process of developing and issuing the order, exclusive of privileged internal communications.

EPA filed a 19 volume administrative record, consisting of almost 9000 pages of documents which EPA considered in developing and issuing the Order, exclusive of privileged internal communications. Because the administrative record consists of

all relevant documents that EPA considered in issuing the Order, the question seeks information that is irrelevant, unnecessary, and not related to an issue of material fact. The request is also overbroad and unduly burdensome to require EPA to review all files regarding the Respondent or the Site from 1988 to the present, for all media when all relevant information is in the administrative record.

B. QUESTION 2

See Response to Question 1. This question is also redundant because it seeks the same information as Question 1.

C. QUESTION 3

See General Objections set forth in Section III above. EPA objects to this question because the question seeks privileged internal communications between the Regional Administrator and his or her staff. Questions concerning privileged internal communications are prohibited. 40 C.F.R. § 24.14(d)(2). In addition, this question does not seek information relating to an issue of material fact because the Respondent has not raised any issue concerning the Regional Administrator's involvement in this case. Furthermore, all documents that EPA considered in developing and issuing the Order are in the administrative record.

D. QUESTION 4

See General Objections set forth in Section III above. EPA also objects to the Question to the extent that it seeks information that is protected under the attorney-client, attorney

work product, deliberative process, or other governmental privilege.

In addition, the identity of the persons who have provided advice, criticism, input, or had other involvement regarding any Sparton submission to EPA are irrelevant, unnecessary, unduly burdensome, and not related to issues of material fact, because the Respondent cannot take their depositions or cross-examine these witnesses at the hearing. 40 C.F.R. § 24.15(a). Furthermore, this question does not seek information related to an issue of material fact because the Respondent has not raised the issue of the involvement of EPA's contractors in this case. It would also be unduly burdensome on EPA to go back nine years to find out which personnel under contract to EPA provided advice on the case. EPA's comments in regard to the Respondent's submissions are set forth in the administrative record.

Finally, this question actually consists of two questions: (1) the identity of each person; and (2) a description of their communications.

E. QUESTION 5

See General Objections set forth in Section III above. EPA also objects to the Question to the extent that it seeks information that is protected under the attorney-client, attorney work product, deliberative process, or other governmental privilege.

In addition, the identity of the persons who prepared or reviewed the administrative record, and each document the

individual selected to be included in the administrative record was removed, are irrelevant, unnecessary, and not related to any issues of material fact, because the Respondent cannot take their depositions or cross-examine the persons who prepared the administrative record at the hearing. 40 C.F.R. § 24.15(a). The administrative record consists of almost 9000 pages of documents which EPA considered in developing and issuing the order, exclusive of privileged internal communications.

Furthermore, this question actually consists of five questions: (1) the identity of the persons who were involved in preparation of the administrative record; (2) when they began the task; (3) the instructions they were given; (4) who reviewed their work product; and (5) what documents they selected to be included in the administrative record were removed.

F. QUESTIONS 6, 7, AND 8

See General Objections set forth in Section III above. EPA also objects to these Question to the extent that they seek information that is protected under the attorney-client, attorney work product, deliberative process, or other governmental privilege.

The identity of the persons who were involved with the development of the documents in question (and the related information) are irrelevant, unnecessary, and not related to any issues of material fact, because the Respondent cannot take their depositions or cross-examine these persons at the hearing. 40 C.F.R. § 24.15(a). In addition, this question does not seek

information related to an issue of material fact because the Respondent has not raised any issue concerning the qualifications of EPA contractor personnel in this case.

Furthermore, Questions 6, 7, and 8 each actually consist of four questions: (1) identity of the individual; (2) the education, training, and work experience of the individual; (3) the nature and extent of their involvement; and (4) their communications relating to their involvement.

G. QUESTION 9

See General Objections set forth in Section III above. EPA also objects to these ten subquestions or subparts to the extent that they seek information that is protected under the attorney-client, attorney work product, deliberative process, or other governmental privilege.

These ten subquestions or subparts are irrelevant, unnecessary, unduly burdensome, and not related to any issues of material fact. The Presiding Officer must be an attorney "who has had no prior connection with the case, including the performance of any investigative or prosecuting functions." 40 C.F.R. § 24.09. Mr. Chandler stated that his only prior involvement in the case was as the Presiding Officer at the public hearing in Albuquerque, New Mexico on February 1, 1996. Letter from Mark E. Chandler to James B. Harris dated November 6, 1996. Mr. Malone has stated that he did not participate in this case until he was assigned as Presiding Officer. Letter to Counsel from George Malone, III dated

January 14, 1997. Mr. Chandler's and Mr. Malone's work experience, supervisors, and past RCRA actions are irrelevant and unrelated to either Mr. Chandler's or Mr. Malone's qualifications to be the Regional Judicial Officer in this case. The Respondent is also challenging the impartiality of the past and current Presiding Officers without any evidence.

H. QUESTION 10

See General Objections set forth in Section III above. This question is not related to any issue of material fact because the Respondent has not raised any issue concerning arsenic concentrations above the applicable drinking water standards in either its Protective Response or its Memorandum Regarding Sparton Technology, Inc.'s Position on the Facts, the Law, and Relief Sought by EPA dated February 4, 1997 (Memorandum). In addition, copies of any analytical results from ground water samples collected at or near the Plume, including the results of any arsenic testing that were considered in the development of the Order, are contained in the administrative record.

I. QUESTION 11

See General Objections set forth in Section III above. This question is irrelevant, unnecessary, and overly burdensome, and not related to any issue of material fact. All of the information that the Respondent is seeking relating to reinjection of ground water are site specific issues. The design, operation, and maintenance of an injection well is dependent upon several factors that vary between individual

sites. Therefore, this question is irrelevant and unnecessary, and not related to any issue of material fact. This question is also overly burdensome because EPA would have to potentially review thousands of RCRA and CERCLA files to make this determination.

Furthermore, this question actually consists of twelve (12) subquestions or subparts: (1) identification of each RCRA or CERCLA facility that has an reinjection well; and for each reinjection well, (2) the date the reinjection decision was made; (3) the date reinjection commenced; (4) the size of the well; (5)the rate at which water was reinjected; (6) the total capital costs; (7) the annual operation and maintenance costs; (8) the percent of time such well has operated; (9) total amount of water reinjected; (10) the causes of any non-operation of the reinjection well; (11) what was done to address the problems causing the well not to operate; and (12) the cost of correcting the problems.

J. QUESTION 12

See General Objections set forth in Section III above. This Question is irrelevant, unnecessary, overly burdensome, and not related to any material issues of fact. The Respondent has not raised any issue in regard to permitting requirements for the surface discharge of treated ground water in its Protective Response or Memorandum. All of the information that the Respondent is seeking relating to permits are site specific issues and is irrelevant and unnecessary. The decision as to

whether to issue a permit, the applicable limits, and the time necessary to get a permit depend upon the circumstances of the case. This question is also overly burdensome to EPA. EPA would have to potentially review thousands of RCRA and CERCLA files to identify these facilities, and then potentially review hundreds of water permit files.

This question actually consists of eight subquestions or subparts: (1) identifying the permit; (2) specifying the discharge limits; (3) describing the technical or legal basis for the limits; (4) identifying the time to get the permit; (5) specifying the capital costs; (6) specifying the operation and maintenance costs; (7) identifying the instances in which discharge to the surface has been discontinued; and (8) explaining the reason for the discharge.

K. QUESTION 13

See General Objections set forth in Section III above. Question 13 is not related to any issue of material fact in the Order. The Respondent has not raised any issue concerning the permitting process for the discharge of recovered and treated ground water to the waters of the United States in its Protective Response or Memorandum.

L. QUESTION 14

See General Objections set forth in Section III above. This Question is overly burdensome, by requiring EPA to potentially review thousands of RCRA and CERCLA files and hundreds of reports to determine whether the geology and hydrogeology is similar to

the Sparton site and whether chlorinated solvents are present. This Question is also irrelevant and not related to any issue of material fact because the Respondent has not raised a comparative issue concerning the applicability of the geology and hydrogeology of another site to the Sparton site.

This Question actually consists of two subquestions or subparts: (1) identifying each RCRA and CERCLA facility with geology and hydrogeology similar to the Sparton site where chlorinated solvents are present; and (2) determining whether restoration has been achieved and maintained for four consecutive quarters.

M. QUESTION 15

See General Objections set forth in Section III above. This Question is irrelevant, unnecessary, overly burdensome, and not related to any issue of material fact. This Question would require EPA to potentially review thousands of RCRA and CERCLA files to determine whether containment has been accepted by EPA as an appropriate remedy. Whether containment is an acceptable remedy depends, inter alia, upon site specific conditions.

N. QUESTION 16

See General Objections set forth in Section III above. This Question is irrelevant and unnecessary. Technical impracticability, as related to restoration of ground water to drinking water standards, is determined on a site specific basis utilizing EPA Publication 9234.2-25, Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, EPA/540-

R-93-080, a copy of which is part of the Administrative Record. [Administrative Record Document Nos. 001605 - 001638]. Also, this question is not related to an issue of material fact because the Respondent has not submitted a technical impracticability waiver to EPA based on this guidance.

O. QUESTION 17

See General Objections set forth in Section III above. This Question is overly burdensome by requiring EPA to potentially review hundreds of documents in the EPA Region 6 library, plus thousands of RCRA and CERCLA files to determine if a discussion is provided on the effects of "residual-phase VOC" on achieving restoration. This issue is also related to technical impracticability. Therefore, this question is not related to an issue of material fact because the Respondent has not submitted a technical impracticability waiver to EPA based on the guidance referenced above.

P. QUESTION 18

See General Objections set forth in Section III above. This Question is overly burdensome by requiring EPA to potentially review thousands of RCRA and CERCLA files to determine whether reinjection of recovered and treated ground water was considered as an option and rejected. Also, this Question is irrelevant and unnecessary because the issue of whether reinjection of recovered ground water was considered and rejected depends, inter alia, upon site specific conditions.

Q. QUESTION 19

See General Objections set forth in Section III above. This Question is overly burdensome by requiring EPA to potentially review hundreds of documents in the EPA Region 6 library, plus thousands of RCRA and CERCLA files, to determine if a discussion of how "natural attenuation" or "intrinsic bioremediation" can transform chlorinated solvents into materials whose presence in ground water would not be of concern to regulatory agencies.

R. QUESTION 20

See General Objections set forth in Section III above. This Question is irrelevant and unnecessary because EPA has already provided or listed the guidance on RCRA remedy selection in the administrative record. EPA has also proposed regulations in the Federal Register concerning the RCRA remedy selection process. In addition, this Question is not related to any issue of material fact because the Respondent has not raised any issue relating to naturally occurring substances that occur in the ground water above enforceable drinking water standards.

S. QUESTION 21

See General Objections set forth in Section III above. This Question is irrelevant, unnecessary, and overly burdensome by requiring EPA to potentially review thousands of RCRA and CERCLA files to determine whether the nature and extent of ground water contamination was adequately characterized for purposes of designing a remedy. Whether there is sufficient information to

design a remedy to address ground water contamination depends upon the site specific conditions.

T. QUESTION 22

See General Objections set forth in Section III above. This Question is irrelevant, unnecessary, overly burdensome, and not related to any issue of material fact. This Question would require EPA to potentially review hundreds of permit files to determine if recovered ground water was being discharged under a permit.

This question actually consists of four subquestions or subparts: (1) identifying the permit; (2) specifying the pollutants that can be discharged; (3) the limits imposed on the pollutants; and (4) how the limits were arrived at.

U. QUESTION 23

See General Objections set forth in Section III above. This Question is unnecessary and overly burdensome by requiring EPA to potentially review thousands of RCRA and CERCLA files to determine whether the ground water that could be used as drinking water has been impacted.

In addition, this question actually consists of three subquestions or subparts: (1) identifying the facility; (2) describing the date the condition was first identified; and (3) whether the remediation is currently constructed and operating as designed.

V. DEADLINE FOR EPA FILING A RESPONSE TO QUESTIONS POSED BY THE REGIONAL JUDICIAL OFFICER

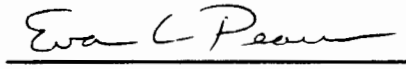
The current deadline for the Court to transmit relevant questions to EPA is February 17, 1997. This date is a federal holiday. If a decision is not made before then, then a new deadline giving EPA at least fourteen (14) days to respond needs to be established, because the rules provide for a minimum of fourteen (14) days for EPA to respond to the questions, unless an extension is granted. 40 C.F.R § 24.14(d)(2).

VI. CONCLUSION

EPA has shown that the questions posed by the Respondent are either irrelevant, redundant, unnecessary, unduly burdensome to EPA, or do not involve issues of material fact. Therefore, pursuant to 40 C.F.R. § 24.14(d)(2), the Presiding Officer should strike all of the questions submitted by the Respondent.

Dated this 13th day of February, 1997.

Respectfully Submitted,



Evan L. Pearson
Senior Enforcement Attorney
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX (214) 665-3177

009319

CERTIFICATE OF SERVICE

I hereby certify that on the 13th day of February, 1997, the original of the foregoing EPA's Response to Respondent's Request to Submit Written Questions to EPA was delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that true and correct copies were sent to the following by the method indicated:

HAND DELIVERED

Honorable George Malone, III
Acting Regional Judicial Officer
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

FIRST CLASS MAIL

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

Eva L Pearson

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

MEMORANDUM

SUBJECT: In the Matter of Spartan Technology, Inc.
Docket No. RCRA VI-001(h)-96-H

FROM: George Malone, III
Presiding Officer, Acting

TO: Regional Judicial and Presiding Officers

Attached is the "Order Denying Questions By Respondent" which I prepared in the above RCRA Part 24 proceeding. Feel free to call me if you have any questions.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

February 19, 1997

MEMORANDUM

SUBJECT: In the Matter of Spartan Technology, Inc.
Docket No. RCRA VI-001(h)-96-H

FROM: George Malone, III
Presiding Officer, Acting (6RC-HO)

TO: Jerry Clifford
Deputy Regional Administrator (6RA-D)

Attached is a copy of the "Order Denying Questions By Respondent" which I prepared in the above RCRA Part 24 proceeding. Because you signed the memorandum designating me as the Presiding Officer, I thought it would be helpful to keep you informed with respect to substantive events, such as this one. There is no need for action by you or the Regional Administrator (RA) at this point. However, after the public hearing on March 27, 1997, I will proceed with writing a recommended decision, which will require a final decision from the RA.

I hope this information is useful, and feel free to call me (ext. 8030) if you have any questions. Thank you for your time and attention already expended in this matter.

cc: Walter L. Sutton (w/ Attachment)

Attachment

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EPA REGION VI
HEARING CLERK

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)
	) U.S. EPA DOCKET NO.
SPARTAN TECHNOLOGY, INC.	) RCRA VI-001(h)-96-H
ALBUQUERQUE, NEW MEXICO	)
	)
EPA I.D. NO. NMD083212332	) ORDER DENYING QUESTIONS
	) BY RESPONDENT
RESPONDENT	)

BACKGROUND

The Environmental Protection Agency (EPA) issued an initial administrative order dated September 16, 1996, against Spartan Technology, Inc., the Respondent, under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h).[1] The Respondent received a copy of the initial administrative order on September 18, 1996. On October 21, 1996, the EPA filed a motion with the Presiding Officer requesting a schedule for prehearing submissions and a hearing date. The prehearing and hearing schedule was filed on December 16, 1996. Consistent with the prehearing schedule, on February 10, 1997, the Respondent filed with the Presiding Officer, a Request to Submit Written Questions to EPA. In reaching my conclusion

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[1] When an administrative order is issued unilaterally under RCRA Section 3008(h), the order is referred to as an initial administrative order. See 40 C.F.R. § 24.02(a).

regarding the written questions, applicable laws and regulations were carefully considered.

SCOPE AND STANDARD OF REVIEW

In order for the EPA to bring an action pursuant to Section 3008(h) of RCRA, the EPA Administrator must make a determination that there is, or has been a release of hazardous waste into the environment, from a facility authorized to operate under RCRA Section 3005(e). Once that determination is made, the EPA Administrator may issue an order requiring corrective action or other response measures deemed necessary to protect human health and environment. See 42 U.S.C. § 6928(h).

Any orders issued under Section 3008(h) of RCRA requiring corrective action are subject to the Rules Governing Issuance of and Administrative Hearings on Interim Status Corrective Action Orders (Rules), found at 40 C.F.R. Part 24. The Rules provide that the Regional Administrator shall issue the final decision on initial administrative orders. See 40 C.F.R. § 24.18. However, under 40 C.F.R. § 24.06, the Regional Administrator is required to designate a Presiding Officer to conduct hearings regarding initial administrative orders, and to preside over the prehearing proceedings.[2]

If the initial administrative order requires the Respondent to undertake specified corrective measures, either alone or in

[2] In this case, the Regional Administrator appointed the current Presiding Officer on January 6, 1997.

conjunction with the RCRA Facility Investigation or Corrective Measures Study, then procedures in 40 C.F.R. Part 24, Subpart C (Hearings on Orders Requiring Corrective Measures), govern.[3] Subpart C provides more formality than 40 C.F.R. Part 24, Subpart B (Hearings on Orders Requiring Investigations or Studies), with respect to the submission of evidence and argument before and at hearings. However, both Subparts B and C, are informal adjudicatory procedures that do not afford the parties to the hearing the right to either, call or cross-examine witnesses. See 40 C.F.R. §§ 24.11, 24.15.

An example of heightened formality provided in Subpart C proceedings, include the Respondent's right to request permission to submit up to 25 written questions to the EPA concerning "issues of material fact in the order." See 40 C.F.R. § 24.14(d). While the Presiding Officer may direct the EPA to respond to the questions, the Presiding Officer should consider whether such responses are required for full disclosure and adequate resolution. In addition, the Presiding Officer has the discretion to delete or revise questions found to be irrelevant, redundant, unnecessary, or an undue burden on the Agency. Finally, the Presiding Officer shall not allow questions regarding privileged communications. See 40 C.F.R. § 24.14(d).

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[3] The initial administrative order issued in this case requires, among other things, corrective measures including soil vapor extraction, ground water extraction and treatment, and reinjection of treated ground water.

DISCUSSION

A. The Respondent's Questions

In this case governed by 40 C.F.R. Part 24, Subpart C, the Respondent took advantage of 40 C.F.R. § 24.14(d), by filing a Request to Submit Written Questions to EPA, on February 10, 1997. The Respondent's request included some 23 written questions.[4] In general, these 23 questions can be divided into several different categories.

The Respondent describes these categories as information relating to whether the administrative record is complete, the consistency of the EPA's decision in this action with other sites, the costs of reinjection wells, the difficulties of dealing with removal of chlorinated solvents from groundwater, the impact of arsenic in the groundwater, the likelihood that restoration will succeed at the site, the existence of biological and chemical forces causing natural attenuation at the site, and the number of monitoring wells necessary to characterize the

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[4] The EPA objects on the ground that the Respondent submitted more than 25 questions, due to the inclusion of subquestions and subparts. See EPA's Response to Respondent's Request to Submit Written Questions to EPA, page 1. This Order Denying Questions By Respondent does not address that point for reasons provided below; however, the EPA should note that the Presiding Officer has the discretion to allow more than 25 questions. "In most instances, no more than 25 questions, ... , may be posed." See 40 C.F.R. § 24.14(d)(1).

nature and extent of ground water contamination.[5]

B. The EPA Response

On February 13, 1997, the EPA filed its response to the Respondent's Request to Submit Written Questions to EPA. In general, the EPA objected to the Respondent's questions on three grounds. First, the EPA alleges that the Respondent's questions seek information not related to issues of material fact in the initial administrative order. Second, the EPA contends the Respondent's questions are either irrelevant, redundant, unnecessary, or place an undue burden on EPA. As mentioned in footnote number 4, the EPA also believes that the Respondent has improperly submitted more than 25 questions.

C. Material Facts In The Order

Again, the Subpart C proceedings limits the Respondent's right to request permission to submit written questions to the EPA concerning "issues of material fact in the order". See 40 C.F.R. § 24.14(d). As Presiding Officer, I interpret the phrase "issue of material fact" to be analogous to the federal summary judgment standard set forth in Fed. R. Civ. P. 56, and therefore, to demonstrate that the EPA should be ordered to answer questions, the requester must show that there is a genuine issue of material fact.

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[5] See Respondent's Request to Submit Written Questions to EPA, page 1.

This legal standard has two elements. First, the Respondent must show that the factual issue raised is material. This means that, under applicable law, the factual issue might affect the outcome of the proceeding. Second, this issue must be genuine. That is, the Respondent must present sufficient probative evidence from which a reasonable decision maker could find in the Respondent's favor, by a preponderance of the evidence. If, on the other hand, the evidence, viewed in a light most favorable to the Respondent, is such that no reasonable decision maker could find in the Respondent's favor, then it is appropriate for the Presiding Officer to deny the Respondent's request.[6]

Careful examination of the Respondent's questions 1 through 9 demonstrates that the questions fail to relate to the facts provided in the initial administrative order. As such, these questions are overbroad and do not address issues of material facts in the initial administrative order as required by 40 C.F.R. § 24.14(d). Assuming that the Respondent's questions 1 through 9 does address facts included in the initial administrative order, these questions are not material.

Generally, the Respondent's questions 1 through 3 request

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[6] There are numerous sources from which to choose, that provide a detailed analysis on the "genuine issue of material fact" standard. Two examples include the Supreme Court review in Celetox v. Catrett, 477 U.S. 317 (1986), and the Environmental Appeals Board in, In re Mayaguez Regional Sewage Plant, 4 E.A.D. 772, 780 (EAB 1993), aff'd sub nom. Puerto Rico Aqueduct and Sewer Authority v. U.S. EPA, 35 F.3d 600 (1st. Cir. 1994).

the EPA to identify each and every communication between the EPA, the State of New Mexico, the City of Albuquerque, and all federal representatives, including Congressional representatives, and communications between the EPA Regional Administrator and other EPA representatives.

Questions 4 through 9 request information regarding the identification of EPA contractor employees, persons involved in putting the administrative record together, persons involved in the Final RCRA Corrective Action Decision, their respective education/training/work experience, and communications related to their respective involvement, persons involved in the Technical Review Final Corrective Measures Study Report, their respective education/training/work experience and communications related to their respective involvement, and persons involved in the Technical Review Report on the Effectiveness of the Groundwater Recovery Well System in the Upper Flow Zone, their respective education/training/work experience and communications relating to their respective involvement, and the qualifications of the current and previous Regional Judicial Officer.

The Respondent's questions 1 through 9 does not have any bearing on whether the initial administrative order was legally issued under applicable law. Before issuing an initial administrative order pursuant to Section 3008(h) of RCRA, the EPA Administrator must make a determination that there is, or has been a release of hazardous waste into the environment, from a

facility authorized to operate under RCRA Section 3005(e). Once that determination is made, the EPA Administrator may issue an order requiring corrective action or other response measures deemed necessary to protect human health and environment.

According to the statutory authority provided above, the EPA has no legal duty to establish any of the items included the Respondent's questions 1 through 9, before issuing an initial administrative order. Thus, requiring the EPA to respond to such questions will not produce any information affecting the issuance of the initial administrative order and the terms provided therein. Plainly stated, the Respondent's questions 1 through 9 do not rise to the level of material facts.

D. Full Disclosure And Adequate Resolution

According to the Subpart C, informal adjudicatory procedures, the Presiding Officer should determine whether responses to the Respondent's questions are required for full disclosure and adequate resolution of the facts. See 40 C.F.R. § 24.14(d). Assuming, once again, that the Respondent's questions 1 through 9 are related to facts in the initial administrative order, the same questions do not require a response for full disclosure and adequate resolution of the facts.[7]

The Respondent's questions 1 through 9 were generally stated

[7] The Respondent's question number 10 does not require a response for full disclosure and adequate resolution of facts as well Thus, the following discussion also addresses the Respondent's question number 10.

before and there is no need for restatement. Question 10 requests the EPA to identify and provide copies any water quality testing results for arsenic.[8] Such questions, including 1 through 10, are more appropriate when it has been demonstrated that inadequacies or irregularities, including the failure to provide material information, occurred in the compilation of the administrative record. A response to the Respondent's questions 1 through 10 may be warranted where Agency action is adjudicatory in nature and the Agency fact-finding procedures are found to be inadequate or irregular.[9]

While this action is adjudicatory in nature, the fact-finding procedures are not inadequate or irregular, as the EPA fully developed and compiled a substantial administrative record, including approximately 19 categories of documents, containing thousands of pages of information.[10] The fully developed

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[8] The administrative record includes results of site sampling and analysis for arsenic at, and near the plume of contamination. See Administrative Record, Document Type 5.

[9] See Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402, 415 (1971). The above-cited Supreme Court case was used as guidance in the full disclosure and adequate resolution analysis. Also, in Chemical Waste Management, Inc. v. U.S. E.P.A., 873 F.2d 1477, 1482-1483, (1989), the Court recognized that analysis of the administrative record, written submissions, and oral statements of the parties, was appropriate to resolve disputed factual issues.

[10] The EPA's informal adjudicatory procedures found at 40 C.F.R. Part 24, were upheld in Chemical Waste Management, Inc. v. U.S. E.P.A., 873 F.2d 1477 (1989).

administrative record submitted by EPA pursuant to 40 C.F.R. § 24.03(b), discloses material information, sufficient enough to resolve disputed factual issues in this action. The administrative record demonstrates that, when the EPA compiled the record, it allowed the public to participate, including the Respondent, in the investigation and selection of corrective measures deemed necessary at the site.

More specifically, it is evident that the administrative record was built upon technical sampling and analysis, the exchange of ideas and opinions, comments of experienced technical and legal representatives, and informed citizens, and an explanation by the EPA providing reasons for accepting or rejecting various proposals. See Administrative Record, Document Types 1, 5, 7, 9, and 11. Stated differently, the administrative record reflects full disclosure and contemporaneous analysis of material information concerning the site. It also demonstrates scrutiny of all interested parties, including the EPA and Respondent. Without question, there is not a scintilla of evidence suggesting that the administrative record contains insufficient details to resolve disputed factual issues in this action.

In addition to the compilation of the administrative record, the Subpart C, informal adjudicatory procedures, afforded the Respondent the opportunity to submit a memorandum with supporting

affidavits and exhibits, stating its position.[11] The Respondent also has the opportunity to file additional information in support of its claim no later than March 14, 1997, in accordance with the prehearing schedule dated December 16, 1996. And, of course, the Respondent is scheduled to participate in a Subpart C, public hearing regarding the initial administrative order.

The Subpart C, informal adjudicatory procedures, gives the Presiding Officer the discretion to tailor hearing procedures in accordance with the needs of the particular case. See Chemical Waste Management, Inc. v. U.S. E.P.A., 873 F.2d 1477, 1483. Because the administrative record contains sufficiently detailed information, and the Respondent has, and will continue to have, ample opportunity to submit information stating its position in these proceedings, responses to the Respondent's questions 1 through 10, are not necessary for full disclosure and adequate resolution of the facts in this action.

E. Undue Burden On The Agency

The Subpart C, informal adjudicatory procedures, require the Presiding Officer to delete or revise the Respondent's questions that present an undue burden on the Agency. See 40 C.F.R. § 24.14(d). Generally, the Respondent's questions 11 through 23, seek from the EPA, information concerning policy and guidance

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[11] The Respondent took advantage of this opportunity and submitted a Memorandum Regarding Spartan Technology, Inc.'s Position on the Facts, the Law, and the Relief Sought by EPA, on February 4, 1997.

documents, technical and legal information, reports and studies, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq., and RCRA site data and information, remedy selection data and information, water treatment systems data and information, costs of water treatment systems and maintenance data and information, and national pollutant discharge elimination system (NPDES) permits data and information. If the EPA were directed to respond to the Respondent's questions 11 through 23, that would entail a review of virtually all EPA CERCLA, RCRA and NPDES files, and information and data contained in EPA libraries, including Headquarters, Regional and Field offices.

The EPA should not have to bear this burden, especially when the information, excluding confidential and privileged documents, is publicly available. While the Respondent is entitled to a detailed factual background of this particular administrative action, it cannot expect the government to perform its arduous, legal and technical research for a couple of reasons. First, the requested information is public information that can be obtained from various sources outside the EPA, including but not limited to, Lexis/Nexis, Westlaw, and the Chemical Waste Litigation Reporter. Based upon information provided in these proceedings, including the administrative record, the Respondent possesses the requisite level of sophistication to perform the technical and

legal research requested to be imposed upon the EPA. See Administrative Record, Document Types 1, 5, and 7.

Second, to the extent that any internal EPA file, policy document, or study/report, including those found in EPA Headquarters, Regional and Field offices, does not contain confidential or privileged information, it is subject to public review. In light of the information before me, these proceedings lack justifiable circumstances that warrants excusing the Respondent from extinguishing its affirmative responsibility, to conduct its own technical and legal research, with respect to EPA documents, files and studies/reports. Undoubtedly, background information regarding the promulgation of 40 C.F.R. Part 24, suggests that the EPA should not be required to conduct such an exhaustive research effort on behalf of the Respondent.

When the EPA promulgated the Part 24 regulations which govern these proceedings, it carefully considered resources and costs issues.[12] While the EPA clearly expressed its desire to conserve Agency resources and costs, there was no indication that the EPA intended to establish procedures requiring its employees and representatives, to serve as publicly paid research consultants, for parties subject to an initial administrative order. As such, under 40 C.F.R. Part 24, the EPA has no legal duty to expend scarce government resources on reviewing and

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[12] See 53 Fed. Reg. 12257-12258 (1988); and Chemical Waste Management, Inc. V. U.S. E.P.A., 873 F.2d 1477, 1485.

gathering, publicly available information, for the Respondent. Due the totality of circumstances described above, the Respondent's questions 11 through 23, are unduly burdensome on the Agency.

CONCLUSION

I find that the EPA is not required to respond to the Respondent's questions 1 through 9 because the questions do not address issues of material fact in the initial administrative order and, with respect to questions 1 through 10, responses are not required for full disclosure and adequate resolution of the facts. I also find that the Respondent's questions 11 through 23 should be deleted because they are unduly burdensome.[13]

ORDER

Accordingly, the Respondent's Request To Submit Written Questions to EPA is HEREBY DENIED.

SO ORDERED, this 18th day of February 1997.

GEORGE MALONE, III
REGIONAL JUDICIAL OFFICER, ACTING

[13] In addition, the Respondent's 23 questions are also questionable on other 40 C.F.R. § 24.14(d) grounds. However, I find it unnecessary to address those issues in this Order Denying Questions By Respondent.

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In the Matter of Spartan Technology, Inc., Respondent
Docket No. RCRA VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Lorena S. Vaughn, Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing Order dated February 18, 1997, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. Thompson & Knight 1700 Pacific Avenue Suite 3300 Dallas, Texas 75201	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED
Mr. Evan Pearson, Senior Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Lorena S. Vaughn
Regional Hearing Clerk

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

February 25, 1997

HAND DELIVERED

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: Sparton Technology, Inc.
U.S. EPA Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Please file the enclosed EPA's Response to the Memorandum Regarding Sparton Technology, Inc.'s Position on the Facts, the Law and the Relief Sought by EPA in the above entitled case.

Sincerely,

Evan L. Pearson
Senior Enforcement Counsel

Enclosure

cc: Honorable George Malone
James B. Harris

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REGION 6
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IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

EPA'S RESPONSE TO THE MEMORANDUM REGARDING SPARTON TECHNOLOGY, INC.'S POSITION ON THE FACTS, THE LAW AND THE RELIEF SOUGHT BY EPA

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I. INTRODUCTION

The United States Environmental Protection Agency, Region 6 (EPA), by and through its undersigned attorney, hereby files its Response to the Memorandum Regarding Sparton Technology, Inc.'s Position on the Facts, the Law and the Relief Sought by EPA dated February 4, 1997 (Sparton Memorandum or Memorandum). This Brief will explain why EPA believes that the Presiding Officer should issue a decision which recommends that the Initial Administrative Order (Order) be issued as a Final Administrative Order by the Regional Administrator without any modifications or changes.

This Brief sets out the background and procedural history of the case, discusses the history of RCRA corrective action, and explains how EPA has proven, by a preponderance of the evidence, each of the six requirements of Section 3008(h) of RCRA. In addition, this Brief discusses how the remedy was selected, and explains why the Respondent's proposed remedy does not protect human health and the environment. This Brief also addresses a number of the remaining issues that the Respondent has raised.

Furthermore, in its Protective Response and Request for Hearing filed October 18, 1996 (Respondent's Answer or Answer), the Respondent disputed EPA's jurisdiction, almost every finding of fact, conclusion of law, and relief provision, numerous items in the attached Final Decision and Response to Comments (FDRTC) document, and raised numerous affirmative defenses. Rather than responding to these issues in its Memorandum, the Respondent merely incorporated its Answer (which only made conclusory

allegations concerning these issues) by reference. Sparton Memorandum at p. 2, fn. 1. However, 40 C.F.R. § 24.14(c) requires that:

> the Respondent shall file a memorandum stating and supporting respondent's position on the facts, law and relief. The memorandum must identify each factual allegation and all issues regarding the appropriateness of the terms of the relief in the initial order that respondent contests and for which the respondent requests a hearing. The memorandum must clearly state respondent's position with respect to each such issue. Respondent must also include any proposals for modification of the order. The memorandum shall also present any arguments on the legal conclusions contained in the order. (emphasis added).

Furthermore, the Scheduling Order issued December 16, 1996 stated in regard to this memorandum that "the Respondent shall therein identify the facts it will contest and the law as it sees it". Because the Respondent specifically failed to address these issues in its Memorandum, it has waived its right to pursue these issues. 40 C.F.R. § 24.14(c); see FRCP 56(e).

II. BACKGROUND AND PROCEDURAL HISTORY

Sparton Technology, Inc. (Respondent) is the owner and operator of a facility located at 9621 Coors Road NW, Albuquerque, New Mexico (Facility). From 1983 - 1988, hazardous waste and/or hazardous waste constituents were detected in ground water monitoring wells at the Facility. As a result of this contamination, on October 1, 1988, EPA and the Respondent entered into a corrective action administrative order on consent (AOC), U.S. EPA Docket No. VI-004(h)-87-H, pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h). [Administrative Record (AR) at p. 006056]. The AOC required the Respondent to conduct interim

measures, a RCRA Facility Investigation (RFI)[1], and a Corrective Measures Study (CMS)[2] for the Facility.

On or about May 21, 1992, Respondent submitted a Final RFI Report to EPA for approval. EPA approved the Final RFI Report on July 1, 1992. On or about December 8, 1995, EPA issued for public comment, a Statement of Basis which described the various remedial alternatives for the Facility. The Statement of Basis and the administrative record for the Facility were made available to the public and the Respondent for review and comment from December 8, 1995, to February 8, 1996. A public hearing to receive comments on the remedial alternatives was held on February 1, 1996.

Based on analyses of ground water samples collected in January 1996, trichloroethylene (TCE) contamination resulting from Facility operations ranges from 7,600 ppb at the Facility, 3,200 ppb near the center of the off-site TCE plume, to less than 5 ppb at a distance of at least 1/2 mile from the Facility. A summary of the analytical results for the January 1996 sampling is attached as Exhibit 1.[3] The approximate boundary of the TCE

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[1]The purpose of the RFI is characterize the nature and extent of contamination, and to gather the necessary data to support the corrective measures study. 55 Fed. Reg. 30798, 30801 - 02 (July 27, 1990).

[2]The purpose of the CMS is to develop and evaluate remedial alternatives, and to recommend one of the alternatives to EPA. Final RCRA Corrective Action Plan, OSWER Directive 9902.3-2A at p. v. (May 1994).

[3]Other hazardous waste or hazardous waste constituents released to the ground water include 1,1,1-trichloroethane, 1,1-dichoroethene, and tetrachloroethylene.

plume in the ground water is also illustrated in Exhibit 2. The TCE plume is approximately 3300 feet long, 1650 feet wide (covering approximately 90 acres, with the plume depth ranging from 50 to 125 feet below the top of the water table).[4] The TCE plume has contaminated an aquifer of the Santa Fe Group aquifer system, which the City of Albuquerque and other nearby municipalities rely on as their sole source of drinking water. The TCE plume is also located in an area the City of Albuquerque had intended to use as a future well site. A public drinking water supply well, New Mexico Utilities Well No. 2, is approximately two (2) miles downgradient from the leading edge of the TCE plume.

There is also extensive on-site soil contamination which may act as a continuing source of contamination by migrating downward to the drinking water. A soil vapor monitoring well was installed near the two former surface impoundments (the East and West Ponds) and the on-site sump in 1996. Analyses of air and soil samples collected from the monitoring well in June 1996 showed high contaminant concentrations. Exhibit 3.

On May 13, 1996, the Respondent submitted its Final CMS Report to EPA for approval. As required by the AOC, the CMS Report set forth a number of corrective measure alternatives, and recommended one alternative. Section IV.A.3 of the AOC and Task

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[4]Exhibit 3 was prepared by the Respondent, and may not accurately reflect the boundary and associated dimensions of the plume, because the existing ground water monitoring system does not completely define the horizontal and vertical extent of the contamination.

IX of the Corrective Action Plan (CAP) of the AOC provided that EPA would select the remedy for the Facility. On June 24, 1996, after approving the Final CMS Report with concerns, EPA issued its Final Decision and Response to Comments (FDRTC). [AR at p. 008606]. The FDRTC document evaluated several remedial alternatives against EPA's remedy selection criteria, and selected a remedy based on these criteria. EPA selected Alternative 4 - Expanded Ground Water Extraction and Soil Vapor Extraction as the remedy for the Facility. [AR at p. 008647 - 52]. On June 24, 1996, EPA terminated the AOC.

Attempts to negotiate a RCRA 3008(h) Administrative Order on Consent to implement EPA's selected remedy were unsuccessful. Therefore, on September 16, 1996, EPA filed an Initial Administrative Order (Order) against the Respondent pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h), and 40 C.F.R. Part 24, seeking an Order requiring the Respondent to implement the remedy identified in the FDRTC document. On October 18, 1996, the Respondent filed its Answer. On December 16, 1996, the Presiding Officer issued a Scheduling Order. On February 4, 1997, the Respondent filed its Memorandum. The Respondent filed a Request to Submit Written Questions to EPA on February 10, 1997, which was denied by the Presiding Officer on February 18, 1997.

III. BACKGROUND OF RCRA CORRECTIVE ACTION

RCRA establishes a comprehensive federal program governing the generation, transportation, treatment, storage, and disposal

of hazardous wastes to "minimize the present and future threat to human health and the environment." 42 U.S.C. § 6902(b). Section 3005(a) of RCRA, 42 U.S.C. § 6925(a) requires that a hazardous waste treatment, storage, or disposal facility can only be operated in accordance with a permit. Recognizing that EPA could not issue permits to all applicants before RCRA's effective date, Congress provided that a facility in existence as of November 19, 1980, could obtain "interim status", allowing it to continue operating until final action on its permit application. 42 U.S.C. § 6925(e).

To obtain interim status, a facility was required to file a Notification of Hazardous Waste Activity (Notification) with EPA by August 19, 1980, and a RCRA Part A permit application with EPA by November 19, 1980. 42 U.S.C. § 6925(e). The interim status facility must then comply with the standards set forth in 40 C.F.R. Part 265. 40 C.F.R. § 265.1(b). At a later date, a facility must file a RCRA Part B permit application to obtain a RCRA permit. Upon successful completion of the RCRA Part B permit process, a hazardous waste permit is issued, and the facility must comply with this permit and the regulatory standards set forth in 40 C.F.R. Part 264. 40 C.F.R. § 264.1(b).

In November 1984, the President signed into law the "Hazardous and Solid Waste Amendments of 1984" (HSWA). "HSWA was adopted in response to concerns about widespread groundwater contamination from interim status facilities." U.S. Environmental Protection Agency v. Environmental Waste Control,

917 F.2d 327, 330 (7th Cir. 1990), cert denied, 499 U.S. 975, 111 S.Ct. 1621 (1991). HSWA provided EPA with the authority to require corrective action at permitted facilities in Section 3004(u) of RCRA, 42 U.S.C. § 6924(u), and at interim status facilities in Section 3008(h) of RCRA, 42 U.S.C. § 6928(h). The purpose of Section 3008(h) of RCRA was to ensure that EPA would "have the power to deal directly with an ongoing environmental problem without awaiting issuance of a final permit." 5 U.S.C.C.A.N. 5682 (1984).

In July 1990, EPA proposed to promulgate detailed regulations regarding corrective action.[5] The rules were designed "to establish a comprehensive regulatory framework for implementing the Agency's corrective action program under RCRA." 55 Fed. Reg. at 30799. Although these rules were proposed under authority of the "permit" sections of RCRA, and were to be implemented through RCRA permits, EPA stated that the provisions "will provide guidelines for corrective action imposed through administrative orders under section 3008(h) of RCRA." Id. at 30802. This Federal Register Notice also proposed a new Subpart S to 40 C.F.R. Part 264, which defined requirements for conducting remedial investigations, evaluating potential

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[5]"Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities", 55 Fed. Reg. 30798 (July 27, 1990).

remedies, and selecting and implementing remedies at RCRA facilities.[6] 55 Fed. Reg. 30798.

On May 1, 1996, EPA published an Advanced Notice of Proposed Rulemaking for RCRA Corrective Action. 61 Fed. Reg. 19432 (May 1, 1996).[7] This Notice introduced "EPA's strategy for promulgation of corrective action regulations and requested public input on a variety of issues and concepts associated with corrective action." Id. at 19434.

IV. EPA HAS MET THE STATUTORY REQUIREMENTS FOR THE ISSUANCE OF THIS ORDER

Section 3008(h) of RCRA, 42 U.S.C. § 6928(h) provides the following:

> Whenever on the basis of any information the Administrator determines that there is or has been a release of hazardous waste into the environment from a facility authorized to operate under section 3005(e) [section 6925(e)] of this title, the Administrator may issue an order requiring corrective action or such other response measure as he deems necessary to protect human health or the environment. . . .

Therefore, to issue this Order, EPA must show the following:

(1) There is or has been a release

(2) into the environment;

(3) of hazardous waste;

(4) from a facility

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[6]Although EPA has finalized only a few sections of the 1990 proposal, the bulk of the proposal is routinely used as guidance during corrective action. Chemical Waste Management, Inc. v. U.S. Environmental Protection Agency, 873 F.2d 1477, 1484 (D.C. Cir. 1989).

[7]Corrective Action for Releases from Solid Waste Management Units at Hazardous Waste Management Facilities, 61 Fed. Reg. 19432 (May 1, 1996).

(5) authorized to operate under section 3005(e) of RCRA [interim status]; and

(6) corrective action or other response measures are necessary to protect human health or the environment.

40 C.F.R. § 24.17(a) requires that EPA show that each contested provision in the Order is supported by a preponderance of the evidence in the record. In its Answer, the Respondent disputed each of the above elements. However, in its Memorandum, the Respondent did not specifically challenge the first five elements. Because the Respondent specifically failed to address these issues in its Memorandum, it has waived its right to dispute these elements. 40 C.F.R. § 24.14(c); see FRCP 56(e); Section I, supra, at p. 2.

In fact, the contradictory nature of the Respondent's position becomes apparent when it stated in its Memorandum that "there may have been releases of these solvents to the environment" [Sparton Memorandum at p.3 (emphasis added)], but then included over 13 years of sampling data showing TCE releases to ground water. Sparton Memorandum, Attachment A, Table 2. Furthermore, the Respondent has previously admitted that the "contaminant release originated primarily from the solvent storage sump" at the facility. CMS Report at p. II-5 [AR at p. 005504].

As demonstrated below, EPA has met its burden of proof for each of the six elements necessary for a RCRA Section 3008(h) Order to be issued.

A. THERE IS OR HAS BEEN A RELEASE

EPA has defined release as "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, escaping, leaching, dumping, or disposing into the environment." Interpretation of Section 3008(h) of the Solid Waste Disposal Act, at pp. 4 - 5 (December 16, 1985) [Exhibit 4]; 61 Fed. Reg. at 19442. Furthermore, Section 3008(h) of RCRA applies to all releases of hazardous waste, including releases that occurred prior to the enactment of RCRA. In the Matter of Liquid Chemical Corporation, Docket No. RCRA-09-88-004, Final Decision at pp. 13 - 14 (August 15, 1989). This interpretation ensures that Section 3008(h) is implemented no less broadly than Section 3004(u), which requires corrective action for all releases of hazardous waste and constituents from any solid waste management unit "regardless of the time at which waste was placed in such unit." Section 3008(h) authority also extends to releases that have migrated off-site. Interpretation of Section 3008(h) of the Solid Waste Disposal Act, at p. 9. Exhibit 4. In addition, neither the timing nor the amount of the release are relevant. In the Matter of Sharon Steel Corporation, Docket No. RCRA-III-061-CA, Final Decision at pp. 22 (February 9, 1994).

The Respondent admitted that "contaminant release originated primarily from the solvent storage sump" at the facility. CMS Report at p. II-5 [AR at p. 005504]. Evidence of a release has

also been discussed in Section I, supra.[8] Therefore, EPA has proven the first element.

B. INTO THE ENVIRONMENT

The term "environment" has also never been defined under RCRA, but EPA takes a common sense approach. As EPA has stated, "[t]he authority conferred upon the Agency by [section 3008(h)] is a broad one. The Legislative History makes it clear that the term 'release' as it is used in this section is not limited to releases to ground water." 50 Fed. Reg. 28702, 28716 (July 15, 1985. Thus, the definition of "environment" includes "surface waters, groundwater, land surface or subsurface strata or air." Interpretation of Section 3008(h) of the Solid Waste Disposal Act at p. 5 [Exhibit 4]; 42 U.S.C. § 9601(8) (definition of environment under CERCLA). Here, the releases were to ground water and soil.

C. OF HAZARDOUS WASTE

The language of Section 3008(h) refers simply to "hazardous waste" rather than hazardous waste listed or identified under section 3001 [6921], as is found in other provisions of RCRA [e.g., Section 3004(v)]. EPA believes that this omission is deliberate, and that Congress intended that the broader statutory definition of hazardous waste would apply [Section 1004(5) of RCRA, 42 U.S.C. § 6903(5)], as opposed to the regulatory definition [40 C.F.R. Part 261]. Interpretation of Section 3008(h) of the Solid Waste Disposal Act at p. 6. Exhibit 4. The

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[8]See Exhibits 1 - 3 for specific evidence of releases.

term "hazardous waste" also includes those hazardous constituents found in 40 C.F.R. Part 261, Appendix VIII. Id. at pp. 6 - 7 [Exhibit 4]; United States v. Clow Water Systems, 701 F.Supp 1345, 1356 (S.D. Ohio 1988).

The Respondent's own analyses of ground water samples collected in January 1996, show that TCE contamination resulting from Facility operations ranges from 7,600 ppb at the Facility, 3,200 ppb near the center of the off-site contaminant plume, to less than 5 ppb at a distance of at least 1/2 mile from the Facility. Other hazardous wastes or hazardous waste constituents detected in the ground water include 1,1,1-trichloroethane, 1,1-dichoroethene, and tetrachloroethylene. 40 C.F.R. §§ 261.31, 261.33(f), and 40 C.F.R. Part 261, Appendix VIII. Exhibit 1. These same contaminants have also been detected by the Respondent in the soil. Exhibit 3. Furthermore, the Respondent has admitted that there is a release of hazardous waste constituents into the ground water. Respondent's Answer ¶ 14. Therefore, it is clear that the first three elements have been met, namely that trichloroethylene and other hazardous wastes and/or hazardous constituents have been released into the ground water and soil.

D. FROM A FACILITY

"Facility" is defined in 40 C.F.R. § 260.10 as:

> (1) All contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combinations of them).

> (2) For the purpose of implementing corrective action under § 264.101, all contiguous property under the control of the owner or operator seeking a permit under subtitle C of RCRA. This definition also applies to facilities implementing corrective action under RCRA Section 3008(h). (emphasis added)

The clear language of Section 3008(h) "authorizes corrective action for any release from a 'facility'. It does not require the Agency to find that a release originated in a discernable waste management unit." Interpretation of Section 3008(h) of the Solid Waste Disposal Act at p. 8 [Exhibit 4]; In the Matter of Liquid Chemical Corporation, Docket No. RCRA-09-88-004, Final Decision at p. 14; In the Matter of Solvay Animal Health, Inc., Docket No. VII-90-H-0001, Final Decision at p. 21 (April 22, 1991).

If one reviews Exhibits 2 and 5 (which were prepared by the Respondent), it is clear that the Respondent's site meets the definition of "facility", and the release occurred from the Sparton Facility.

E. AUTHORIZED TO OPERATE UNDER INTERIM STATUS

In order for the facility to qualify for interim status, a facility must: (1) have been in existence on November 19, 1980; (2) submitted a Notification of Hazardous Waste Activity (Notification) to EPA by August 19, 1980; and (3) submitted a RCRA Part A permit application to EPA by November 19, 1980. Interpretation of Section 3008(h) of the Solid Waste Disposal Act at p. 10. Exhibit 4.

The Respondent disputes that it was authorized to operate under interim status "because the information available to

Respondent is that hazardous wastes were neither treated, stored nor disposed of at the Plant after November 19, 1980." Respondent's Answer ¶ 16. Apparently, the basis of its claim is that "it has no record of hazardous waste being accumulated at the Plant for longer than ninety days after November 19, 1980." Id. at ¶ 5.

The Respondent submitted a Notification prior to August 19, 1980, and a RCRA Part A permit application prior to November 19, 1980. In these documents, the Respondent stated that it treated, stored, or disposed of hazardous waste.[9] [AR at p. 008435 and 008437].

Furthermore, from 1975 through August 1983, the Respondent stored hazardous waste in two surface impoundments, the "West Pond" (beginning in 1975) and the "East Pond" (beginning in 1977). CMS Report at p. II-1 [AR at p. 005500]. Storage is defined as the "holding of hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed of, or stored elsewhere." 40 C.F.R. § 260.10. There is no time limit proscribed to be considered a storage facility when storing hazardous waste in a surface impoundment. The less than 90 day accumulation period that the Respondent refers to only applies to generators who accumulate hazardous waste in containers or tanks

[9]For some unexplained reason, the Respondent disputes the characterization of those activities in the documents. Respondent's Answer ¶¶ 6 and 7. However, Richard D. Mico, a current officer of Sparton Technology, Inc. certified under penalty of perjury that the information was true, accurate, and complete.

for less than 90 days. It does not apply to surface impoundments. 40 C.F.R. § 262.34. In fact, in its closure plan for the two surface impoundments, the Respondent admitted that it operated four hazardous waste storage units, including two surface impoundments (ponds). [AR at p. 004352]. Despite this previous admission by the Respondent, the Respondent continues to assert that it did not store hazardous waste.[10]

Furthermore, because the two surface impoundments were not "clean closed"[11] [AR at p. 002718], the Respondent must provide the same level of post-closure care for the surface impoundments as one would for a landfill. 40 C.F.R. § 265.228(a)(2). Thus, the Facility is also considered a "disposal facility". 40 C.F.R. § 260.10.

Therefore, the Facility is a treatment, storage, or disposal facility because the Respondent stored and disposed of hazardous waste in surface impoundments before and after November 19, 1980, and met the other statutory requirements. Thus, the facility obtained interim status by operation of law. State of New Mexico v. Watkins, 969 F.2d 1122, 1130 (D.C. Cir. 1992).

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[10]40 C.F.R. § 24.04(c) provides that "the original of any pleading, letter, or other document . . . shall be signed by party filing or by his counsel or other representative. The signature constitutes a representation by the signer that he has read the pleading, letter, or other document, and to the best of his knowledge, information, and belief, the statements made therein are true, and that is not interposed for delay." (emphasis added).

[11]The clean closure requirements are set forth in 40 C.F.R. § 265.228(a)(1).

EPA has consistently interpreted the requirement that a facility be "authorized to operate under interim status" to mean that corrective action may be required under section 3008(h) whether a facility is operating "under interim status, is closing, or is closed under interim status, has lost interim status, or failed to properly obtain interim status." 55 Fed. Reg. at 30855. This policy furthers Congress's intent that hazardous waste management facilities conduct corrective actions regardless of whether they receive a permit (operating or post-closure) or not. Interpretation of Section 3008(h) of the Solid Waste Disposal Act at p. 11. Exhibit 4. Because the Facility lost interim status on June 30, 1987 [AR at p. 008444], corrective action must be imposed through a RCRA Section 3008(h) order.

F. CORRECTIVE ACTION OR OTHER RESPONSE MEASURES ARE NECESSARY TO PROTECT HUMAN HEALTH OR THE ENVIRONMENT

1. THE CONTAMINATED GROUND WATER PRESENTS A THREAT TO HUMAN HEALTH AND THE ENVIRONMENT

In order to establish that corrective action or other response measures are necessary to protect human health or the environment, EPA must show a present or potential threat posed by the release. Interpretation of Section 3008(h) of the Solid Waste Disposal Act at p. 13 (emphasis added). Exhibit 4.

As previously shown, hazardous waste/hazardous waste constituents have been released into the environment. Hazardous wastes/hazardous waste constituents are present in the soil beneath the Facility, and are present in an aquifer(s) in the

Santa Fe Group aquifer system for a distance of approximately 1/2 mile from the Facility. The ground water contains TCE at concentrations of 7,600 ppb beneath the Facility, and 3200 ppb near the center of the plume. In addition, significant concentrations of 1,1,1-trichloroethane, 1,1-dichloroethane, and tetrachloroethylene are also present in the ground water. Exhibit 1. The contaminant plume will continue to migrate and is likely to enter other areas of the Santa Fe Group aquifer system unless corrective action is taken.

The City of Albuquerque and other nearby municipalities rely on the Santa Fe Group aquifer system as their sole source of drinking water. The TCE plume is also located in an area the City of Albuquerque had intended to use as a future well site. Resolution of the Albuquerque City Council [Exhibit 6]; Affidavit of Norman Gaume [Exhibit 7]. For example, a public water system well, New Mexico Utilities Well No. 2, withdraws ground water from an aquifer(s) in the Santa Fe Group, and is only two (2) miles downgradient from the leading edge of the ground water contaminant plume. The contaminate plume is moving generally in a northwesterly direction towards the well. The continued presence of the contaminant plume emanating from the Sparton facility also prevents further utilization of this valuable resource in the immediate area. Id.

Maximum Contaminant Levels (MCLs), established by EPA regulations promulgated under the SDWA, are the maximum allowable concentrations of a specific contaminant in water supplied by

public water systems. 42 U.S.C. § 300f(3). MCLs are health based standards that EPA has determined that are protective of human health. See 55 Fed. Reg. at 30814. The MCLs are codified at 40 C.F.R. § 141.61(a). Table 1 lists some of the ground water contaminants identified in the ground water and the corresponding MCL.

TABLE 1 MAXIMUM CONTAMINANT LEVELS (MCLs)	
Contaminant	**MCL** **µg/l (ppb)**
Trichloroethene	5
1,1,1-Trichloroethane	200
1,1-Dichloroethylene	7
Tetrachloroethylene	5

If one compares the ground water contaminant concentrations in Exhibit 1 to the corresponding MCLs identified in Table 1, it is clear that concentrations greatly exceed the MCLs. For example, the TCE concentration in the off-site ground water (3200 ppb) is over 600 times the corresponding MCL (5 ppb). Therefore, since the contaminant concentrations in the aquifer exceed the limits established by the Safe Drinking Water Act, there is a potential threat to human health. State of New York v. Shore Realty Corporation, 759 F.2d 1032, 1038, fn. 4 (2nd Cir. 1985) (release to ground water posed threat to human health even if drinking water supplies not threatened).

Furthermore, the proposed 40 C.F.R. § 264.525(d)(1)(iv) provides that in determining the cleanup levels that are protective of human health for a potential source of drinking water, EPA must consider MCLs in establishing cleanup standards. 55 Fed. Reg. at 30878. If there wasn't a potential threat to human health and the environment due to the contamination of a potential source of drinking water, one wouldn't establish cleanup levels for the aquifer. Id. at 30804. Therefore, it is clear that a release to a potential source of drinking water presents a potential threat to human health.

The ground water contamination also poses a threat to the environment. The definition of "environment" includes ground water. Interpretation of Section 3008(h) of the Solid Waste Disposal Act at p. 5 [Exhibit 4]; 42 U.S.C. § 9601(8). Ground water, especially a drinking water aquifer, is also considered a natural resource. See 42 U.S.C. § 9601(16). In addition, the State of New Mexico defines "water pollution" as:

> introducing or permitting the introduction into water[12], either directly or indirectly, of one or more . . . contaminants in such quantity and in such durations as may with reasonable probability . . . unreasonably interfere with the public welfare or the use of property.

NMSA § 74-6-2.A (1996). The Respondent not only threatened, but interfered with the public welfare and the use of the ground water by contaminating the drinking water aquifer. Ground water

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[12]The definition of "water" includes ground water. NMSA § 74-6-2.G (1996).

is also protected as a natural resource under 20 NMAC 6.2.3101 [cited in FDRTC at p. 36 (AR at p. 008642)].

Furthermore, the State of New Mexico defines "substantial adverse environmental impact" as "an act or omission of the violator . . . that amounts to more than ten thousand dollars ($10,000) damage or mitigation costs to . . . ground water". NMSA § 74-6-2.O. The TCE plume (which covers approximately 90 acres) is in the Santa Fe Group aquifer system, which the City of Albuquerque and other nearby municipalities rely on as the sole sources of drinking water. The TCE plume is also located in an area the City of Albuquerque had intended to use as a future well site. Resolution of the Albuquerque City Council [Exhibit 6]; Affidavit of Norman Gaume [Exhibit 7]. Therefore, it appears that the TCE plume has had a "substantial adverse environmental impact", and that the environment has been harmed.

The Respondent has cited EPA's "Proposed Guidelines for Ecological Risk Assessment" [61 Fed. Reg. 47552 (September 9, 1996)] as support for its proposition that corrective action is not required for contaminated ground water unless it alters an ecological system. Sparton Memorandum at p. 6. Since EPA has established above that there is a risk to human health and the environment from the ground water contamination, this statement is irrelevant. Also, the premise of this statement is incorrect, because an "ecological risk assessment provides only a portion of the information required to make risk management decisions." 61 Fed. Reg. 47552, 47559 (September 9, 1996). Therefore, it is

only one item that is considered in the remedy selection process. In addition, the Respondent makes the statement that "EPA has recently indicated that impacts to a portion of the environment do not necessarily require a response unless that impact alters an ecological system", citing page 47557 of the Federal Register as support. However, this page is merely an introduction to the ecological risk assessment process. The Respondent's statement is unsupported by any information or implied meaning on this page. Finally, EPA has already shown above that the ground water has not only been threatened, but a substantial adverse environmental impact has occurred because of the contamination emanating from the Respondent's facility.

2. PROTECTION OF GROUND WATER SHOULD BE BASED ON THE HIGHEST POTENTIAL BENEFICIAL USE OF THE GROUND WATER

In order to protect human health, and to protect ground water as a natural resource (protection of the environment), the protection of ground water from threats should be based on its highest beneficial use to which the ground water can presently or potentially be put to use. 55 Fed. Reg. at 30804. Therefore, the presence of the contaminant plume in a potential drinking water aquifer presents a risk to human health and the environment. See discussion at Section IV.F.1 above.

However, the Respondent alleges that according to reports by Mr. Pierce Chandler and Mr. W. Peter Balleau, there is no threat to human health because there is no current or planned use of the

aquifer.[13] Sparton Memorandum, Attachments A and B. Mr. Balleau also contends that the ground water is unavailable for public water supply as a result of site conditions at Sparton, and that there is more than an adequate amount of ground water available for drinking water elsewhere in the Albuquerque valley. Sparton Memorandum, Attachment B, at pp. 5 and 7. The Respondent also cites Exhibit D as support for its claim that the President of New Mexico Utilities has no plans to use the impacted ground water.[14] Sparton Memorandum at p. 7, fn. 2. However, this Exhibit was not filed with the Brief, and therefore any reference to this Exhibit should be stricken.[15]

However, the City of Albuquerque strongly contradicts the Respondent's allegations. The Albuquerque City Council has passed a resolution which states in part:

> Whereas, the hazardous wastes emanating from the Sparton site threaten to contaminate a unique hydrogeological structure known as a "recharge window";[16] and

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[13]Neither Mr. Chandler or Mr. Balleau address potential risk to the environment.

[14]The obvious reason for this statement is that New Mexico Utilities would have build a treatment facility to treat the ground water below the MCLs before it could be used.

[15]When the Respondent's Memorandum was brought to the undersigned for filing (because the Regional Hearing Clerk was absent), I noticed that Exhibit D was missing. I informed Mr. Harris' paralegal (who brought the Memorandum to be filed) of this, and was told by her that the Exhibit would be added later. Over 20 days have passed since the Memorandum has been filed, and the Exhibit has not yet been submitted.

[16]A recharge window is a relatively small area of maximum recharge potential between the surface and the aquifer.

> Whereas, the aquifer impacted and endangered by the Sparton contamination is master planned as the location of the Corrales Trunk Primary Well Field and as such is a critical resource for the City of Albuquerque; and
>
> Whereas, the Groundwater Protection Policy and Action Plan adopted by the City designates the area impacted and endangered by the Sparton contamination as a critical area for groundwater quality protection; and
>
> Whereas, the mission of the Groundwater Protection Policy and Action Plan adopted by the City is to ensure the quality of our groundwater resources so that the public health, quality of life, and economic vitality of this and future generations are not diminished;
>
> * * * *
>
> The City finds:
>
> * * * *
>
> That the City has a compelling interest in protecting the health, safety, and welfare of its citizens, including the vigorous protection of the City's limited groundwater resources.
>
> That the groundwater and recharge window in the vicinity of the Sparton facility comprises a valuable resource for the City, which the City intends to develop and utilize.
>
> * * * *
>
> The Public Works Department and Environmental Health Department shall take programmatic action to determine the best uses of the aquifer and recharge window in the vicinity of the Sparton facility.

Exhibit 6.

A more detailed explanation of the City's position and a response to Mr. Balleau's report is set forth in the Affidavit of Norman Gaume, the Water Resources Manager for the City of Albuquerque. Exhibit 7.

Mr. Chandler also cited modeling that showed that the plume's continued migration would not affect drinking water at

the New Mexico Utility well. However, Mr. Chandler did not include the modeling with his report. Sparton Memorandum, Attachment A at pp. 32 - 33. Furthermore, EPA has previously reviewed the modeling submitted by the Respondent, and determined that it was unlikely to be of any use in predicting the fate and transport of the contaminant plume. Technical Review, Final Corrective Measures Study Report dated June 20, 1996, at pp. 16 - 19 [AR at pp. 008383 - 008385]; See the Report of Richard H. Kuhlthau for a further discussion of this issue [Exhibit 8].[17]

3. EPA DID CHALLENGE THE FINDINGS OF THE CMS REPORT

Furthermore, contrary to the Respondent's statement, EPA did challenge the Respondent's risk assessment and provided a factual basis for its finding regarding the threat to human health. In EPA comments on Sparton's Final CMS Report, EPA stated the following:

> On pages III-63 to III-69, Sparton has attempted to demonstrate, through perceived restrictions, why there is not a reasonable likelihood that the ground water would be used as a future source of drinking water. However, Sparton's discussion concerning whether the City of Albuquerque could construct a drinking water well in the New Mexico Utilities service area is irrelevant. Ground water is a critical natural resource for the State of New Mexico. Ground water is currently the sole source of drinking water in the Albuquerque area, and ground water will remain an integral part of the drinking water supply even if other sources of drinking water are obtained. Thus, it is EPA's intent to make the ground water available to all persons, public and private, regardless of the boundaries of the current service area.
>
> . . . Furthermore, Sparton failed to mention that New Mexico Utilities previously obtained approval from the State

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[17]The "Reports" attached as Exhibits to EPA's Brief are actually "Declarations" as provided in 28 U.S.C. § 1746.

Engineer's Office to drill a drinking water well near the Sparton facility.

Technical Review, Final Corrective Measures Study Report at pp. 11 - 12 (June 20, 1996) [AR at pp. 008377 - 78].

The FDRTC document (which was incorporated by reference into the Order), also identified the contaminated drinking water aquifer as presenting a threat to human health, and identified the MCLs as a cleanup level that was protective of human health. FDRTC at p. 17 [AR at p. 008623]; see Initial Administrative Order, Section IV, ¶¶ 13 - 14.

Since EPA has established that there is an actual or potential threat to human health and the environment to a potential source of drinking water, the next step is to determine how to protect human health and the environment. EPA has stated that "potentially drinkable ground water [should] "be cleaned up to levels safe for drinking [MCLs] throughout the contaminant plume, regardless of whether the water was in fact being consumed." 55 Fed. Reg. at 30804.

In order to determine the appropriate corrective action to protect human health and the environment from this threat, EPA used four remedy threshold criteria, five balancing criteria, and the two modifying criteria. This process is discussed below.

4. THE REMEDY SELECTED BY EPA PROTECTS HUMAN HEALTH AND THE ENVIRONMENT

The general goal for remedy selection is that "remedies should be protective of human health and the environment, and maintain protection over time." 61 Fed. Reg. at 19448. In order

to meet these remedial goals, one must first determine the expectations and/or objectives for the remedy. The expectations which are appropriate for the Sparton site, include:

> EPA expects to return usable groundwaters to their maximum beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. . . EPA also expects to control or eliminate surface and subsurface sources of groundwater contamination.

61 Fed. Reg. at 19448; see 40 C.F.R. § 300.430(a)(1)(iii)(F).

EPA also established the following corrective action objectives as protective of human health and the environment at the Sparton site:

> (1) prevent further migration of the contaminant plume; (2) restore the contaminated aquifer to the more stringent of Federal or State standards; and (3) reduce the quantity of source material in the soil or ground water, to the extent practicable, to minimize further release of contaminants to the surrounding ground water, and to ensure no further contaminant migration to the ground water above the existing cleanup goals established for ground water.

FDRTC at p. 18 [AR at p. 008624].

These objectives are protective of human health and the environment because: (1) preventing further migration of the contaminant plume prevents contamination of the unaffected areas of the aquifer(s), a potential source of drinking water and a valuable natural resource; (2) restoring the contaminated aquifer to MCLs protects human health by returning usable ground water to a safe level for drinking; and (3) reducing the amount of source material protects human health and the environment by preventing further contamination.

As required by the AOC, the Respondent set forth a number of corrective measure alternatives in its Final CMS Report. These individual corrective measure alternatives were combined and renumbered in the FDRTC to present seven alternatives for addressing the release of hazardous waste and hazardous waste constituents into the soil and ground water. FDRTC at pp. 18 - 19 [AR at pp. 0008624 - 25]. These alternatives were evaluated against the nine criteria outlined in the Guidance on RCRA Corrective Action Decision Documents, Office of Solid Waste and Emergency Response (OSWER) Directive 9902.6 (April 29, 1991)[18] [AR at p. 006137]. The OSWER directive identified four remedy threshold criteria and five balancing criteria. The four threshold criteria that all remedies generally are required to meet are:

(1) be protective of human health and the environment;

(2) attain media cleanup standards;

(3) control the source(s) of releases so as to reduce or eliminate, to the extent practicable, further releases of hazardous waste (including hazardous waste constituents) that might pose threats to human health and the environment; and

(4) comply with applicable standards for waste management.

These threshold criteria were established to EPA in order to select remedies that are protective of human health and the

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[18]These are the same criteria set forth in the Proposed Rule for Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities, 55 Fed. Reg. at 30823 - 30824, and the Advanced Notice of Proposed Rulemaking for Corrective Action for Releases from Solid Waste Management Units at Hazardous Waste Management Facilities, 61 Fed. Reg. at 19449.

environment, and to provide "goals for cleanup and screening tools for potential remedies." 61 Fed. Reg. at 19449. If a remedy meets the four threshold criteria, it should then be evaluated using the following five balancing criteria:

(1) long-term reliability and effectiveness;

(2) reduction of toxicity, mobility, or volume of wastes;

(3) short term effectiveness;

(4) implementability; and

(5) cost.

These five balancing criteria "represent an appropriate combination of technical measures and management controls for addressing environmental problems". 55 Fed. Reg. at 30824. These balancing criteria are not ranked in terms of relative importance. Any one of the balancing criteria might prove to be most important at a particular site. 61 Fed. Reg. at 19449.

In addition, EPA considered two modifying criteria:

(1) state acceptance; and

(2) community acceptance.

These two items were added to recognize the State's role in environmental protection, and that the local community is the principal beneficiary of the remedial actions. FDRTC at pp. 40 - 41 [AR at pp. 008646 - 47].

Using the criteria set forth above, EPA selected Alternative 4 - Expanded Ground Water Extraction and Soil Vapor Extraction. The remedy consists of:

1. Continued operation of the existing on-site ground water extraction and treatment system;

2. Further characterization of the extent of contamination in the ground water and the vadose zone[19];

3. Installation and operation of additional ground water extraction well(s); and

4. Installation and operation of an on-site soil vapor extraction (SVE) system.

[AR at p. 008646].

EPA's detailed justification for selecting Alternative 4 and explanation why the implementation of Alternative 4 is necessary to protect human health and the environment is set forth in the FDRTC at pages 34 - 46 [AR at pp. 008640 - 008652], and incorporated by reference into this brief.

As shown above, EPA followed Agency guidance and the proposed Subpart S rules in making its remedy selection. In order for the Presiding Officer to depart from Agency guidance and the proposed Subpart S rules, it must provide a "reasoned justification" for doing so. In Re: Delco Electronic Corporation, RCRA Appeal No. 93-10, slip op. at p. 13 (September 28, 1994). Although the Respondent challenged EPA's evaluation of the nine remedy selection criteria in its Respondent's Answer, it failed to do so in its Memorandum. Because the Respondent failed to clearly state its position on these issues in its Memorandum, the Respondent has waived its right to pursue these issues. 40 C.F.R. § 24.14(c); see FRCP 56(e).

Therefore, because EPA has shown by a preponderance of the evidence that the proposed remedy is necessary to protect human

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[19]The vadose zone is the unsaturated soil above the water table.

health and the environment, the Presiding Officer should recommend that the remedy in be implemented in accordance with the provisions of the Order.

V. RESPONDENT'S PROPOSED REMEDY DOES NOT PROTECT HUMAN HEALTH AND THE ENVIRONMENT

When EPA made its remedy selection in June 1996, Sparton had not proposed an off-site containment well to contain the plume. The Respondent's recommendation, as set forth in its CMS Report, and identified as Alternative 2 in the FDRTC document, was as follows:

> 1. Installation of five additional ground water monitoring wells to confirm the conclusions in the CMS Report about plume location and movement;
>
> 2. A phased approach to soil vapor extraction, involving the implementation of a testing program in the source area. If, as expected, that testing establishes concentrations above the 10 ppmV threshold, no further action would be required;[20]
>
> 3. Converting an on-site ground water monitoring well (MW-32) to a ground water extraction well, to enhance the current on-site ground water recovery system; and
>
> 4. An annual evaluation to determine the need for any further corrective measures studies, based on changes in land use.

CMS Report at pp. VIII-2 - VIII-4 [AR at pp. 005693 - 95].

Alternative 2 would not be protective of human health and the environment because the contaminant plume would continue to migrate, contaminating more of the aquifer each day, and ruining a valuable natural resource. The ground water would also remain

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[20]Obviously, the Respondent's prediction was erroneous, because the soil vapor results greatly exceeded the 10 ppmV threshold. Exhibit 3.

above the MCLs, thus posing a potential threat to human health. The institutional controls proposed to address the off-site contamination are insufficient to protect human health and the environment. The proposed controls consisted of reviewing permit applications for private or public drinking water wells in the area on an annual basis. This would be accomplished by giving notice to the State Engineer's Office that the Respondent should be notified if any well drilling applications are received. The Respondent would also participate in any permit proceedings related to the application. CMS Report at p. VIII-3 [AR at p. 005694].

Using the remedy selection criteria set forth in Section IV.F.4 above, EPA determined that Alternative 2 would be of limited use or unable to meet the media cleanup standards because it would not address the off-site ground water contamination. It would only recover contaminants from beneath the facility. FDRTC at p. 36 [AR at p. 008642]. Therefore, it would not be protective of human health and the environment because the contaminant plume would continue to migrate, and the contaminant concentrations in the ground water would remain above the MCLs. Because it was not protective of human health and the environment by not meeting the media cleanup standard of the remedy threshold criteria, EPA did not have to evaluate Alternative 2 using the five balancing criteria. In Re: Delco Electronics Company., RCRA Appeal No. 93-10, slip op. at p. 13; 55 Fed. Reg. at 30823; 61 Fed. Reg. at 19449. EPA nevertheless evaluated Alternative 2

using the five balancing criteria. Alternative 2 would also not provide the best long term approach for protection of human health and the environment [balancing criteria no. 1], because it only relied on institutional controls to address the off-site contamination. Alternative 2 would also achieve the least reduction in ground water contamination [balancing criteria no. 3] by addressing only the on-site contaminated ground water. FDRTC at pp. 37 - 38 and 41 - 42 [AR at pp. 008643 - 44 and 008647 - 48].

Furthermore, NMED, the City of Albuquerque, the New Mexico Office of the Natural Resource Trustee, the County of Bernalillo, and the citizens at the public hearing all supported an expedited plan for restoring the contaminated groundwater, with specific recommendations for Alternatives 4 and 5. FDRTC at pp. 40 - 41 [AR at pp. 008646 - 47].

After EPA selected the remedy in the FDRTC, the Respondent proposed a one-well containment system to NMED for preventing further movement of the contamination. Sparton Memorandum at p. 9. However, this proposal has never been formally presented to EPA until EPA received the Respondent's Memorandum. The Respondent has also proposed a soil vapor extraction (SVE) system, and to increase its on-site ground water containment program to 20 gallons per minute. Sparton Memorandum, Attachment E. No other details were provided by Sparton in its Memorandum.

The Respondent's proposal still does not protect human health and the environment because the continued presence of the

contaminant plume above the MCLs in the drinking water aquifer presents a potential threat to human health, and continues to pose a threat to the environment due to the contamination of a valuable natural resource. The Respondent's proposal is also dependent upon obtaining authorization to discharge the recovered and treated ground water into the Calibacillas Arroyo[21]. Sparton Memorandum at p. 9. If this authorization is not received, the Respondent will not install a containment well.

In order for the Presiding Officer to recommend to the Regional Administrator that the Respondent's proposal should be implemented as part of this Order, the Presiding Officer must, to the extent appropriate, follow the selection criteria set forth in the OSWER Directive 9902.6 and the Federal Register to determine whether the remedy protects human health and the environment. In Re: Delco Electronics Corporation, RCRA Appeal No. 93-10, slip op. at p. 13 ("unexplained deviation from the approach to remedy selection outlined in a proposed Agency rule would be unacceptable."). The Respondent has failed to provide such an analysis in its Memorandum.

Even in the absence of such an analysis by the Respondent, it is clear that containment of the contaminant plume will not reduce the contamination below MCLs, which EPA has shown is necessary to protect human health and the environment. Therefore, the Respondent' remedy cannot be considered for implementation. However, EPA, following Agency guidance and the

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[21]An arroyo is a watercourse in an arid region.

proposed rules in making its remedy selection, has demonstrated by a preponderance of the evidence, that EPA's selected remedy best protects human health and the environment.

Furthermore, the Respondent seeks to have the cost of injection wells be the determining factor in the remedy selection. Sparton Memorandum at p. 11. However, cost is only one factor, because RCRA's overriding mandate is protection of human health and the environment. 55 Fed. Reg. at 30825. In addition, the use of injection wells only relates to disposal of the treated ground water; it does not relate to restoration of the aquifer, which is the central portion of EPA's remedy. Also, as explained in Section VII, infra, the Order does not state that injection wells will be used for the disposal of the treated ground water. This is EPA's preferred method because it is most likely to conserve this valuable natural resource, but the final disposal method will be determined at a later date.

VI. STRUCTURE AND REQUIREMENTS OF ORDER

A. CORRECTIVE MEASURES IMPLEMENTATION

Since the RFI and CMS has been completed, the final step in the corrective action process is corrective measures implementation (CMI). The corrective action sought in the Order is set forth generally in Section VII of the Order - Work to be Performed, and more specifically in the Corrective Action Plan (CAP) [Attachment 1 to the Order]. The CAP implements the remedy selected by EPA in FDRTC document. The remedy consists of:

1. Continued operation of the existing on-site ground water extraction and treatment system, and continued monitoring of the existing ground water monitoring wells;

2. Further characterization of the extent of contamination in the ground water and the vadose zone;

3. Installation and operation of an on-site soil vapor extraction (SVE) system; and

4. Installation and operation of additional ground water extraction well(s); and

The remedy is divided into the following five tasks:

Task I - Operation of the existing on-site ground water extraction and treatment system, and continued monitoring of existing ground water monitoring wells.

Task II - The submission of a Health and Safety Plan.

Task III - The submission of a Public Involvement Plan.

Task IV - Soil Vapor Extraction Corrective Measure. This task implements the soil vapor extraction system. In order to properly design and implement the system, the Respondent must submit a vadose zone investigation workplan, a vadose zone investigation report, design plans and specifications, a construction workplan, and an operation and maintenance plan. Reports are also required to ensure that the SVE system was properly constructed and when the SVE system has achieved its remediation goals.

Task V - Ground Water Extraction Corrective Measure. This task implements the ground water recovery and treatment system. In order to properly design and implement the system, the Respondent must submit a ground water investigation workplan, a ground water investigation report, design plans and specifications, a construction workplan, and an operation and maintenance plan. Reports are also required to ensure that the ground water recovery and treatment system was properly constructed and when the system has achieved its remediation goals.

Tasks I - III are self evident and need no further explanation. Task IV consists of the installation of a soil vapor extraction (SVE) system. Under Task IV, SVE wells would be installed in the soil above the water table to create a partial

vacuum in the soil. This vacuum produces a flow of air which vaporizes the volatile organic compounds from the surrounding soil. The air and vapor mixture is then drawn into SVE wells and collected at the surface for treatment before venting to the atmosphere. FDRTC at p. 22 [AR at p. 008628]. The Respondent supports the implementation of an SVE system. Sparton Memorandum, Attachment E, at p. 4.

Task V is the Ground Water Extraction Corrective Measure. As part of this Task, additional ground water monitoring wells will be installed to further characterize the extent of contamination in the ground water. Data collected from these monitoring wells will also be used to design and evaluate the performance of the ground water extraction system. CAP, Tasks V.A and V.B.1, at pp. 22 and 28 - 29.

As recommended in the May 1, 1996 Federal Register Notice[22] EPA is using a phased approach for the Ground Water Extraction Corrective Measure. The Order requires the Respondent to conduct an aquifer test to collect data "to design and install [an off-site] ground water extraction system to prevent further migration of the contaminant plume." CAP, Tasks V.A and V.B.1.d, at pp. 22 and 29; FDRTC at p. 42 [AR at p. 008468][23]. The Order also requires the installation of ground water extraction wells to contain the contaminant plume. CAP, Task V.B; FDRTC at pp. 42 -

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[22]61 Fed. Reg. at 19441.

[23]Citations to the FDRTC document and the Administrative Record have been provided for the Presiding Officer's convenience to show the relationship between the FDRTC document and the CAP.

43 [AR at pp. 008648 - 49]. EPA used three wells for cost estimates, but the actual number of wells will be determined later based on the aquifer test and other data. FDRTC at p. 42 [AR at p. 008468]. The ground water extraction system will be monitored for a period of time to determine its effectiveness. Additional on-site extraction wells will also be installed to prevent off-site migration of the plume.[24] FDRTC at p. 43 [AR at pp. 008649]. EPA has previously determined that the current on-site ground water extraction system is not adequate to contain the plume on-site. Technical Review, Report on the Effectiveness of the Ground Water Recovery System in the Upper Flow Zone (June 20, 1996) [AR at p. 008248]. NMED concurs in this assessment. Letter to Samuel Coleman, EPA from Ed Kelly, NMED, dated November 18, 1996 [Exhibit 9].

After installation and operation of the initial extraction wells, additional extraction wells will be added as necessary to maximize the removal of contaminants and restore the aquifer for use as a source of drinking water. CAP, Task V.D.8 at p. 37; FDRTC at pp. 43 [AR at pp. 008649].

B. THE REQUIREMENTS OF THE ORDER ARE NECESSARY TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT

The Respondent has alleged that the Order contains numerous requirements that are not necessary to protect human health or the environment, and that EPA has provided no statutory or

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[24]The Order does not make any distinction between the installation of either on-site or off-site ground water extraction wells. They will be submitted in the same plans.

regulatory authority for the inclusion of such provisions. Sparton Memorandum at 12. The Respondent did not cite any authority in its Memorandum as to why each of these requirements are not necessary to protect human health and the environment. Therefore, this is an unsupported blanket allegation.

This same issue was addressed In the Matter of: Amoco Oil Company, Docket No. RCRA-3008(h)-VIII-95-02, Final Decision (February 23, 1996). The Court held that:

> Section 3008(h)(1) clearly states . . . "the Administrator may issue an order requiring corrective action or such other response measure as he deems necessary to protect human health and the environment . . . ." The focus of this provision is on the order as a whole, not each and every provision (emphasis in original).

Id. at 23.

The legislative history for Section 3008(h) makes it clear that EPA is given "considerable discretion to craft the contents of the order." 5 U.S.C.C.A.N. 5682 (1984). The portions of the Order objected to are as follows:

> Section III.2 - 5 - Binding Effect of Order, Provide Copies of Order to Contractors, Transfer of Ownership;
>
> Section VI - Project Manager;
>
> Section VII.5 - Public Involvement Plan;
>
> Section VIII.3, 4, 5, 6, 7, and 8 - Providing Reports and Samples to EPA, Review of Reports, Noncompliance with Plans, Additional Work;
>
> Section IX.1 - 2, 5 - Facility Access and Record Retention;
>
> Section X.1, 4 - Submit Results of Sampling to EPA and Split Sampling;
>
> Section XI - Quality Assurance;

Section XII - Dispute Resolution;

Section XIII.6 and 7 - Reservation of Rights;

Section XIV - Financial Assurance;

Section XV - Indemnification of the United States;

Section XX.1 - Subsequent Modification of Order;

Section XXI - Final Agency Action;

Section XXIII - Statement of Severability;

Section XXIV - Participation in Community Relations Activities; and

Section XXVI.1 - Termination and Satisfaction;

EPA has already established that the corrective action proposed in this Order is necessary to protect human health. The provisions in the Order are reasonable exercises of EPA's authority to implement the corrective action program under Section 3008(h). See In the Matter of Solvay Animal Health, Inc., Docket No. VII-90-H-001, Final Decision at p. 30. The provisions objected to by the Respondent are included in the Order to ensure that: (1) proper and effective EPA oversight and decision making can occur in a timely manner; (2) emergency situations can be addressed; (3) the ability to respond to new information is maintained; (4) compliance with other related requirements, such as public involvement, is achieved; and (5) the effective implementation of the key components of the order (document certification, sampling and analysis, quality assurance, etc.). In objecting to these provisions, the Respondent just made a blanket allegation without any support. Therefore, EPA does not have to separately justify each provision

of the Order. In the Matter of: Amoco Oil Company, Docket No. RCRA-3008(h)-VIII-95-02, Final Decision at p.23.[25] In addition, dispute resolution and final agency action have been addressed in Section VI.E below.

In fact, the absurdity of the Respondent's position is demonstrated by the fact that the Respondent has included a number of the so-called "ultra vires" provisions in its own proposed Order (Sparton Memorandum, Attachment E). The provisions that Sparton has included in its Order, but objects to as being unnecessary to protect human health or the environment are as follows (the section numbers are the section numbers contained in EPA's Order):

A. Section III.2 (Binding Effect of Order);

B. Section VI (Project Manager);

C. Section VIII.6 (Providing copies of deliverables to EPA Project Manager and NMED);

D. Section X.1 and 4. (Sampling and Document Availability);

E. Section XI (Quality Assurance); and

F. Section XX.1 (Subsequent Modification of Order).

Therefore, all of the challenged portions of the Order should remain in the Order.

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[25] See In the Matter of Solvay Animal Health, Inc., Docket No. VII-90-H-001, Final Decision at pp. 33 - 46 for a discussion of many of the same sections set forth above. Financial assurance is addressed in 55 Fed. Reg. at 30855.

C. THE METHOD OF DISPOSAL OF THE TREATED GROUND WATER AND THE NUMBER OF MONITORING WELLS NECESSARY TO CHARACTERIZE THE PLUME AND TO DESIGN AND EVALUATE THE PERFORMANCE OF THE GROUND WATER EXTRACTION SYSTEM SHOULD BE LEFT TO THE TECHNICAL EXPERTISE OF EPA

The Respondent claims that the Order requires reinjection of the treated ground water. Sparton Memorandum at 11. However, the Order does not identify a specific option for disposal of the treated ground water. CAP, Task V.B.1.f. at p. 29.

Two options were considered in the FDRTC: reinjection back into the aquifer or reuse at the surface. These two options were evaluated because they involved conservation of the ground water. Although reinjection was the preferred option, EPA stated that it would explore the reuse scenario during the design phase of the ground water extraction system. FDRTC at pages 45 - 46 [AR at pp. 008651 - 52]. CAP, Task V.B.1.f. at p. 29.

The Respondent has set forth an alternative to ground water injection, discharge to the Calabacillas Arroyo. EPA had asked the Respondent to address this method of disposal in its Final CMS Report. The Respondent stated the following:

> EPA also directed that surficial recharge in the Calabacillas Arroyo be considered (U.S. EPA, 1996). A "Calabacillas Recharge Window" was described by Mr. Steve Hanson of the USDOI Bureau of Reclamation (BuRec) during the public meeting on February 1, 1996, and in a subsequent memorandum furnished to EPA. The memorandum provided little meaningful or area-specific information on hydrogeological features to allow evaluation of this alternative. The memorandum further referenced several reports published through 1996 (by author and date); however, review of these referenced reports did not provide any specific information. In lieu of any specific hydrogeological data, <u>this alternative is speculative at best</u> and probably is comparable to injection wells and infiltration galleries.

Final CMS Report at page VII-35 [AR at p. 005647] (emphasis added).

Therefore, at the time EPA selected the remedy, the Respondent had rejected discharge into the Calabacillas Arroyo as an option. The Respondent previously preferred discharge into the Rio Grande as an option. Final CMS Report at page VII-36 [AR at p. 005648]. However, the Respondent is no longer supporting discharge into the Rio Grande as an option.

Because the Order does not contain a specific option for disposal, the Presiding Officer should not recommend that a specific disposal method be implemented or eliminated. This is the type of technical decision that should best be left to the technical expertise of EPA. In the Matter of General Electric Company, RCRA Appeal No. 91-7, slip op. at 16 (November 6, 1992); In Re: Chemical Waste Management of Indiana, Inc., RCRA Appeal Nos. 95-2 and 95-3, Lexis p. 16 (June 29, 1995); In Re: Envirotech, L.P., UIC Appeal Nos. 95-2 through 95-37, slip op. at 25 (February 15, 1996).

Furthermore, discharge into the Calibacillas Arroyo involves the issuance of an NPDES permit, and authorization from the Albuquerque Metro Area Flood Control District (AMAFCA), the City of Albuquerque, and possibly NMED. The Respondent applied for an NPDES permit on January 31, 1997. The NPDES permit process also involves public review and comment period. If the Presiding Officer orders that the water should be discharged into the

Calibacillas Arroyo, and the authorizations are not received,[26] no cleanup will take place. Furthermore, requiring discharge into the Arroyo as part of this order would in essence bind EPA into issuing the Respondent an NPDES permit no matter what the outcome of the permit evaluation process and public comment.

In summary, no final decision as to the method of the disposal of the treated ground water has been made. Reinjection, discharge into the Calabacillas Arroyo, or any other option that the Respondent submits that is "consistent with the criteria in the FDRTC document for conservation of the ground water resource" will be considered. CAP, Task V.B.1.f. at p. 29. This decision should be left to the technical expertise of EPA. In the Matter of General Electric Company, RCRA Appeal No. 91-7, slip op. at 16; In Re: Chemical Waste Management of Indiana, Inc., RCRA Appeal Nos. 95-2 and 95-3, Lexis p. 16; In Re: Envirotech, L.P., UIC Appeal Nos. 95-2 through 95-37, slip op. at 25.

The Respondent also asserts that the Order requires twenty wells to adequately characterize the plume. Sparton Memorandum at p. 9. Once again, the Order does not require a specific number of wells. Twenty wells were used in the FDRTC document for cost purposes, but the FDRTC document stated that the actual number will be determined during site characterization. FDRTC at p. 42 [AR at p. 008648]. The additional ground water monitoring wells will be installed to further characterize the extent of

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[26]This statement in no way implies that an NPDES permit will or will not be issued. The permit application will be judged on its own merits.

contamination in the ground water, and the data used to design and evaluate the performance of the ground water extraction system. CAP, Tasks V.A and V.B.1, at pp. 22 and 28 - 29. The number of wells and their location should be left to the technical expertise of EPA. In the Matter of General Electric Company, RCRA Appeal No. 91-7, slip op. at 16; In Re: Chemical Waste Management of Indiana, Inc., RCRA Appeal Nos. 95-2 and 95-3, Lexis p. 16; In Re: Envirotech, L.P., UIC Appeal Nos. 95-2 through 95-37, slip op. at 25.

D. THE RESPONDENT HAS FAILED TO PROPOSE MODIFICATIONS TO THE SPECIFIC PROVISIONS AND TIME FRAMES SET FORTH IN THE CAP.

Other than objecting to almost every provision of the Order, the Respondent has not proposed alternative language or modifications for the entire CAP, including the proposed time frames for implementing the Order. Therefore, the Respondent has waived its right to challenge the language of the CAP. 40 C.F.R. § 24.14(c); see FRCP 56(e).

E. THE MECHANISM FOR MODIFYING REPORTS AND WORKPLANS AND THE DISPUTE RESOLUTION PROVISION PROVIDE ADEQUATE DUE PROCESS TO THE RESPONDENT

The Respondent argues that the Order requires it to prepare and submit numerous reports and plans to EPA for approval, with EPA having the right to modify the reports and plans, without providing the Respondent with any meaningful review process. The Respondent claims that the dispute resolution provision improperly shifts the burden of proof to the Respondent, and makes EPA the judge for determining disputes. The Respondent also claims that the Order prohibits judicial review of the

dispute resolution process, violating Section 3008(b) of RCRA. Sparton Memorandum at pages 12 - 13. Once again, the Respondent makes a number of allegations, but does not cite any authority in support of its position.

The mechanism for approving reports and workplans is set forth in Section VIII.4 of the Order. The Respondent submits a plan to EPA for approval, the specific requirements for which are set forth elsewhere in the Order. EPA reviews the plan, and either approves it or modifies it. Upon EPA approval or modification, the Respondent must implement the approved or modified plan. Alternatively, EPA can require the Respondent to submit a revised plan within thirty (30) days to address the deficiencies. EPA would then either approve or modify the revised plan. The Respondent would then implement the approved or modified plan.

If the Respondent objects to any provision of a modified plan, it can invoke the dispute resolution provisions of Section XII of the Order. Through this Dispute Resolution provision, the Respondent has a right to meet informally with the staff, submit a written statement to the Hazardous Waste Enforcement Branch Chief objecting to the decision, and to receive a written explanation of the decision from the Hazardous Waste Enforcement Branch Chief. If the Respondent is not satisfied, it also has a right to submit a written statement to the Director of the Compliance Assurance and Enforcement Division (Director), have an informal conference with the Director, and receive a written

decision from the Director after the conference. This provides adequate due process for the Respondent.

The Environmental Appeals Board addressed an almost identical issue in the context of a RCRA corrective action permit appeal. In the Matter of General Electric Company, RCRA Appeal 91-7 (April 13, 1993). Under the terms of the proposed permit, GE's RFI, CMS, and interim measures submittals were subject to review and approval by the Region, and the Region was authorized to revise or require revision of the submittal. By revising the submittals, the Region could require GE to perform additional tasks, such as install additional ground water monitoring wells. Id. at 3 - 5.

GE argued that revisions of its submittals constituted modifications of the permit and were subject to the formal permit modification procedures set forth in the regulations. Id. at 5. The EAB held that following the formal permit modification procedures was not required, because when EPA revises a submittal, "it is merely exercising its authority under the existing permit language to ensure that the contemplated studies and investigations are adequate for the selection of corrective remedies. Id. at 10. Likewise, any revisions to the Respondent's submittals will be to ensure that the contemplated investigations, construction, and operation of the corrective measures meet the requirements in the Order. Therefore, there is no modification of the Order requiring any public hearing. Thus,

the Respondent's contention that the requirements of Section 3008(b) applies to this situation must be rejected.

GE also argued that due process considerations required that the permit contain a dispute resolution clause and subsequent judicial review. Id. at 12. The EAB held that due process required that the permit contain a dispute resolution provision that contained provisions for: (1) the permittee has the right to submit written statements to staff members responsible for making the disputed revisions and to meet informally with such staff members; (2) notice detailing the Region's reasons for proposing to revise or require revision to the submission; (3) a hearing to take place before the permittee was expected to comply with the revision; (4) the right to meet with the ultimate decision maker (this person must be the same person who issued the permit); and (5) a written decision on the record, explaining the Region's final decision and responding to comments submitted by the permittee. Id. at 14 - 16. The Dispute Resolution provision of the Order (Section XII) clearly meets the due process requirements set forth by the EAB.

Furthermore, the EAB held that there was no requirement for judicial review of any contested provision, even if daily penalties accumulated. This is because GE has an opportunity for a hearing at an administrative level (e.g., before the Division Director) before it was expected to comply with a revision. Id. at 22. The EAB ruled that the administrative hearing before the Division Director and the opportunity for judicial review at the

enforcement stage of the proceeding is all that due process requires. Id. at 22 - 23. Likewise, since the Respondent has the right to an administrative hearing before EPA under the dispute resolution provision of the Order, and the right for judicial review to contest the imposition of any penalties, the Respondent has received adequate due process.

VII. REINJECTION OF THE TREATED GROUND WATER IS A TECHNICALLY AND ECONOMICALLY FEASIBLE OPTION

In the event that the Presiding Officer wishes to determine the appropriate disposal option, the attached Report of Michael S. Raimonde (Treated Groundwater Injection) and Affidavits of Baird Swanson, Dennis McQuillan, and Joint Affidavit of Dennis McQuillan and Baird Swanson [Exhibits 10 - 13], demonstrate that reinjection of the treated ground water is a technically and economically feasible option. In regard to technical feasibility, the Respondent cites the report of Mr. Gary Richardson. Sparton Memorandum, Attachment C. However, Mr. Richardson has incorrectly described the problems associated with the injection well operations at General Electric, and the problems associated with the Fina site do not exist at the Sparton site. Affidavits of Baird Swanson and Dennis McQuillan [Exhibits 11 - 12].

In addition, Mr. Richardson has not presented any compelling evidence, analysis, or factual examples demonstrating that injection wells are not an appropriate disposal option for the treated ground water at the Sparton site. Mr. Richardson has also overstated the difficulties of injecting treated ground

water by merely restating potential problems out of the literature. Sparton Memorandum, Attachment C, at p. 2. Whereas the Report of Michael S. Raimonde presents either solutions or explains why the problems would not occur at the Sparton site. Exhibit 10.

Also, the Respondent contends that reinjection wells are not a cost-effective mechanism for dealing with recovered ground water in the Albuquerque area in general and at this site in particular. Sparton Memorandum at p. 11. Mr. Richardson claims that the high costs are directly related to the difficult operating problems presented by reinjection wells. Sparton Memorandum at 11. However, the Report of Michael S. Raimonde clearly shows that the reinjection is a economically and technically feasible option at the Sparton site. Exhibit 10.

Furthermore, Mr. Richardson did not present any documentation supporting his estimates that the capital costs for one injection well would be $500,000, and that the operation and maintenance costs would be $200,000 per year. As to the Respondent's statement that EPA estimated that three reinjection wells would cost almost $1.3 million, with operation and maintenance costs of $200,000, EPA used the Respondent's cost figures from the CMS Report. The capital cost of $1,237,000 that the Respondent cited in its CMS Report was for a 600 gallons per minute (gpm) injection well system. The capital costs cited by the Respondent in its CMS Report for a 200 gpm system was $412,500. CMS Report at p. VII-30 [AR at p. 005642]. The

Respondent claims that discharge to the Calabacillas Arroyo will only cost $10,000, but fails to include any documentation showing capital costs or operation and maintenance costs.

Rather than relying on the Respondent's data, EPA has calculated the cost of reinjection. The capital costs are as follows:

Six inch diameter well (with additional treatment system)

A. 200 gallons per minute (gpm) - $123,063
B. 600 gpm - $142,881

Ten inch diameter well (with additional treatment system)

A. 200 gpm - $149,938
B. 600 gpm - $169,756

Exhibit 10.

Therefore, it is clear that the Respondent clearly overestimated the cost of reinjection.

Finally, the Respondent contends that based on field work conducted by Mr. Richardson, discharge to the arroyo would serve the same function as reinjection wells. Sparton Memorandum at p. 12. However, the Respondent did not provide any documentation in support of its claim.

VIII. EPA'S SELECTED REMEDY IS A TECHNICALLY FEASIBLE OPTION FOR GROUND WATER REMEDIATION

The Respondent previously claimed in its CMS Report that it is not technically practicable to restore the ground water to drinking water standards. [AR at pp. 005629 - 005631]. However, this argument was rejected by EPA in its Technical Review of the CMS Report. [AR at pp. 008378 - 008382]. The Respondent again raised this issue in Mr. Chandler's Report. Sparton Memorandum,

Attachment A. The Respondent also claims that the Respondent's one-well containment system will achieve restoration in the same time as EPA's remedy. These arguments are addressed in the attached Report of Vincent Malott [Exhibit 14]. Mr. Malott's Report also responds to a number of other issues in Mr. Chandler's Report.

There are three factors that determine whether restoration is feasible: (1) the physical characteristics of the aquifer; (2) the physical characteristics of the contaminants; and (3) the adequacy of the ground water extraction system design.[27] Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, Interim Final, at p. 1 (OSWER Directive 9234.2-25) [TI Guidance] [AR at p. 001613].

For this site, the physical characteristics of the aquifer and the contaminants provides a favorable environment for an aggressive remedial strategy utilizing ground water extraction throughout the contaminant plume. Report of Vincent Malott at p. 5 [Exhibit 14]. As opposed to the Respondent's one-well containment proposal, EPA's selected remedy utilizes active ground water extraction throughout the contaminant plume. See 55 Fed. Reg. at 30804 and 30830. EPA's remedial option is the most aggressive strategy since it relies on maximizing the removal of contaminant mass through additional wells installed within the contaminant plume. An aggressive strategy will generally result

[27]The importance of an adequate ground water monitoring system to design and evaluate the performance of the ground water extraction system is discussed in Section IX below.

in a significantly shorter restoration timeframe than other remedial options. TI Guidance at p. 16 [AR at p. 001634].

In addition, a shorter remediation timeframe is desired to reduce the potential for human exposure where there is current or reasonably expected near-term future use of the ground water. TI Guidance at p. 22 [AR at p. 001634]. The aquifer is reasonably expected to be used in the near-term future. Affidavit of Norman Gaume [Exhibit 7]; Letter to Desi Crouther, EPA from A. Norman Gaume dated December 5, 1995 [AR at p. 004644].

The designation of an aquifer for near-term future use can generally be found in the State's ground water classification scheme. In the absence of a State's classification scheme, the designation of an aquifer for future use is determined at the local level. In this case, the City of Albuquerque is dependent on ground water as a sole source of drinking water and has determined that the impacted aquifer is a significant natural resource requiring remediation. Resolution of the Albuquerque City Council [Exhibit 6]. The Presiding Officer should not recommend that the aquifer designation be changed from its near-term future use to a lesser standard. This is the type of decision that should be left to the City of Albuquerque or the State of New Mexico.

Furthermore, a determination of technical impracticability should not be made at this time. EPA believes that in most cases, technical impracticability decisions "should be made only after interim or full-scale aquifer remediation systems are

implemented because it often it is difficult to predict the effectiveness of remedies based on limited site characterization data alone." TI Guidance at p. 10 [AR at p. 001622]. In the Order, EPA has provided that the Respondent can submit a Technical Impracticability demonstration to EPA at any time. CAP, Task V.D. at pp. 37 - 38.

In addition, the requirements set forth for a technical impracticability demonstration in the TI Guidance are extremely technical in nature. See e.g., TI Guidance at p. 14 [AR at p. 001626]. The Presiding Officer should not make this determination on the basis of arguments presented in three pages in the CMS Report [AR at pp. 005629 - 005631] and 5 pages in Mr. Pierce's Report. Sparton Memorandum, Attachment A, pp. 33 - 38. Therefore, the decision as to when and if the contaminated aquifer cannot be returned to its highest beneficial use in the shortest timeframe should also be left to the technical expertise of EPA. In the Matter of General Electric Company, RCRA Appeal No. 91-7, slip op. at 16; In Re: Chemical Waste Management of Indiana, Inc., RCRA Appeal Nos. 95-2 and 95-3, Lexis p. 16; In Re: Envirotech, L.P., UIC Appeal Nos. 95-2 through 95-37, slip op. at 25.

IX. ADDITIONAL GROUND WATER MONITORING WELLS ARE NEEDED TO ADEQUATELY CHARACTERIZE THE CONTAMINATE PLUME AND TO DESIGN AND EVALUATE PERFORMANCE OF THE GROUND WATER EXTRACTION SYSTEM

In its comments on the CMS Report, EPA determined that the Respondent's ground water monitoring system did not adequately define the full vertical and horizontal extent of the contaminant

plume or adequately define the contaminant concentrations throughout the plume. [AR at pp. 008368 - 69 and 008377 - 78]. EPA anticipated further investigation of the ground water contaminant plume to address both the deficiencies in the ground water monitoring system, and to collect the data necessary to design and evaluate the performance of the ground water extraction system. FDRTC at p. 42 [AR at p. 008648] (emphasis added). After EPA issued the FDRTC document, the Respondent installed five additional monitoring wells. Despite these additional wells, the current ground water monitoring system is inadequate. An explanation of how the current ground water monitoring system is inadequate to meet the aforementioned requirements is set forth in the attached Report of Vincent Malott at pp. 3 - 6. [Exhibit 14]

The data from these additional monitoring wells is needed to ensure that an inadequate ground water extraction system design will not inhibit ground water restoration. This data is critical to the design and implementation of an efficient and cost effective extraction system that not only prevents further migration of the leading edge, but also focuses on restoring aquifer water quality by maximizing contaminant mass removal and minimizing clean up time. Id. at pp. 5 - 6.

"Defining the horizontal and vertical extent of contamination through the entire plume is necessary to establish well locations, screen depths, and pumping rates that will not only encompass and contain the plume, but will also adequately

flush contaminated portions of the aquifer, as well as provide for monitoring the effectiveness of the system. To maximize contaminant mass removal, it is also generally necessary to locate extraction wells in areas of maximum contamination. To achieve this, the distribution of contaminant concentrations within the plume must be relatively well known. In order to design a cost effective system for treatment of the ground water once it is extracted, reasonably accurate estimates of contaminant concentrations within the system influent are needed. This also requires that the distribution of contaminant concentrations within the plume be relatively well established." Id. at p. 6.

Furthermore, "defining the physical characteristics of the aquifer is also necessary to establish well locations, screen depths, and pumping rates that will not only encompass and contain the plume, but will also adequately flush contaminated portions of the aquifer. An aquifer test is performed to collect such data. The physical characteristics of the aquifer are variable from beneath the Facility to the western end of the plume. The aquifer test performed beneath the Facility is inadequate in providing the data necessary to design the ground water extraction system in the off-site areas." Id.

Therefore, the additional site characterization is critical in preventing remediation system design inadequacies which may lead to an inability to achieve restoration of the contaminated aquifer. If EPA is prevented from requiring the Respondent to

install additional monitoring wells, the ground water extraction system will, in all likelihood, not achieve its goals. Therefore, the decisions as to the number and location of ground water monitoring wells, along with the aquifer test, should be left to the technical expertise of EPA. In the Matter of General Electric Company, RCRA Appeal No. 91-7, slip op. at 16; In Re: Chemical Waste Management of Indiana, Inc., RCRA Appeal Nos. 95-2 and 95-3, Lexis p. 16; In Re: Envirotech, L.P., UIC Appeal Nos. 95-2 through 95-37, slip op. at 25.

X. OTHER ISSUES RAISED BY RESPONDENT

In its brief, the Respondent states that EPA was required to accept the remedy identified in the CMS Report, and because EPA selected a remedy different from the one identified in the CMS Report, EPA violated the terms of the AOC. Rather than briefing this issue, the Respondent simply declared that pursuing this issue any further would be futile. Sparton Memorandum at pp. 1 - 2.

There is a very good reason why the Respondent is not pursuing this issue. The AOC on its face does not support the Respondent's allegations that EPA was required to select the Respondent's remedy. As to remedy selection, the AOC states:

> Upon EPA's review of the CMS and selection of a corrective measure . . . EPA shall provide a sixty (60) day period for negotiation of a new administrative order on consent for implementation of the corrective measure.

AOC at p. 15 (emphasis added) [AR at p. 006071]. The CAP further provides:

> The purpose of this Corrective Measure Study (CMS) [to be completed by the Respondent] is to develop and evaluate the corrective measure alternative or alternatives and to recommend the corrective measure or measures to be taken at Sparton.

CAP at p. 32 (emphasis added) [AR at p. 006125]. Finally, the CAP also states:

> The Respondent shall justify and recommend a corrective measure alternative . . . The U.S. EPA will select the corrective measure alternative or alternatives to be implemented . . . .

Id. at 40 (emphasis added) [AR at p. 006133].

Neither the AOC nor the CAP affirmatively requires EPA to select the remedy recommended by the Respondent in the CMS. Rather, the AOC and the CAP require the Respondent to identify alternatives and "recommend" a corrective measure(s) to EPA. Although EPA considered the Respondent's recommendation, the AOC and CAP specifically provide that "EPA will select" the appropriate remedy for the Site. Thus, EPA is not bound by the Respondent's recommendation.

The Respondent also states that the Part 24 procedures challenging the Order are unconstitutional. However, the Respondent also declined to seek any further relief on these issues, also arguing that it would be futile. Sparton Memorandum at p. 2. In any event, the Part 24 procedures have already been reviewed by the U.S. Court of Appeals for the District of Columbia, and were found on their face to meet the requirements of due process. Chemical Waste Management, Inc. V. U.S. Environmental Protection Agency, 873 F.2d 1477 (D.C. Cir. 1989).

In addition, Sparton raised a number of defenses in its Respondent's Answer, but failed to address these issues in its Memorandum, other than stating in a footnote that it incorporated that document by reference. The general defenses that it raised, but did not brief, are set forth below, followed by EPA's response:

> A. Disputes that the Director of the Compliance Assurance and Enforcement Division of Region 6 has the authority to issue the Order because Congress did not intend that such authority was to be delegated to any subordinates or, in the alternative, that if such authority could be delegated, then only to the regional administrators, and not to any lower level employees.

The authority to issue this Order has been delegated to the Regional Administrator by EPA Delegation No. 8-31 and 8-32, dated April 16, 1985, and further delegated to the Director of the Compliance Assurance and Enforcement Division, Region 6. [AR at pp. 008429 - 008434]. See also Exhibit 15. There is nothing in the legislative history of Section 3008(h) that even infers that Congress did not intend to delegate this authority to subordinates of the Administrator, given the fact that there are thousands of facilities subject to corrective action. Despite the Respondent's allegations, it obviously does not even believe its own allegation, because it cited the aforementioned delegations in its Proposed Order. Sparton Memorandum, Attachment E, at p. 1.

B. Administrative record is not complete or accurate.

The administrative record consists of almost 9000 pages. The Respondent was free to submit any document to EPA to be

placed in the administrative record. EPA has stated that this Order is based on the administrative record, and the Respondent has failed to cite any reason showing why it is not complete or accurate.

C. EPA's decision to issue the Order and request the relief specified was based on political and not technical factors, and was decided upon before the administrative record was developed.

EPA has stated that this Order is based on the administrative record in this case. The Respondent has made an unsustained allegation, which deserves no further response.

The Respondent also alleged a number of "affirmative defenses" which it has not provided any response in support thereof. Because the Respondent bears the burden of proof on its affirmative defenses, and failed to provide argument in support of these affirmative defenses, it did not meet its burden of proof. See United States v. First City National Bank of Houston, et al., 386 U.S. 361, 366 (1967). Therefore, no response is necessary by EPA.

As previously stated, the Respondent disputed almost every Findings of Fact and Conclusions of Law in the Order. In that EPA has established the six necessary requirements to issue the RCRA Section 3008(h) Order, and because the Respondent did not address these issues in its Memorandum, EPA will not address the so called "disputed" findings of fact and conclusions of law.

Finally, in its Answer, the Respondent made a number of unsupported allegations concerning the FDRTC. EPA's response to these unsupported allegations is set forth in Exhibit 16.

XI. THE RESPONDENT'S PROPOSED ORDER IS UNENFORCEABLE, DEFICIENT, AND CONTRADICTORY

As an alternative to EPA's Order, the Respondent has submitted a proposed Order to the Presiding Officer for consideration. Sparton Memorandum, Attachment E. This Order is deficient, contradictory, and unenforceable.

First, the Order is unenforceable, because it only requires Sparton to implement the work that is agreed to by EPA <u>and</u> Sparton. Sparton Memorandum, Attachment E, Section VI. Furthermore, there are no standards for determining the content of the proposals for the soil vapor extraction system, the on-site containment system, and the off-site containment system. Under the Respondent's Order, the Respondent could submit a totally inadequate proposal for off-site containment, and EPA could not force the Respondent to implement it until the two parties managed to reach agreement. Therefore, the Respondent could delay implementation indefinitely. In essence, this would be an "Illusory Order", because it leaves the discretion to implement any work to the Respondent. Congress gave EPA the authority to issue corrective action orders. Giving total discretion to the Respondent would thwart EPA's congressional mandate to select remedies that are protective of human health and the environment.

Second, in its proposed Findings of Fact and Conclusions of Law of the proposed Order, the Respondent has included numerous Findings of Fact and Conclusions of Law that it has previously disputed, and also included a number of the so-called "ultra

vires" provisions that it objected to as being not necessary to protect human health or the environment. If the Respondent was truly serious about its objections, it would not reallege these provisions in its own Order. Therefore it appears that the Respondent did not dispute these provisions in good faith. 40 C.F.R. § 24.04(c). These disputed provisions from the Order that the Respondent included in its Proposed Order are as follows:

Section II.2; Section III - Findings of Fact Nos. 2, 3, 4, 5, 7, and 9; Section IV - Conclusions of Law Nos. 2, 3, 4, and 5; Sections V, VII.4, IX.1 and 4, X, and XII.1.

XII. RECALCULATION OF GROUND WATER EXTRACTION REMEDY COSTS

The costs set forth in the FDRTC document were based on cost figures provided by the Respondent. Because the Respondent has raised the issue of ground water extraction, treatment and disposal cost in this proceeding, EPA has recalculated the cost of the ground water extraction portion of its proposed remedy (including ground water monitoring) using its own cost documentation. These cost figures are based on using three extraction wells and one injection well for a 600 gallons per minute (gpm) system.[28] Report of Michael S. Raimonde (Cost Estimate) [Exhibit 17]. The actual number of extraction and injection wells will depend upon the site specific conditions.

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[28]The ground water extractions system in the FDRTC document used three extraction wells and three injection wells for cost purposes. If the system requires three injections wells, there would be an additional capital cost of $220,000, or $110,000 per well.

These cost figures have then been converted to present value. Exhibit 18. These costs are set forth below, and do not include the costs related to the SVE system or the current on-site ground water extraction system.

Total Cost

Water Treatment Without Ion Exchange for Metals Removal (Discharge to Arroyo)

Present Worth Cost: $5,927,635
Total Capital Cost: $1,265,488
Total Operation & Maintenance: $303,308/Years 1 - 30

Water Treatment With Ion Exchange for Metals Removal (Discharge to Arroyo)

Present Worth Cost: $6,174,685
Total Capital Cost: $1,512,538
Total Operation & Maintenance: $303,308/Years 1 - 30

Water Treatment Without Ion Exchange for Metals Removal (Reinjection)

Present Worth Cost: $6,087,391
Total Capital Cost: $1,425,244
Total Operation & Maintenance: $303,308/Years 1 - 30

Water Treatment With Ion Exchange for Metals Removal (Reinjection)

Present Worth Cost: $6,334,441
Total Capital Cost: $1,672,294
Total Operation & Maintenance: $303,308/Years 1 - 30

As one can see, these costs are significantly lower than the costs cited in the FDRTC document, which were based on the Respondent's cost figures from the CMS Report. Therefore, the Respondent greatly overestimated the costs of the ground water extraction system.

XIII. CONCLUSION

Based on the foregoing and the administrative record, EPA has shown by a preponderance of the evidence that it is entitled to the relief set forth in the Initial Administrative Order. Therefore, the Presiding Officer should issue a decision which recommends that the Initial Administrative Order (Order) be issued as a Final Administrative Order by the Regional Administrator without any modifications or changes.

Dated this 25th day of February, 1997.

Respectfully submitted,

Evan L. Pearson
Senior Enforcement Counsel
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX - (214) 665-3177

CERTIFICATE OF SERVICE

I hereby certify that on the 25th day of February, 1997, the original of the foregoing was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by the method indicated:

HAND DELIVERED

Honorable George Malone
Acting Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

FIRST CLASS MAIL

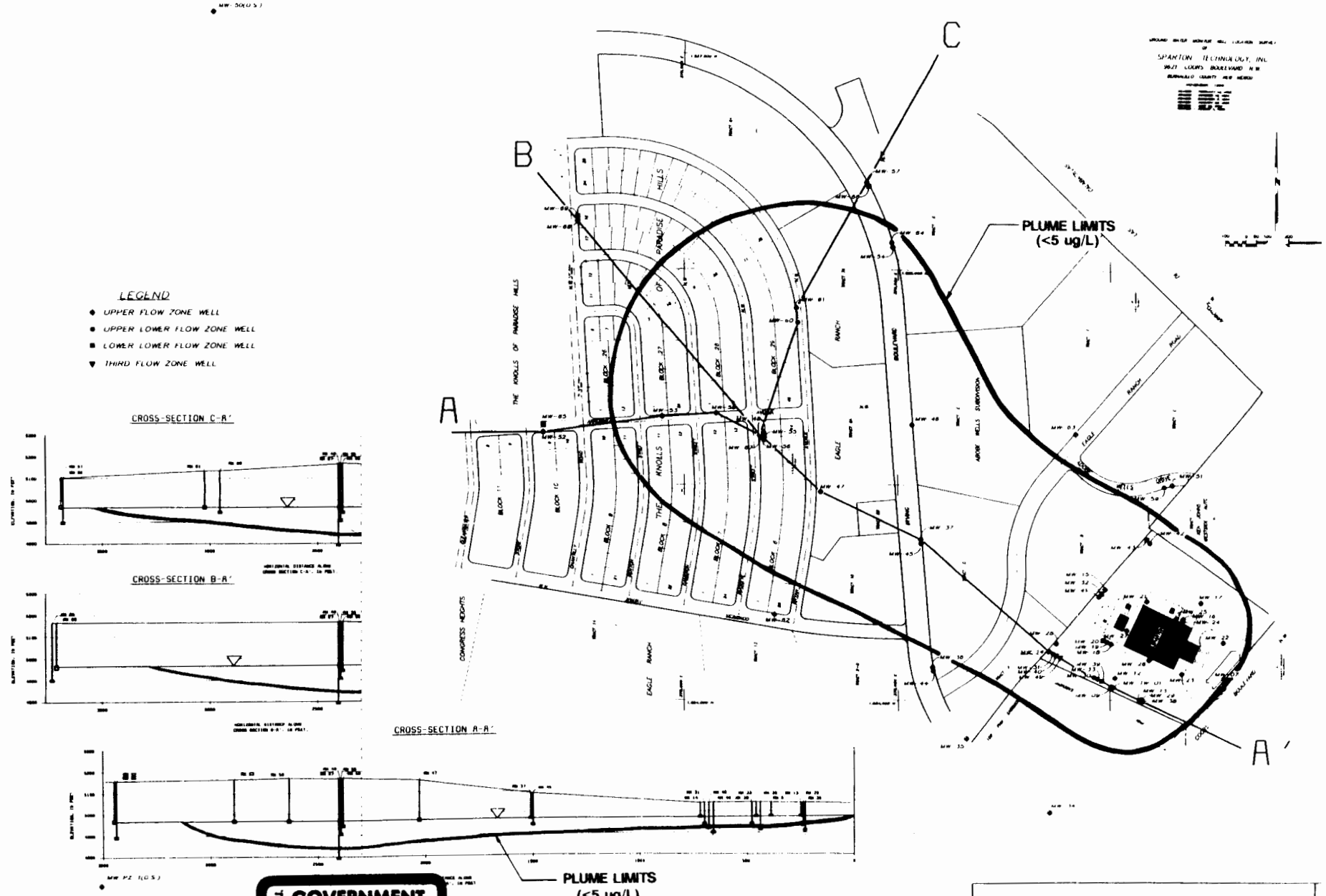
James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

SUMMARY OF ANALYTICAL RESULTS FOR GROUND WATER SAMPLES COLLECTED IN JANUARY 1996

Well Number	CONTAMINANTS				
	Trichloroethene (µg/ℓ)	1,1,1-Trichloroethane (µg/ℓ)	1,1-Dichloroethene (µg/ℓ)	Tetrachloroethylene (µg/ℓ)	Total Chromium (mg/ℓ)
Upper Flow Zone On-Site Monitoring Wells					
MW-7	340	92	14	0.8	0.04
MW-9	570	82	25	2.2	< 0.01
MW-12	1000	61	29	<5.0	0.02
MW-13	380	54	14	<0.5	< 0.01
MW-14	290	5.8	4.6	1.7	1.53
MW-16	7600	1900	93	73	0.19
MW-17	3800	1100	<100	<250	No Data
MW-21	220	95	10	2.2	< 0.01
MW-22	46	29	6.2	0.5	< 0.01
MW-33	2000	160	200	11	4.11
Upper Flow Zone Off-Site Monitoring Wells					
MW-34	< 0.3	< 1.0	< 0.2	<0.5	< 0.01
MW-35	< 0.3	< 1.0	< 0.2	<0.5	0.02
MW-36	1.9	< 1.0	< 0.2	<0.5	0.03
MW-37	720	< 10	25	<5.0	< 0.01
MW-47	36	< 1.0	0.7	<0.5	0.05
MW-48	350	< 1.0	7.0	<0.5	0.13
MW-51	< 0.3	< 1.0	< 0.2	<0.5	< 0.01
MW-52	< 0.3	< 1.0	< 0.2	<0.5	0.01
MW-53	100	< 1.0	1.1	<0.5	0.06
MW-57	< 0.3	< 1.0	< 0.2	<0.5	0.02
MW-58	270	< 1.0	3.4	<0.5	0.15
MW-61	1900	13	34	10	0.04
MW-62	1.8	7.2	7.0	<0.5	< 0.01
MW-63	< 0.3	< 1.0	< 0.2	<0.5	< 0.01
PZ-1	< 0.3	< 1.0	< 0.2	<0.5	< 0.01

GOVERNMENT EXHIBIT 1

SUMMARY OF ANALYTICAL RESULTS FOR GROUND WATER SAMPLES COLLECTED IN JANUARY 1996					
Well Number	CONTAMINANTS				
	Trichloroethene (µg/ℓ)	1,1,1-Trichloroethane (µg/ℓ)	1,1-Dichloroethene (µg/ℓ)	Tetrachloroethylene (µg/ℓ)	Total Chromium (mg/ℓ)
Upper Lower Flow Zone On-Site Monitoring Wells					
MW-19	24	< 1.0	0.7	<0.5	< 0.01
MW-29	0.9	< 1.0	< 0.2	<0.5	< 0.01
MW-30	19	< 1.0	0.5	<0.5	< 0.01
MW-31	2.7	< 1.0	< 0.2	<0.5	0.09
MW-41	290	20	15	3.1	< 0.01
MW-42	470	57	55	<5.0	< 0.01
Upper Lower Flow Zone Off-Site Monitoring Wells					
MW-44	< 0.3	< 1.0	< 0.2	<0.5	< 0.01
MW-45	59	< 20	< 4.0	<10	0.03
MW-46	3200	96	220	24	0.19
MW-56	430	< 1.0	11	<0.5	0.26
MW-59	< 0.3	< 1.0	< 0.2	<0.5	< 0.01
MW-60	170	< 1.0	4.8	<0.5	< 0.01
MW-64	15	< 1.0	0.6	<0.5	< 0.01
Lower Lower Flow Zone On-Site Monitoring Wells					
MW-20	1.3	< 1.0	< 0.2	<0.5	< 0.01
MW-32	760	36	110	<5.0	< 0.01
MW-38	< 0.3	< 1.0	< 0.2	<0.5	0.02
MW-39	< 0.3	< 1.0	< 0.2	<0.5	0.13
MW-40	< 0.3	< 1.0	< 0.2	<0.5	< 0.01
MW-43	95	29	23	<2.5	<0.01
Lower Lower Flow Zone Off-Site Monitoring Well					
MW-55	940	< 1.0	8.4	<0.5	1.04
Third Flow Zone On-Site Monitoring Well					
MW-49	< 0.3	< 1.0	< 0.2	<0.5	< 0.01



GOVERNMENT EXHIBIT 2

PROJECT NO.

Black & Veatch

009416

ANALYTICAL RESULTS FOR
AIR SAMPLES COLLECTED IN JUNE 1996
WELL VP-1

Well VP-1	Approximate Depth Below Ground Surface (ft.)	CONSTITUENTS			
		Trichloroethene (mg/m^3)	1,1,1-Trichloroethane (mg/m^3)	1,1-Dichloroethene (mg/m^3)	Tetrachloroethylene (mg/m^3)
Zone 1	10	18,000	4,800	150	290
Zone 2	20	21,000	5,800	200	300
Zone 3	30	24,000	6,500	230	320
Zone 4	40	22,000	6,300	340	310
Zone 5	50	8,200	3,100	360	120
Zone 6	60	8,700	3,300	460	160

ANALYTICAL RESULTS FOR
SOIL SAMPLES COLLECTED IN JUNE 1996
WELL VP-1

Approximate Depth Below Ground Surface (ft.)	CONTAMINANTS			
	Trichloroethene ($\mu g/l$)	1,1,1-Trichloroethane ($\mu g/l$)	1,1-Dichloroethene ($\mu g/l$)	Tetrachloroethylene ($\mu g/l$)
8.5	87,000	12,000	900	4,200
28	ND	ND	ND	ND
37	ND	ND	ND	ND
47	110	ND	ND	ND
57	260	ND	ND	ND

GOVERNMENT EXHIBIT
3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 16 1985

MEMORANDUM

SUBJECT: Interpretation of Section 3008(h) of the Solid Waste Disposal Act

FROM: J. Winston Porter, Assistant Administrator
Office of Solid Waste and Emergency Response

Courtney M. Price, Assistant Administrator
Office of Enforcement and Compliance Monitoring

TO: Regional Administrators
Regional Counsels
Regional Waste Management Division Directors
Director, National Enforcement Investigation Center

As part of our effort to support case development activities undertaken by United States Environmental Protection Agency personnel, we are transmitting to you guidance on the use of Section 3008(h), one of the corrective action authorities added to the Solid Waste Disposal Act by the Hazardous and Solid Waste Amendments of 1984. As you are aware, Section 3008(h) allows the Agency to take enforcement action to require corrective action or any other response necessary to protect human health or the environment when a release is identified at an interim status hazardous waste treatment, storage or disposal facility. Because the authority is broad, both with respect to the kinds of environmental problems that can be addressed and the actions that the Agency may compel, we have produced the attached document to provide initial guidance on the interpretation of the terms of the provision and to describe administrative requirements. The document will be revised as case law and Agency policy develop. In addition, the Office of Solid Waste and Emergency Response intends to develop technical guidance on various types of response measures and the circumstances in which they might be appropriate.

In view of the need to issue RCRA permits and to ensure that the substantial number of interim status facilities expected to cease operation in the near future are closed in an environmentally sound manner, we encourage you to use the interim status corrective action authority as appropriate to supplement the closure and permitting processes. Questions or comments on this document or the use of Section 3008(h) authority in general can be addressed to Gene A. Lucero, Director of the Office of Waste Programs Enforcement (FTS 382-4814, WH-527) or Fred Stiehl, Associate Enforcement Counsel for Waste (FTS 382-3050, LE-134S).

Attachment

009418

GOVERNMENT EXHIBIT 4

RCRA SECTION 3008(h)

THE INTERIM STATUS CORRECTIVE ACTION AUTHORITY

DECEMBER 16, 1985

I. INTRODUCTION

The Hazardous and Solid Waste Amendments of 1984 have substantially expanded the scope of the RCRA hazardous waste management program. One of the most significant provisions is the interim status corrective action authority, which allows EPA to take enforcement action to compel response measures when the Agency determines that there is or has been a release of hazardous waste at a RCRA interim status facility. Prior to the 1984 Amendments, EPA could require remedial action at interim status facilities by, inter alia, (1) using RCRA §7003 or CERCLA §106 authorities if an imminent and substantial endangerment may have been presented, or (2) when significant ground-water contamination was detected, calling in Part B of the RCRA permit application and requiring corrective action as a condition of the permit. The Amendments added Section 3008(h) to deal directly with environmental problems by requiring clean-up at facilities that have operated or are operating subject to RCRA interim status requirements.

The purpose of this document is to provide preliminary guidelines on the scope of Section 3008(h) and to summarize appropriate procedures. The document will be revised as case law and Agency policy develop. Other relevant RCRA guidances that may be consulted include:

- Final Revised Guidance on the Use and Issuance of Administrative Orders under Section 7003 of RCRA, Office of Enforcement and Compliance Monitoring and Office of Solid Waste and Emergency Response - September, 1984.
- Issuance of Administrative Orders under Section 3013 of RCRA, Office of Enforcement and Compliance Monitoring and Office of Solid Waste and Emergency Response - September, 1984.
- Draft Guidance on Corrective Action for Continuing Releases, Office of Solid Waste and Emergency Response - February, 1985.
- Final RCRA Ground-Water Monitoring Compliance Order Guidance, Office of Solid Waste and Emergency Response - August, 1985.

- Draft RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, Office of Solid Waste and Emergency Response - August, 1985.
- Draft RCRA Preliminary Assessment/Site Investigation Guidance, Office of Solid Waste and Emergency Response - August, 1985.

II. DELEGATIONS OF AUTHORITY

On April 16, 1985, the Administrator signed delegations enabling the Regional Administrators, the Assistant Administrator for Solid Waste and Emergency Response and the Assistant Administrator for Enforcement and Compliance Monitoring to exercise Section 3008(h) authority. There are three new delegations, 8-31, 32 and 33. The first enables the Regional Administrator or the Assistant Administrator for Solid Waste and Emergency Response to determine that there is or has been a release of hazardous waste at or from a RCRA interim status facility. The second and third delegate the authority to issue orders and sign consent agreements. The authority to refer civil judicial actions is found in Delegation 8-10.

Because Section 3008(h) is quite broad, both with respect to the types of environmental problems that may be addressed and the actions that EPA may compel, delegation of Section 3008(h) authority is subject to limitations. To issue an administrative order or sign a consent agreement, the Regions must obtain advance concurrence from the Director, Office of Waste Programs Enforcement, Office of Solid Waste and Emergency Response and must notify the Associate Enforcement Counsel for Waste, Office of Enforcement and Compliance Monitoring. Until the Agency as a whole gains experience in using the new authority, this requirement is necessary to ensure that sound precedent is established and national program priorities are addressed. The Office of Waste Programs Enforcement intends to waive advance concurrence, however, for those Regions that demonstrate sufficient experience in using Section 3008(h) as indicated by the number and quality of §3008(h) orders submitted for review in the next six months. Civil judicial actions will be handled in accordance with existing procedures for referrals.

To expedite §3008(h) actions, the Regions should establish procedures for drafting and reviewing orders and referrals and clearly delineate the roles and responsibilities of Regional RCRA enforcement and program personnel (including CERCLA personnel as necessary) and the Office of Regional Counsel in those processes. Draft orders should be sent to the Chief, Compliance and Implementation Branch, RCRA Enforcement Division, Office of Waste Programs Enforcement.

Headquarters is committed to conducting timely review of §3008(h) orders. To avoid the delays associated with discussion and review of rough drafts, we ask that orders be in "near final" form when they are submitted. Generally, the orders will be examined to determine whether (1) the elements of proof are adequately defined and documented, (2) the response to be compelled is practicable and environmentally sound, and (3) the action supports national RCRA program goals. Written comments or concurrence will be provided to the Regions within ten working days of receipt.

III. SCOPE OF SECTION 3008(h)

Section 3008(h) provides:

> " (1) Whenever on the basis of any information the Administrator determines that there is or has been a release of hazardous waste into the environment from a facility authorized to operate under Section 3005(e) of this subtitle, the Administrator may issue an order requiring corrective action or such other response measure as he deems necessary to protect human health or the environment, or the Administrator may commence a civil action in the United States district court in the district in which the facility is located for appropriate relief, including a temporary or permanent injunction.
>
> (2) Any order issued under this subsection may include a suspension or revocation of authorization to operate under Section 3005(e) of this subtitle, shall state with reasonable specificity the nature of the required corrective action or other response measure, and shall specify a time for compliance. If any person named in an order fails to comply with the order, the Administrator may assess, and such a person shall be liable to the United States for, a civil penalty in an amount not to exceed $25,000 for each day of noncompliance with the order."

To exercise the interim status corrective action authority, the Agency must first have information that there is or has been a release of hazardous waste to the environment at or from an interim status facility. Second, the corrective action or other response measure, in the judgment of the Agency, must be necessary to protect human health or the environment. Key terms are discussed below in greater detail.

"Whenever on the basis of any information the Administrator determines ..."

The opening clause of Section 3008(h) authorizes the Agency to make the determination that there is or has been a release of hazardous waste into the environment on the basis of 'any information'. Appropriate information can be obtained from a variety of sources, including data from laboratory analyses of soil, air, surface water or ground water samples, observations recorded during inspections, photographs, and facts obtained from facility records.

The reference to a determination by the Administrator should be considered in the context of the term 'any information'. To satisfy any requirement imposed by the statute, an order should contain a specific determination. A civil referral should also be based on a written determination that there is or has been a release.

" ...that there is or has been a release...into the environment..."

The trigger for issuing §3008(h) orders and initiating civil referrals is the existence of information that there is or has been a release, which is a lower threshold than the showing of 'substantial hazard' under RCRA Section 3013 or 'imminent and substantial endangerment' under RCRA Section 7003 or CERCLA Section 106. While the statute does not define the term 'release', the Agency believes that, given the broad remedial purpose of Section 3008(h), the term should encompass at least as much as the definition of release under CERCLA. See 42 U.S.C. §9601(22). Therefore a release is any spilling, leaking, pumping,

pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment. The exemptions described in the CERCLA definition are considered inapplicable or inappropriate for RCRA purposes, however, and are not included in the RCRA definition.

The term 'environment' is also broad. The legislative history for Section 3008(h), which discusses use of the authority to respond to releases to various environmental media, makes it clear that Section 3008(h) is not limited to a particular medium. H. Rep. No. 1133, 98th Cong., 2d Sess. 111-112 (1984). The Agency will use Section 3008(h) to address releases to surface waters, groundwater, land surface or subsurface strata and air.

It is not necessary to have actual sampling data to show a release. An inspector may find other evidence that a release has occurred, such as a broken dike at a surface impoundment. Less obvious indications of release might also be adequate to make the determination. For example, the Agency could have sufficient information on the contents of a land disposal unit, the design and operating characteristics of the unit, and the hydrogeology of the area in which the unit is located to conclude that there has been a release to groundwater.

In addition to on-site information gathering undertaken specifically to support a §3008(h) action, other sources that may provide information on releases include:

- Inspection Reports.
- RCRA Part A and Part B permit applications.
- Responses to RCRA §3007 information requests.
- Information obtained through RCRA §3013 orders.
- Notifications required by CERCLA §103.
- Information-gathering activities conducted under CERCLA §104.
- Informants' tips or citizens' complaints corroborated by supporting information.

A determination that there is or has been a release does not require that specific amounts of hazardous waste or hazardous constituents be found in the environment. Quantities or concentrations of hazardous wastes or hazardous constituents should be considered when ordering interim or complete corrective actions, however, because response actions compelled by the Agency must be necessary to protect human health or the environment.

"...of hazardous waste..."

In contrast to many Subtitle C provisions, the language of Section 3008(h) refers to "hazardous waste" rather than "hazardous waste identified or listed under Subtitle C". The Agency believes that the omission of a reference to wastes listed or identified at 40 CFR Part 261 was deliberate, and Congress did not intend to limit Section 3008(h) only to materials meeting the regulatory definition of hazardous waste. The Conference Report specifically endorses the use of corrective action orders to respond to releases of hazardous constituents. H. Rep. No. 1133, 98th Cong., 2d Sess. 111 (1984). The legislative history also indicates that the new authority should be at least as broad as the corrective action authority in the federal RCRA permit program. Id. at 111-112. Those regulations address both hazardous waste and hazardous constituents. Moreover, Section 3004(u), the 'Continuing Releases' provision requiring clean-up of releases from any solid waste management unit at a treatment, storage or disposal facility seeking a RCRA permit, applies to releases of hazardous constituents as well as releases of listed and characteristic wastes. H. Rep. No. 198, 98th Cong., 1st Sess. 60 (1983). Therefore, Section 3008(h) may also be used to compel response measures for releases of hazardous constituents from hazardous or solid waste.

"Hazardous constituents" are the substances listed in Appendix VIII to 40 CFR Part 261. H. Rep. No. 198, 98th Cong., 1st Sess. 60-61 (1983). According to the legislative history for Section 3004(u), which is read in conjunction with Section 3008(h), the term also includes Appendix VIII hazardous constituents released from solid waste and hazardous constituents that are reaction by-products. S. Rep. No. 284, 98th Cong., 1st Sess. 32 (1983). It should be noted that the legislative history for the new underground storage tank provisions states that Section 3008 is not applicable to underground storage tanks regulated under Subtitle I. Such releases may be addressed by Section 7002 and Section 7003 authorities, however. H. Rep. No. 1133, 98th Cong., 2d Sess. 127 (1984). Section 3008(h) remains applicable to releases from underground tanks containing hazardous or solid waste subject to Subtitle C provisions.

"...from a facility..."

For interim status corrective action purposes, EPA intends to employ the definition of 'facility' adopted by the Agency in the corrective action program for releases from permitted facilities. The preamble to the permitting requirements for land disposal facilities indicates that the term 'facility' refers to ..."the broadest extent of EPA's area jurisdiction under Section 3004 of RCRA...[meaning] the entire site that is under the control of the owner or operator engaged in hazardous waste management." 47 FR 32288-89 (July 26, 1982). See also the Final Codification Rule. 50 FR 28712 (July 15, 1985). Therefore, the definition of facility encompasses all contiguous property under the owner or operator's control.

The permit program, as amended by Section 3004(u), requires corrective action for releases of hazardous waste and hazardous constituents from solid waste management units at a facility. EPA interprets 'solid waste management unit'

to include any discernable unit used for waste management. See 50 FR 28712 (July 15, 1985). Since the legislative history describes the interim status corrective action authority as a "supplement" to permitting authority and indicates that the interim status authority should be at least as broad as the permit authority, Section 3008(h) clearly authorizes EPA to require corrective action for any release of hazardous waste from discernable waste management units. The Agency's authority to use Section 3008(h) to address releases from solid waste management units as well as hazardous waste management units is discussed in the Final Codification Rule. 50 FR 28716 (July 15, 1985).

The language of Section 3008(h), however, suggests that Congress did not intend to limit EPA's authority to releases from discernable units. Unlike Section 3004(u), Section 3008(h) broadly authorizes corrective action for any release from a "facility". It does not require the Agency to find that a release originated in a discernable waste management "unit".

The legislative history supports this interpretation. Prior to enactment of Section 3008(h), the RCRA regulations required corrective action for releases to groundwater from permitted 'regulated units' (surface impoundments, waste piles, landfills and land treatment areas that received Subtitle C hazardous waste after a specified date). 40 CFR 264.100 and 40 CFR 264.90. Congress criticized this approach as too slow and too limited, however, and created the interim status corrective action authority to "deal directly with an ongoing environmental problem at interim status facilities." H. Rep. No. 1133, 98th Cong., 2d Sess. 110-112 (1984). Moreover, Congress clearly did not intend the authority to be limited to the scope of the existing permit program. For instance, the legislative history lists several examples of releases outside the regulatory program for which a §3008(h) action is appropriate, including

releases from waste management units not required to undertake corrective action or otherwise exempt from RCRA regulations and releases, such as air emissions, to environmental media other than groundwater. Id. at 112.

The text of the statute, the broad remedial purpose, and the clear intent to authorize action beyond the scope of the permit regulations support the position that Section 3008(h) authorizes EPA to address all types of releases of hazardous waste within a facility. As discussed previously, the term 'hazardous waste' encompasses 'hazardous constituents' from both hazardous and solid waste.

Section 3008(h) will also be used to address releases that have migrated from the facility. New Section 3004(v), which provides that EPA may issue orders requiring corrective action for releases that have crossed the facility boundary if the permission of the owner of the affected property can be obtained, supports the Agency's interpretation that such releases are subject to action under Section 3008(h). See also the Final Codification Rule. 50 FR 28716 (July 15, 1985).

In a §3008(h) order or judicial referral, Agency personnel should describe hazardous and solid waste management units within the boundary of the facility and hazardous and solid wastes (and associated hazardous constituents) managed by the facility in addition to information indicating that a release has occurred. Since Section 3008(h) unequivocally authorizes EPA to address releases from units, the order or complaint should establish some link between the hazardous constituents in a release and the hazardous or solid wastes in waste management units where possible. For example, the findings of fact might state that the facility treats, stores or disposes of certain listed Subtitle C wastes, that those wastes were listed because they contain the hazardous constituents cited in Appendix VII to 40 CFR Part 261 and that some or all of those constituents have been found in the environment, thereby indicating a release.

"...authorized to operate under Section 3005(e)..."

This clause encompasses several classes of hazardous waste treatment, storage and disposal facilities. First, facilities that have met each requirement for obtaining interim status in a timely manner are subject to Section 3008(h). With respect to those facilities brought into the hazardous waste management system when the Phase I RCRA rules went into effect, to establish interim status EPA must demonstrate that: (1) the facility was in existence on November 19, 1980, and; (2) the owner or operator complied with the requirements of Section 3010(a), regarding notification of hazardous waste activity, and; (3) the owner or operator submitted a Part A application in accordance with 40 CFR 270.10. As to those facilities in existence on the date of regulatory or statutory changes that render the facility subject to the requirement to obtain a permit under Section 3005, to establish interim status the Agency must demonstrate (1) that the facility was in existence on the appropriate date and (2) submitted a Part A permit application in accordance with the requirements of 40 CFR 270.10. If a statutory or regulatory change requires notification under Section 3010, EPA must also establish that the facility submitted the notification.

Second, Section 3008(h) applies to facilities that treat, store, or dispose of hazardous waste, but have not actually obtained interim status because the owner or operator did not fully comply with the requirements to submit a Section 3010 notification and/or a Part A. Such facilities have been allowed to operate in accordance with a formal enforcement action or an Interim Status Compliance Letter requiring compliance with Part 265 standards. Furthermore, the owners or operators are not relieved of the duty to apply for and obtain a final RCRA permit. See e.g., the notice of implementation and enforcement policy for loss of interim status under Section 3005(e), 50 FR 38947-48 (September 25, 1985).

The Agency believes that Congress intended the interim status corrective action authority to apply to such facilities. The legislative history for Section 3008(h) supports this position by making it clear that the authority can be used to address releases from units that do not have interim status, such as wastewater treatment tanks. H. Rep. No. 1133, 98th Cong., 2d Sess. 112 (1984).

Third, EPA considers Section 3008(h) to be applicable not only to owners or operators of facilities in the above two categories but also to units or facilities at which active operations have ceased and interim status has been terminated pursuant to 40 CFR Part 124 or Sections 3005(c) and 3005(e)(2) of RCRA. Section 3008(h) specifically provides that the interim status corrective action orders may include a suspension or revocation of the authority to operate under interim status, as well as any other response necessary to protect human health or the environment. Consequently, a corrective measures program can be imposed under Section 3008(h), even if a facility's interim status has been taken away as a result of an interim status corrective action order. The Agency also believes that Section 3008(h) can be used to compel responses to releases at facilities that lost interim status prior to a §3008(h) action. This approach is consistent with Congressional intent to assure that significant environmental problems are addressed at facilities that treat, store or dispose of hazardous waste but do not have a final RCRA operating or post-closure permit. H. Rep. No. 1133, 98th Cong., 2d Sess. 110-112 (1984).

Where a State is authorized to administer the RCRA program, the requirements for obtaining the State's equivalent to interim status may differ from those of the federal program. In authorized States that do not duplicate the federal procedures, hazardous waste treatment, storage and disposal facilities that have not been granted or denied a final RCRA permit are generally considered interim status facilities. Land disposal facilities that were issued State permits

after November 8, 1984 but have not yet received the federal portion of the permit applicable to continuing releases under Section 3004(u) are treated for purposes of this guidance in the same manner as interim status facilities. Similarly, hazardous waste underground injection wells that did not receive a UIC permit prior to that date will also be treated in the same manner as interim status facilities. See the notice of implementation and enforcement policy for loss of interim status under Section 3005(e). 50 FR 38947 (September 25, 1985).

"...Corrective action or such other response measure as he deems necessary to protect human health or the environment ..."

Prior to the Hazardous and Solid Waste Amendments of 1984, the term "corrective action", in the RCRA regulatory context, referred to removal or treatment in place of Appendix VIII hazardous constituents in groundwater. 40 CFR 264.100. Section 3008(h) is not restricted to remedial action for ground-water contamination, however. The statutory language and the legislative history indicate that a wide range of responses to releases to all media from waste management activities may be compelled. Financial assurance for any response measure may also be required.

The authority can be used to require implementation of one or more stages of a clean-up program, such as:

- Containment, stabilization or removal of the source of contamination,
- Studies to characterize the nature and extent of contamination and to assess exposure and health and environmental effects,
- Identification and evaluation of remedies,
- Design and construction of the chosen remedy,
- Implementation of the remedy, and
- Monitoring to determine the effectiveness of the remedy.

For example, a §3008(h) order might require that the owner or operator conduct a study to characterize the nature and extent of contamination, then select a remedy and submit a corrective action plan to EPA. The Agency and the owner or operator would then confer on the plan and amend the order to reflect any modifications. H. Rep. No. 1133, 98th Cong., 2d Sess., 111 (1984). Because a study on the nature and extent of contamination and the selection and design of a remedy may require a significant amount of time, Section 3008(h) should be employed to require interim measures as necessary to protect human health and the environment prior to completion of the study and selection of a remedy. Examples of interim remedies that could be compelled include removal of the waste or containment of the source of the contamination by lining a unit or erecting dikes. In some instances, preliminary pumping and treating of affected groundwater may be appropriate.

While the information needed to make a determination that there is or has been a release is minimal, more information may be needed to justify a specific interim or full remedy. The Administrator can require "corrective action or such other response measures as he deems necessary to protect human health or the environment." To show that a response may be necessary to protect human health or the environment, the present or potential threat posed by the release should be described. The Agency may consider a variety of factors, including the quantity of hazardous waste; the nature and concentration of hazardous constituents or other hazardous properties exhibited by the waste; the facility's waste management practices; potential exposure pathways; transport and environmental fate of hazardous constituents; humans or environmental receptors that might be exposed; the effects of exposure, and; any other appropriate factors. To compel corrective action investigations or studies, only a general threat to human health or the environment needs to be identified.

IV. ADMINISTRATIVE ACTIONS

Under Section 3008(h), the Agency can issue administrative orders or commence a civil judicial action. The decision to pursue an administrative or judicial remedy must be made on a case-by-case basis since each approach has advantages and disadvantages. An administrative order, for instance, can usually be issued quickly, while preparation for a judicial action may be more time-consuming and must be referred to the Department of Justice. On the other hand, a judicial order or consent decree can be enforced readily since the court already has jurisdiction of the matter.

EPA may issue a §3008(h) administrative order to require corrective action or any response necessary to protect human health or the environment. The order may include a suspension or revocation of authorization to operate. If any person named in the order fails to comply with the order, the Agency may impose a civil penalty not to exceed $25,000 for each day of noncompliance.

Notice to States

Section 3008(h) does not require that States be given notice of an impending action. To ensure that the Agency is fully informed of relevant facts and, in view of the Federal/State relationship, consultation with the State should usually precede an EPA action. To avoid misunderstandings, reasonable notice should be given to the State when an action is taken. The notice should include the location and a description of the facility, the names and addresses of the owners and operators, the conditions requiring a response and a description of the action that EPA will require.

Elements of Orders

Because it is the focal point in all proceedings subsequent to its issuance, the initial order must be as complete as possible. Failure to develop an adequate document may have adverse consequences if the Agency seeks judicial enforcement. All §3008(h) orders should contain the following general elements:

- A statement of the statutory basis for the order.
- Factual allegations showing that there is or has been (1) a release (2) of hazardous waste or hazardous constituents (3) into the environment (4) at or from an interim status facility. Facts indicating that the response is necessary to protect human health or the environment should also be presented.
- A determination, based on the factual allegations, that there is or has been a release of hazardous waste or hazardous constituents to the environment from an interim status facility.
- An order that clearly identifies the tasks to be performed, and a schedule of compliance accompanied by appropriate reporting and approval requirements.
- A statement informing the respondent that he has a right to request a hearing within 30 days of issuance concerning any material fact in the order or the terms of the order.
- A notice of opportunity for an informal settlement conference. It is the Agency's policy to encourage settlement of §3008(h) actions through informal discussions. The respondent should be cautioned, however, that a request for a conference does not affect the 30 day period for requesting a hearing.
- A statement that EPA may assess penalties not to exceed $25,000 per day of non-compliance with the order.

It may be appropriate to include a provision for stipulated penalties in orders on consent. Such a provision, however, should be drafted to make it clear that the stipulated penalty is not EPA's sole remedy and that Agency has not waived its statutory authority to assess penalties under Section 3008(h)(2). It is recommended that the Regions pursue judicial referrals to impose penalties for noncompliance with a §3008(h) administrative order rather than issuing a subsequent order for penalties.

Releases from liability and covenants not to sue may be sought by parties negotiating §3008(h) orders. These provisions terminate or seriously impair the Federal Government's right of action against a party. In general, the interim CERCLA Settlement Policy (December 5, 1984) may be followed. Releases generally will not be appropriate, however, where the extent of contamination, the reliability of the remedy or long-term operation and maintenance requirements are uncertain. If provided, they should be narrowly drawn. In addition, EPA personnel should exercise particular care in drafting such provisions to ensure that they do not restrict the operation and enforcement of the on-going RCRA regulatory program. Moreover, the order should also contain a provision reserving the Agency's right to take additional action under RCRA and other laws. For example, EPA should reserve the right to expend and recover funds under CERCLA; to bring imminent and substantial endangerment actions under RCRA §7003 and CERCLA §106; to assess penalties for violations of and require compliance with RCRA requirements under §3008(a); to address releases other than those identified in the order; to require further action as necessary to respond to the releases addressed in the order, and; to take action against nonparties if appropriate.

Hearing Requirement

To issue a unilateral §3008(h) order, EPA must comply with the requirements of Section 3008(b) with respect to an opportunity for a hearing. 130 Cong. Rec. S9175 (daily ed. July 25, 1984). Although procedures for §3008(a) administrative actions have been established by regulation (See 40 CFR Part 22), those regulations are not legally applicable to §3008(h) actions. Hearing procedures for §3008(h) actions are under development. Until formal guidance is available, a Region that intends to issue a unilateral order should contact the Office of Waste Programs Enforcement, Office of Solid Waste and Emergency Response.

Development and Preservation of the Administrative Record

§3008(h) orders might be reviewed in administrative or judicial proceedings. Therefore, it is essential that information required by the statute and all other relevant information or documents obtained by the Agency be compiled in an administrative record, preserved and readily retrievable. The EPA official initiating the action should maintain a file that contains the following:

- EPA investigative records, such as inspection reports, sampling and analytical data, copies of business records, photographs, etc.;
- Reports and internal Agency documents used in generating or supporting the enforcement action, including expert witness statements;
- Copies of all documents filed with the Regional Hearing Clerk or the Presiding Officer;
- Copies of all relevant correspondence between EPA and the respondent;
- Written records of conferences and telephone conversations between EPA and the respondents, and;
- Copies of all correspondence between EPA and State or other federal agencies pertaining to the enforcement action.

V. CIVIL JUDICIAL ACTIONS

Under Section 3008(h), EPA may initiate civil judicial action to compel appropriate relief, including a temporary or permanent injunction, or to enforce a §3008(h) administrative order. As noted previously, the decision to pursue administrative or judicial remedies will be made on a case-by-case basis. Generally, however, a civil judicial action may be preferable to issuance of an administrative order in the following types of situations:

- A person is not likely to comply with an order or has failed to comply with a §3008(h) order.
- A person's conduct must be stopped immediately to prevent irreparable injury, loss or damage to human health or the environment.
- Long-term, complex and costly response measures will be required. (Because compliance problems are more likely to arise during implementation of these actions than while carrying out a simple, short-term action, it may be better to have the matter already before the court for ease of enforcement.)

Other factors that could be considered include the value of a favorable decision as precedent and the need to deter noncompliance by other potential targets for EPA enforcement action under Section 3008(h).

A request to file a civil judicial action must be referred by the Assistant Administrator for Enforcement and Compliance Monitoring to the Department of of Justice. The procedures that Agency personnel should follow to develop a referral and support litigation are described in the RCRA/CERCLA Case Management Handbook (August, 1984) and the RCRA Compliance/Enforcement Guidance Manual (September, 1984).

VI. USE OF SECTION 3008(h) IN RELATION TO PERMITTING, CLOSURE AND OTHER AUTHORITIES

RCRA Permits

The pre-HSWA regulations applicable to corrective action at permitted facilities deal only with a remedial program for treatment in place or removal of groundwater contaminated by a release from a 'regulated unit'. (Prior to HSWA, the term 'regulated unit' meant a surface impoundment, landfill, land treatment unit or waste pile that operated after January 26, 1983. Enactment of new Section 3005(i), which provides that the Part 264 groundwater monitoring, unsaturated zone monitoring and corrective action requirements are applicable at the time of permitting to landfills, surface impoundments, waste piles and land treatment units that received Subtitle C hazardous wastes after July 26, 1982, necessitated a corresponding change in the definition of regulated unit). Enactment of Section 3004(u) enlarged the universe of units subject to corrective action at RCRA facilities by requiring that a facility seeking a RCRA permit address all releases of hazardous waste and hazardous constituents at any hazardous or solid waste management unit.

In addition to increasing the number and kinds of units subject to corrective action, EPA will use the Section 3004(u) authority to address releases to air, land and surface waters as well as to groundwater. Furthermore, Section 3004(v) allows EPA to require corrective action beyond the facility boundary where necessary to protect human health and the environment unless the facility owner or operator is unable to obtain permission from the owner of the affected property.

Permitting can be a lengthy process. Therefore, the interim status corrective action authority should be used to address significant environmental problems prior to issuance of the permit. With respect to 'regulated units', which cannot be permitted until the facility is in compliance with Part 270 requirements to assess ground-water contamination and develop a corrective action plan if necessary, Section 3008(h) may be particularly useful for compelling activities not addressed by the Part 265 and Part 270 regulations. For instance, interim corrective action measures could be required prior to permit issuance. For releases from solid waste management units and hazardous waste management units other than 'regulated units', Section 3008(h) may be used to compel interim measures, studies to characterize the nature and extent of contamination and the threat posed by the release, selection of remedy and design, construction and implementation of the remedy.

If an interim status facility is seeking an operating permit or will be required to obtain a post-closure permit, any §3008(h) action at that facility should be designed to meet the needs of the permitting process to the extent possible. If all necessary steps in a corrective measures program will not be completed prior to issuance of a permit, compliance schedules in the order should be developed so that they can be readily incorporated in the permit.

RCRA Closures

EPA believes that the interim status corrective action authority will be useful in assuring environmentally sound closures of RCRA hazardous waste management units. Section 3008(h) may be used to supplement the interim status closure regulations. Approval of a closure plan does not limit the Agency's ability to use Section 3008(h), as well as other applicable corrective action authorities, to deal with releases of hazardous waste or hazardous constituents. In view of the number of interim status closures anticipated as a result of new statutory and regulatory requirements, the Regions are encouraged to employ the interim status corrective action authority to assure that RCRA hazardous waste management units are closed in a manner that properly protects human health and the environment.

Other Enforcement Authorities

Because of the broad scope of Section 3008(h) and the variety of activities that can be compelled, the interim status corrective action authority may be employed in conjunction with other enforcement authorities, although it may be appropriate to issue separate,concurrent orders due to differing hearing requirements. For example, where a violation is associated with a release of hazardous waste or hazardous constituents, a Section 3008(a) action should be used to require compliance with the regulation and assess penalties while a Section 3008(h) action could be employed to compel response actions that go beyond regulatory requirements. Section 3013, which allows the Agency to compel owners or operators of treatment, storage or disposal facilities to conduct certain types of studies, may be used when the presence of hazardous waste may present a substantial threat but EPA does not have sufficient information to make a determination that there is or has been a release.

With regard to imminent and substantial endangerment actions, the legislative history makes it clear that enactment of Section 3008(h) does not alter the Agency's interpretation of Section 7003. H. Rep. No. 1133, 98th Cong., 2d Sess. 111 (1984). RCRA §7003 or CERCLA §106 actions are appropriate if conditions at an interim status facility may present an imminent and substantial endangerment and the Agency needs to move quickly to address the problem. The 'imminent hazard' provisions of RCRA and CERCLA may be especially helpful if the Agency wishes to take action against responsible parties other than or in addition to the current owner or operator.

VII. RESERVATION

The policies and procedures set forth herein and the internal office procedures adopted pursuant hereto are intended solely for the guidance of United States Environmental Protection Agency personnel. These policies and procedures are not intended to, do not, and may not be relied upon to create a right or benefit, substantive or procedural, enforceable at law by a party to litigation with the United States. The Agency reserves the right to take any action alleged to be at variance with these policies and procedures or that is not in compliance with internal office procedures that may be adopted pursuant to these materials.

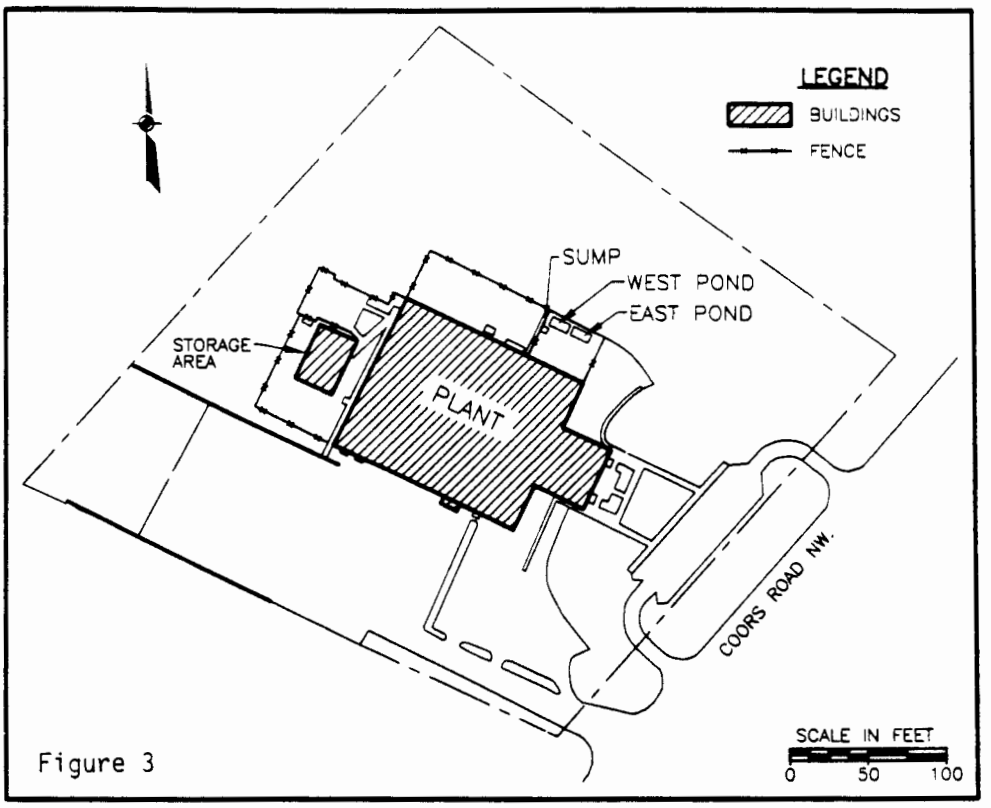


Figure 3

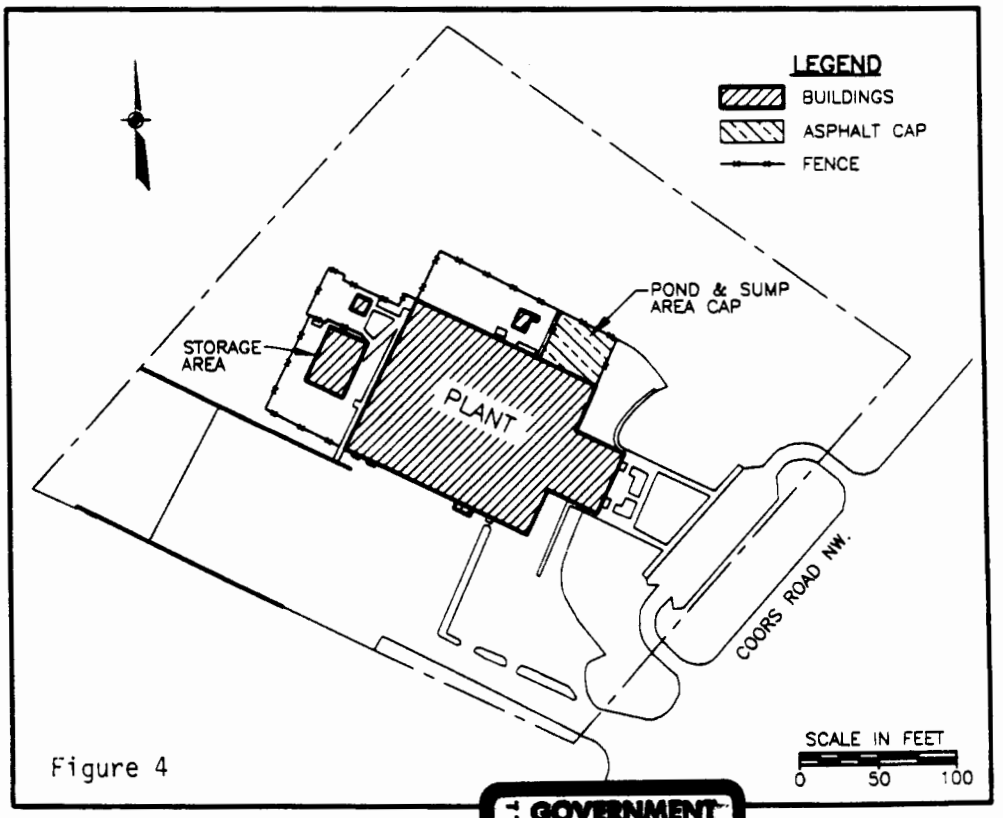


Figure 4

GOVERNMENT EXHIBIT 5

Post-it® Fax Note 7671	Date 2 pages ▶ 4
To Evan Pearson	From Debra Kane
Co./Dept.	Co.
Phone #	Phone # 505/768-4500
Fax # 214/665-2182	Fax #

CITY of ALBI

TWELFTH COUNCIL

COUNCIL BILL NO. R-57 ENACTMENT NO. 92-1996

SPONSORED BY: Alan B. Armijo

RESOLUTION

RECOGNIZING AN IMMINENT AND SUBSTANTIAL ENDANGERMENT RELATED TO CONTAMINATION IN THE VICINITY OF THE SPARTON TECHNOLOGY SITE AT 9621 COORS ROAD NW, ALBUQUERQUE; DECLARING THE CITY'S COMPELLING INTEREST IN PROTECTING THE CITY'S WATER RESOURCES; CALLING UPON STATE AND FEDERAL AUTHORITIES TO ACT IMMEDIATELY TO REQUIRE RESPONSIBLE PARTIES TO CHARACTERIZE AND ABATE THE IMMINENT AND SUBSTANTIAL ENDANGERMENT; AND, CALLING FOR INDEPENDENT PROGRAMMATIC AND LEGAL ACTION BY THE CITY OF ALBUQUERQUE.

WHEREAS, hazardous industrial solvent wastes and hazardous metal plating wastes were disposed of at the property and facility owned and operated by Sparton Technology located at 9621 Coors Road N.W., Albuquerque, New Mexico; and

WHEREAS, investigations at the Sparton Technology site demonstrate that the hazardous wastes, including the constituents trichloroethylene (TCE) and chromium, are present in the soil and continue to be released into groundwater; and

WHEREAS, the demonstrated concentrations of hazardous wastes present in soil and groundwater at the Sparton site greatly exceed safe levels established by the State of New Mexico and the United States government; and

WHEREAS, investigations at the Sparton site demonstrate that the release of contamination from the Sparton site is continuous, has migrated off the Sparton property, has migrated beyond the farthest and deepest monitoring wells, and that the contamination is uncontrolled and continues to spread; and

WHEREAS, the hazardous wastes emanating from the Sparton site threaten to contaminate a unique hydrogeological structure known as a "recharge window"; and

WHEREAS, the aquifer impacted and endangered by the Sparton contamination is master planned as the location of the Corrales Trunk Primary Well Field and as such

Underscored Material - New
[Bracketed Material] - Deletion

GOVERNMENT EXHIBIT 6

1 is a critical resource for the City of Albuquerque; and

2 WHEREAS, the Groundwater Protection Policy and Action Plan adopted by the
3 City designates the area impacted and endangered by the Sparton contamination as
4 a crucial area for groundwater quality protection; and

5 WHEREAS, the mission of the Groundwater Protection Policy and Action Plan
6 adopted by the City is to ensure the quality of our groundwater resources so that the
7 public health, quality of life, and economic vitality of this and future generations are
8 not diminished; and

9 WHEREAS, the goals and policies of the Groundwater Protection Policy and
10 Action Plan call for the City to identify responsible parties, to seek expeditious cleanup
11 remedies, and to promote the vigorous enforcement of groundwater laws and
12 regulations; and

13 WHEREAS, the City's interests and rights in the development and use of the
14 aquifer and recharge window are damaged by the contamination released and
15 emanating from the Sparton site; and

16 WHEREAS, protracted negotiations between Sparton Technology and the
17 United States Environmental Protection Agency have not resulted in adequate
18 characterization and abatement of the imminent and substantial endangerment.

19 BE IT RESOLVED BY THE COUNCIL, THE GOVERNING BODY OF THE CITY OF
20 ALBUQUERQUE:

21 Section 1. The City finds:

22 A. That the contamination emanating from the Sparton facility
23 presents an imminent and substantial endangerment to health or the environment.

24 B. That the City has a compelling interest in protecting the health,
25 safety, and welfare of its citizens, including vigorous protection of the City's limited
26 groundwater resources.

27 C. That the groundwater and recharge window in the vicinity of the
28 Sparton facility comprises a valuable resource for the City, which the City intends to
29 develop and utilize.

30 Section 2. The City calls upon the appropriate State and Federal authorities
31 to act immediately to require the responsible parties to characterize and abate the
32 imminent and substantial endangerment at the Sparton site.

33 Section 3. The Public Works Department and Environmental Health

Underscored Material - New
[Bracketed Material] - Deletion

Department of the City shall take programmatic action to determine the best uses of the aquifer and recharge window in the vicinity of the Sparton facility.

Section 4. The City Attorney's Office shall take available legal action to establish independent standing to require responsible parties to characterize and abate the imminent and substantial endangerment at the Sparton facility, and to seek recovery of damages and costs to the City caused by the contamination.

Underscored Material - New
[Bracketed Material] - Deletion

PASSED AND ADOPTED THIS 19th DAY OF August, 1996

BY A VOTE OF 8 FOR AND 0 AGAINST.

Yes: 8
Excused: Robbins

Steve D. Gallegos, President
City Council

APPROVED THIS 9th DAY OF September, 1996

Martin J. Chavez, Mayor
City of Albuquerque

ATTEST:

City Clerk

Underscored Material - New
[Bracketed Material] - Deletion

RECEIVED
ALBUQUERQUE CITY CLERK
SEP 10 AM 8 24

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

In the Matter of:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 Coors Road, N.W.	)	U.S. EPA Docket No:
Albuquerque, New Mexico 87114	)	RCRA VI-001(h)-96-H
	)	
EPA I.D. No. NMD083212332	)	
	)	

AFFIDAVIT

STATE OF NEW MEXICO)
) ss:
COUNTY OF BERNALILLO)

I, NORMAN GAUME, upon personal knowledge, state under oath as follows:

1. I am the Manager of the Water Resources Division of the City of Albuquerque, Public Works Department and have been employed in the Public Works Department or its predecessor agency of the City of Albuquerque since 1978. A summary of my education and professional experience is attached.

2. I have reviewed the brief memorandum entitled "Report of W. Peter Balleau, C.P.G., P.Hg., Sparton Technology, Inc., Site Impact on Groundwater-Resource Availability". In general, the document misrepresents to a significant degree the importance of the groundwater resources contaminated by Sparton Technology, Inc. and the consequences of this contamination to the City of Albuquerque's planned use of this portion of the aquifer for water supply. No technical basis is presented for many of the opinions expressed and the significance of other facts are misrepresented. As a result, the conclusions reached are not supported by the analyses described in the report.

3. The discussion in the report (page 7) on the fact that there is only a 40-year supply of high-quality water available to the City reinforces the need for expeditious containment and remediation of the Sparton contamination. It is the formally adopted policy of the City of Albuquerque and the County of Bernalillo that the water resources of the regional shall be managed to provide a permanent adequate supply. The Sparton contamination has and will substantially interfere

GOVERNMENT EXHIBIT 7

with the implementation of that policy. Even if that were not the case, 40 years is a very short time frame in terms of water supply planning in the West. New sources of supply, in the unlikely event that they can be obtained at all, could easily require in excess of 40 years to develop.

4. Mr. Balleau states that "hydraulic control and containment can be maintained at the site with practical capture well-layout and pumping rates" that would provide a "contiguous area where wells reasonably should not be completed for public water supply purposes [that] need not be greater than...approximately one quarter mile (125 acres) around the plume center" (page 3). In my opinion, Sparton's historical actions and statements are inimical to their implementation of this "practical" containment system.

5. Specific comments regarding Mr. Balleau's report follow:

   a. The estimated range suggested for the areal extent of the plume ("30-90 acres") is clearly a very optimistic one. Based just on the existing monitoring wells, upon information, the plume is at least 2,600 feet long and at least 1,000 feet wide (along the northwest site boundary). The contamination would be likely to spread transverse to the flow direction as it moves downgradient, so the areal extent has to be at least 60 acres and it could be this small only if the contamination abruptly stops at the downgradient well MW 61 (where the TCE concentration rose to 2000 ppb in 1995 and then decreased to 760 ppb in July 1996, probably due to a mass of concentrated contamination in the groundwater flowing even farther downgradient). The width transverse to the flow direction at this point near MW 61 could reasonably be estimated to be about 1,000 to 1,500 feet. If the actual plume extends another 1,000 feet downgradient, the total areal extent would more likely be from about 80 acres to over 90 acres. The lack of monitoring well control to the south of the plume and to the northwest means that contamination could occur in an even larger area.

   b. It is misleading to characterize contaminant concentrations off site as "declining" (page 2). Concentrations in a majority of the wells are decreasing because the majority of the wells are close to the former source of the contamination and significant new sources of contamination in the magnitudes originally present may not exist.

   c. The point missed is that the concentrations in the wells on the edge of the plume are increasing, indicating further (advective/dispersive) migration of the plume off site. For example, upon information, over the sampling period (about 1989 to 1993 or 1994, depending on the well), contaminant concentrations have been increasing in Wells 53, 58, 61 and 62 in the UFZ, 56 and 60 in the ULFZ, and 55 in the LLFZ. All of these wells are on the leading edge of the plume. Therefore, the plume is continuing to migrate off site.

d. There is no technical basis supporting the adequacy of the suggested (page 3) 1/4 mile buffer zone around the plume. There are no calculations presented to support the ½-plume-width metric or the 500-foot vertical separation also referred to on page 3. Moreover, it is not clear how such a "buffer zone" would be applied given that the areal extent of the plume is not very well defined in some areas, especially to the south.

e. Needless to say and unfortunately, the assumption (page 3) that "...the future condition of the site will include active control and containment" is inconsistent with previous proposals by Sparton. Specifically, the ability to maintain hydraulic containment referred to in the 2nd paragraph on page 5 would require a commitment to robustness in the design of the pump and treat systems - the systems would need to be able to pump and treat significantly larger flow rates. A commitment to conservative or robust designs has been absent in previous proposals by Sparton.

f. Upon information and belief, the simple equation used on page 4 derives from mathematical assumptions of steady-state flow in an uniform and isotropic aquifer, bounded by impermeable layers on the top and bottom and of infinite areal extent and with wells fully penetrating its saturated thickness. It cannot be used to assess the impact of deeper wells on containment in the upper portions of the aquifer.

g. The report uses inconsistent estimates of vertical contaminant transport. Page 4 refers to "particle tracking models" that show vertical transport to city wellfields typically less than 300 feet in 40 years (7.5 ft./yr.). This rate of vertical movement is over two times as great as the rate estimated for the vertical spread of the contamination at the site on page 2.

h. The basis for the conclusion that only a small portion of the buffer zone would be impacted by TCE (page 5, 1st paragraph) is not apparent.

i. The report speculates that "the Sparton site is in the expected zone of poor water quality" with the delineation of the "poor quality zone" being Mr. Balleau's. Some data is presented in the report to support this conclusion but it is my belief that these data are not representative. The report notes specific conductance values in Sparton wells as high as 1,100 micromhos/cm, however, there is no maximum contaminant level (MCL) for specific conductance. A specific conductance value of 1,100 does roughly correlate to a total dissolved solids value of 600-700 mg/l. The secondary MCL for TDS is 500 mg/l, but that value is noted as being for aesthetic purposes only. The 1,100 micromhos/cm value presented appears to be a maximum value. However, the range or average specific conductance values observed in the Sparton wells would be more pertinent to assessing the quality of the area as a groundwater resource. Sampling of many of the Sparton monitoring wells by the New Mexico Environment Department in

October 1996 found TDS levels almost always below 500 mg/l. Therefore, I conclude that the high values discussed in Mr. Balleau's report are anomalies or are artifacts of the Sparton contamination. Additionally, the sampling procedures under which these specific conductance values were obtained are not noted. If the 1,100 micromhos/cm value was observed in a sample from an initial well purge volume, it is not necessarily indicative of local groundwater quality. This isolated specific conductance value is not evidence that the shallow groundwater is of unsuitable quality for public water supply.

j. The report also notes a maximum nitrite-nitrate nitrogen value of 9.6 mg/l observed in a Sparton well. The MCL for Nitrate as N is 10 mg.l, therefore even this maximum Sparton value does not appear to even be in excess of the MCL. The report provides no data showing the nitrate makes the water unsuitable for public supply.

k. The report notes hardness values ranging from 180 to 285 mg/l CaCO, in the Sparton wells. As with specific conductance there is no MCL for hardness, but the report indicates that water with hardness values in excess of 180 mg/l is considered "very hard" per Hem, 1992. However, the USEPA's Quality Criteria for Water (1976) denotes the water with hardness values of 150-300 mg/l as being "hard" and water with hardness values in excess of 300 mg/l as being "very hard". Hardness levels do not, however, preclude use of groundwater, and in fact there are several active City of Albuquerque wells that have displayed maximum hardness values in excess of 200 mg/l (i.e. San Jose #1, Ponderosa #3, Duranes #6, Lomas #1) (City of Albuquerque Aquifer Surveillance Program Summary Statistics, 1996). Furthermore, groundwater sampling conducted by the NMED in October, 1996 indicated a hardness range of 20-285 mg/l in the Sparton wells. The hardness of the water does not make it unsuitable for public supply.

l. The report refers to manganese values "up to" 0.41 mg/l in background well MW-51. The secondary MCL for manganese is 0.05 mg/l but that MCL is specifically noted as being an aesthetic standard and therefore levels in excess of that standard do not preclude use of the groundwater. Furthermore, the phrase "up to" 0.41 mg/l infers multiple sampling events or sets of results. If there have been multiple sets of sampling results, the average manganese value for MW-51 or at least the range in manganese values would be more representative of the background groundwater quality. Furthermore, elevated levels of manganese occurring in the Albuquerque basin are generally associated with anoxic groundwater conditions primarily confined to the South Valley and the portions of the North Valley, east of the Rio Grande. Elsewhere, throughout the city, elevated manganese levels are rarely observed. Elevated manganese levels are often caused by analyses of turbid samples. The detected manganese levels observed in Sparton Well MW-51 appear to be a local anomaly, perhaps even associated with contamination from the Sparton facility.

m. Finally, as noted above, average values of these parameters, or the ranges of values obtained over several sampling events would be more useful than isolated maximum values in assessing groundwater quality. Notwithstanding this misleading use of the worst-case data, there is no evidence presented that the background water quality is unsuited for public supply.

n. The quotation from the Water Conference Paper (page 6) actually misquotes the referenced report by Thorn and others. The quotation from the referenced paper incorrectly states that the city has pumped 2.7 million acre feet (1962-92). The figure actually used in the cited report is about 2.5 million acre feet.

o. This quotation also puts forth an optimistic and incautious estimate of the volume of water in the "most productive part of the aquifer" of "3 million acre feet". This estimate is arrived at by using an arbitrary (and optimistic) estimate of the specific yield of the aquifer (the volume of the aquifer that actually yield water to wells) of 20 percent. A better estimate is that used in the USGS numerical model of groundwater flow in the Albuquerque basin of 15%. The effect is to overestimate the volume of water by some 700,000 acre feet. Interestingly, the more realistic value of 15% is used in the report (pages 2 and 3) to estimate the volume of contaminated groundwater. The effect of this inconsistency is to produce *higher* estimates of the total groundwater resource and to produce *lower* estimates of Sparton's impact on the groundwater.

p. The report's discussion of the City's "Wellfield Plan" and the now dated 1995-2005 Decade Plan ignores both the historic intent of the City's planning and recent developments. The intent put forth in the 1982 master plan was to locate a primary wellfield surrounding the immediate vicinity of Sparton. The primary wellfield would pump into a water storage reservoir to meet demands throughout a service area that would extend for several square miles and would meet rapidly increasing demands in this fast-growing area.

q. Recent developments include the identification by the U.S. Bureau of Reclamation and the New Mexico Bureau of Mines and Mineral Resources of the Calabacillas Arroyo as one of the region's rare *recharge windows* where the surface materials are permeable and are in good hydraulic connection with the good-quality deep aquifer system. This led to the development of an alternative, considered in the City's recently completed evaluation of water supply alternatives, that combined recharge of the City's San-Juan-Chama surface water in the arroyo with nearby production wells to effect a sustainable supply in this area. It turned out to a very favorable alternative from both cost and technical considerations - except of course for the uncontrolled Sparton contamination in the area which prevents any water resources development in this area.

r. The reference to the proposed critical management area (page 7), is also misleading for two reasons. First, CMAs have been suggested as a concept and

are far from being a regulatory requirement. Second, even if they were to become a part of the region's water management regulations, their intent is not to prevent the development of *sustainable* groundwater supplies such as that contemplated by the Calabacillas recharge alternative described above.

s. The report's first conclusion (page 7), appears to have underestimated the amount of contamination; there have been no effective steps taken so far to contain the contamination from "further migration".

t. Certainly the City is now effectively prevented from installing its planned production wells within the "buffer zone" discussed in the second conclusion. As a matter of practicality and prudence, it is also prevented from installing them in an area that is substantially greater than the "buffer zone" due to the contamination caused by Sparton.

u. The third conclusion is not supported by the data. Were it not for the TCE and chromium contamination , much of the shallow water at and off the site would be suitable for public water supply.

v. Finally, it is simply not true, as alleged by the fourth conclusion, that the TCE plume does not impact the City's cost to supply its customers with water. Without contamination at the site, the City would develop low-cost, sustainable *local* supplies. Without this option, water supply must be imported into the area at substantially greater cost.

FURTHER AFFIANT SAYETH NAUGHT.

Norman Gaume, Affiant

Sworn and subscribed to before me this 24th day of February, 1996.

Notary Public at Large

My Commission Expires:

6/13/99

EXPERIENCE AND EDUCATION SUMMARY

Norman Gaume, P.E.

4451 Avenida del Sol, N.E.
Albuquerque, New Mexico 87110
(505) 768-3631 (work)
(505) 268-8054 (home)

EXPERIENCE

1994 to date	Manager, Water Resources Division, Public Works Department, City of Albuquerque — Division mission is to secure Albuquerque's safe, adequate, and sustainable public water supply. Division programs include water supply assessment and strategic planning, implementation of the water conservation program and the city/county Ground Water Protection Policy and Action Plan, and arsenic treatment planning. Mr. Gaume co-chairs the Albuquerque/Bernalillo County Groundwater Protection Policy Implementation Committee and is project manager for development of the Albuquerque Water Resources Management Strategy and related water supply technical assessment activities.
1991 to 1994	Technical Programs Manager, Water Utility Division, City of Albuquerque — Managed technical services section, including water production facilities planning, design, and construction; water supply assessment and planning; aquifer and drinking water quality assessment and regulatory compliance; cross connection control; water conservation program development; and operations technical support activities for Albuquerque's 445,000 customer municipal water system. Chaired staff committee that developed award winning city/county ground water protection policy adopted in 1994. Project manager for water resources assessment and management and water supply planning activities.
1990 — 1991	Operations Manager, Water Utility Division — Responsible for operations and maintenance of the municipal water system.
1987 — 1990	Technical Support Manager, Water Utility Division — Implemented various technical programs for the municipal water system, including a major award winning program for the comprehensive rehabilitation of water wells, reservoirs, pump stations, and major system valves; water quality assessment and regulatory compliance; well and pump performance assessment; and cross connection control.
1985 — 1987	Assistant Division Manager, Liquid Waste Systems Division — Coordinated design and construction of large multiple project wastewater plant expansion program to assure uninterrupted facility operations. Initiated and managed implementation of award winning 2.2 megaWatt digester gas cogeneration project and plant-wide process control automation system for the City of Albuquerque's 50 million gallon per day secondary wastewater treatment plant. Managed technical support services including safety, training, and computer services.
1980 — 1984	Plant Manager, Liquid Waste Systems Division — Responsible for operations and maintenance of the city's wastewater treatment, wastewater pumping, and storm water pumping facilities. Implemented major improvements in process control, odor control, and staff training. Led staff team that took treatment facilities from operating under federal and state stipulated agreements to abate a public nuisance to a national award for excellence in operations and maintenance.

EXPERIENCE
(continued)

1978 — 1980	Maintenance Engineer, Liquid Waste Systems Division —Responsible for maintenance of wastewater treatment plants and wastewater and stormwater pumping stations.
1974 — 1978	Staff Engineer, Water Resources Engineers, Inc., Austin, Texas. Conducted studies and prepared plans for water resources management.
1972 — 1974	Graduate Teaching Assistant and U.S. Environmental Protection Agency Traineeship, Civil Engineering Department, New Mexico State University
1966 — 1972	Cooperative Education Program, New Mexico State University —satellite tracking and offshore geophysical exploration navigation at work-phase locations in Alaska, Iran, Pakistan, Mauritius, offshore Caribbean, and offshore West Africa.

EDUCATION

M. S. in Civil Engineering, New Mexico State University, 1980
Major: Sanitary Engineering Minor: Experimental Statistics
Thesis: A Hydrologic and Water Quality Model of the Mesilla and Rincon Valleys of the Rio Grande

B. S. in Electrical Engineering, New Mexico State University, 1973

Diploma, Hobbs High School, Hobbs, New Mexico, 1966

"Basic Management Program," Anderson Graduate School of Management, University of New Mexico, 1981

HONORS

Director's Award, City of Albuquerque, Public Works Department, 1993
Water Pollution Control Federation William D. Hatfield Award, 1986, "in recognition of outstanding performance in works operation, management, and advancement of knowledge in the field of water pollution control.
U. S. Environmental Protection Agency Operations and Maintenance Excellence Award, 1986
Plant Maintenance Merit Award, Rocky Mountain Water Pollution Control Association, 1982.
Phi Kappa Phi
Eta Kappa Nu
National Merit Scholarship Finalist, 1966

LICENSE

Registered Professional Engineer, New Mexico No. 6969

PROFESSIONAL AFFILIATIONS

American Water Works Association
Association of Metropolitan Water Agencies

IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-VI-001 (h)-96-H

REPORT OF RICHARD H. KUHLTHAU ON SPARTON TECHNOLOGY, INC. MODELED IMPACT TO NEW MEXICO UTILITIES WELL

FEBRUARY 24, 1997

The following assessment concerns the results of a groundwater computer model present in Appendix 3 of the Draft Final Corrective Measures Study (CMS) Report dated May 6, 1996, by Sparton Technology, Inc. (Sparton). According to Sparton, the groundwater computer model was run to determine if the trichloroethene (TCE) plume from the Sparton facility will reach the New Mexico Utilities' well over a 200 to 300 year period. As reported in the CMS Report, the computer model was based on a Department of Energy semi-analytical model named AT123. My report is based on a review of the modeling results presented Appendix 3 of the CMS Report, a supplemental memorandum from Pierce Chandler of Black & Veatch to Vincent Malott of EPA dated June 3, 1996, EPA's review of the modeling results as presented in the Technical Review of the Final Corrective Measures Study Report dated June 20, 1996 (pages 16-19), the Report of Pierce Chandler dated February 4, 1997, and DOE's documentation for the AT123D model (Yeh, 1981). My report is also based on my training, education, and experience as a practicing groundwater hydrologist. A copy of my curriculum vitae is attached.

As indicated in EPA's Technical Review of the Final Corrective Measures Study Report dated June 20, 1996 (Technical Review), Sparton's documentation of its modeling effort is incomplete. Sparton has failed to provide important information regarding a number of different aspects of its modeling effort. Sparton has failed to document fully the model (computer code) actually used in its study; all input parameters used to run the model, including the actual source configuration and contaminant release rate; and the results of model runs, including the distribution of TCE within the plume above a concentration of 10 ug/l. Sparton has also failed to identify the units (inches, feet, centimeters, meters, etc.) associated with the dispersivity values that it has reported using in its modeling efforts.

In spite of these deficiencies in model documentation, the conclusions presented by EPA in Comment 13 of EPA's June 20 Technical Review appear well founded based on the information available in the May, 1996 Draft Final CMS Report and the June 3, 1996 Memorandum. EPA's technical review also appears to indicate a significant effort to understand the assumptions, input parameters, and calibration involved in Sparton's modeling effort.

The Technical Review has expressed concern that the calibration process has resulted in an unrealistic ratio between the longitudinal and transverse dispersivity. The Technical Review also indicated that it appeared that the model was calibrated using a discrete (possibly point) source. The Technical Review further indicated that such a source would not account for a number of mechanisms other than dispersion that likely resulted in the spreading of contaminants

GOVERNMENT EXHIBIT 8

from the original point of release to a much larger area within the upgradient portion of the contaminant plume. Calibration under such an assumption would likely result in the ratio between longitudinal and transverse dispersivity that was obtained by Sparton and could significantly impact the long-term predictions provided by the model. In spite of these clearly identified concerns, Sparton has provided no further information refuting this assumption, nor has it provided any additional information clearly delineating the dimensions of the original source area assumed in its model effort.

The June 20 Technical Review also expressed concern regarding the vertical dispersivity value used in Sparton's modeling effort. Sparton has since provide information indicating that a vertical dispersivity of 0.01 was used (see Report by Pierce Chandler at p. 33). While no units were again provided, Sparton also indicated that this value was 0.2 to 2.0 percent of the calibrated horizontal values. This statement is confusing because in its June 3, 1996 Memorandum Sparton has previously identified its longitudinal and transverse dispersivity for the calibrated model to be 0.55 and 45, respectively. Based on these values and assuming equivalent units, the vertical dispersivity appears to have been 0.02 to 2.0 percent rather than 0.2 to 2.0 percent of the calibrated horizontal values. However, as Sparton has pointed out, these values for the ratio of vertical to horizontal dispersivities are close or significantly less than the ratio recommended in the June 20 Technical Review in absence of site specific data. Consequently, the assumed ratios between vertical and horizontal dispersivities do not appear, themselves, to be a cause for significant concern.

One of the underlying issues cited in the Technical Review in connection with the concerns regarding the vertical dispersivity used in the calibrated model was accounting for the excessive dilution and apparent disappearance of mass observed in the model results. Further inspection of the figures provided in Appendix 3 of the May, 1996 Final CMS Report indicate that no contaminant contours above 10 ug/l have been shown although a source concentration of 10,000 ug/l was assumed. This is particularly evident in Figure 1. Figure 1 was reported to be a preliminary run assuming minimal dispersivity values. Under such an assumption, maximum contaminant concentrations should be located only a short distance behind the leading edge of the plume. However, no contaminant concentration above 10 ug/l (corresponding to the contour identified as 1 ($\log_{10}$ 10)) was depicted on the figure. While Sparton may have been most concerned with predicting and illustrating the leading edge of the plume, the failure to depict concentrations above 10 ug/l may be responsible for EPA's concern regarding the apparent loss of mass in the modeled results. In any case, the apparent loss of mass in the model results remains a valid and important concern, and Sparton did not provide any further discussion or information regarding this concern.

Depiction and evaluation of contaminant concentrations above 10 ug/l could also provide further validation of model calibration. Figure 2 of Appendix 3 of the May, 1996 Final CMS Report portrays the calibration run and similarly depicts no concentration contour above 10 ug/l. However, by examining the position of the contours for intermediate concentrations such as 1000 and 3000 ug/l observed within the plume with those predicted by the model, it would have been

possible to further validate the calibration of the model, particularly the calibrated value for longitudinal dispersivity. However, no such analysis has been submitted by Sparton.

Although the units for dispersivity have never been identified, the calibrated dispersivity values are likely to have underestimated the longitudinal migration of the leading edge of the plume while overestimating the lateral spreading and, consequently, dilution of the plume. If we assume, based on the units provided for other distances documented for Sparton's modeling effort, that the units of the dispersivity values reported are feet, the longitudinal dispersivity used in the calibrated model is 0.55 feet. This value can be compared with observed values for longitudinal dispersivities that have been documented in the literature. Zheng and Bennett (1995, Figure 9-3, pg. 245) have reported the results of a study of 59 sites in which the observed longitudinal dispersivity for plumes of approximately 1000 meters (3281 feet) in length ranged between approximately 10 and 200 meters (32 and 656 feet). Based on the units assumed for the longitudinal dispersivity used in the calibrated model and on this comparison, it would appear that Sparton has significantly underestimated the longitudinal dispersivity and, thereby, possibly underestimated significantly the longitudinal migration of the leading edge of the plume.

Thus, the substantive concerns expressed by the June 20, 1996 Technical Review remain valid. Although sufficient documentation to fully evaluate Sparton's modeling effort has yet to be provided, the calibration appears to have been based on incorrect assumptions and resulted in an unrealistically low ratio of longitudinal to transverse dispersivity. Sparton has provided little additional information or analyses to address EPA's concerns regarding the modeling results.

I state under penalty of perjury that the foregoing is true and correct.

Excuted February 24, 1997.

A.T. Kearney, Inc.

Richard H. Kuhlthau, Ph.D.
Project Director

References

Yeh, G.T., 1981. AT123D: Analytical transient one-, two-, and three-dimensional simulation of waste transport in an aquifer system. ORNL-5602. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 88p.

Zheng, C. and G. Bennett, 1995. Applied Contaminant Transport Modeling. Van Nostrand Reinhold, New York, 440 pp.

CURRICULUM VITAE

Richard H. Kuhlthau
Project Director
A.T. Kearney, Inc.
Alexandria, VA

EDUCATION

B.S. Physics, Georgia Institute of Technology, Atlanta, Georgia, 1971.

M.S. Environmental Sciences, University of Virginia, Charlottesville, Virginia, 1979. Thesis topic: Sensitivity Analysis of Regional Ground-Water Models.

Ph.D. Civil Engineering, Colorado State University, Fort Collins, Colorado, 1994. Dissertation Topic: Numerical Simulation of Three-Phase Flow in Porous Media.

Preclinical Sciences Coursework, School of Medicine, University of Virginia, 1971-72.

PROFESSIONAL EXPERIENCE

1977 - Present, Consulting Groundwater Hydrologist

Undertaken consulting and fixed term employment assignments with private consulting firms, governmental agencies, and private industry. Consulting assignments have included both foreign and domestic work. A partial listing of clients and project work is presented below:

A. T. Kearney, Inc.
Alexandria, Va.

- Under contract to U.S. Environmental Protection Agency, performed completeness and technical reviews of geohydrologic site characterizations and proposed ground-water monitoring programs submitted with Part B Applications for permits at RCRA Hazardous Waste Management Facilities. Reviews included preparation of comments for inclusion in Notice of Deficiency or Notice of Intent to Deny sent to the applicant by the regulatory agency in response to an application for permit. Participated in the review of applications for more than thirty facilities. Also participated either as principal technical analyst or senior QC reviewer in RCRA Facility Investigation (RFI) and Corrective Measures (CMS) work plan and report reviews at more than 10 sites. Reviews included evaluation of groundwater monitoring programs, groundwater flow and contaminant transport modeling, NAPL distribution and migration, and corrective measures.

- Under contract to Westinghouse/Hanford, as senior hydrologist and coauthor, assisted in the preparation of RFI work plans for the 100-N Area at DOE's Hanford Reservation in Hanford, Washington. In this role, was responsible for comprehensive analysis of extensive geohydrologic and ground-water contamination data and for the formulation of a comprehensive plan to further characterize contamination and evaluate future remedial options. Also provided technical support during design of a vapor extraction program in 200-Area at the Hanford Reservation.

Morton & Potter
Potomac, Maryland

- Provided geohydrologic analysis in support of efforts to identify acceptable disposal (burial) options for low-level radioactive waste at several private uranium processors. Also supported efforts to characterize and to develop remediation options for ground-water contamination resulting from past management of low-level radioactive wastes. The technical support provided included the design and/or review of geohydrologic investigations and associated ground-water monitoring programs, analysis and interpretation of geohydrologic and ground-water quality data, and the analysis of fate and transport (including modeling) for the purpose of risk analysis. Also retained in response to special NRC license requirement to provide an independent review of the ground-water monitoring program at one uranium processing facility.

Geo/Resource Consultants
Washington, D.C.

- Under contract to the U.S. Environmental Protection Agency (TES III & IV), directed the oversight of RI/FS studies undertaken by potentially responsible parties (PRP's) at CERCLA (Superfund) sites. Activities included the review of work and sampling plans, direction of field oversight, review of RI reports, and negotiations support. Also directed the performance of RCRA Facility Assessments (RFA'S) and the review of work plans submitted by o wner/operators for RCRA Facility Investigations (RFI's). In addition, provided technical support in the initial stages of the development of a masterplan for the use of groundwater resources for the city of San Francisco.

GCA Technology Division
Bedford, Mass.

- Under contract to the U.S. Environmental Protection Agency (Office of Waste Programs Enforcement) prepared guidance for use by EPA Regional Enforcement personnel when evaluating ground-water monitoring programs implemented at interim status facilities to meet the requirements of 40 CFR, Part 265, Subpart F. Guidance designed to assist the Regions in determining the adequacy of these monitoring programs and in formulating enforcement actions for facilities at which the monitoring program is found to be inadequate. Particular emphasis was placed on the review of assessment programs planned for or implemented at interim status facilities. This guidance provided the basis for the initial draft of the Technical Enforcement Guidance Document (TEGD).

Radian Corporation
Research Triangle Park, N. C.

- Under contract to the U.S. Environmental Protection Agency (Office of Solid Waste), assisted in revisions intended to update the Agency's manual providing ground-water monitoring guidance to owners and operators of RCRA interim status facilities. The revisions were designed to ensure that ground-water monitoring programs implemented at interim status facilities conform, to the extent possible, with the monitoring programs that will eventually be required under a Part 264, RCRA permit. The revisions also included more com-

prehensive guidance on formulating assessment programs at facilities found to be contaminating ground water during interim status.

GeoTrans, Inc
Herndon, Va.

- Under contract to the U.S. Environmental Protection Agency (Office of Solid Waste), provided technical assistance to the Agency during development of regulations specifying RCRA ground-water monitoring and response programs at hazardous waste facilities (40 CFR, Part 264, Subpart F). Following promulgation of these regulations, was one of the principal authors of the Permit Writer's Manual developed by the Agency to provide guidance during the review of permit applications and subsequent establishment of the provisions in hazardous waste facility permits necessary under Subpart F requirements. Guidance was provided in the manual on the full range of monitoring and response issues encountered during the permitting of a hazardous waste facility. These issues included the specification of adequate monitoring well location and design features, specification of suitable sampling and analysis procedures, establishment of ground water protection standards, use of predictive techniques in evaluating contaminant transport and fate, and evaluation of corrective action measures at contaminating hazardous waste management sites.

- Under contract to the U.S. Environmental Protection Agency (Office of Solid Waste), was one of the principal instructors in a RCRA training course conducted by EPA Headquarters for each of the regional offices. Training course was designed to prepare Regional and State personnel for permitting hazardous waste facilities under the groundwater monitoring and response provisions of 40 CFR, Part 264, Sub-Part F. Course material included both technical and procedural aspects of establishing ground-water monitoring and response program in RCRA permits.

Geraghty & Miller, Inc.
Annapolis, Maryland

- Under contract to the American Petroleum Institute, was principal investigator for a national study to determine the hazards posed by refinery waste water impoundments to underlying ground-water resources. Study included an evaluation of ten refineries located throughout the U.S. and the preparation of a manual to assist refinery operators in assessing ground-water pollution problems at their individual refineries.

- Under contract to the American Petroleum Institute, was principal investigator in an effort to supply extensive technical support for a suit filed in the U.S. Federal District Court of Appeals against the U.S. EPA seeking revisions in the Solid Waste Disposal Regulations promulgated under the Resource Conservation and Recovery Act.

- Under contract to the U.S. Environmental Protection Agency (Office of Drinking Water), was one of the principal authors of a comprehensive reference document describing underground injection well construction practices.

- Under contract to the U.S. Environmental Protection Agency (Office of Drinking Water), was principal author of a guidance document for evaluating proposed well abandonment procedures. The document was intended for use by State and Federal Regulators in implementing Underground Injection Control (UIC) Programs.

Nuclear Safety Associates
Rockville, Maryland

- Provided geohydrologic analysis for submission to the Nuclear Regulatory Agency of potential sites for the burial (storage) of low level radioactive wastes. Work performed included analysis of available, regional hydrogeologic information as well as additional field investigations necessary to further identify site hydrogeology. Field investigations were conducted to identify and delineate existing low level radioactive waste buried nearby the proposed disposal site and which required reburial at the newly licensed sites. Ground-water monitoring systems were also designed and installed at the three licensed burial pits already existing at the site.

The World Bank
Washington, D.C.

- Prepared for the Office of Environmental Affairs a series of case studies analyzing the potential environmental hazards posed by industrial projects financed by the Bank, including the measures implemented to reduce these hazards. Prepared an internal policy paper for presentation to the Bank's Board of Executive Directors which detailed past and present activities in the environmental sector and made recommendations for future areas of involvement.

- Prepared for the Office of the Water Supply Advisor a set of eleven individual country reports which analyzed the range of water supply and sanitation technologies in use in these countries. The study was undertaken as part of the Bank's research project on Appropriate Technology in Water Supply and Waste Disposal.

MetaMetrics, Inc.
Washington, D.C.

- Under contract to the Office of Water Research and Technology (U.S. Dept. of Interior), was project director and hydrologist for a study to determine the feasibility of a desalting technology demonstration project on the Laguna Pueblo in New Mexico. The study included a regional water resources evaluation to determine potential sources for the desalting plant as well as for non-desalting alternatives, water demand analysis, evaluation of desalting technology alternatives, design of desalting plant to a level of costing, and evaluation of reject brine disposal alternatives and their environmental impacts. An environmental assessment of the proposed project was also completed.

- Under contract to the U.S. Agency for International Development, was project director and hydrologist of a multi-disciplinary team assembled to conduct a feasibility study for the Jaffna Market Town Water Supply Project in Sri Lanka. The feasibility study required the identification and verification of an adequate water supply, water system design to the level of costing, and the associated economic, financial, social, technical, institutional, and public health analyses for two separate water supply systems. The study required extensive investigation and evaluation of regional and local ground-water systems that were characterized by a sensitive salt water-fresh water interface. A scope of work for the development of a water resources master plan for the entire Jaffna Peninsula was also formulated.

- Under contract to the U.S. Agency for International Development, provided technical assistance to the El Salvador mission in its development of a rural water supply/sanitation project.

The project involved the development of a national operation and maintenance program, the development and execution of a training course for paratechnical and local maintenance personnel, the rehabilitation of existing rural water supply systems, and the selection and trial of appropriate technologies for the rural water supply and sanitation sector in El Salvador.

Wade Miller Associates, Inc.
Arlington, Virginia

- Under contract to the U.S. Environmental Protection Agency (Office of Drinking Water), was one of the principal analysts in a national study to assess the condition and problems associated with the operation of public water supply systems on American Indian reservations with the goal of formulating a strategy for the Agency to follow for achieving compliance on Indian reservations with public drinking water regulations authorized by the Safe Drinking Water Act. The study included site visits of reservations throughout the country and an analysis of technical, economic, institutional, operation and maintenance, and social considerations relevant to providing safe public drinking water supplies on American Indian reservations.

JRB Associates, Inc.
McLean, Virginia

- Under contract to the U.S. Environmental Protection Agency, was principal analyst for a study to provide the Office of Research and Development with a framework for tracking and assessing its research program conducted in support of the Agency's regulatory program for controlling toxic as wastes required by the revised Clean Water Act of 1977. The project required an analysis of EPA's toxic waste water control program as well as the research necessary to provide an effective basis for such a program.

1976, U.S. Environmental Protection Agency, Washington, D.C.

As a summer intern in the Office of Drinking Water (four months), provided technical support for and participated in the development of regulations which implemented the Underground Injection Control provisions of the Safe Drinking Water Act.

1974-1977, University of Virginia, Charlottesville, Virginia

While a graduate student in the Department of Environmental Sciences, was a research assistant responsible for assembling and maintaining electronic equipment used for in-situ water quality monitoring and for making field and laboratory water analysis as part of a research project measuring primary productivity in a local river basin. As a teaching assistant, provided instruction and supervision in graduate fluid dynamics course.

1973-1974, Inter-Technology Corporation, Warrenton, Virginia

As a researcher, participated in studies analyzing various aspects of national energy programs including energy resource management and conservation.

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
National Ground Water Association
American Geophysical Union

American Water Resources Association
International Water Resources Association

PUBLICATIONS AND PAPERS

Kuhlthau, Richard H., 1979. Sensitivity Analysis of a Regional Ground-Water Model of the Accomac-Onancock Region of the Eastern Shore of Virginia. Masters Thesis, University of Virginia, Charlottesville, Virginia.

Kuhlthau, Richard H., 1979. Country Studies in Appropriate Sanitation Alternatives: Volume VI of the World Bank's "Appropriate Technology for Water Supply and Waste Disposal in Developing Countries." Public Utilities Report RES 21, World Bank, Washington, D.C.

Thompson, W. E. and R. H. Kuhlthau, 1980. Assessment of Potential Hazard to Ground Water Posed by Refinery Waste-Water Impoundments. American Petroleum Institute, Washington, D.C., 199 pp.

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Mahan, J. S., D. A. McGlincy, R. H. Kuhlthau, W. E. Thompson, S. Bailey, and D. Zimombra, 1982. Injection Well Construction Practices and Technology: Reference Manual for U.S. EPA Underground Injection Control Program. U.S. EPA Contract #68-01-5971, 308 pp.

Kuhlthau, R. H., V. Amy, J. S. Mahan, and C. Smith, 1982. Technical Well Abandonment Guidance Manual for U.S. EPA Underground Injection Control Program. U.S. EPA Contract #68-01-5971, 46 pp.

Kuhlthau, R. H., and C. R. Faust, 1983. RCRA Permit Writer's Guidance Manual: Ground-Water Protection (40CFR Part 164, Subpart F). U.S. EPA Contract #68-01-6464.

Kuhlthau, Richard H., 1994. Collocation Finite Element Model of Three-Phase Flow in Porous Media. Ph.D. Dissertation, Colorado State University, Fort Collins, Colorado.

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November 18, 1996

Samuel Coleman, P.E., Director
Compliance Assurance and Enforcement Division
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue - Suite 1200
Dallas, Texas 75202-2733

Re: <u>Sparton Technology, Inc.</u>

Dear Mr. Coleman:

My staff has reviewed the "Protective Response and Request for Hearing" filed by Sparton Technology, Inc. on October 18, 1996, in response to the EPA corrective action order under the Resource Conservation and Recovery Act (RCRA) (EPA Docket No. RCRA-VI-001(h)-96-H). The document contains a factual allegation regarding the State of New Mexico with which we take strong issue.

In paragraph 40 of the document, on page 12, Sparton states that "Respondent also disagrees further analysis is necessary to enhance the on-site extraction and treatment system, because the CMS and more recent discussions with the state of New Mexico establishes one additional well will be sufficient." Nothing in our recent discussions with Sparton representatives would "establish," or even suggest our belief that one additional well would be sufficient for an on-site extraction and treatment system for the Sparton facility. Quite the contrary, as we have made clear to Sparton representatives, we anticipate that more than one additional on-site well will be necessary. We have been willing to approve the installation of an additional on-site well as an interim measure, but only upon Sparton's express recognition that the Environment Department does not consider the installation of a single well to be adequate.

We made this point in our October 17, 1996 letter from Ana Marie Ortiz to Jim Harris, Sparton's attorney. We state, at page 4 of the letter, that the Environment Department will approve of the installation of the on-site well only if we have "Sparton's express recognition

GOVERNMENT EXHIBIT 9

that NMED does not consider the on-site interim pump and treat system to provide on-site groundwater containment even after this proposal is implemented."

While we disagree with many of the other allegations in Sparton's "Protective Response," we feel it is necessary to respond in particular to this incorrect characterization of the Environment Department's position.

If you have any questions on this matter, please call me at (505) 827-2855.

Sincerely,

Ed Kelley, Director
Water and Waste Management Division

cc: David W. Hockenbrocht, Sparton
Evan Pearson, EPA
Gloria Moran, EPA
Vincent Malott, EPA
Charlie de Saillan, AGO
Steve Cary, ONRT
Gary O'Dea, City of Albuquerque
Patrick Trujillo, Bernalillo County
David Fishel, DOJ
Jim Harris, Thompson & Knight
Jan Appel, Sparton

IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-VI-001 (h)-96-H

REPORT OF MICHAEL S. RAIMONDE ON SPARTON TECHNOLOGY, INC. TREATED GROUNDWATER INJECTION

February 24, 1997

The following is an assessment conducted by Metcalf & Eddy, Inc. personnel working under my direction. The assessment concerns the expected performance and estimated costs of the proposed injection wells intended for use to dispose of treated groundwater at the Sparton Technology Coors Road Facility (Sparton) in Albuquerque, NM. The treatment involves the removal of trichloroethene (TCE) using vapor stripping. This report is based, in part, on my experience as a project manager and practicing hydrogeologist specializing for ten years in soil and groundwater remediation, with specific emphasis on groundwater remediation of volatile organic compounds. I hold a Bachelor of Science Degree from the Department of Geology and Mineralogy at The Ohio State University and have completed the required graduate course work at New Mexico State University in the Department of Earth Sciences. To the best of my knowledge, the following is true and correct.

CONSIDERATIONS FOR INJECTING TREATED GROUNDWATER

1. Calcium Carbonate (Incrustation)

Difficulties with reinjecting groundwater can be encountered in some situations. Such problems are in most cases predictable and preventable. A common problem associated with reinjecting groundwater is the potential for precipitating calcium carbonate during the treatment and reinjection process. The precipitation is driven by a rising pH often associated with treatment processes such as air stripping where carbon dioxide is stripped from the groundwater, causing a rise in the water pH.

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GOVERNMENT EXHIBIT 10

Calcium carbonate precipitation is preventable in a groundwater reinjection system by maintaining the pH sufficiently low to prevent precipitation. This is typically achieved by the addition of acid or the use of carbon dioxide injection in the air used for stripping.

2. Iron and Manganese

Groundwater with high concentrations of iron or manganese can cause problems by clogging injection wells. These metals can precipitate under oxidizing conditions and the precipitate may be problematic for piping and reinjection wells. Iron can also be utilized by iron oxidizing bacteria (discussed below) under the appropriate conditions and these bacteria are known to generate clogging biomasses. Both the chemical precipitation and the bacterial clogging can be prevented by reducing the pH of the water prior to entering the treatment process (prior to encountering oxidizing conditions). Iron is typically not a problem for a reinjection process if the total concentration in the groundwater is less than approximately 0.3 mg/L, which is the case at Sparton.

3. Fine-grained Sediment Clogging

It is true that sand and fine-grained material, if entrained in the reinjection water may clog a reinjection well or recharge gallery. However, it is also true that the granular sediment can be readily removed from extracted groundwater prior to injection by common physical means such as particulate filters and sand filters. In the early stages that a pumping well is placed into operation, it is common for the well to continue to develop fine-grained sediment from around the well screen. With proper development and filtration, fine-grained sediment is not present in the injected water.

4. Bacterial Contamination of the Aquifer

Given the low BOD of most groundwater, it is not likely that significant bacterial growth will occur in the recharge wells. The threat from bacteria will come from iron oxidizing bacteria which will have a supply of sufficiently oxidized water. The low concentration of iron in the Sparton and City of Albuquerque groundwater noted above would preclude this problem for the reinjection well. It is likely that acidification would be required to prevent precipitation of calcium carbonate and this acidification would reduce the already small potential for iron bacteria fouling.

5. Chemical reactions between groundwater and recharge water of different quality causing precipitation of insoluble products.

This would potentially be a concern if the reinjection water had a chemical composition significantly different from the groundwater. However, the reinjected water will be groundwater and will vary only slightly in composition from the aquifer water.

6. Mechanical Jamming of the Aquifer

Any time water is withdrawn from or injected into the aquifer, the direction of water movement in the vicinity of the well is changed. This process may have some minor effect on the productive capacity of recovery wells and may also have a small effect on the capacity of injection wells. However, these effects may be reduced by proper design, development and operation.

7. Swelling of Clay Colloids in the Aquifer.

The reinjection of similar water into this aquifer should have little or no bearing on the swelling of clay colloids in this aquifer. If colloids are present in the treated water, such colloids would not be present if appropriate filtering mechanisms are employed.

8. Ion Exchange Reactions That Could Result in Clay Particle Dispersal.

Presumably this ion exchange would occur as a result of providing water to the aquifer of significantly different chemical composition than the water present in the aquifer. The reinjection water will be of very similar chemical composition because it is derived from the same aquifer. Minor changes in water chemistry should have negligible effect on clay particles in the aquifer.

9. Injection Tubing Corrosion

If carbon steel is ultimately used for the injection wells and/or the transfer piping, the Ryznar and Langelier indices should be determined. Based on these indices, if corrosion potential is indicated, engineering controls may be taken to reduce or eliminate the corrosion potential. Alternatively, PVC well construction can be utilized, and this problem will be eliminated. Softening of these materials could occur at very high concentrations or in constant contact with free-phase solvent. However, based on concentrations present in groundwater, this is not a likely problem. It is unlikely that fiberglass plastics would be used for well construction based on issues such as cost and material availability.

10. Biochemical Changes in the Recharge Water

With higher concentrations of iron in the reinjected water, iron bacteria could become a problem. The low concentration of iron in the Sparton groundwater and the City of Albuquerque wellfields does not indicate that an iron bacteria problem is likely. Acidification of the water to prevent calcium carbonate precipitation will also help deter iron bacteria. Sulfate reducing bacteria will not thrive in waters which have become oxygenated which will result from vapor stripping and are not an issue for this process.

11. Gas Binding or Air Entrainment

Air entrainment in the recharge water could reduce the permeability of the deposit. However, sand filtration of the water after air stripping (if air stripping is employed) followed by a stilling tank will remove entrained air. If air stripping is not used, entrained air is not an issue.

12. Water Temperature and Viscosity Due to Temperature Differences Between Injected Water and Groundwater

Slight temperature differences will exist between the injected water and the groundwater and these could result in slight viscosity differences. This should not effect the reinjection process or influence clogging processes in the wells in measurable amounts.

Groundwater quality data from a select group of wells (MW-5 through MW-23) at Sparton and a large number of wells from the City of Albuquerque wellfields were obtained (Attachment A). These data suggest that some degree of acidification will be required to prevent the precipitation of calcium carbonate, particularly if air stripping were employed. The iron content of the Sparton and Albuquerque groundwater appears to be low enough to not be of a concern for reinjection.

A typical treatment train for this site may consist of a surge tank, an initial sand filter to remove fines from the extracted water, acidification to prevent precipitation, air stripping, ion exchange to remove chromium, final filtration through sand (secondary precaution), a surge/stilling tank, and pressurized delivery of the water for reinjection. This is not a difficult or unusual treatment process. Given adequate design and operation of this type of a treatment process, there should be little or no problems with reinjection.

Hughes Missile Systems Plant Number 44 (Air Force)

An example of an effective reinjection system is the Hughes Missile Systems Plant 44 (Air Force) operation in Tucson, Arizona. This system extracts and reinjects at a continuous rate of approximately 3000 gpm, and has operated for about 10 years. Tim Allen (hydrogeologist responsible for operation of the system) was contacted regarding problems that may have been encountered with reinjection at the Plant 44 site (personal communication, Attachment B). Mr. Allen indicated that some minor problems were encountered with reinjection in the early days of system operation. The original design involved the drainage of water from the final stilling tank to the wells with water level feedback control at each well to control the quantity of water entering a given well. This

set-up did result in minor precipitation problems at the reinjection wells. It was concluded that the passive drainage of water to the wells resulted in vacuum conditions in portions of the pipeline leading to the wells causing minor chemical changes to occur resulting in precipitation. During the period when this condition existed (1987 until 1990) the injection wells required redevelopment about once per year. In 1990, a change was made to the system which allowed pressurization of the delivery pipes to the wells. Since that change, Mr. Allen indicated that no well development has been required. The wells have operated continuously for approximately 7 years with no redevelopment requirements. Moreover, no injections wells have required replacement.

The water quality at the Plant 44 site is similar to the quality indicated in the data from the Sparton wells and Albuquerque wellfields. Table 1 compares the water quality of the reinjection water at Plant 44 (range of values over the operational life of the system) to the ranges reported for the Sparton and City of Albuquerque wellfields.

TABLE 1
Comparative Water Quality Data

Constituent	Plant 44 Concentration Range (mg/L)	Sparton Facility On-site-Off-site (mg/L)	City of Albuquerque Wellfield Range (mg/L)
Nitrate	0.5 - 10.38	<0.1 - 23	0.2 - 5.0
Alkalinity	25 - 158	NA	NA
Bicarbonate	NA	146 - 320	139 -158`
Calcium	41 - 108	53 - 91	8.5 - 55
Magnesium	8.7 - 13.5	8 - 22	1.7 - 6.4
Chloride	16 - 32	9 - 139	11 - 67
Sulfate	79 - 340	11 - 271	30 - 81
Total Dissolved Solids	276 - 580	344 - 656	214 - 346
Hardness	134 - 328	180 - 285	28 - 154
Iron	<0.02 - 0.45	0.016 - 0.226	.013 - .023
Manganese	<0.002 - 0.011	<0.005 - 6.5	<0.003 - 0.0047
Barium	<0.01 - 0.1	0.03 - 3.0	.029 - 210
Chromium	0.02 - 0.04	<0.005 - 1.23	0.00055 - 0.0084

The comparison in Table 1 indicates a similar water quality at the Plant 44 site to the Sparton wells and municipal wellfields in Albuquerque. Based on this comparison, with adequate engineering design and operation, it is unlikely that Sparton will experience water quality-related problems with reinjection.

COST ESTIMATE AND CONSIDERATIONS FOR INJECTION WELL DESIGN

An estimate for the installation of necessary filtration equipment beyond what would normally be used if injection were not employed is included in Attachment C. The cost of the installation of reinjection wells are provided in Attachment D. Basic design criteria and assumptions are discussed below.

The design of a well requires selection of the casing diameter and material; estimating well depth; selecting screen length, diameter and material; determining the screen slot size; and choosing the well completion method. Following is a discussion of each of these design elements on which the estimate is based.

Casing Diameter

The diameter of the casing must be sufficient to assure that the water velocity is 5 ft/sec or less. From Table 13.2, Page 417 of Groundwater and Wells by Driscoll, a 10-inch diameter casing can be used for a maximum flow rate of 1,230 gpm with a velocity of 5 ft/sec. If the desired injection rate is 600 gpm, a properly designed 10-inch diameter well will provide adequate capacity.

A 6-inch diameter casing can be used for a maximum flow rate of 450 gpm with a water velocity less than 5 ft/sec. If the desired injection rate is 200 gpm, a 6-inch diameter well will provide adequate capacity.

Casing Material

Low-Carbon steel casing is likely appropriate for either of the well diameters. Although low carbon steel is not highly corrosion resistant, it will generally give a satisfactory service life where waters are noncorrosive and nonincrusting. As discussed above, incrustation can be controlled by adequate treatment and operation.

Well Depth

A 400 feet depth is used for each well design based on the design depth of injection wells in the South Valley Superfund Site (Vincent Malott, personal communication).

Well Screen Length

For cost estimation purpose, a 200 feet length screen is used for each well. This is the screen length of the injection wells in the South Valley Superfund Site (Vincent Malott, personal communication).

Well Screen Slot Openings

Based on review of existing well logs and lithologic descriptions provided in the Corrective Measures Study, a slot size of 0.065 is used for both wells for this cost estimate.

Well Screen Diameter and Type

Telescoping 10-inch and a 6-inch diameter are used for these wells. The screen type proposed is assumed to be type 316 stainless steel.

I state under penalty of perjury that the foregoing is true and correct.

Executed on February 24, 1997.

Metcalf & Eddy, Inc.

Michael S. Raimonde

Michael S. Raimonde
Project Manger

Attachments

ATTACHMENT A

614-890-7421

UNITED STATES DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, *Secretary*

GEOLOGICAL SURVEY

Thomas B. Nolan, *Director*

Reprinted 1965

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Bibliography: p. 81-83.

1. Water-supply—U.S. 2. Water, Underground—U.S. I. Becker, Edith, 1930—, joint author. II. Title. (Series)

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Water from Candelaria, Griegos, San Jose, and Duranes well fields supply the valley area of the city. Water that is not used in the valley is pumped to nearby parts of the city on the east mesa. Water from Bel Air, Burton, Love, Atrisco 2, Thomas, and Leyendecker well fields, in addition to the unused water in the valley, supply the east mesa. Water from Atrisco 1 and West Mesa well fields supply the west mesa.

Analytical data—Albuquerque

	4 wells, West Mesa Station [1]	17 wells, Santa Barbara Station [2]	44 wells, Burbank Station [3]	8 wells, Thomas Station [4]
Percent of supply	4	24	60	6
Date of collection	7-26-61	7-26-61	7-26-61	7-26-61
Type of water: F, finished	F	F	F	F
Chemical analyses (In parts per million)				
Silica (SiO_2)	47	69	34	33
Iron (Fe)	.0	.00	.00	.01
Calcium (Ca)	8.5	29	34	55
Magnesium (Mg)	1.7	8.4	2.9	4.1
Sodium (Na), Potassium (K)	107	52	33	47
Bicarbonate (HCO_3)	155	153	189	168
Carbonate (CO_3)	16	0	0	0
Sulfate (SO_4)	81	66	32	30
Chloride (Cl)	11	11	14	67
Fluoride (F)	.9	.6	.6	.5
Nitrate (NO_3)	5.0	.2	.9	.3
Dissolved solids (residue at 180° C)	346	308	214	316
Hardness as $CaCO_3$	28	99	97	164
Noncarbonate hardness as $CaCO_3$	0	0	0	24
Specific conductance (micromhos at 25° C)	506	409	327	514
pH	8.0	8.0	7.9	7.8
Color	0	0	0	0
Temperature °F	68	70	73	73
Radiochemical analyses (Beta activity and radium in picocuries per liter; uranium in micrograms per liter; <, less than)				
Beta activity	7.1	9.8	5.0	
Radium (Ra)	<.1	<.1	<.1	
Uranium (U)	9.8	4.7	2.0	
Spectrographic analyses (In micrograms per liter. <, less than; ND, looked for but not found)				
Silver (Ag)	<0.5	ND	<0.3	
Aluminum (Al)	42	13	40	
Boron (B)	75	47	60	
Barium (Ba)	20	47	210	
Beryllium (Be)	ND	ND	ND	
Cobalt (Co)	ND	ND	ND	
Chromium (Cr)	8.4	.55	4.6	
Copper (Cu)	2.1	4.7	2.0	
Iron (Fe)	22	13	23	
Gallium (Ga)	40	3.9	25	
Manganese (Mn)	4.7	2.0	<3	
Molybdenum (Mo)	2.3	<1	2.8	
Nickel (Ni)	ND	ND	3.3	
Phosphorus (P)	ND	ND	ND	
Lead (Pb)	ND	3.9	3.7	
Rubidium (Rb)	ND	7.5	4.0	
Tin (Sn)	ND	ND	ND	
Strontium (Sr)	180	310	380	
Titanium (Ti)	ND	ND	<3	
Vanadium (V)	70	16	21	
Zinc (Zn)	ND	ND	ND	

[1] Composite of Atrisco 1 and West Mesa well fields.
[2] Composite of Griegos, Candelaria, and Duranes well fields.
[3] Composite of Griegos, Candelaria, Duranes, San Jose, Atrisco 2, Leyendecker, Burton, and Love well fields.
[4] Composite of Thomas and Leyendecker well fields.

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NEW MEXICO

Albuquerque

ALBUQUERQUE

Ownership: Municipal.
Population served: 201,189.
Sources of supply:
Seventy-nine wells in 14 well fields:
- Main plant (along east edge of valley between Central Avenue and Indian School Road), 19 wells, 60-716 feet deep.
- Candelaria (Candelaria Road at Arno Street), 4 wells, 288-553 feet deep.
- Griegos (vicinity of Rio Grande between Montano Road and Candelaria Road), 5 wells, 820-900 feet deep.
- San Jose (South Broadway at San Jose Road), 7 wells, 306-510 feet deep.
- Bel Air (San Mateo Blvd. at Menaul Blvd.), 2 wells, 370-402 feet deep.
- Burton (Burton Park), 1 well, 1,000 feet deep.
- Love (Los Altos Park), 5 wells, 1,170-1,284 feet deep.
- Atrisco 1 (vicinity of Rio Grande between Rincon Road and Gonzales Road), 3 wells, 500-813 feet deep.
- Atrisco 2 (vicinity of Rio Grande between Osage Road and Five Points Road), 10 wells, 207-504 feet deep.
- Duranes (vicinity of Rio Grande between Mountain Road and Matthew Avenue), 8 wells, 834-1,000 feet deep.
- West Mesa (Central Avenue West at 90th Street), 1 well, 1,100 feet deep.
- Thomas (vicinity of Wyoming Blvd. at Montgomery Blvd.), 4 wells, 1,020-1,224 feet deep.
- Leyendecker (vicinity of Louisiana Blvd. at Montgomery Blvd.), 4 wells, 1,000-1,020 feet deep.
- Vol Andia well field (along Montgomery Blvd. between San Mateo Blvd. and Carlisle Blvd.), 6 wells, 1,010-1,025 feet deep will supply part of the east mesa by the summer of 1962.

Auxiliary and emergency supplies: Main plant with 19 wells used during periods of heavy water demand.
Average amount of water used daily in system: 30.0 mgd (U.S. Public Health Service, 1962a).
Treatment: Chlorination and settling in clear wells.
Finished-water storage: 80 million gal in 21 reservoirs.
Days of finished-water storage (storage, in million gal/average daily water used, in mgd): 2.7.
Remarks: All well fields supplying the west mesa are connected, and all well fields supplying the valley and east mesa are connected. As the demand in an area exceeds storage water, available water can be pumped to the area of deficient supply.

009475

P.03

ATTACHMENT B

ATT-CLIENT PRIVILEGED:

M&E Metcalf & Eddy

An Air & Water Technologies Company

Memorandum

FILE: Spartan Tech - ATK

DATE: 1-29-97

TO: Jim Peeples

OFFICE: COLUMBUS

FROM: Michael Ramond

COMPANY: M&E

16:35

SUBJECT: Phone call - Tom Allen - HUGHES Missile Systems
Plant Operations - Plant 44

This serves as a phone log of our conversation:

At 16:10 today, I spoke with Mr. Tom Allen at Hughes Missile Systems Plant 44 Operations in Tucson, Az. I asked him about the re-injection wells and the O&M needs.

He indicated that prior to the mid-1990, they typically had to re-develop their injection wells once a year. The system consists of a 3000 gpm pumping system, Cr^{+3} removal system, air stripping towers w/ sulfuric acid addition, vapor phase carbon, ~~and surge tank~~ sand filters, and surge tank. Water was re-injected by pumping water to the well head where float controls controlled flow into well. In 1990, Hughes pressurized the system from the surge tank to the injection wells eliminating the pressure changes formerly in the system. Since that time, they have not, in his memory, had to re-develop a plugged or inefficient injection well. That's 7 years.

Michael L. Ramond

009477

P.S. TIMOTHY J. ALLEN, RPG
HYDROLOGIST
HUGHES MISSILE SYSTEMS CO.
BLD 826, P.O. BOX 11337
TUSCON AZ 85734-1337
520-794-8450

FORM 172
REV. 11/91

ATTACHMENT C

SPARTON TECHNOLOGIES COST INFORMATION

200 GPM SYSTEM

ITEM	COST
SAND FILTER UNIT	$1,375
AUTOMATIC PURGE SYSTEM FOR SAND FILTER	$825
BOOSTER PUMP FOR SAND FILTER UNIT	$2,500
SAND FILTER SYSTEM SHIPPING COST	$150
SAND FILTER SYSTEM ASSEMBLY/SETUP COST	$500
5,000-GALLON CAPACITY SURGE TANK	$3,900
SURGE TANK SHIPPING COST	$500
SURGE TANK SETUP COST	$200
SUBTOTAL	$9,950
25% CONTINGENCY	$2,488
OTAL ESTIMATED COST FOR 200 GPM SYSTEM	**$12,438**

600 GPM SYSTEM

ITEM	COST
SAND FILTER UNIT	$6,325
AUTOMATIC PURGE SYSTEM FOR SAND FILTER	$930
BOOSTER PUMP FOR SAND FILTER UNIT	$6,300
SAND FILTER SYSTEM SHIPPING COST	$200
SAND FILTER SYSTEM ASSEMBLY/SETUP COST	$700
15,000-GALLON CAPACITY SURGE TANK	$10,300
SURGE TANK SHIPPING COST	$750
SURGE TANK SETUP COST	$300
SUBTOTAL	$25,805
25% CONTINGENCY	$6,451
TOTAL ESTIMATED COST FOR 600 GPM SYSTEM	**$32,256**

009479

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ATTACHMENT D

PRELIMINARY COST ESTIMATE FOR 6-INCH INJECTION WELLS INSTALLATION
SPARTON TECHNOLOGY, INC.
(02-24-97)

Item#	Description	Quantity	Unit	Unit Cost	Total Cost
1	Drill & Install a 6-inch, 400 ft Well (see attached detailed cost)	1	LS	$48,000.00	$48,000
2	Pumps and Electric (a)	1	LS	$15,000.00	$15,000
3	Oversite (b)	14	Days	$750.00	$10,500
4	Pilot Hole (c)	1	LS	$15,000.00	$15,000
	Subtotal				$88,500
	Contingency (25%)				$22,125
	Total Estimated Cost				$110,625

Note: (a) Estimated lumpsum price for material and installation of pump and electric (Estimated price is based on previous experience)
(b) Oversiting by a geologist at 10-hours per day and $75 per hour
(c) Estimated price based on previous experience

If discharge piping is necessary from treatment plant to injection well, an extra cost of $20,000 shall be included in this cost estimate (with the assumed length of 1000 ft and @ $20/ft)

P:\PRC J\SPARTON\IJW6.WK1

PRELIMINARY COST ESTIMATE FOR 10-INCH INJECTION WELLS INSTALLATION
SPARTON TECHNOLOGY, INC.
(02-24-97)

Item#	Description	Quantity	Unit	Unit Cost	Total Cost
1	Drill & Install a 10-inch, 400 ft Well (see attached detailed cost)	1	LS	$65,000.00	$65,000
2	Pumps and Electric (a)	1	LS	$15,000.00	$15,000
3	Oversite (b)	20	Days	$750.00	$15,000
4	Pilot Hole (c)	1	LS	$15,000.00	$15,000
	Subtotal				$110,000
	Contingency (25%)				$27,500
	Total Estimated Cost				$137,500

Note: (a) Estimated lumpsum price for material and installation of pump and electric (Estimated price is based on previous experience)
(b) Oversiting by a geologist at 10-hours per day and $75 per hour
(c) Estimated price based on previous experience

If discharge piping is necessary from treatment plant to injection well, an extra cost of $20,000 shall be included in this cost estimate (with the assumed length of 1000 ft and @ $20/ft)

P:\PROJ\SPARTON\IJW10.WK1

Stewart Brothers
DRILLING COMPANY

Phone 505-287-2986
Fax 505-287-7660
306 Airport Road
Post Office Box 2067
Milan, New Mexico 87021

FAX

From:	Joel H. Stewart	Date:	1/30/97
To:	Reddy Nandela	Fax:	(614) 890-7421
Firm:	Metcalf & Eddy, Inc.	Pages:	3

Re: 6" & 10" Injection Wells
Albuquerque, New Mexico

Mr. Nandela,

Thank you for the opportunity to provide this cost estimate for the drilling and installation of injection wells near Albuquerque, New Mexico. Please find our cost estimate enclosed.

Please note, this estimate includes a single Mobilization/Demobilization. It is assumed that both wells will be drilled consecutively.

Stewart Brothers will not be responsible for containment or disposal of drill cuttings. This will be provide by the client or owner.

Thanks again, for allowing us to assist you with these costs. If you have any questions, please call.

Sincerely,

Joel H. Stewart

Email: jstewart@stewartbrothers.com
Web. http://www.stewartbrothers.com

Metcalf & Eddy, Inc.
January 30,1997
Cost Estimate

Stewart Brothers
DRILLING CO.

Drill and Install 1 - 400' 6" Injection Well

BID ITEM	QTY	UNIT	PRICE	EXTENDED
A. LABOR & EQUIPMENT				
1. Mob/Demob	1	LS	$5,000	$5,000
2. Drill and Install Surface Casing (if needed)	20	FT	$80	$1,600
3. Drilling (11" mud rotary)	400	FT	$28	$11,200
4. Well Installation	400	FT	$15	$6,000
5. Development	24	HR	$190	$4,560
6. Surface Completion	1	EA	$500	$500
7. Hole Abandonment	0	FT	$6	$0
8. Decon	4	HR	$190	$760
9. Standby	0	HRS	$190	$0
10. Per Diem	28	Man-Day	$60	$1,680
			A Subtotal	$31,300
B. MATERIALS				
1. 6 5/8" 316 SS Screen	200	FT	$52	$10,400
2. 6 5/8" LCS Blank Casing	200	FT	$8	$1,600
3. Sand	90	SKS	$10	$900
4. Enviroplug Chips	6	SKS	$15	$84
5. Cement w/ 3% Bentonite	75	SKS	$10	$750
			B Subtotal	$13,734
			A + B Total	$45,034
			New Mexico GRT @ 5.5625%	$2,505
			Grand Total	$47,539

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TELEPHONE NUMBER (505) 287-2986 • FAX NUMBER (505) 287-7660

Metcalf & Eddy, Inc.
January 30,1997
Cost Estimate

Stewart Brothers
DRILLING CO.

Drill and Install 1 - 400' 10" Injection Well

BID ITEM	QTY	UNIT	PRICE	EXTENDED
A. LABOR & EQUIPMENT				
1. Drill and Install Surface Casing (if needed)	20	FT	$100	$2,000
2. Drilling (14 3/4" mud rotary)	400	FT	$52	$20,800
3. Well Installation	400	FT	$16	$6,400
4. Development	24	HR	$190	$4,560
5. Surface Completion	1	EA	$500	$500
6. Hole Abandonment	0	FT	$8	$0
7. Decon	4	HR	$190	$760
8. Standby	0	HRS	$190	$0
9. Per Diem	40	Man-Day	$60	$2,400
			A Subtotal	$37,420
B. MATERIALS				
1. 10 3/4" 316 SS Screen	200	FT	$92	$18,400
2. 10 3/4" LCS Blank Casing	200	FT	$16	$3,200
3. Sand	120	SKS	$10	$1,200
4. Enviroplug Chips	8	SKS	$15	$120
5. Cement w/ 3% Bentonite	100	SKS	$10	$1,000
			B Subtotal	$23,920
			A + B Total	$61,340
			New Mexico GRT @ 5.5625%	$3,412
			Grand Total	$64,752

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TELEPHONE NUMBER (505) 287-2986 • FAX NUMBER (505) 287-7660

A F F I D A V I T

STATE OF NEW MEXICO)
) SS
COUNTY OF SANTA FE)

I, Baird Hemingway Swanson, being first duly sworn upon my oath, depose and state as follows:

1. My name is Baird Hemingway Swanson.

2. I have a Bachelor of Science Degree in Geology from the University of New Mexico with a minor in Chemistry, Mathematics and Physics, and in Spanish language.

3. I have 19 years of professional experience: eight years in petroleum exploration as a consultant and ten years as a regulator for the State of New Mexico, including private geologic consulting.

4. I have provided technical testimony for the N.M. Legislature, the New Mexico Water Quality Control Commission, and in N.M. District Court in the area of investigation and remediation of soil and ground-water contamination.

5. I am currently employed by the New Mexico Environment Department (NMED) Ground Water Quality Bureau as senior technical staff for the Assessment and Abatement Program.

General Electric Superfund Site

6. The G.E. Superfund site, is located in Albuquerque's south valley on Broadway SW between Woodward Rd. and Rio Bravo Rd. The groundwater at the site is contaminated with both chlorinated solvents and petroleum hydrocarbon contamination. The ground water cleanup pump-and-treat system was designed and constructed by Smith Technology Corporation (Smith). Treated ground water is reinjected utilizing one 6 inch diameter by 400 +/- foot depth and nine 8 inch diameter by 400+/- foot depth injection wells at the site.

7. The first 6-inch diameter well, IW-631, was constructed as the

GOVERNMENT EXHIBIT
H

first well to receive pumping test water and well development water. It was first able to inject approximately 120 gallons per minute (gpm) for about 15-20 minutes. Thereafter, the injection rate slowed to a constant 35-40 gpm. Smith had initially believed the injection problems to be related to bio-fouling, however, that turned out not to be the case. Instead, Smith discovered that their descalant injection system was defective because it was not adding enough descalant. Smith also believed that at least part of the problem with IW-631 was due to the size limitation of having to use a 200 gpm pump in a 6-inch diameter well for development purposes. The 8-inch wells were subsequently developed with 600 gpm pumps.

8. Smith's review of logs and cuttings revealed that IW-631 was completed with the top of screen set through a thick section of clay, which was not previously recognized as extensive in the area. Further review of the IW-631 well development and injection curves showed that the clay layer was acting as a laterally extensive confining layer. The injection capacity, even after redevelopment, never exceeded 35-40 gpm, further supporting this evaluation. Such confining layers and silty to clayey units do not exist at the Sparton site.

9. The additional nine 8-inch diameter injection wells, IW-632 through IW-640, were redesigned due to the performance of the IW-631 to be screened above the extensive clay layer, so as to allow for unconfined aquifer injection capacity. This, along with better development possible from tripling allowable development rates to 600 gpm, resulted in injection wells that have all been tested for injection capacity of 300 gpm each, or a grand total injection capacity of 2735 gpm, not the 820 gpm cited by Gary Richardson. Actual reinjection flow is currently averaging 788 gpm. While it is true that one of the 8 inch wells is scheduled for redevelopment, it was attributed to the descalant injection problem allowing precipitation to occur in the well nearest the treatment building.

10. Each of the above-described wells initially cost $ 80,000.00 per well, and if necessary, Smith plans to redevelop once every 2 years of operation with a cost of 10,000.00 per well.

Chevron Site

11. The Chevron Bulk Terminal is situated to the east of the GE site. There are four 8-inch diameter wells 120+/- feet deep at the site to reinject treated ground water. Gravity feed, rather than pumping, is used to dispose of ground water. The total gravity feed capacity of these wells is 40 gpm per well (total 160 gpm), however, the pumping injection capacity is 140 gpm per well (total 560) gpm. No problems have been reported at the Chevron site.

FURTHER AFFIANT SAYETH NAUGHT.

AFFIANT

SUBSCRIBED AND SWORN before me this day 24th day of Feb, 1997, by Affiant.

NOTARY PUBLIC

My Commission Expires:

June 1st 1998

AFFIDAVIT

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Dennis McQuillan being first duly sworn upon my oath depose and state as follows:

1. My name is Dennis Martin McQuillan.

2. I received a Bachelor of Science Degree in Geology from the University of New Mexico with a minor in Chemistry, Mathematics and Physics.

3. I have 19 years of professional experience, including experience as a government regulator, private consultant, educator and free-lance writer.

4. I have provided expert technical testimony to the U.S. Congress, N.M. Legislature, N.M. Water Quality Control Commission (WQCC), N.M. Environmental Improvement Board, and to N.M. District Court. I have been judicially qualified as an expert in the investigation and remediation of soil and ground-water contamination.

5. I am currently employed by the New Mexico Environment Department (NMED), as the Ground Water Quality Bureau, Remediation Manager. I and my staff oversee and conduct the investigation and remediation of soil and ground-water contamination. For a decade, I have maintained a computerized data base on all forms of anthropogenic ground-water contamination in New Mexico, including information on remediation. As such, I have personal knowledge of many remedial actions involving re-injection of treated ground water.

Atex/Fina

6. I am familiar with the Fina case referenced in the statement of Mr. Gary Richardson, and worked on that case from 1981 to 1985. At that time, the case was known as Atex Station 213. The site is located at 3501 Isleta SW, in the inner Rio Grande Valley. Nearly 40,000 gallons of unleaded gasoline were discharged from a leaking underground storage tank.

7. The site is located in an area of chemically reducing conditions in the shallow ground water. Reducing conditions are those where redox-sensitive elements such as nitrogen, iron, manganese and sulfur, can undergo chemical reactions involving electron gain. Conversely, oxidizing chemical reactions involve electron loss. Moderate reducing conditions are characterized by low concentrations of nitrate, with elevated concentrations of iron and manganese. In more strongly reducing conditions, sulfate reduction and methanogenesis also can occur.

8. I have conducted studies in the Albuquerque South Valley over many years and have concluded that reducing conditions naturally occur in many Valley areas, and that these conditions were regionally exacerbated by septic-tank discharges. Locally, as occurred at the

GOVERNMENT EXHIBIT 12

Atex/Fina site, conditions have been made even more reducing by intrinsic biodegradation of petroleum hydrocarbons. Dissolved ground-water concentrations of iron and manganese at the Atex/Fina site in 1984 were as high as 140 mg/L and 3.4 mg/L respectively. WQCC standards for iron and manganese are 1.0 mg/L and 0.2 mg/L respectively.

9. An air stripper and injection wells used to treat and dispose of the ground water were installed at the site in 1986, modified in 1987, and shut down in 1989 due to numerous problems. One of the problems was mineral fouling in the injection wells. This problem was caused by the water not being properly treated for iron, manganese and other minerals prior to either air stripping or re-injection.

10. Atex/Fina is not an appropriate case to compare with the Sparton case for the following reasons:

a. Atex/ Fina is located in a chemically reducing, inner-valley hydrogeologic environment, while Sparton is located outside of the inner valley in an oxidizing environment;

b. Atex/Fina involves gasoline, while Sparton involves chlorinated solvents; and

c. at Atex/Fina, the water was not properly treated for minerals prior to air stripping or re-injection.

Singer/Digital

11. The Singer/Digital case is much more appropriate to compare with Sparton. This site, located at 5600 Jefferson Blvd., NE in Albuquerque, was used as a manufacturing facility by the Singer Company and then by Digital Equipment Corporation. Like Sparton, the Singer/Digital site is located outside of the inner Rio Grande Valley in an oxidizing environment, and involves chlorinated solvents.

12. Pursuant to WQCC Regulations, and with NMED oversight and approval, Digital conducted a hydrogeologic investigation, completed soil-vapor extraction, and installed a ground-water, air-stripping and re-injection system. I approved Digital's ground-water treatment system in my official NMED capacity on September 28, 1995. Digital's design included three extraction wells, water-treatment with a sequestrant scale-corrosion control product, a tray air-stripping unit, and two re-injection wells.

13. The system became operational on February 28, 1996, and has successfully processed approximately 114 gallons per minute (gpm) of ground water for the past year. In fact, system performance demonstrated that only one of the two designed injection wells was necessary.

Other Cases

14. Re-injection of treated ground water is occurring at many other sites in New Mexico. Based on my knowledge and experience, mineral and biological fouling problems have been

successfully prevented and controlled by chlorination, acidification and by the use of sequestrant scale-corrosion control products. Aqua Mag is such a commercial product commonly used in New Mexico.

15. New Mexico Governor Gary Johnson signed Executive Order 96-30 directing state agencies to improve water conservation. Pursuant thereto, NMED Secretary Mark E. Weidler issued a directive that treated ground water should be re-injected rather than pumped to waste.

FURTHER AFFIANT SAYETH NAUGHT.

Dennis McQuillan
AFFIANT

SUBSCRIBED AND SWORN to before me this 24th day of February, 1997 by Dennis McQuillan, Affiant.

Gloria S. Lopez
NOTARY PUBLIC

My Commission Expires:

June 1st 1998

AFFIDAVIT

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

We, Dennis McQuillan and Baird Swanson being first duly sworn upon our oaths depose and state as follows:

1. We are the authors of individual affidavits attached hereto.

2. This joint affidavit provides facts and conclusions, supported by our individual affidavits, that each of us can attest to based on our education and experience.

3. Re-injection of treated ground water is a technically and economically feasible option used at many sites in New Mexico.

4. Re-injection can be accomplished by use of an injection well.

5. Fouling of the injection apparatus and injection zone can be prevented and controlled.

6. Re-injection of treated ground water, rather than pumping to waste, complies with the water-conservation directive of New Mexico Governor Gary Johnson as per Executive Order 96-30.

FURTHER AFFIANTS SAYETH NAUGHT.

Dennis McQuillan
AFFIANT, DENNIS MCQUILLAN

Baird Swanson
AFFIANT, BAIRD SWANSON

SUBSCRIBED AND SWORN to before me this 24th day of , 1997 by Dennis McQuillan and Baird Swanson, Affiants.

Gloria S. Lopez
NOTARY PUBLIC

My Commission Expires:

June 1st 1998

009492

GOVERNMENT EXHIBIT
13

IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-VI-001 (h)-96-H

REPORT OF VINCENT MALOTT
FEASIBILITY OF GROUND WATER REMEDIATION AT THE SPARTON TECHNOLOGY SITE

FEBRUARY 25, 1997

The following assessment concerns the feasibility of ground water remediation for contamination originating from the Sparton Technology, Inc. facility in Albuquerque, New Mexico. This report is based on a review of the Administrative Record, applicable EPA guidance documents, and my experience as the project manager for this site from 1991 to the present. I am an environmental scientist with the U.S. Environmental Protection Agency and hold a Bachelors of Science and Master of Science degrees in geology from the University of Texas at Arlington.

Background

Summarizing from EPA's Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration [AR p. 001613], the Superfund and RCRA Corrective Action programs share the common purposes of protecting human health and the environment from contaminated ground waters, and restoring those waters to a quality consistent with their current, or reasonably expected future uses. Protection of human health and the environment is clarified in the Preamble to the Proposed Subpart S to 40 CFR Part 264: "Potentially drinkable ground water would be cleaned up to levels safe for drinking throughout the contaminated plume, regardless of whether the water was in fact being consumed." 55 Fed. Reg. 30798, 30804 (July 27, 1990). Restoration of contaminated ground water is one of the primary objectives of the RCRA Corrective Action program. Restoration refers to the reduction of contaminant concentrations to levels required under the RCRA Corrective Action programs. For ground water currently or potentially used for drinking water purposes, these levels are the Maximum Contaminant Levels (MCLs) or State MCLs.

Summarizing from page 18 of EPA's Final Decision and Response to Comments (FDRTC) (Attachment 1 to the RCRA 3008(h) Initial Administrative Order), the following corrective action objectives for the site were established as protective of human health and the environment: (1) containment and reduction of the source area, (2) containment of the leading edge of the contaminant plume, and (3) restoration of the contaminated aquifer to the cleanup goals.

009493

GOVERNMENT EXHIBIT 14

There are three current remedial options proposed for achieving these objectives: (1) EPA's selected remedy as described in Alternative 4 of the FDRTC [p. 28-29, 41-46]; (2) the Respondent's proposed remedy as described in the Draft Final Corrective Measures Study Report dated May 6, 1996, [AR p. 005693-005700] and in the FDRTC [Alternative 2, p. 21-24]; and (3) the Respondent's implied proposal contained in their Memorandum of February 4, 1997, and a similar proposal to the New Mexico Environment Department dated July 10, 1996 [AR p. 008889-008891]. Each of the three remedial options involves a different level of aggressiveness that includes both the choice of technology and/or the relative intensity of how the technology is applied to this site.

Containment and Reduction of the Source Area

As discussed in EPA's Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration [AR p. 001620], "Where it is technically practicable to contain the long-term sources of contamination, such as the DNAPL zone, EPA expects to restore the aqueous contaminant plume outside the DNAPL zone to required cleanup levels. Effective containment of the DNAPL zone generally will be required to achieve this long-term objective because ground-water extraction remedies (e.g. pump and treat) or in situ treatment technologies are effective for plume restoration only where source areas have been contained or removed." Trichloroethene concentrations in some of the on-site monitoring wells indicate the possible presence of DNAPL beneath the Sparton facility. EPA's remedial option requires the implementation of a ground water extraction system to "maximize contaminant removal and prevent further migration from the Facility to off-site areas." [FDRTC p. 43]. Characteristics of the aquifer material beneath the Sparton facility indicate that containment of the high contaminant concentrations is generally feasible. The possible presence of DNAPL beneath the Sparton facility makes containment an important step in any effort to remediate the larger off-site plume.

In the Technical Review of the Report on the Effectiveness of the Groundwater Recovery Well System in the Upper Flow Zone [AR p. 008248-008276], concerns over the validity of the capture zones predicted in the Well Effectiveness Report prevented EPA from accepting many of Sparton's conclusions regarding the effectiveness of the recovery well system. In general, EPA determined that the existing recovery system is not capable of preventing off-site migration or maximizing contaminant removal. Therefore, EPA's remedial option will require the installation of additional ground water extraction well(s) to accomplish this objective. Each of Sparton's proposals rely on the installation of one to two extraction wells with a total pumping rate of 20 gallons per minute or less as described in either the CMS Report,

the Respondent's Memorandum of February 4, 1997, or separate proposal to the New Mexico Environment Department dated July 10, 1996. The Respondent has not provided to EPA an analysis with supporting data demonstrating that either one of the Respondent's proposals would effectively meet the objective of preventing further migration from the Facility to off-site areas and maximizing contaminant removal. A preferable approach is to determine the number of extraction wells as part of comprehensive engineering design for on-site containment rather than setting an arbitrary limit.

In addition, the vertical extent or base of the plume has not been completely defined for the aquifer beneath the Sparton facility. An example is the absence of definition for the base of the contaminant plume beneath wells MW-32, MW-43, and the general area beneath the original source areas. Contaminant concentrations in these two wells may indicate the possibility of DNAPL movement across the site that is independent of the general ground water flow direction. The amount of contamination migrating to deeper parts of the aquifer cannot be reliably estimated. EPA has previously addressed the issue of defining the vertical extent of contamination in EPA's letter of February 20, 1996 [AR p. 006024-006055]. Without the actual boundary of the plume defined, the containment system may have to be more robust to account for any uncertainty in establishing the containment area boundary around the pumping well. Defining the horizontal and vertical extent of contamination for the on-site plume is necessary to establish well locations, screen depths, and pumping rates that will encompass and contain the plume, as well as provide for monitoring the effectiveness of the system. Thus, EPA required further investigation of the ground water contaminant plume to address the deficiencies in the ground water monitoring system as part of the remedy implementation [FDRTC p. 19].

Containment of the Leading Edge of the Contaminant Plume

Typically, hydraulic containment systems are designed to provide long-term containment at the lowest cost by optimizing well locations and by minimizing pumping rates [Methods for Monitoring Pump-and-Treat Performance, EPA/600/R-94/123, p 1; Incorporated by Reference into the AR]. Plume containment offers the potential advantages of preventing further spreading of the contaminated ground water, thereby limiting the size of the plume, and preventing further degradation of the aquifer. The general characteristics of the off-site aquifer are favorable for the implementation of a ground water extraction system for containment of the plume. However, additional information on the plume dimensions and hydraulic conductivity of the aquifer will improve the system design. The plume is not completely defined in the downgradient areas and the lateral dimensions are not defined in the upgradient direction (back toward the facility)

which may also influence the scope of the required capture zone. In addition, the average conductivity reported for the aquifer beneath the Sparton facility will likely increase to the west toward the leading edge of the contaminant plume. Without the actual boundary of the plume and better definition of the aquifer characteristics, the containment system may have to be more robust to account for any uncertainty in establishing the containment area boundary around the pumping wells. Defining the horizontal and vertical extent of the contaminant plume is necessary to establish well locations, screen depths, and pumping rates that will encompass and contain the plume, as well as provide for monitoring the effectiveness of the system. Thus, EPA required further investigation of the ground water contaminant plume to address the deficiencies in the ground water monitoring system as part of the remedy implementation [FDRTC p. 19].

EPA's option requires the design and implementation of a ground water extraction system capable of preventing further migration of the contaminant plume. EPA's remedial option did not place any restrictions on the number or location of extraction wells in meeting this objective. The design and construction of the system will be based on the site specific characteristics of the aquifer and dimensions of the contaminant plume to minimize cost yet still meet the objective [FDRTC p. 42]. The option contained in the Respondent's memorandum provides for a one-well containment system. The Respondent has not submitted an analysis with supporting data demonstrating that the one-well proposal is capable of achieving the stated objective. In its proposed Order [Attachment E to Sparton's memorandum], the Respondent leaves open the option of having multiple wells to contain the contaminant plume. A preferable approach is to determine the number of extraction wells as part of comprehensive engineering design for on-site containment rather than setting an arbitrary limit. The Respondent's preferred remedial option in the CMS Report relies on natural attenuation to manage the off-site plume. Continued migration during the natural attenuation of the plume can produce further degradation of an even larger area of the aquifer [FDRTC p. 22, 41-42].

Restoration of the Contaminated Aquifer

Many factors can inhibit ground water restoration. These factors may be grouped under three general categories: (1) hydrogeologic factors; (2) contaminant-related factors; and (3) remediation system design inadequacies [Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, AR p. 001634; Considerations in Ground-Water Remediation at Superfund Sites and RCRA Facilities, p. 2, incorporated by reference in the AR].

Regarding the hydrogeologic factors, in the area of the off-site contaminant plume, the sand and gravel in the aquifer provides a favorable environment for a ground water extraction system. While the contrast in permeability between the sand and sandy gravel deposits may result in some preferential flow during pumping, reasonable flushing rates through both layers should be attainable [EPA letter of February 20, 1996, AR p. 006040-006041; EPA Technical Review of the CMS Report, AR p. 008378-008382]. Likewise the contaminant related factors are also favorable for a ground water extraction system. The relatively low sorption potential of TCE in the aquifer material in the area of the off-site plume also appears to favor a strategy for ground water extraction [See discussion on sorption in No. 29 attached to this Report; EPA letter of February 20, 1996 at AR p. 006041; and EPA Technical Review of the CMS Report dated June 20, 1996 at AR p. 008378-008382]. The Respondent also concurs that TCE is relatively mobile [See Report by Pierce Chandler at p. 19]. The combination of these factors provides a favorable environment for an aggressive remedial strategy utilizing ground water extraction throughout the off-site contaminant plume. Areas of DNAPL beneath the Sparton facility may effectively prevent restoration of this portion of the aquifer. However, additional source control technologies and even future technologies may allow even this part of the aquifer to be restored.

The third factor can be addressed by designing and implementing an appropriate system. As discussed in the Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, [AR p. 001614], examples of designing inadequacies in a ground water extraction system include an insufficient number of extraction wells, or wells whose locations, screened intervals, or pumping rates lead to an inability to capture the plume. Design inadequacies may result from incomplete site characterization, such as inaccurate measurement of hydraulic conductivity of the affected aquifer. The existing ground water monitoring system does not completely define the full vertical and horizontal extent of the contaminant plume or adequately define the contaminant concentrations throughout the plume. EPA required further investigation of the ground water contaminant plume to address the deficiencies in the ground water monitoring system as part of the remedy implementation [FDRTC p. 19].

The vertical extent of the contaminant plume is generally estimated by the use of TCE concentrations less than 5 ppb as detected in monitoring wells. The areal extent of the contaminant plume is approximately 90 acres, of which 70 acres or more extends west of the Sparton facility property. Within this approximately 70 acre area of the contaminant plume, there is only one well (MW-67) that monitors water quality below the base of the contaminant plume. Well MW-67 also appears to be near the edge of the contaminant plume. The remainder of the plume in the off-site area is currently undefined. Because the vertical

extent or base of the plume has not been defined, the amount of contamination migrating to deeper parts of the aquifer cannot be reliably estimated. The horizontal extent of the contaminant plume is also poorly defined. The contaminant plume continues to migrate in a general west to northwest direction along a path approximately 1600 feet wide. Monitor wells across the general center of the plume's leading edge are separated by almost 1,100 feet. The other two recently installed well clusters are on the side of the plume outside of the general center of the migration pathway.

Data collected from the additional investigation is critical to the design and implementation of an efficient and cost effective extraction system that not only prevents further migration of the leading edge but also focuses on restoring aquifer water quality by maximizing contaminant mass removal and minimizing clean up time.

Defining the horizontal and vertical extent of contamination through the entire plume is necessary to establish well locations, screen depths, and pumping rates that will not only encompass and contain the plume but will also adequately flush contaminated portions of the aquifer, as well as provide for monitoring the effectiveness of the system. To maximize contaminant mass removal it is also generally necessary to locate extraction wells in areas of maximum contamination. To achieve this, the distribution of contaminant concentrations within the plume must be relatively well known. In order to design a cost effective system for treatment of the ground water once it is extracted, reasonably accurate estimates of contaminant concentrations within the system influent are also needed. This requires that the distribution of contaminant concentrations within the plume be relatively well established.

Defining the physical characteristics of the aquifer is also necessary to establish well locations, screen depths, and pumping rates that will not only encompass and contain the plume, but will also adequately flush contaminated portions of the aquifer. An aquifer test is performed to collect such data. The physical characteristics of the aquifer are variable from beneath the Facility to the western end of the plume. The aquifer test performed beneath the Facility is inadequate in providing the data necessary to design the ground water extraction system in the off-site areas.

Therefore, the additional site characterization is critical in preventing remediation system design inadequacies which may lead to an inability to achieve restoration of the contaminated aquifer. As cited in the Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration [AR p. 001614], "Failure to achieve desired cleanup standards resulting from inadequate system design or operation is not considered by EPA to

be a sufficient justification for a determination of technical impracticability of ground water cleanup."

The Respondent's remedial option presented in the Memorandum relies on natural gradient flushing of the plume toward the containment wells located at the leading of the plume. This system, if operated to contain the leading edge of the contaminant plume, and operated in conjunction with an adequate on-site containment system, may eventually restore the ground water in the off-site plume. However, as previously noted, the Respondent has not demonstrated that the proposed system will achieve each of these objectives. This remedial option is a less aggressive strategy that will generally involve a longer remediation timeframe. The Respondent has not provided an analysis with supporting data to EPA for review documenting the expected reduction in contaminant mass from a single-well extraction system and the associated timeframes [CMS Report, AR p. 005490-006023]. The prediction of a 25-30 year timeframe for removal of only a <u>majority</u> of the contamination from the aquifer in the Report of Pierce Chandler [p. 39] is undocumented in either his Report or the CMS Report [AR p. 005490-006023]. Finally, the longer timeframe associated with natural gradient flushing does not meet the reasonably expected near-term future use of the ground water.

The Respondent's remedial option presented in the CMS Report relies on natural attenuation to attain the required cleanup goals. While natural attenuation consists of chemical, physical, and biological processes, Sparton did not specify which of the three were responsible for the reduction in contaminant concentrations in the off-site areas. There was no demonstration or site data involving the biological or chemical degradation of trichloroethene (TCE), which has the highest concentration and widest distribution. The only processes remaining under the term of "natural attenuation" are the physical processes such as dilution, which will reduce contaminant toxicity by lowering concentrations during continued migration of the contaminant plume. However, dilution does not result in a reduction in the contaminant mass, only the concentration. As already pointed out on page 19 of this Report, TCE is relatively mobile and should travel at the same rate as ground water flow. Thus, natural attenuation is not expected to significantly reduce the contaminant mobility through adsorption of contaminant to the sands and gravels present in the aquifer. Finally, the Respondent has never demonstrated that the natural attenuation process will lead to the remediation of the contaminant plume, especially the widespread occurrence of TCE.

Conclusions

1. Ground water extraction is a feasible option to effectively contain the contaminant plume and isolate the source material beneath the Sparton facility.

2. Ground water extraction is a feasible option to effectively contain the leading edge of the dissolved contaminant plume and prevent further plume migration.

3. Ground water extraction to restore the dissolved plume in the off-site aquifer is generally dependent on the successful containment of remaining source areas beneath the facility and containment of the leading of the contaminant plume. Restoration is a feasible option for the dissolved plume based on the aquifer characteristics and contaminant properties.

4. As noted in the Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration [AR p. 001634], a shorter remediation timeframe is desired to reduce the potential for human exposure where there is current or reasonably expected near-term future use of the ground water. The aquifer is reasonably expected to be used in the near-term future [See Affidavit by Norman Gaume, Exhibit 7; City of Albuquerque letters dated December 5, 1995, AR p. 006048-006050, and February 8, 1996 at AR p. 003519-003521; Albuquerque City Council resolution, Exhibit 6; Ground Water Protection Policy and Action Plan, AR p. 001895-002058]. The use of ground water extraction throughout the contaminant plume is an aggressive remedial strategy to shorten the remediation timeframe.

5. Other issues set forth in Mr. Pierce Chandler's Report are addressed in Appendix A.

I state under penalty of perjury that the foregoing is true and correct.

Executed on February 25, 1997.

Vincent Malott

Vincent Malott

APPENDIX A

APPENDIX A

Report of Pierce L. Chandler, Jr., On Geology/Hydrogeology Characterization, Contaminant Plume Characterization, Risk Assessment, and Aquifer Restoration, Sparton Technology Coors Road Facility, Albuquerque, New Mexico.

EPA Response

1. **According to Dr. John Hawley, the Sparton plume is the best ground water tracer test conducted in the Albuquerque area and defines the local ground water flow rate and direction.**

   The Respondent did not include a report, analysis, or reference prepared by Dr. John Hawley in support of this statement in the Memorandum. EPA cannot comment on statements that may have been taken out of context by the Respondent.

2. **Subsurface conditions are extremely heterogenous as shown by a comparison of boring logs from wells MW-48, MW-55, and MW-56 in well cluster 9.**

   EPA addressed this issue in its letter of February 20, 1996, in reference to the difficulty of remediation at the site [AR at p. 006040-006041]. In summary, there were no extensive layers of silts or clays identified in the off-site aquifer within the contaminant plume. A comparison of boring logs from other well clusters in the off-site contaminant plume did not identify any similar occurrence of significant variation as identified in well cluster 9.

3. **Hydraulic conductivity, as defined by multiple-well pump testing, is in the range of 21 to 32 feet/day, and matches regional values.**

   The Respondent has presented a generally broad and somewhat misleading statement regarding the range of hydraulic conductivity throughout the plume area. This hydraulic conductivity range was generated from an aquifer test conducted on-site at the Facility with wells screened in all three flow zones. However, the on-site geologic characteristics of the upper flow zone are much different than those found in the upper-lower and lower-lower flow zones. As discussed in EPA's letter of February 20, 1996 [AR p. 006024-006055], this hydraulic conductivity range is not representative of the upper flow zone beneath the Sparton facility. This difference is demonstrated in the range of hydraulic conductivity values calculated by EPA (0.5 to 16.6 feet/day) in the Technical Review of the Report on the Effectiveness of the Ground Water Recovery Well

System in the Upper Flow Zone [AR p. 008248-008276] or even by Sparton (0.1 to 7.2 feet/day) in the Report on the Effectiveness of the Groundwater Recovery Well System [AR p. 005193-005489]. In addition, the presence of coarser grained material in the off-site area may result in a corresponding increase in the hydraulic conductivity. Unfortunately, no hydraulic conductivity data has been obtained by the Respondent for the off-site area. Such data will be valuable for any design work involving ground water extraction.

4. **The average hydraulic gradient is approximately 0.002 based on contours from Figure 3.**

The Respondent has indicated an average hydraulic gradient based on a potentiometric map illustrating water level data collected in July 1996. The Respondent has not submitted the July 1996 water level elevation data to EPA and did not include such data in the Memorandum. EPA cannot comment on the accuracy of this statement.

For comparison purposes, a water level contour map (Attachment B) was prepared for EPA using data contained in the CMS Report for upper flow zone monitoring wells in August 1995 [AR p. 005744-005748]. A review of the contour map indicates a variable gradient across the plume area. In general, the ground water gradient in the upper flow zone is steeper in the immediate area of the facility than in the downgradient areas of the contaminant plume. However, these steep gradients only persist for a short distance relative to the total migration distance of the contaminant plume. Off-site, water level contouring for August 1995 data clearly indicate that a gradient of .003 is more appropriate for the area near Irving Boulevard west to the leading edge of the plume.

5. **Flow rate is less than 100 feet/year.**

As the precise location of the leading edge of the contaminant has not been established, and the distance between the contaminated monitor well and the "clean" monitor well are approximately 1,100 feet, there has been no definitive determination that the plume is moving "less than 100 feet per year" as opposed to "approximately 100 feet per year". EPA has addressed this issue in its letter of February 20, 1996 [AR p. 006031-006033]. EPA had previously determined the rate to be somewhere between 100 to 300 feet/year.

6. **Regional flow was predicted to be more westerly to southwesterly. Local flow direction is west-northwest because of a closer well spacing.**

   The site data reveals the presence of a significant local variation in the general flow direction which is not accounted for in the regional, basin-wide analysis.

7. **The Albuquerque Basin has been characterized to the point that long-range projections and modifying impacts can modeled with confidence.**

   The Respondent's reference to regional modeling is misleading if applied to the local conditions at the Sparton site. As noted on page 1 of the Water-Resources Investigations Report 94-4251, Simulation of Ground-Water Flow in the Albuquerque Basin, Central New Mexico, 19010-1994, With Projections to 2020, "Rather than putting the model through a rigorous calibration process, discrepancies between simulated and measured responses in hydraulic head were taken to indicate that the understanding of a local part of the aquifer system was incomplete or incorrect." Regional modeling performed by the USGS did not accurately represent the local ground water elevations, flow direction or gradient. Therefore, the understanding of the local part of the aquifer system in the vicinity of the Sparton plume is incomplete or incorrect.

8. **The chlorinated solvent plume at the Sparton facility is well characterized and understood. Additional investigation is not needed to fill information/data gaps. The existing information is adequate to assess potential risk/threat and for any remedial design purposes.**

   EPA has previously addressed this issue in its letter of February 20, 1996 [AR p. 006032-006037] and in EPA's Technical Review of the CMS Report dated June 20, 1996 [AR p. 008368-008369, 008377-008378]. In summary, areas of the contaminant plume have not been adequately defined with regard to the full vertical and horizontal extent. The collection of this additional data may alter the plume dimensions shown in Figure 4 of this Report. In addition, hydraulic conductivity values have not been determined for the off-site areas. These data are necessary in order to design an efficient and cost effective ground water extraction system. The installation of the five new monitoring wells did not define the leading edge of the contaminant plume.

9. **EPA's concerns on plume characterization numbered 3, 5, 7, and 9 in the Technical Review of the CMS Report dated June 20, 1996, have been addressed by the installation of five new wells.**

The contaminant plume boundary depicted in Figure 4 of this Report is still an estimated boundary placed between two monitoring wells (MW-61 and MW-68) approximately 1,100 feet apart [EPA number 3 and 9 at AR p. 008368-008378]. EPA's concerns regarding the reasonable depiction of contaminant concentrations within the interior of the plume were not addressed by the installation of five new wells outside of the contaminant plume [EPA number 5 at AR p. 008369]. It should be noted that Figure 4 of this Report does not even depict interior concentrations. EPA's concerns regarding the determination of the vertical extent of the contaminant plume were not addressed by the installation of only one new well inside the plume [EPA number 7 and 9 at AR p. 008377-008378]. The vertical extent has still not been defined in the center of the plume containing the highest reported contaminant concentrations.

10. **Plume width is significant due to the low groundwater flow rates and the heterogenous subsurface conditions.**

The Respondent has previously cited the relative width of the plume as evidence that contaminant transport is diffusion dominated [Respondent's letter dated November 6, 1995; AR 004616-004643] and later that concentration-related mechanics exerted a larger influence than velocity-related mechanics [CMS Report; AR 005490-006023]. EPA has previously addressed these assertions in EPA's letter dated February 20, 1996 [AR 006024-006055] and EPA Technical Review of CMS Report dated June 20, 1996 [AR 008367-008386]. The Respondent is now asserting that the plume is the result of low ground water flow rates and heterogenous conditions without attempting to address the other factors identified by EPA that more likely account for the dimensions of the plume. This language appears to be different than previously used in correspondence, but apparently is intended to have the same meaning.

11. **There are 13 well clusters.**

In the Respondent's RCRA Facility Investigation Report, 10 well clusters are listed [AR p. 00125]. With the installation of five new monitoring wells, the Respondent now lists 13 well clusters. However, the Respondent did not provide copies of the boring logs in this Memorandum for EPA review.

12. **Sparton contends that plume concentrations are decreasing as a result of (1) source removal, (2) operation of the on-site ground water recovery system, and (3) natural attenuation processes.**

This issue has been previously addressed in EPA's letter of February 20, 1996 [Administrative Record 006024-006055]. While natural attenuation consists of chemical, physical, and biological processes, Sparton did not specify which of the three were responsible for the reduction in contaminant concentrations in the off-site areas. There was no discussion or site data involving the biological or chemical degradation of trichloroethene (TCE), which has the highest concentration and widest distribution. The only processes remaining under the term of "natural attenuation" are the physical processes such as dilution, which will reduce contaminant toxicity by lowering concentrations through dilution involving continued migration of the contaminant plume, leading to further degradation of an even larger area of the aquifer. However, dilution does not result in a reduction in the contaminant mass, only the concentration. As already pointed out on page 19 of this Report, TCE is relatively mobile and should travel at the same rate as ground water flow. Thus, natural attenuation is not expected to significantly reduce the contaminant mobility through adsorption of contaminant to the sands and gravels present in the aquifer. Finally, the Respondent has never demonstrated that the natural attenuation process will lead to the remediation of the contaminant plume, especially the widespread occurrence of TCE.

Sparton further attempts to support this position by presenting trends in various wells showing decreasing concentrations of TCE. However, the issue missed in Sparton's analysis is that the concentrations in the wells near the leading edge of the plume are increasing, indicating further migration of the plume off-site. Increases in concentrations have been observed over the last several years in wells 53, 55, 56, 58, 60, 61, and 64. Therefore the plume is continuing to migrate off-site with dilution as a primary mechanism for the decrease in contaminant concentrations.

Sparton also attempts to support this position by presenting trends in shallow soil gas surveys showing decreasing concentrations of volatile chemicals. Such surveys are generally conducted at a depth of 5 feet or less. However, while Sparton contends such surveys can determine changing contaminant concentrations in the ground water, why was Sparton not able to predict the extremely high contaminant concentrations found in the soil when sampling the soil vapor monitoring well. In fact, Sparton stated in the CMS

Report, page VIII-2, "If, as expected, that testing establishes concentrations in the soil at or below 10 ppmV, no further action will be required." [AR p. 005693] Obviously, Sparton's interpretation of the shallow soil gas survey did not predict the extremely high levels of contaminant vapors in the soil. Any interpretation then of the ground water contaminant concentrations is questionable. Even reliance on shallow soil gas surveys to determine the extent of the plume is questionable, since soil gas concentrations were present extended beyond the general plume boundaries in some areas, but were not present over other areas of the plume. Conclusions drawn from the shallow soil gas survey do not present a reliable indicator of changing plume concentrations.

13. **The TCE plume is migrating in a west-northwest direction at a rate of less than 100 feet/year.**

This issue has been previously addressed by EPA in a letter dated February 20, 1996 [AR 006024-006055]. In summary, the rate of plume migration has been estimated to be at least 100 feet/year.

14. **Continued monitoring consisting of semi-annual to annual monitoring of selected, representative wells for VOC is more than adequate.**

As cited in the EPA document, Methods for Monitoring Pump-and-Treat Performance, EPA/600/R-94/123, [incorporated by reference in the Administrative Record], performance monitoring during any remediation effort is dependent on site specific conditions. Further stated, a higher frequency of sampling is necessary early in the operation of any remediation effort. Information from the frequent sampling is utilized to optimize sampling efficiency and reduce sampling frequency in the later phases. Sparton's recommendation is premature since there is no operating system that contains the contaminant plume or is significantly reducing contaminant concentrations.

15. **The nearest potential receptor/exposure pathway is the New Mexico Utilities (NMU) municipal supply well approximately 2.1 miles from the leading edge of the plume.**

The Respondent incorrectly describes the NMU well as a potential receptor. The NMU well is the closest <u>existing</u> receptor. The Respondent's statement incorrectly assumes that there will be no other water supply wells drilled in the area. The potential exists for the aquifer to be utilized in the immediate area and the Respondent cannot adequately foresee into the future that such use will never occur.

16. **The Respondent claims that EPA challenged the decision to model the plume migration toward the NMU well.**

In fact, EPA stated in the Technical Review of the CMS Report (AR p. 008384):

> Sparton indicates on page 1 of Appendix 3 (of the CMS Report) that the direction of the gradient was placed toward the Paradise Hills well, even though this does not agree with the USES model (emphasis added). It would seem more appropriate to compare the ground water flow direction at the site and the apparent direction of plume migration, with the direction to the production well. The USES model is much less likely to be able to provide an accurate flow direction for this isolated area than empirical evidence.

As is evident in the technical review, EPA was challenging the Respondent's claim that the flow direction was inappropriate. EPA fully supports modeling the plume migration toward the NMU well.

17. **The Respondent states that the model was confirmed by the additional ground water monitoring wells installed in summer 1996.**

The model presented in the CMS Report never predicted the distances that the plume was expected to move since 1993 (when plume migration was observed in previously "clean" monitoring wells), nor the time frames estimated for the plume to reach the locations of the newly installed wells in 1996. While EPA has already demonstrated that the model is unlikely to predict the fate and transport properties of the plume, the monitoring wells do not provide any confirmation of the modeling effort.

18. **The plume poses no current or reasonably foreseeable risk/threat to human health.**

As previously demonstrated, there has been no reliable evaluation of the future impact from continued plume migration on the surrounding aquifer. Regardless of whether such an evaluation is present however, ground water is a critical natural resource for the State of New Mexico. Ground water is currently the sole source of drinking water in the Albuquerque area, and ground water will remain an integral part of the drinking water supply even if other sources of drinking water are obtained. Thus, it is EPA's intent is to make the ground water available to all persons, public and private.

19. **Aquifer restoration is technically impracticable based on an analysis using EPA's Guidance for Evaluating the Technical Impracticability of Groundwater Restoration.**

This issue has been previously addressed by EPA in its Technical Review of CMS Report dated June 20, 1996 [AR p. 008367-008386]. Further, Sparton has made no attempt to even address the extensive off-site contaminant plume.

20. **The infeasibility of aquifer restoration is further confirmed by the case histories presented in the EPA document Evaluation of Ground-Water Extraction Remedies: Phase II (1992) and in Alternatives for Groundwater Cleanup (National Research Council, 1994).**

This issue has been previously addressed by EPA in its Technical Review of CMS Report dated June 20, 1996 (AR p. 008367-008386)]. In summary, Sparton fails to note that the success of aquifer restoration can be limited by the presence of DNAPL at the site. EPA has already acknowledged that the presence of DNAPL beneath the facility will limit the effectiveness of ground water extraction for restoration of the aquifer beneath the facility. However, EPA has also noted that for more than 70 acres of the 90 acre plume, ground water extraction has a sufficient likelihood to succeed. Ultimate success is a matter to be determined after implementation and operation of an appropriately designed, constructed, and maintained system. Further, Sparton has made no attempt to even address the extensive off-site contaminant plume.

Issues not pointed out in this discussion regarding the study results are: (1) aquifer restoration is a remedial goal for 17 out of the 24 sites; (2) in a majority of the 24 cases, NAPLs were not addressed in the site investigation or the remedial design; DNAPL is expected to be present beneath the Sparton facility and can be accounted for in the remedial design; and (3) site characterization data was insufficient to assess contaminant movement and ground water system response to extraction; EPA has included additional investigative activities in the selected remedy to ensure that this data is provided for in the system design at Sparton.

21. **Sparton's proposed remediation activities will produce the same results over the same 30-year time frame.**

This Report did not present an analysis or documentation concerning the expected reduction in contaminant mass from a single-well remediation system combined with an existing or slightly expanded on-site remediation system. Likewise, the

CMS Report did not present an analysis of such a system. [CMS Report; AR p. 5490-6023].

22. **Proposed remediation would provide for containment of the leading edge of the plume.**

The CMS Report did not contain a proposal for containment of the leading edge of the plume, and the Respondent has not submitted such a proposal to EPA for approval. In addition, the Respondent has never agreed to implement a remedy which would achieve the objective of containment as outlined in EPA's Final Decision document dated June 24, 1996. In contrast, the Respondent has submitted various proposals to NMED for a single-well extraction system installed somewhere near the leading edge of the plume. NMED has not approved such a system for implementation at the site. Based on correspondence from NMED, the Respondent has not presented site-specific data demonstrating that such a system would be effective in containing the leading edge of the plume.

23. **The containment proposal was conditioned to the economical treatment and disposal of extracted ground water.**

The Respondent has not defined "economical" as it relates to the treatment and disposal of extracted ground water. The term "economical" should be based on a financial analysis of Sparton Technology and Sparton Corporation to demonstrate what level of funding is available. The Respondent has presented cost estimates for various disposal scenarios, without supporting documentation, in an apparent effort to demonstrate that the project is too expensive. While EPA's intent is not to design such a system for the Respondent, EPA has prepared a separate cost estimate to clarify the potential costs involved for disposal of treated ground water. These costs are provided in Exhibits 17 and 18.

24. **Proposed expansion of the on-site ground water extraction system to enhance on-site containment and removal of source material.**

The Respondent presented an option in the CMS Report for converting an existing monitoring well on the Facility property into a ground water extraction well. However, the Respondent did not provide any documentation on how the proposed well would influence the ground water contamination beneath the Facility or even enhance on-site containment. Since the contamination beneath the Facility continues to migrate off-site, any ground water extraction would be useful. However, the objective established by EPA is to maximize contaminant removal and prevent further migration from Facility to off-site areas [page 43, Attachment A - Final Decision and Response to Comments, RCRA § 3008(h)

Initial Administrative Order]. The Respondent has not demonstrated how such a converted monitoring well would meet these objectives. In summary, the conversion of a single monitoring well pumping a 20 gallons per minute is not expected to prevent the migration of a contaminant plume from the facility boundary.

25. **EPA provided erroneous and misleading depictions of capture zones for the existing onsite recovery well system.**

EPA presented a technical evaluation of the onsite recovery well system in its Technical Review of the Report on the Effectiveness of the Ground Water Recovery Well System in the Upper Flow Zone [AR p. 008248-008276]. The Respondent challenged EPA's evaluation on three issues.

(1) EPA has a basic misunderstanding of the Hvorslev methodology to require constant rate or equilibrium conditions.

In its technical review, EPA pointed out that a number of assumptions in the Hvorslev methodology (Appendix 3 of Respondent's Report on the Effectiveness of the Ground Water Recovery Well System in the Upper Flow Zone [AR p. 5193-5489] appear to be violated by site conditions and the implementation of the pumping test.

> As discussed on page 9 of the Hvorlsev methodology, "[d]erivation of the basic differential equation ... assumed that artesian conditions prevail or that the flow required for pressure equalization does not cause any perceptible draw-down of the ground-water level." To meet this condition, the test is to be initiated by causing an instantaneous change in the water level in the piezometer through the sudden introduction or removal of a known volume of water (page 339 of the text, Groundwater, Freeze and Cherry, 1979).

This requirement has not been waived and still applies to the test data collected at the Sparton facility. In fact, the Respondent did not dispute that this is a requirement of the test method.

(2) EPA averaged well-location-specific hydraulic conductivities ranging two orders of magnitude and hydraulic gradient ranging over one order of magnitude to obtain single values for calculations at all well locations.

However, EPA utilized more representative values for predicting the capture zones for the recovery wells. These values resulted in capture zones significantly smaller than

those predicted by the Respondent. As EPA point out in its evaluation,

> . . . even if the hydraulic conductivity values calculated using the Hvorslev method were considered valid, the capture zones depicted in the revised Figure 7 of the Well Effectiveness Report would have to be considered unrealistic. In several cases the computed capture zones are large enough to encompass portions of the facility that are not adequately represented by the localized parameter values used in the computations. This is particularly true for the capture zone predicted for recovery well MW-28. In spite of a pumpage of less than three gallons per hour, a capture zone encompassing an area several times the size of the Sparton facility has been depicted.

Therefore, EPA's analysis demonstrates a more realistic view of the effects of the on-site recovery system.

(3) EPA chose to ignore actual field demonstrations of capture determined from long-duration, multiple-well pump tests (specifically wells MW-24 and MW-25).

According to data from the pump tests, average flow rates from wells MW-24 and MW-25 were 12.3 gallons and 19.2 gallons per hour, respectively. This resulted in an observed drawdown of less than 0.1 feet in MW-25 during pumping of MW-24, and less than 0.2 feet in MW-24 during pumping of MW-25, at a distance of less than 33 feet. However, flow rates during operation of MW-24 and MW-25 as recovery wells in late February 1992, are 1.0 and 1.8 gallons per hour, respectively. As recovery wells, MW-24 and MW-25 are pumping less than 10% of the volume than during the pump test. Because of the significant difference between pumping rates used during the pump test and pumping rates used for operation of the recovery system, drawdowns in MW-24 and MW-25 will be significantly reduced. In addition, this would indicate that the capture zones for these wells would be small which supports EPA's calculated maximum capture zone widths of 8.9 feet and 16 feet for MW-24 and MW-25, respectively as opposed to Sparton's proposed figure of 66 feet.

Therefore, concerns over the validity of the capture zones predicted in the Respondent's Report on the Effectiveness of the Ground Water Recovery Well System in the Upper Flow Zone prevent EPA from accepting many of Sparton's conclusions regarding the effectiveness of the recovery well system. EPA's evaluation of the existing on-site ground water

extraction system demonstrates that the system is not capable of containing contaminants from migrating off-site.

26. **Sparton has proposed installation of a soil vapor extraction system to remove source material from the unsaturated zone in the vicinity of the original contamination source area.**

EPA concurs with the proposal to install a soil vapor extraction system to remove source material from the unsaturated zone in the vicinity of the original contamination source area. However, it should be pointed out that the Respondent has previously disputed the installation of a SVE system at the site by implying that EPA was unreasonable in proposing such a system. The Respondent's letter dated November 6, 1995, [AR p. 004616-004643] contended that a SVE system was not cost-effective and that significant quantities of source material no longer remained the unsaturated zone. EPA disputed this claim in its letter of February 20, 1996 [AR p. 006024-006055]. The Respondent furthered the claim of no significant remaining source material in the CMS Report [AR p. 005490-006023] by stating "If, as expected, that testing establishes concentrations in the soil at or below 10 ppmV, no further action will be required." (emphasis added) [AR p. 005693]. The statement was proved inaccurate following the installation of a soil vapor monitoring well in June 1996. Analytical results from sampling of this well confirmed the presence of significant concentrations of contaminant vapors above 10 ppmV in the unsaturated zone.

27. **Hydraulic conductivity and ground water flow rates are low. As a result, ground water extraction and treatment will require a very long time frame because of the extremely large volume of water to be treated and the rate at which the water can be removed by wells.**

The hydraulic conductivity values of 32 feet/day obtained for the aquifer beneath the Sparton facility are not too low to prevent remediation. The presence of sandy gravels and a likely increase in the hydraulic conductivity west of the Sparton facility indicates that the aquifer is sufficiently permeable for remediation using ground water extraction.

28. **The plume dimensions and contaminant distributions will not allow efficient, high rate ground water extraction. Large drawdowns associated with high pumping rates will pull contamination down into lower portions of the aquifer. Aggressive pumping will thus result in the removal and treatment of very large volumes of relatively uncontaminated water without achieving significant remediation.**

These are design issues that can be dealt with through proper design and operation of a ground water extraction system [EPA letter of February 20, 1996, AR p. 006041-006044].

29. **Restoration will require removal of both dissolved phase contamination from ground water and sorbed-phase (residual DNAPL) contamination from saturated fine-grained clays and silts.**

DNAPL is a widely used acronym for dense nonaqueous phase liquid. As such, it is used as a label identifying contaminants such as chlorinated solvents that are migrating in the subsurface as separate phase, immiscible liquids. This term is widely used to distinguish between nonaqueous phase contaminant and aqueous phase contaminants, that is to distinguish between contaminant migrating as a separate phase in the subsurface distinct from ground water and contaminants migrating in solution with ground water. Due to it density relative to water, mobile DNAPL generally migrates downward through the subsurface, although it can migrate laterally as it accumulates on subsurface material that act as low permeability barriers. DNAPL will generally continue to migrate until it reaches a barrier which contains it or until the release of DNAPL is retained completely in subsurface materials as residual DNAPL.

As DNAPL migrates through porous media, some amount of DNAPL is left behind as residual saturation due to capillary forces. This residual saturation is also frequently referred to as residual DNAPL, or less frequently as entrained or entrapped DNAPL. This residual DNAPL is left in place, as its name implies, as a separate, nonaqueous phase. Residual DNAPL is generally immobile. Residual DNAPL will tend to dissolve into ground water and can provide an ongoing source of dissolved contaminants in ground water which can then result in a dissolved contaminant plume downgradient of an area of residual or contained DNAPL. Due to a number of factors including the low solubility and dissolution kinetics, dissolution of residual DNAPL may be slow. For this reason, residual DNAPL can persist in the subsurface for extended period and can be difficult to remediate.

Dissolved contaminants migrating with ground water flow from the area of residual DNAPL are then sorption phenomena. Cohen and Mercer (1993, p. C-5) have indicated that "sorption refers to processes that remove solutes from the fluid phase and concentrates them on the solid phase of a medium." The National Research Council (1994, p. 60) has indicated that "the tendency of a contaminant to sorb to solid material in the subsurface is governed by a number of molecular interactions of chemical, electrostatic, or physical origins." This is in contrast to the capillary forces which are responsible for retaining residual DNAPL in subsurface material.

Thus, as the dissolved contaminant migrate with ground water through aquifer material some amount of these contaminants will partition onto the solid aquifer matrix. This partition between the aqueous and solid phase is also responsible for retarding plume migration. However, Piwoni and Keeley (1990) indicated that degree of sorption for nonpolar organic contaminants such as TCE is strongly related to the organic content of the soil. Keely and Piwoni have indicated that the sorption coefficient can be estimated using only octanol-water partitioning coefficients and soil organic content values. As indicated in the Ground Water Issue Paper, TCE Removal from Contaminated Soil and Ground Water [AR p. 002256-002265], the "low K_{oc} (octanol-water coefficient) for TCE translates into little retardation (sorption) by soil or aquifer organic materials," and "(s)ince the retardation is so low, pump and treat technologies appear attractive as remediation alternatives."

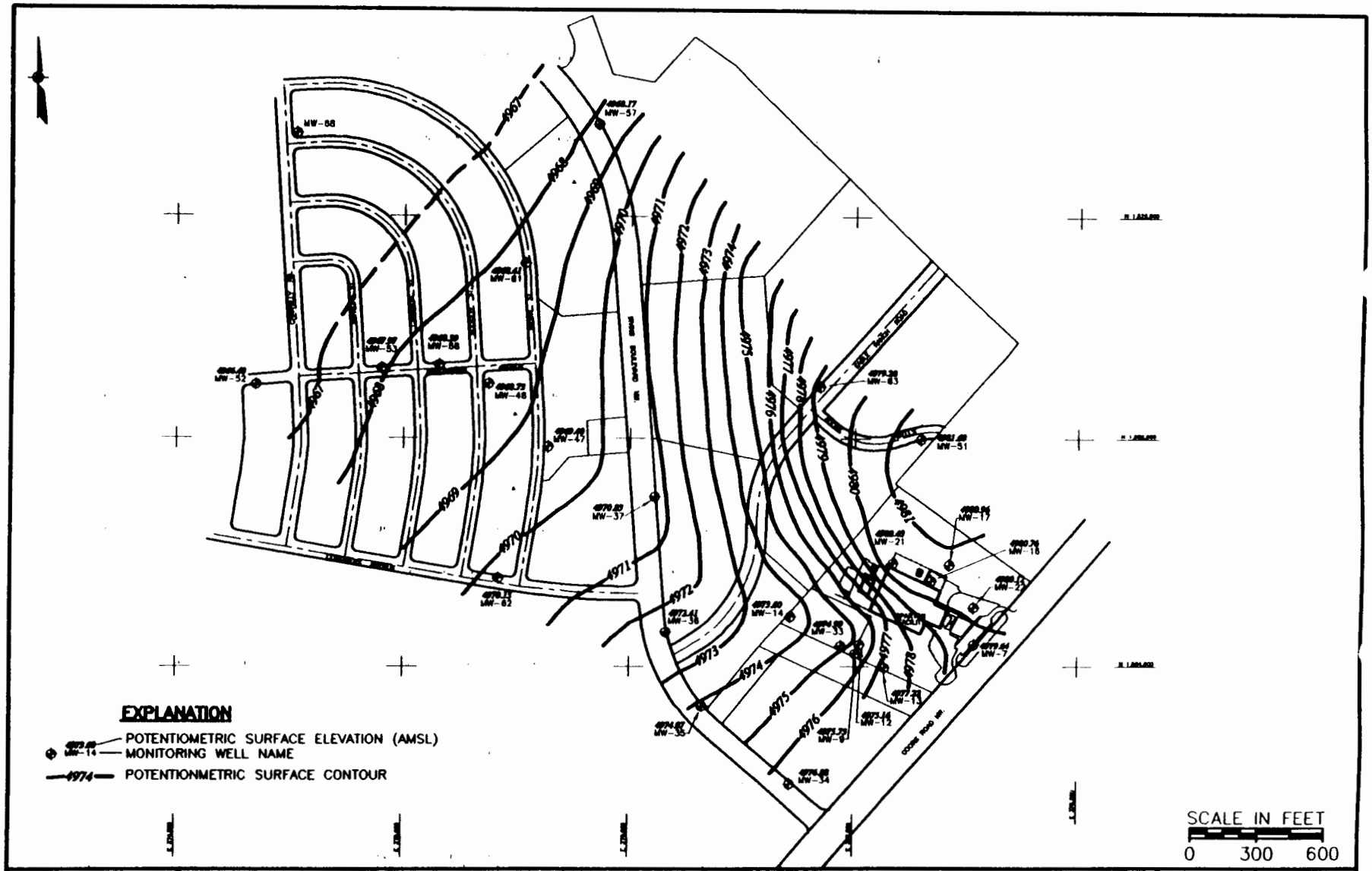
When asserting its doubt that the impacted aquifer can be restored by any technically practicable methodologies in any reasonable time frame, Sparton has expressed surprise that EPA does not believe that sorbed-phase VOC or residual DNAPL is not present throughout the plume [see Report by Pierce Chandler at p. 36]. However, EPA has not maintained that sorbed phase VOC is not present throughout the contaminant plume. Rather, EPA has maintained that the degree of sorption is not so great as to render restoration of the downgradient portion of the plume technically impractical through the use of pump and treat remedy [EPA letter of February 20, 1996, AR p. 006024-006055]. Based on the low sorption potential for TCE documented in the literature, this appears to be a reasonable conclusion in the absence of data to the contrary. The Respondent does not appear to have provided any data demonstrating high sorption coefficient for TCE in the downgradient portion of the plume, although it has repeatedly conducting borings in this area for the purpose of installing monitoring wells.

EPA has, however, acknowledged that there may be a portion of the plume that contains residual DNAPL which may present difficulties for restoring the ground water quality. Although this area has not been precisely delineated by Sparton, it is likely to be fairly limited in size. Since DNAPL tends to migrate downward, it spreads laterally only when encountering a low permeability barrier. While low permeability material that may have served as a barrier to vertical migration have been identified beneath the Sparton property itself, extensive low permeability deposits have not been identified in the area downgradient portions of the plume. Thus, EPA's belief that DNAPL has not migrated laterally significant distances into the downgradient portion of the plume appears well founded. It does not appear that Sparton has provided any data identifying DNAPL in the downgradient portions of the plume.

30. **Technical impracticability of restoration at Sparton's site is also confirmed by the additional case history information contained in Alternatives for Groundwater Cleanup (National Research Council, 1994).**

As pointed on page 15 of the NRC book, the ability of conventional pump-and-treat systems is highly site specific and that the systems may be effective for cleaning up plumes of dissolved contamination. With effective containment of the high contaminant concentrations beneath the Sparton facility, restoration is feasible for the almost 1/2 mile dissolved contaminant plume.

APPENDIX B



Metcalf & Eddy

SPARTON TECHNOLOGY, INC.
UPPER FLOW ZONE
POTENTIOMETRIC SURFACE CONTOURS BASED ON WATER LEVEL MEASUREMENTS COLLECTED BY SPARTON AUGUST 3, 1995
ALBUQUERQUE, NEW MEXICO

Project Number	
166022	
File Name	Figure
SP--COL16	1

009518

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 19 1995

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

MEMORANDUM

SUBJECT: Office of Enforcement and Compliance Assurance and Regional Roles in Civil Judicial and Administrative Site Remediation Enforcement Cases

FROM: Steven A. Herman
Assistant Administrator

TO: Assistant Administrators
Regional Administrators
General Counsel
Regional Counsels
Regional Waste Management Division Directors
Office of Enforcement and Compliance Assurance Office Directors

On July 11, 1994, I issued a redelegation of authority and guidance on Headquarter's involvement in regulatory enforcement cases. This guidance stemmed, in part, from recommendations made by the Regional Impacts Task Force regarding the division of roles and responsibilities between Headquarters and the Regions in the enforcement and compliance assurance program. The approach embodied in those redelegations includes a focus on value-added participation of the appropriate EPA personnel, a focus on "nationally significant" matters and issues, and flexibility in terms of the overall review and concurrence process.

This memorandum and its attachment follow up that July 11, 1994 redelegation of regulatory enforcement matters, and establishes the roles of the Office of Enforcement and Compliance Assurance (OECA) and the Regions in the handling of civil judicial and administrative cases under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), the Resource Conservation and Recovery Act (RCRA) corrective action enforcement program, the Leaking Underground Storage Tank (LUST) program (where corrective action activities are involved) and the Oil Pollution Act (OPA) (where remediation activities are involved). This memorandum supersedes all prior guidance documents and memoranda which established Headquarters (Office of Waste Program Enforcement or Office of Enforcement) concurrence or consultation roles in these areas. This memorandum does not address: 1) regulatory enforcement actions, including the Emergency Planning and Community Right-To-Know Act (EPCRA), which are handled by the Office of Regulatory Enforcement, or 2) the Office of Solid Waste and Emergency Response (OSWER) or the Office of General Counsel's (OGC) role in site remediation

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cases. This redelegation and guidance is effective immediately and will be reviewed annually.

This represents a further shift of case specific authority from OECA to Regional Offices, while maintaining the optimal level of OECA participation which is necessary and appropriate in the given circumstance. All classes of RCRA corrective action, OPA remediation, LUST corrective action, and CERCLA judicial actions will be directly referred to the Department of Justice (DOJ), except for parallel proceedings.

Pursuant to this redelegation and guidance, case specific matters will be handled under three basic approaches: (1) matters which require Headquarter's concurrence; (2) matters which require consultation with Headquarters; and (3) other matters for which neither concurrence or consultation are formally required, but where interaction between the Region and Headquarters is encouraged and desirable. These approaches are set out in greater detail in the attachment. The purpose for these approaches is to maximize the quality and efficiency of our enforcement and compliance program, recognizing the roles and expertise of staff in both the Regions and in OECA.

Shifting case specific authority to the Regions also recognizes the maturity of the site remediation programs, the impressive track record of the Regions in carrying out their responsibilities, and the efficiencies that can be achieved. It does not signal an intention to operate this enforcement program as if EPA were split into ten totally independent offices. It is imperative that Regions and Headquarters continue to maintain contact on a voluntary cooperative basis. Consistency and coordination continue to be important operating principles.

Effective communication and oversight will occur by taking advantage of routine and *ad hoc* opportunities. Headquarters will continue to participate in nationally managed cases, directly referred cases when the case or issue rises to national attention, when more than one Region is taking action against the same company (*e.g.*, multi-regional bankruptcies, natural gas pipelines), and where there is a national initiative. Day to day contact by phone or computer and national meetings and workgroups will provide opportunities to exchange information and provide necessary alerts to "hot" matters. Regions should use these occasions to identify to Headquarters cases which will require concurrence, mandatory consultation, or input/participation. OSRE also intends to conduct after-the-fact audits of Regional performance to identify any problems with the procedures and delegation limitations set out in this memorandum. Where appropriate, Headquarters oversight may be reduced or heightened on a Region-specific basis as a result of these reviews.

In conjunction with the redelegation and guidance issued on July 11, 1994 regarding regulatory enforcement matters, this memorandum setting forth similar guidance for Superfund enforcement, RCRA corrective action, and other remediation programs, should improve the overall quality of the Agency's enforcement and compliance assurance program. Notwithstanding any of the requirements set out above, frequent and collegial communication between the Regions and Headquarters is an essential part of our operating

principles. The processes described in this memorandum and its attachment will hopefully place both the Regions and OECA in a better position to identify and address the many significant issues that arise in the context of a national enforcement and compliance assurance program.

cc: John C. Cruden, Chief, Environmental Enforcement Section, DOJ

Attachment

ATTACHMENT

REQUIRED CONCURRENCES AND CONSULTATIONS

Headquarters concurrence is required for a substantially smaller number of matters than previously required. Concurrence will only be required in civil judicial settlements: where total site costs exceed $100 million (raised from the previous threshold of $60 million); where a settlement significantly deviates from written Agency policy or breaks new ground in an important sensitive area; or where the Region anticipates recovering less than 50% of total site costs (unless the primary element limiting recovery is ability to pay). In addition, Headquarters approval will be needed for the decision to grant a covenant not to sue without reopeners in a CERCLA settlement (except for *de minimis* and bankruptcy settlements), for "hold action" letters to DOJ requesting a delay in filing a complaint beyond 60 days, for "no action" assurances, for Federal facility CERCLA agreements, and for settlements with multi-media covenants not to sue. More detailed descriptions of these categories, and procedures for obtaining concurrence, are set out below.

Headquarters consultation allows Headquarters to be aware of certain types of matters, and to have input, but in a less burdensome manner than formal concurrence. By and large consultation is required only in situations that previously required formal concurrence. The consultation process is designed to reduce burdens on the Regions in several ways. First, the process is less formal and will entail less paperwork. Second, consultation can, and in many cases should, occur prior to conclusion of negotiations, reducing the potential for delay. Finally, consultation is mandatory only for the element of the case that falls within the described consultation category. Other aspects of the case need not be submitted to Headquarters (except to the extent needed to provide context). The attachment describes the consultation categories and the procedure to be followed. Note that in some cases where concurrence had been required in the past that neither concurrence nor consultation is now mandated.

Voluntary cooperative interaction should take place over a wide range of issues and case specific questions. Headquarters personnel often possess specialized expertise that Regions are encouraged to call upon. Headquarters staff will relay policy direction and intent, convey information from the national perspective, and serve as conduits of information from one Region to another. In some cases Headquarters staff can be assigned to handle specific matters, in effect supplementing Regional staff. OECA/Office of Site Remediation Enforcement (OSRE) is also available to offer informal advice and serve as a sounding board for new ideas.

The concurrence and consultation requirements apply to settlements of cases that have been referred to DOJ, to those that are settled in pre-referral negotiations, and to unilateral orders, administrative orders on consent, and agreements.

A. Required CERCLA Concurrences[1]

Requests for Headquarters concurrence will require a written request for concurrence from the appropriate Regional official addressed and sent to the appropriate Headquarters official. A copy plus attachments should also be sent to the Office Director/OSRE (or for Federal facility matters, to the Office Director, Federal Facilities Enforcement Office). The request will consist of a memorandum that identifies the settlement provision or circumstance that triggers the Headquarters concurrence with a copy of the 10-point settlement analysis attached. A copy of this memorandum should be faxed, sent by computer or regular mail to one of the Headquarters staff assigned to the case so they may begin the concurrence process.

1. Concurrence by the AA/OECA is required for RD/RA settlements and large "cashout" settlements (>$10million) at sites where total past and future costs exceed $100 million.

Settlements at sites where costs exceed $100 million are by their nature of national significance and often attract much public attention. To determine the appropriate level of Headquarters' involvement with the settlement, the total past costs plus projected future costs of all operable units at the site should be used as the basis for calculating costs, even if the settlement is for one operable unit at the site or for one group of PRPs. Concurrence by the AA/OECA is not required for "cashouts" less than $10 million unless they are covered by paragraph A.5 of this attachment. This provision should apply to only a few sites annually.

2. Concurrence by the AA/OECA is required for settlements which significantly deviate from written Agency policy or which break new ground in an important sensitive area.

This is a clarification of prior CERCLA settlement policy, in which Headquarters retained authority over settlements involving "substantial deviations from Agency policy," a category of precedent setting cases. (*See* OSWER Dir. No. 9012.10-a). This category can involve issues already covered by specific guidance documents or new potentially

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[1] On September 13, 1987, certain CERCLA settlement authorities were delegated to the RAs by Delegations 14-13-B (civil judicial enforcement actions) and 14-14-E (*de minimis* settlements under §122(g)). These delegations also required RAs to obtain Headquarters concurrence for most CERCLA settlements.

A June 17, 1988 memorandum (OSWER Directive # 9012.10-a) waived the concurrence requirements completely for most categories of CERCLA settlements and delegated another category of settlements to the RAs with a Headquarters consultation requirement. The memorandum did retain Headquarters concurrence for certain types of settlements, and for all settlement types not specifically identified. The June 17, 1988 memorandum was incorporated into the limitations section of the revised CERCLA delegations 14-13-B and 14-13-E issued on May 11, 1994. The limitations in delegations 14-13-B and 14-13-E envision further modification of the categories of settlements that are delegated to the RAs.

controversial issues. Identification of cases falling within this class will require an ongoing cooperative Regional/Headquarters effort.

3. Concurrence by the AA/OECA is required for "hold action letters" to DOJ requesting delay in filing a complaint beyond 60 days.

4. Concurrence by the AA/OECA is required for "no action" assurances, *i.e.*, promises outside the context of a formal enforcement proceeding that EPA will not take enforcement action. Comfort letters that do not contain express assurances that enforcement action will not be taken do not require Headquarters concurrence.

5. Concurrence by the Office Director (OD)/OSRE, will be required for settlements which compromise greater than 50% of total past and projected future response costs, except when: total past and projected future response costs are less than $2 million, or the settlement puts total recovered costs at the site over 50% of total past and projected future costs, or the Region has documented a reasonable expectation for achieving greater than 50% total past and projected future response costs recovery at the site. This category does *not* include bankruptcy settlements, settlements in which the primary basis for the compromise is ability to pay, *de minimis* settlements, or de micromis settlements.

This requirement focuses on total site settlement achievements rather than specific settlement components. Headquarters involvement in settlements that significantly compromise site costs is important for overall program accountability. Total site costs include all past and projected future costs.

6. Advance written approval by the OD/OSRE is required before offering to grant PRPs a covenant not to sue without reopeners. This category includes: (1) extraordinary circumstances settlements under CERCLA §122(f)(6)(B); (2) settlements with special covenants under CERCLA §122(f)(2); (3) judicial or administrative settlements relying on the "inherent settlement authority of the Attorney General" (*e.g.*, "cashout" settlements in which a premium payment is accepted in lieu of reopeners or in which reopeners are excluded based upon extraordinary circumstances-type factors). It does *not* include settlements granting covenants not to sue without reopeners when they are based on filed bankruptcies (Chapters 7 or 11), settlements granted to insurance companies that pay the maximum claim at a site on behalf of an insured that is a PRP, or *de minimis* or de micromis generator settlements.

Headquarters maintains approval authority for such covenants because of the finality of relieving parties of future liability at a site, the potential precedential effect, and the level of public scrutiny and Congressional oversight that this type of settlement receives. Each

time a covenant not to sue without reopeners is to be granted, the site-specific justification must be clearly documented.

7. Settlements that include multi-media covenants not to sue require the concurrence of the AA/OECA. (Multi-media covenants are those that address site remediation and regulatory violations.) Covenants not to sue under § 7003 do not require concurrence.

8. Settlements of nationally managed CERCLA cases (*e.g.*, Love Canal) require the concurrence of the AA/OECA.

9. Concurrence by the AA/OECA is required for CERCLA cleanup agreements with Federal agencies involving 100% federal ownership of property, 100% federal operation of a site, or mixed work at a formerly used defense site.

Federal facility matters are often issues of national significance. Because disputes may be raised to the Administrator, Headquarters maintains a concurrence role in Federal facility CERCLA cases. Therefore, the Federal Facility Enforcement Office (FFEO) should be contacted regarding these Federal facility CERCLA cases.[2]

OSRE will continue to be the contact for private sites with Federal PRPs. FFEO and OSRE will work with each other to determine the logical lead at sites with mixed federal and private ownership.

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[2] Contacting the OD/FFEO is consistent with the procedures in the "Guidance on Coordination of Federal Facility Enforcement Actions with the Office of Enforcement," dated October 20, 1992, which continue as before, and provide for notice to the OD/FFEO as early as possible before certain actions are taken or announced against either federal agencies or their contractor-operators.

B. Required CERCLA Consultations

Requests for Headquarters consultations can be made by telephone (or in writing) to the Headquarters staff person assigned to the case (contact the appropriate RSD Branch Chief or Senior Counsel if no one is assigned to the case). Background information necessary to provide context for the provision or circumstance that triggers the Headquarters consultation, and any other information regarding special elements involved should be E-mailed, faxed or mailed at the same time to the Headquarters person assigned to the case. Regional and Headquarters staff should discuss the provision or circumstances requiring consultation in detail. A letter from the RSD Branch Chief or Senior Counsel to the appropriate Regional Branch Chief will confirm that the consultation took place and will summarize any comments or concerns Headquarters has with the proposal. Telephone or computer conversations may provide advance notice that the consultation requirements have been met.

1. Consultation at the OD/OSRE level is required for:

   a. Settlements in which, under any applicable penalty policy, the Region is contemplating waiving greater than 50% of potential civil penalties under CERCLA §§ 104(e)(5), 106(b) or 109(c) or greater than 50% of stipulated penalties, or any treble damages. (Waiver of administrative penalties under § 109(a) and (b) do not require consultation.)

   b. Multi-regional bankruptcy cases after the concurrence of all relevant RAs. (For multi-media covenants, see A.7.)

The compromise of claims for civil or stipulated penalties and treble damages has received heightened Congressional scrutiny as EPA has moved to an enforcement first approach, issuing greater numbers of UAOs for performance of work. This is an area in which the Agency needs to ensure vigorous enforcement and in which national consistency is important.

2. Consultation at the RSD Director level is required for:

   a. Administrative settlements under § 122(h) where the Region is contemplating compromises of future costs. (This replaces the prior consultation requirement for § 122(h) settlements where total past and future site costs exceed $500,000.)

   b. All mixed funding settlements for: mixed work; preauthorization; and "cashouts" in which the amount recovered under the settlement is greater than $10 million.

Unless specifically delegated to a Regional Administrator under Delegation 14-9-A, OSWER approval is needed before Regions enter into preauthorization agreements. OSRE should be contacted when a preauthorization proposal meriting serious consideration is first submitted by PRPs. OSRE will work with the Regions and OSWER's Office of Emergency and Remedial Response to determine if the site is a good candidate and to obtain Headquarters' approval as appropriate.

The $10 million "cashout" provision reflects Headquarters' interest at sites at which PRPs are providing EPA with large amounts of money for EPA (or another party) to do the work at the site. EPA continues to have a strong preference for PRPs to do site work.

c. Settlements based on divisibility of harm provisions. This category does not include situations where divisibility is based on geographically distinct areas of contamination without comingling.

Headquarters will review the site-specific circumstances when divisibility is used to justify a CERCLA settlement. The terms of such a settlement particularly demand national consistency while the courts are split as to what constitutes a basis for divisibility.

d. Settlements involving municipalities as generators or transporters of municipal solid waste.

e. The first settlement in each Region involving de micromis parties.

f. Prospective purchaser agreements.

g. Settlements involving Supplemental Environmental Projects that deviate from the SEP Policy or that compromise penalties as described in B.1 of this attachment (excluding Supplemental Environmental Projects under EPCRA and §103(b) actions).

h. Appeals of adverse Federal administrative decisions.

i. Settlements involving de minimis *landowners*

Due to the complexity of the interaction between the innocent landowner defense and the *de minimis* criteria for qualification, consultation will be retained pending additional Regional experience in this area.

j. Settlements which compromise payment of oversight costs.

k. Pre-Referral Negotiation (PRN) Litigation Reports where OECA expects to have a concurrence role on the settlement. All other PRN Litigation Reports require consultation with the appropriate RSD Branch Chief.

3. Consultation with the RSD Judicial and Administrative Procedures Team is required for:

Section 106(b) petitions.

4. Consultation with designated Headquarters staff is required for:

a. Section 104(e) orders for access.

b. Section 104(e) UAOs for information gathering and Section 122(e) subpoenas, when either the UAO or the subpoena deviates significantly from the current models.

The Regions should consult the AA/OSWER directly on: 1) decisions to obligate more than $6 million for a removal action; and 2) decisions to approve PRP conducted risk assessments. When an enforcement issue is present, OSRE is consulted by OSWER.

Regions are no longer required to: 1) get Headquarters concurrence before issuing the second 30-day extension to the CERCLA RD/RA special notice negotiation moratorium; 2) consult with Headquarters on decisions not to issue a CERCLA UAO for RD/RA; 3) consult with Headquarters prior to issuance of § 106 removal orders; or 4) consult with OSRE on selection of containment-only remedies (consultation with OERR on such decisions should continue).

C. Required RCRA/OPA/LUST Concurrences

Requests for Headquarters concurrence will require a written request for concurrence from the appropriate Regional official addressed and sent to the appropriate Headquarters official. A copy plus attachments should also be sent to the OD/OSRE (or for Federal facility matters, to the OD/FFEO). The request will consist of a memorandum that identifies the settlement provision or circumstance that triggers the Headquarters concurrence and a copy of any available Regional analysis. A copy of this memorandum should be faxed to one of the Headquarters staff assigned to the case so they may begin the concurrence process.

1. Concurrence by the AA/OECA is required for "no action" assurances, *i.e.*, promises outside the context of a formal enforcement proceeding that EPA will not take enforcement action.

2. Concurrence by the AA/OECA is required for "hold action letters" to DOJ requesting delay in filing a complaint beyond 60 days.

3. Settlements that include multi-media covenants not to sue require the concurrence of the AA/OECA. (Multi-media covenants are those that address site remediation and regulatory violations.)

4. Settlements of nationally managed remediation cases (*e.g.*, national natural gas pipelines) require the concurrence of the AA/OECA.

D. Required RCRA/OPA/LUST Consultations

Requests for Headquarters consultations can be made by telephone (or in writing) to the Headquarters staff person assigned to the case (contact the appropriate RSD Branch Chief or Senior Counsel if no one is assigned to the case). Background information necessary to provide context for the provision or circumstance that triggers the Headquarters consultation, and any other information regarding special elements involved should be E-mailed, faxed or mailed at the same time to the Headquarters person assigned to the case. Regional and Headquarters staff should discuss the provision or circumstances requiring consultation in detail. A letter from the RSD Branch Chief or Senior Counsel to the appropriate Regional Branch Chief will confirm that the consultation took place and will summarize any comments or concerns Headquarters has with the proposal. Telephone or computer conversations may provide advance notice that the consultation requirements have been met.

1. Consultation at the OD/OSRE level is required for:

   a. Settlements and orders which significantly deviate from written Agency policy or which break new ground in an important sensitive area.

   b. Multi-Regional bankruptcy cases after the concurrence of all relevant RAs.

2. Consultation at the RSD Director level is required for:

   a. RCRA §7003 UAOs and the first two §7003-only AOCs in each Region (some Regions have already satisfied this requirement).

   b. Appeals of adverse Federal administrative enforcement decisions.

   c. RCRA §3008(h) orders that suspend or revoke authorization to operate under §3005(e) of RCRA.

   d. Settlements involving Supplemental Environmental Projects that deviate from the SEP Policy.

e. Settlements in which, under any applicable penalty policy, the Region is contemplating waiving: greater than 50% of potential civil penalties or greater than 50% of stipulated penalties.

3. Consultation with FFEO is required for:

All actions with respect to Federal agencies under RCRA § 7003 or unilateral or nationally significant actions under RCRA § 3008(h).

The following is EPA's response to the allegations raised by the Respondent in Section V, paragraphs 26 through 58, of its Protective Response and Request for Hearing dated October 18, 1996. The Respondent's allegations concern Exhibit A, Final Decision and Response to Comments dated June 24, 1996, of EPA's Initial Administrative Order under Section 3008(h) of RCRA. The numbers in parenthesis at the end of the Respondent's allegation refers to the numbered paragraph in the Protective Response and Request for Hearing.

1. **Respondent disputes that the decision is based on the administrative record because:**

   a. **The administrative record does not support EPA's decision.**

   b. **The administrative record is neither complete nor accurate. EPA's decision was based on political and not technical factors, and was decided upon before the administrative record was developed. (27)**

   The Administrative Record, consisting of almost 9000 pages, contains laboratory data, technical reviews, letters, reports, and other documents upon which EPA relied upon in selecting the remedy in the Final Decision and Response to Comments document. The Administrative Record does support EPA's decision, as set forth in Section IV.F of EPA's Brief. In fact, the Administrative Record contains a substantial number of documents, letters, laboratory data, etc., submitted by the Respondent to EPA and the New Mexico Environment Department. In addition, the Respondent had an opportunity to comment and provide additional documentation to the Administrative Record during the public comment period for the Statement of Basis, but chose otherwise. The Respondent's contention that political factors was the basis of EPA's decision is purely speculative and without supporting documentation.

2. **Respondent disagrees that residential developments are one quarter of a mile west of the facility, they are more distant. (28)**

   EPA provided an approximate range of 1/4 to 3/4 mile for the distance to the residential developments.

3. **Respondent disagrees that the subsurface soils consist of sandy muds, sands, and gravel, because in fact the subsurface soils are better described as clays and sandy muds interbedded with gravely sands. (28)**

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The Respondent's description does not materially change the general description provided by EPA.

4. **Respondent disagrees that "local groundwater," if that means groundwater in the immediate area of impact, supplies drinking water to the city of Albuquerque as well as process water for industrial purposes. The impacted groundwater is in a service area for New Mexico Utilities, Inc., in which the city of Albuquerque is not authorized to complete wells. Local groundwater, as understood by Respondent does not supply drinking water for New Mexico Utilities, Inc. Respondent is unaware of any process water wells in the immediate vicinity of the impacted groundwater. (28)**

   The local ground water described by EPA is intended to reflect a broadly defined area that includes more than just the immediate area of the Sparton facility.

5. **Respondent did not discontinue manufacturing operations in 1994; it continues to operate a machine shop at the Plant and the Plant is currently active. (28)**

   The reference to 1994 by EPA is intended to reflect the discontinuance of manufacturing operations for electronic components at the Sparton facility.

6. **Respondent disagrees that drums of hazardous waste were stored on the ground surface prior to May 1981, because a new drum storage area was in place by November 19, 1980. (29)**

   According to the Closure Plan for the Pond and Drum Storage Areas, dated December 19, 1985, drums of hazardous waste were stored on the ground surface prior to May 1981 [AR at pp. 004364-004365].

7. **Respondent disagrees that hazardous waste were released to groundwater, because of constituents of hazardous waste were released. (29)**

   EPA's use of the term "hazardous waste" is broadly defined under Section 3008(h) of RCRA, and refers simply to the broader statutory definition of hazardous waste [Section 1004(5) of RCRA, 42 U.S.C. § 6903(5)] as opposed to the regulatory definition [40 C.F.R. Part 261].

8. **Respondent disagrees that the chromium concentration in the soil decreases to approximately twenty ppm outside of the waste management area, because sampling results show that it actually is less than ten parts per million in that area. (30)**

EPA referenced the background chromium concentrations of 2-3 ppm, which are also outside of the waste management area and are also lower than the 10 ppm cited by the Respondent.

9. **Respondent disagrees that surface soil gas survey were conducted in only 1984 and 1987, because a similar survey was conducted in 1991. (30)**

   EPA's description is in reference to activities performed prior to the RCRA § 3008(h) Administrative Order on Consent (Order) signed by EPA and the Respondent in 1988. The 1991 soil gas survey was conducted after the effective date of the Order.

10. **Respondent disagrees that Figure 5 illustrates the approximate capture zones for the on-site wells, because those capture zones are based upon flawed calculations and ignore actual field demonstration of larger capture zones. (31)**

    EPA provided documentation for the capture zones illustrated in Figure 5 in the Technical Review of the Report on the Effectiveness of the Ground Water Recovery Well System in the Upper Flow Zone dated June 20, 1996 [AR at pp. 008248-008276].

11. **Respondent disagrees that Plant operations have been discontinued, because the machine shop continues to operate at the Plant. (31)**

    The reference to discontinuance of manufacturing operations by EPA is intended to reflect the discontinuance of manufacturing operations for electronic components at the Sparton facility.

12. **Respondent disagrees that there are only 47 monitor wells that have been installed as part of investigative activities. At the time of the RFI, 57 wells were in place, and currently there are 62. (31)**

    EPA referenced the 47 monitor wells used to monitor the concentration and migration of contaminants in the ground water. EPA did not include in this number the 8 recovery wells, or the two monitor wells PZ-1 and MW-50, which are approximately ½ mile outside of the estimated plume boundary. As for the five newly installed monitoring wells, the Respondent had not supplied any information concerning these wells at the time the Final Decision and Response to Comments document was signed.

13. **Respondent disagrees with the description of intervals monitored in the groundwater. The interval for the upper-**

lower flow zone is 25-35 feet, not 30-40 feet. The interval for the lower lower flow zone is 55-65 feet, not 50-60 feet. Respondent also disagrees with the implication that each of these flow zones represents some discontinuous groundwater. All of the zones are part of a single groundwater structure. (32)

There is no reference in EPA's description to discontinuous ground water in the aquifer. The Respondent's description of the flow zone depths does not materially change the general description provided by EPA.

14. **Respondent disagrees that the inorganic contaminant with highest frequency of occurrence is chromium, because sampling has established arsenic occurs more frequently. (32)**

EPA's description is in reference to the contaminants released by past waste management practices at the Sparton facility. Apparently, the Respondent believes that arsenic was also released as a result of past waste management practices.

15. **Respondent disagrees that DNAPL's are not identified in any monitoring well, because well 16 has exhibited concentrations above 1% of the solubility of TCE. (32)**

EPA is unaware of any report by the Respondent indicating a physical measurement of DNAPL (e.g., thickness of DNAPL layer) in a monitoring well. As EPA described in the Final Decision and Response to Comments document, "existing concentrations of trichloroethylene indicate the possible presence of a DNAPL in the upper flow zone of the aquifer on-site at the Facility." (p. 10) [AR at p. 008615]. This is confirmed by the Respondent.

16. **Respondent disagrees that the existing monitoring system does not completely define the horizontal and vertical extent of the contamination, because completion of 5 additional monitor wells has allowed the plume to be defined both horizontally and vertically. (33)**

As for the five newly installed monitoring wells, the Respondent had not supplied any information concerning these wells at the time the Final Decision and Response to Comments document was signed. Regardless, the existing monitoring system still does not define the full vertical and horizontal extent of the contaminant plume [EPA's Technical Review of the Final CMS Report, dated June 20, 1996, AR at pp. 008368-008369, and 008377-008378 and Section IX of this Brief].

17. **Respondent disagrees that there are any "findings" in the imminent and substantial endangerment letters involving the Plant. These self-serving letters did not result from any type of administrative, legislative or judicial proceeding, and the validity of any assumptions or conclusions reached in those letters are untested and not sufficiently documented to allow a critical analysis. Respondent would note that the only entity that currently has the legal authority to make use of water in the impacted area, New Mexico Utilities, Inc., has not sent an imminent and substantial endangerment letter to EPA. (33)**

    The notices were referenced to show that the state and local agencies believed that there was an imminent and substantial endangerment to health or the environment. On February 19, 1997, the referenced parties have filed complaints against Sparton Technology, Inc. in U.S. District Court in Albuquerque, New Mexico under the citizen's suit provisions of RCRA § 7002, alleging that an imminent and substantial endangerment to health or the environment exists.

18. **Respondent disagrees with the statement that the impacted groundwater is potentially usable as a source of drinking water, if by "potentially" EPA means there is some reasonable likelihood that impacted groundwater would be used for such purposes. The depth of the impacted groundwater, its location, the availability of utility supplied water, deed restrictions prohibiting completion of individual wells, institutional constraints preventing development of large public supply wells in the area, lack of demand, absence of supporting infrastructure, lack of any plans to develop this impacted groundwater in the future, and other factors all make its use highly unlikely. (33)**

    EPA disagrees with the Respondent's statement. See Section IV.F of this Brief.

19. **Respondent disagrees that a protective goal is restoration of impacted groundwater to levels safe for drinking, because such action is not necessary to "protect" either human health or the environment. (33)**

    EPA disagrees with the Respondent's statement. See Section IV.F of this Brief.

20. **Respondent disagrees that protection of groundwater as a source of drinking water, and as a natural resource under New Mexico regulations means restoration. (33)**

    EPA disagrees with the Respondent's statement. See Section IV.F of this Brief.

21. **Respondent disagrees with the corrective action objectives set forth by EPA. Those objectives are not from the CMS, and are not consistent with the requirements of RCRA and EPA's regulations. (34)**

EPA has established these corrective action objectives as being protective of human health and the environment under Section 3008(h) of RCRA. See Section IV.F of this Brief.

22. **Respondent disagrees that further investigation of the horizontal and vertical extent of groundwater contamination is required, because 5 recently completed monitor wells provide both vertical and horizontal control. (35)**

EPA disagrees with this statement. See Section IX of this brief. As for the five newly installed monitoring wells, the Respondent had not supplied any information concerning these wells at the time the Final Decision and Response to Comments document was signed.

23. **Respondent disagrees with the monitoring frequency, because the July 1996 sampling confirms the conclusions of the CMS that annual monitoring is adequate. (35)**

EPA disagrees with the Respondent's statement. See Section IX of this Brief.

24. **Respondent disagrees with the construction of 20 monitor wells would cost $400,000, because its recent experience suggests the cost will be more in the range of $600,000. (36)**

The $400,000 cost estimate came from the estimated capital costs of $17,500 to $20,000 per well in the Respondent's Final CMS Report [AR at p. 005618]. The Respondent should provide documentation for any cost estimate.

25. **Respondent disagrees that biological processes have not been identified at the site as transforming contaminants. The CMS at page VII-63, showed that the University of New Mexico has identified organisms in similar groundwater that did cause a transformation, and site specific analysis indicates natural attenuation is proceeding. (37)**

It appears that the Respondent is referencing the Technical Completion Report, Effects of Aquifer Environmental Factors on Biodegradation of Organic Contaminants, WRRI Report No. 264. The Report addresses the biodegradation of benzene and 1,1,1-trichlorethane. The Report did not address the biological degradation of trichloroethylene (TCE), the principal contaminant at the site. The Respondent has not

supplied an analysis that biological degradation of TCE or TCA is proceeding at the site.

26. **Respondent disagrees that if no action is taken the contaminant plume will continue to migrate for an indefinite period at concentrations exceeding MCLs. A model submitted in the CMS, at Appendix 3, establishes that before reaching the closest New Mexico Utilities, Inc. well, the plume will dissipate to concentrations below MCLs. (37)**

    EPA has presented a technical evaluation of the ground water modeling in its Technical Review of the CMS Report dated June 20, 1996 [AR at pp. 008382-00835]. Without repeating the previous evaluation, EPA determined that the model used by the Respondent to simulate dispersion of the plume as it approaches the NMU well was poorly conceived and poorly documented. It is unlikely that a model, which was calibrated in the manner described, would be of any use for predicting the effects of dispersion, much less the fate and transport properties of the plume present at and near the facility.

27. **Respondent disagrees that SVE can be enhanced by lowering the water level, because such action is impractical. (38)**

    The Respondent describes how SVE is useful in removing contaminants from dewatered soils in the CMS Report [AR at p. 005669].

28. **Respondent has revised its estimate of the number of wells necessary to operate an effective SVE system, the number is no longer 10 to 20. (38)**

    The 10-20 well estimate was provided by the Respondent [AR at p. 005667]. EPA recognizes that the number of soil vapor extraction wells will be dependent on the size of the contaminant plume and the physical properties of the vadose zone.

29. **Respondent disagrees that monitor wells currently in place are insufficient to monitor the contaminants, because the installation and sampling of those wells has demonstrated to the contrary. (38)**

    EPA disagrees with the Respondent's statement. See Section IX of this Brief.

30. **Respondent disagrees with the present worth cost of alternative 2 because it should be 3.68 million dollars, with a total capital cost of $760,000. The capital cost of groundwater monitoring should be $600,000 not $400,000. (38)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit).

31. **Respondent disagrees that further plume definition is necessary before any alternative can be implemented. (40)**

EPA disagrees with the Respondent's allegation. See Section IX of this Brief.

32. **Respondent disagrees that quarterly sampling is necessary, because the most recent sampling established annual monitoring is sufficient. (40)**

EPA disagrees with the Respondent's statement. See Section IX of this Brief.

33. **Respondent disagrees further analysis is necessary to enhance the on-site extraction and treatment system, because the CMS and more recent discussions with the state of New Mexico establishes one additional well will be sufficient. (40)**

The Respondent's allegation is disputed by the New Mexico Environment Department (NMED). See letter from Mr. Ed Kelley, Director of the Water and Waste Management Division of NMED, dated November 18, 1996 [Exhibit XX]. See also Section VI.A of this Brief.

34. **Respondent disagrees that groundwater from any off-site recovery well would have to be transported back to the facility, because a more cost effective and viable option is discharged through a storm sewer to a Calabacillas Arroyo. (41)**

EPA disagrees with the Respondent's statement. See Section VI.C of this Brief.

35. **Respondent disagrees that any disposal option will have to be consistent with any requirement other than state or federal law, because the other documents identified have no legal force of effect. (42)**

Any disposal option will have to be consistent with Federal, State, and any applicable local law or ordinance.

36. **Respondent disagrees that the groundwater cleanup goals can even be achieved in the impacted area, because of the subsurface geology, the nature of the contaminants, and the experience of other entities in trying to address similar problems at other sites across the country. (42)**

It is unclear if the Respondent is describing all of the area impacted by the contaminant plume, or only a limited area. See Section VIII of this Brief for further discussion.

37. **Respondent disagrees that EPA has described all of the potential impacts to the local community, because it has left off the generation of solid waste and the release of materials into the air. (43)**

The management of all hazardous and solid wastes produced during the remediation effort will be handled according to Federal, State, and local regulations. These regulations are designed to protect the community from accidental exposure.

38. **Respondent disagrees with the cost estimates, because its analysis demonstrates that the present worth cost for water treatment without ion exchange metals removal is 15.021 million dollars, with a total capital cost of $2,325,000, and that the cost of water treatment with ion exchange for metals removal, which all current analysis suggest will not be needed, has a present worth cost of 57.268 million dollars, with a total capital cost of $2,912,500, and annual operation and maintenance cost of $3,535,900. (43)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit). EPA provided a separate cost analysis for water treatment with ion exchange in calculating the overall cost estimates [AR at p. 008428].

39. **Respondent disagrees with the cost estimates for treatment system-ion exchange for metals because its analysis is that annual operation and maintenance costs will be $2,710,000 a year, which 2 million involving disposal of residue. Respondent disagrees with the present worth cost for water treatment with ion exchange for metals removal under alternative 4, because Respondent's analysis shows the present worth cost is 15.247 million dollars, the total capital cost is $2,475,000. (44)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit). EPA provided a separate cost analysis for water treatment with ion exchange in calculating the overall cost estimates [AR at p. 008428].

40. **Respondent disagrees with the present worth cost for water treatment including ion exchange for metals removal, because**

Respondent's analysis shows that number is 57.494 million dollars, that the total capital cost is $3,062,500, and that the annual operation and maintenance cost for years 1 through 3 is $3,563,900 and years 4 through 30 is $3,535,900. (45)

EPA provided a separate cost analysis for water treatment with ion exchange in calculating the overall cost estimates [AR at p. 008428].

41. **Respondent disagrees with the cost estimate for alternative 3 water treatment without ion exchange for metals removal. The total capital cost should be $2,325,900. (45)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit).

42. **Respondent disagrees with the cost estimate for alternative 3 water treatment including ion exchange for metals removal as the total capital cost should be $2,912,500, and the annual operation of maintenance should be $3,535,900. (45)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit). EPA provided a separate cost analysis for water treatment with ion exchange in calculating the overall cost estimates [AR at p. 008428].

43. **Respondent disagrees that air stripping/air sparging would be effective at this site, as Battelle has reviewed this issue and concluded site conditions are such that air sparging would not work. (45)**

EPA's description applied to the general operation of in situ air stripping/air sparging. Site limitations applicable to this technology are discussed on page 30 of the FDRTC [AR at p. 008636].

44. **Respondent disagrees with the total cost for water treatment without ion exchange for metals removal in that the present worth cost is 15.948 million dollars, with a capital cost of $2,852,500. (46)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit).

45. **Respondent disagrees with the total cost for water treatment including ion exchange for metals removal, as the present worth cost should be 58.195 million dollars, the total capital cost is $3,440,000, the annual operating and maintenance cost for years 1 through 3 is $3,682,650, and for years 4 through 30 is $3,535,900. (46)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit). EPA provided a separate cost analysis for water treatment with ion exchange in calculating the overall cost estimates [AR at p. 008428].

46. **Respondent disagrees with the cost estimates for alternative 4 water treatment without ion exchange for metals removal as the total capital cost should be $2,475,000. (47)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit).

47. **Respondent disagrees with the cost estimate for alternative 4 water treatment including ion exchange for metals removals as the total capital cost should be $3,620,500, and the annual operation and maintenance cost for years 1 through 30 should be $3,535,900. (47)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit). EPA provided a separate cost analysis for water treatment with ion exchange in calculating the overall cost estimates [AR at p. 008428].

48. **Respondent disagrees that soil flushing will work at this site, because Battelle has reviewed that subject and concluded site specific conditions will prevent it from being effective. (47)**

EPA's description applied to the general operation of in situ air stripping/air sparging. Site limitations applicable to this technology is discussed on page 30 of the FDRTC [AR at p. 008636].

49. **Respondent disagrees with the total cost estimate for water treatment without ion exchange for metals removal because the present worth cost should be 16.027 million dollars with a total capital cost $3,075,000. (48)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit).

50. **Respondent disagrees with the total cost for water treatment including ion exchange for metals removal because the present worth cost should be 58.454 million dollars with a total capital cost $3,662,500, and annual operation and maintenance cost for years 1 through 3 is $3,695,900, and for years 4-30 $3,535,900. (48)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit). EPA provided a separate cost analysis for water treatment with ion exchange in calculating the overall cost estimates [AR at p. 008428].

51. **Respondent disagrees with the cost estimate for alternative 3 water treatment without ion exchange for metals removal as the total capital cost should be $2,325,000. (48)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit).

52. **Respondent disagrees with the cost estimate for alternative 3 water treatment including ion exchange for metals removal. The total capital cost should be $2,912,500, and the annual operation and maintenance should be $3,535,900. (48)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit). EPA provided a separate cost analysis for water treatment with ion exchange in calculating the overall cost estimates [AR at p. 008428].

53. **Respondent disagrees with the total cost for alternative because the present worth cost is 11.525 million dollars, with a total capital cost of $2,197,500, and an annual operation and maintenance cost for years 1 through 30 of $606,750,000. (49)**

The Respondent's cost estimates apparently include an additional $200,000 cost for monitor well construction. EPA has previously addressed this allegation (See No. 24 of this Exhibit). The Respondent's operation and maintenance costs apparently include the operation of the soil vapor extraction system for years 1-30, while EPA has projected

operation of the soil vapor extraction system only in years 1-3.

54. **Respondent disagrees that the first decision factor is protection of human health and the environment, as that is the only statutory factor EPA is authorized to consider. Respondent disagrees that the final remedy selected for this site must reduce or control contamination in the soil and groundwater, because such action is only required if necessary to protect human health or the environment, and EPA has yet to establish why such action is necessary to achieve either of those goals. Respondent disagrees that merely reducing the levels of contamination in groundwater or soil protects human health or the environment any more than taking no action. (50)**

    EPA disagrees with the Respondent's statement. See Section IV.F of this Brief.

55. **Respondent disagrees that any final remedy at the site has to have a goal of meeting applicable media cleanup standards, because EPA has failed to explain why such action is necessary to protect human health or the environment. Respondent could be more specific as to the basis for its disagreement if EPA had provided something other than a conclusion. (51)**

    EPA disagrees with the Respondent's statement. See Section IV.F of this Brief.

56. **Respondent disagrees that alternatives 4 through 6 would best achieve the media cleanup standards, because those actions will not attain those standards any more quickly than no action. If EPA had been more specific about why those alternatives would "best" achieve the standards, instead of simply providing conclusions, Respondent could have been more specific. (51)**

    EPA disagrees with the Respondent's statement. See Section VIII of this Brief.

57. **Respondent disagrees with the negative implication that if source control measures are taken, cleanup of groundwater to MCLs will result and will not involve an essentially perpetual cleanup situation. Respondent believes that even with source control, restoration will ineffective and essentially involve perpetual cleanup. Respondent disagrees that alternative 4 through 7 provide the most effective source control, because the existing system has been demonstrated to be highly effective, and can be enhanced by the addition of a single well without all of the delays and analysis EPA has proposed. (51)**

EPA disagrees with the Respondent's statement. See Section VIII of this Brief.

58. **Respondent disagrees that recovered groundwater would have to be treated to remove metals, because all analysis suggests that the concentration of metals in groundwater recovered at a rate of more than 50 gpm would be below MCLs. (52)**

As EPA pointed out on page 45 of the FDRTC, "Since the air stripper does not remove metals from the water, additional treatment may be necessary to remove metals, such as chromium, prior to disposal of the treated ground water. Since the concentration of metals in the ground water is variable throughout the contaminant plume, further study will be required to determine to what extent these technologies may be necessary. The sequence of technologies used for the ground water treatment train will be determined during the remedial design." [AR at p. 008651] EPA anticipates that analyses of the produced water from the extraction wells will determine the level of treatment necessary to meet the discharge standards.

59. **Respondent disagrees that EPA evaluated the remedial alternatives on the ability to provide adequate protection of human health and the environment over the long term, because no such critical analysis appears in the Order, Exhibit "A" or the administrative record. Instead EPA's decision involved unsupported conclusions. (52)**

EPA disagrees with the Respondent's statement. See Section IV.F of the Brief.

60. **Respondent disagrees with EPA's unsupported conclusions that alternatives 4 through 6 would be preferable to the institutional controls in alternative 2, but is unable to be more specific because the basis of EPA's position is not provided. Respondent also disagrees that alternative 3 provides a reduction in long term risks, but is unable to be more specific because EPA has not explained the basis for its conclusion. (52)**

EPA disagrees with the Respondent's statement. See Sections IV.F and V of the Brief.

61. **Respondent is unable to determine whether remedial alternatives capable of permanently reducing the overall degree of risk, were favored in the selection process because EPA has yet to identify the risk to human health or the environment for which protection is needed. (53)**

EPA disagrees with the Respondent's statement. See Section IV.F of the Brief.

62. **Respondent disagrees that EPA properly considered cost in evaluating the alternatives, because it did not include realistic time periods, nor did it use appropriate numbers in evaluating the cost of removing metals, nor did it undertake any type of balancing between the additional marginal benefits to human health or the environment as compared to the marginal cost of the various alternatives. (54)**

EPA disagrees with the Respondent's statement. See Section IV.F of the Brief.

63. **Respondent disagrees that a goal of the remedial action is to restore the contaminated groundwater to its beneficial use, because such action is not necessary to protect human health and the environment. Respondent would like to be more specific, but EPA has failed to provide any explanation for the conclusion it reached. Respondent disagrees that alternative 4 is an appropriate remedy, because it believes that protection of human health and the environment can be achieved with what it proposed in the CMS. Respondent would like to be more specific, but EPA has failed to provide the basis and reasoning for its conclusion. (55)**

EPA disagrees with the Respondent's statement. See Section IV.F of the Brief.

64. **Respondent disagrees that alternative 4 is more likely to achieve media cleanup standards, because it will be no more affected than what is proposed in the CMS. Respondent would like to be more specific, but EPA has failed to include the basis or reasoning for its conclusion. (56)**

EPA disagrees with the Respondent's statement. See Sections IV.F.4 and V of the Brief.

65. **Respondent as previously stated, also disagrees with the need for additional monitoring and plume delineation and believes that sufficient data exists to demonstrate that restoration is not practicable at this site, and therefore, further expenditure of funds to establish this point is unnecessary. (56)**

EPA disagrees with the Respondent's statement. See Section IX of this Brief.

66. **Respondent disagrees that disposing of recovered groundwater through the city sewer system is not practicable, because Intel is currently disposing of water of very similar**

quality at the rate of over 3 million gallons per day. Respondent also disagrees that there are only two options for dealing with recovered groundwater, reinjection, or reuse, because a third option, discharge to the Calabacillas Arroyo is available. (57)

In a letter from the City of Albuquerque dated August 4, 1994, the discharge of approximately 1200 gallons per day into the sanitary sewer system was approved with limitations [AR at p. 3802-3803]. No approval was granted to discharge a quantity greater than approximately 1200 gallons per day, effectively eliminating the city sanitary sewer system as a disposal method. In fact, the City of Albuquerque recommended that the Respondent apply for a groundwater discharge permit from the New Mexico Environment Department (NMED) to use the treated groundwater for irrigation. The Respondent did not indicate if such an application had in fact been submitted to NMED. Regarding the discharge option into the Calabacillas Arroyo, see Section VI.C of this Brief.

67. **Respondent disagrees that the leading edge of the plume is moving approximately 100 feet per year, as the latest results from the new monitoring well establish the movement is less than 100 feet per year. (58)**

As the precise location of the leading edge of the contaminant has not been established, and the distance between the contaminated monitor well and the "clean" monitor well are approximately 1,100 feet, there has been no definitive determination that the plume is moving "less than 100 feet per year" as opposed to "approximately 100 feet per year."

68. **Respondent disagrees that lining the Corrales main canal would reduce recharge in the impacted ground water, because such practice would be both ineffective and counterproductive as discussed in the CMS at page VIII-16, Figure 23.**

The Respondent appears to be referring to page VII-16 in this statement. There is no page VIII-16 in the CMS Report submitted to EPA. Regarding the lining of the Corrales main canal, the Respondent has not supplied any data demonstrating that this action would not benefit the remediation of the site. As EPA stated on page 4 of the Response to Comments, ". . . if it is determined that the reduction of this recharge significantly reduces the time frame for meeting cleanup goals, EPA may require the lining of the Corrales Main Canal." [AR at p. 008657].

IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-VI-001 (h)-96-H

REPORT OF MICHAEL S. RAIMONDE ON SPARTON TECHNOLOGY, INC. COST ESTIMATE FOR THE GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

February 24, 1997

The following cost estimate was developed by Metcalf & Eddy, Inc. (M&E) engineers working under my direction. The estimate is for a groundwater extraction and treatment system intended to treat groundwater containing trichloroethene (TCE) at the Sparton Technology Coors Road Facility (Sparton) in Albuquerque, NM. This report is based, in part, on my experience as a project manager and practicing hydrogeologist specializing for ten years in soil and groundwater remediation, with specific emphasis on groundwater remediation of volatile organic compounds. I hold a Bachelor of Science Degree from the Department of Geology and Mineralogy at The Ohio State University and have completed the required graduate course work at New Mexico State University in the Department of Earth Sciences. To the best of my knowledge, the following is true and correct.

BACKGROUND UNDERSTANDING UPON WHICH COST ESTIMATE IS BASED

The impact to the aquifer beneath the site as described in the Corrective Measures Study is primarily by chlorinated solvents. Contaminant concentrations are reported as highest in the upper part of the aquifer. A conceptual groundwater extraction and treatment system is presented below followed by an estimated cost of such a system. The primary chemicals of concern present in the groundwater are trichloroethene (TCE) and 1,1,1-trichloroethane (TCA). For the purpose of this estimate, the highest TCE concentration detected is approximately 7,600 μg/l and an average site concentration is approximately

GOVERNMENT EXHIBIT 17

844 μg/l. The highest TCA concentration is approximately 2,000 μg/l and the average site concentration is approximately 283 μg/l.

Elevated concentrations of chromium have also been detected in the groundwater. For this purpose, the total chromium concentrations (suspended and dissolved) are approximately 0.1 mg/l.

This cost estimate is intended for comparison purposes only. Sufficient data has not been provided to M&E to make a more accurate assessment of these costs. The design and cost estimate for this system are based, in part, on the following assumptions:

- An average TCE recovery (feed) concentration of 2,500 μg/l with a discharge requirement following treatment of less than 5 μg/l. This feed concentration is higher than the approximated site average to account for perturbations in the feed concentration.
- An average TCA recovery concentration of 660 μg/l with a discharge requirement following treatment of less than 5 μg/l. This feed concentration is higher than the approximated site average to account for perturbations in the feed concentration.
- A chromium recovery concentration of 0.1 mg/l with a discharge requirement of less than 0.05 mg/l following treatment.
- One cost estimate is based on a system operating at 200 gpm.
- The second estimate is based on a similar system operating at 600 gpm.

DESCRIPTION OF THE CONCEPTUAL SYSTEM

The 200 gpm and 600 gpm groundwater treatment systems described below were assembled based on the following assumptions:

- Electric power is readily available and there are no restriction precluding its use.
- There is available space for extraction wells, piping runs, and treatment plant.
- The component pricing is based on standard turnaround times with no rush deliveries necessary.
- System and power control components were not shown for clarity purposes.

The attached drawing (Attachment 1) illustrates a basic mechanical schematic of the conceptual treatment system. As stated previously, the treatment process is similar for both the 200 gpm and 600 gpm systems. The following describes the groundwater treatment system shown on the drawing:

1. Groundwater is pumped from subsurface recovery wells to Equalization Tank #1 and through Sand Filter #1.
2. The groundwater is pumped through Bag Filter #1 and through a tray-type vapor stripper to remove the TCE and TCA contaminants. Carbon dioxide gas is bled into

the blower's intake air stream to lower the water's pH, and reduce iron and manganese salt build-up and calcium carbonate incrustation in the stripping unit and injection wells. TCE and TCA are then recovered from the exiting air stream using a granular activated carbon unit.

3. The treated water flows through a booster pump and through Bag Filter #2 to remove particulates.
4. An ion exchange vessel is then used to remove the chromium ions from the groundwater. A tank is used to collect spent acid, backwash during regeneration activities, and metals sludge.
5. The water from the vessel is pumped to Equalization Tank #2 for additional solids settling.
6. From Equalization Tank #2, the water is then pumped to Sand Filter #2 for particulate removal prior to reinjection.

COST ESTIMATE

The cost estimates for the two conceptual treatment systems are supplied in Attachment 2. The estimates were based on the assumptions and treatment systems described above, actual system costs could vary although there is no indication that final costs would be significantly greater.

The attached estimates are separated for the two different operating conditions, a 200 gpm and a 600 gpm treatment system. Each system cost estimate is broken down into the following subsystems:

1. The groundwater extraction system.
2. The groundwater treatment system.
3. The groundwater reinjection system.
4. Estimated annual operations & maintenance for the entire system.
   (net present worth calculations were not made for annual costs)

It is assumed that a single well can produce a maximum of 200 gpm. Thus, for the 200 gpm system, one extraction well is included in the estimate and for the 600 gpm system, three wells are included. This is for estimation purposes only. More or less wells may be necessary to achieve design criteria and no assertion is made here regarding the required number of wells.

Each component of the subsystems is included on the attached tables. The following table summarizes the cost estimates:

	200gpm	600 gpm
Groundwater Extraction System	$135,625	$346,250
Groundwater Treatment System	$425,000	$756,288
Groundwater Injection System	$123,063	$169,756
Estimated Annual O&M	$128,458	$143,308
ESTIMATED TOTAL	**$812,146**	**$1,415,602**

I state under penalty of perjury that the foregoing is true and correct.

Executed on February 24, 1997.

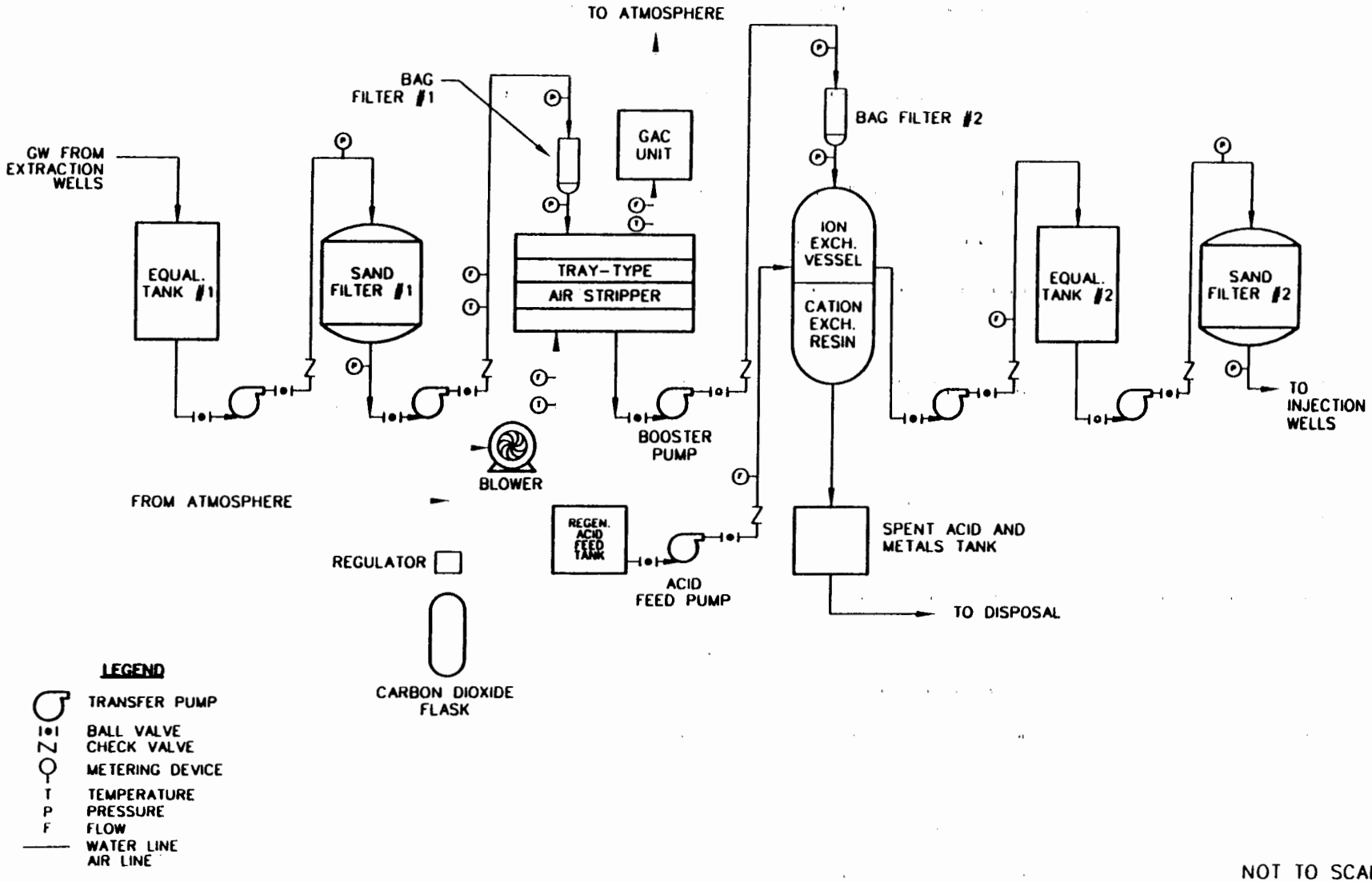
Metcalf & Eddy, Inc.

Michael S. Raimonde

Michael S. Raimonde
Project Manger

Attachments

ATTACHMENT 1



NOT TO SCALE

Metcalf & Eddy

SPARTON TECHNOLOGIES

CONCEPTUAL GROUND-WATER TREATMENT SYSTEM

ALBUQUERQUE, NEW MEXICO

Project Number	
166022-0005-626	
File Name	Figure
AIRSCHM	1

009552

ATTACHMENT 2

TABLE 1A

SPARTON TECHNOLOGY
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

ESTIMATED COSTS FOR 200 gpm GW EXTRACTION SYSTEM
(FOR BUDGETARY PURPOSES ONLY)

Item	Quantity	Units	Unit Cost	Subtotal Cost
Drill & Install a 10-inch, 300 ft Well	1	l.s.	$55,000	$55,000
Pumps and Electric (a)	1	l.s.	$30,000	$30,000
Oversite (b)	14	days	$750	$10,500
Pilot Hole (c)	1	l.s.	$13,000	$13,000
			SUBTOTAL:	**$108,500**
			25% CONT.:	**$27,125**
			ESTIMATED TOTAL:	**$135,625**

Note:

(a) Estimated lump sum price for material and installation of pump and electric
(Estimated price is based on previous experience)

(b) Oversite by a geologist for 10-hours per day at $75 per hour

(c) Estimated price based on previous experience

TABLE 1B

SPARTON TECHNOLOGY
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

ESTIMATED COSTS FOR 200 gpm GW TREATMENT SYSTEM
(FOR BUDGETARY PURPOSES ONLY)

Item	Quantity	Units	Unit Cost	Subtotal Cost
Booster pump	1	ea	$2,500	$2,500
Sand filter	2	ea	$2,800	$5,600
Transfer pump	4	ea	$2,000	$8,000
5000-gal. HDPE equalization tank	2	ea	$3,900	$7,800
Tray-type air stripper with blower	1	ea	$49,000	$49,000
GAC unit	1	ea	$4,500	$4,500
Ion exchange vessel	1	ea	$80,000	$80,000
Carbon dioxide flask	1	ea	$100	$100
CO2 regulator	1	ea	$100	$100
Acid metering pump	1	ea	$400	$400
100-gal regenerating acid feed tank	1	ea	$250	$250
Spent acid and metals tank	1	ea	$1,500	$1,500
Bag filter	2	ea	$2,800	$5,600
3" Sch. 80 PVC, incl. elbows, tees, etc.	80	ft	$25	$2,000
3" PVC ball valves	12	ea	$40	$480
3" PVC check valves	6	ea	$80	$480
1/2" Sch. 80 PVC, incl. elbows, tees, etc.	30	ft	$12	$360
1/2" PVC ball valves	4	ea	$120	$480
1/2" PVC check valves	2	ea	$200	$400
GW flowmeters	3	ea	$500	$1,500
Acid flowmeters	1	ea	$550	$550
Air flowmeters	2	ea	$100	$200
GW pressure gages	8	ea	$25	$200
Miscellaneous electric components	1	l.s.	$5,000	$5,000
Treatment building	1	ea	$40,000	$40,000
General contracting/oversight	1	l.s.	$20,000	$20,000
Mechanical subcontractor	1	l.s.	$25,000	$25,000
Electrical subcontractor (incl. L&M)	1	l.s.	$28,000	$28,000
Controls subcontractor (incl. L&M)	1	l.s.	$30,000	$30,000
Design and permitting	1	l.s.	$20,000	$20,000
			ESTIMATED SUBTOTAL:	**$340,000**
			25% CONTINGENCY:	**$85,000**
			ESTIMATED TOTAL:	**$425,000**

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TABLE 1C

SPARTON TECHNOLOGY
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

200 GPM INJECTION SYSTEM COST ESTIMATE
(FOR BUDGETARY PURPOSES ONLY)

Item	Quantity	Units	Unit Cost	Subtotal
Injection Well Installation				
Drill and Install 6" dia. inj. well (400 ft)	1	l.s.	$48,000	$48,000
Injection Pump	1	l.s.	$15,000	$15,000
Oversite	14	days	$750	$10,500
Pilot Holes	1	l.s.	$15,000	$15,000
			Well Subtotal:	**$88,500**
Filtration System Installation				
Sand Filter Unit	1	each	$1,375	$1,375
Automatic Purge System for Sand Filter	1	each	$825	$825
Booster Pump for Sand Filter	1	each	$2,500	$2,500
Sand Filter System Shipping Cost	1	each	$150	$150
Sand Filter System Assembly/Setup Cost	1	each	$500	$500
5,000-Gallon Surge Tank	1	each	$3,900	$3,900
Surge Tank Shipping Cost	1	each	$500	$500
Surge Tank Setup Cost	1	each	$200	$200
			Filter System Subtotal:	**$9,950**
			EXTRACTION SYSTEM SUBTOTAL:	**$98,450**
			25% CONT.:	**$24,613**
			TOTAL:	**$123,063**

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TABLE 1D

SPARTON TECHNOLOGY
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

200 GPM ANNUAL O&M COST ESTIMATE
(FOR BUDGETARY PURPOSES ONLY)

Item	Quantity	Units	Unit Cost	Subtotal
Direct Labor				
Weekly O&M	1248	hours	$51.15	$63,835
Monthly O&M	480	hours	$61.38	$29,462
Quarterly O&M	80	hours	$61.38	$4,910
Other Direct Costs				
Field Equipment	1	each	$5,500	$5,500
Electricity	12	each	$1,650	$19,800
Other Utilities	12	each	$165	$1,980
Subcontractor Cost	12	each	$248	$2,970
			TOTAL:	**$128,458**

TABLE 2A

SPARTON TECHNOLOGY
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

ESTIMATED COSTS FOR 600 gpm GW EXTRACTION SYSTEM
(FOR BUDGETARY PURPOSES ONLY)

Item	Quantity	Units	Unit Cost	Subtotal Cost
Drill & Install a 10-inch, 300 ft Well	3	each	$55,000	$165,000
Pumps and Electric (a)	3	each	$30,000	$90,000
Oversite (b)	12	days	$750	$9,000
Pilot Hole (c)	1	each	$13,000	$13,000
			SUBTOTAL:	**$277,000**
			25% CONT.:	**$69,250**
			ESTIMATED TOTAL:	**$346,250**

Note:

(a) Estimated lump sum price for material and installation of pump and electric
(Estimated price is based on previous experience)

(b) Oversite by a geologist for 10-hours per day at $75 per hour

(c) Estimated price based on previous experience

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TABLE 2B

SPARTON TECHNOLOGY
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

ESTIMATED COSTS FOR 600 gpm GW TREATMENT SYSTEM
(FOR BUDGETARY PURPOSES ONLY)

Item	Quantity	Units	Unit Cost	Subtotal Cost
200 gpm booster pump	3	ea	$2,500	$7,500
Sand filter	2	ea	$6,500	$13,000
600 gpm transfer pump	3	ea	$3,400	$10,200
200 gpm transfer pump	3	ea	$2,000	$6,000
15000-gal. HDPE equalization tank	2	ea	$10,300	$20,600
Tray-type air stripper with blower	1	ea	$60,000	$60,000
GAC unit	1	ea	$10,000	$10,000
Ion exchange vessel	3	ea	$80,000	$240,000
Carbon dioxide flask	1	ea	$100	$100
CO2 regulator	1	ea	$100	$100
Acid metering pump	3	ea	$600	$1,800
100-gal regenerating acid feed tank	3	ea	$250	$750
Spent acid and metals tank	3	ea	$1,500	$4,500
Bag filter	2	ea	$4,500	$9,000
6" Sch. 80 PVC, incl. elbows, tees, etc.	80	ft	$50	$4,000
6" PVC butterfly valves	12	ea	$200	$2,400
6" PVC check valves	6	ea	$80	$480
3" Sch. 80 PVC, incl. elbows, tees, etc.	30	ft	$25	$750
3" PVC ball valves	6	ea	$40	$240
3" PVC check valves	3	ea	$80	$240
1/2" Sch. 80 PVC, incl. elbows, tees, etc.	75	ft	$12	$900
1/2" PVC ball valves	6	ea	$120	$720
1/2" PVC check valves	3	ea	$200	$600
GW flowmeters	3	ea	$500	$1,500
Acid flowmeters	3	ea	$550	$1,650
Air flowmeters	2	ea	$100	$200
GW pressure gages	12	ea	$25	$300
Miscellaneous electric components	1	l.s.	$7,500	$7,500
Treatment building	1	ea	$50,000	$50,000
General contracting/oversight	1	l.s.	$20,000	$20,000
Mechanical subcontractor	1	l.s.	$35,000	$35,000
Electrical subcontractor (incl. L&M)	1	l.s.	$32,000	$32,000
Controls subcontractor (incl. L&M)	1	l.s.	$38,000	$38,000
Design and permitting	1	l.s.	$25,000	$25,000
			ESTIMATED SUBTOTAL:	**$605,030**
			25% CONTINGENCY:	**$151,258**
			ESTIMATED TOTAL:	**$756,288**

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TABLE 2C

SPARTON TECHNOLOGY
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

600 GPM INJECTION SYSTEM COST ESTIMATE
(FOR BUDGETARY PURPOSES ONLY)

Item	Quantity	Units	Unit Cost	Subtotal
Injection Well Installation				
Drill and Install 10" dia. inj. well (400 ft)	1	l.s.	$65,000	$65,000
Injection Pump	1	l.s.	$15,000	$15,000
Oversite	20	days	$750	$15,000
Pilot Holes	1	l.s.	$15,000	$15,000
			Well Subtotal:	**$110,000**
Filtration System Installation				
Sand Filter Unit	1	each	$6,325	$6,325
Automatic Purge System for Sand Filter	1	each	$930	$930
Booster Pump for Sand Filter	1	each	$6,300	$6,300
Sand Filter System Shipping Cost	1	each	$200	$200
Sand Filter System Assembly/Setup Cost	1	each	$700	$700
15,000-Gallon Surge Tank	1	each	$10,300	$10,300
Surge Tank Shipping Cost	1	each	$750	$750
Surge Tank Setup Cost	1	each	$300	$300
			Filter System Subtotal:	**$25,805**
			INECTION SYSTEM SUBTOTAL:	**$135,805**
			25% CONT.:	**$33,951**
			TOTAL:	**$169,756**

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TABLE 2D

SPARTON TECHNOLOGY
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

600 GPM ANNUAL O&M COST ESTIMATE
(FOR BUDGETARY PURPOSES ONLY)

Item	Quantity	Units	Unit Cost	Subtotal
Direct Labor				
Weekly O&M	1248	hours	$51.15	$63,835
Monthly O&M	480	hours	$61.38	$29,462
Quarterly O&M	80	hours	$61.38	$4,910
Other Direct Costs				
Field Equipment	1	each	$7,150	$7,150
Electricity	12	each	$2,750	$33,000
Other Utilities	12	each	$165	$1,980
Subcontractor Cost	1	each	$248	$2,970
			TOTAL:	**$143,308**

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Capital Costs

Ground Water Extraction System - 600 gpm:	$346,250
Ground Water Treatment System - 600 gpm: Includes Ion Exchange	$756,288
Ground Water Treatment System - 600 gpm: Without Ion Exchange	$509,238
Ground Water Injection System - 600 gpm:	$169,756
Discharge to Arroyo:	$10,000
Ground Water Monitor Wells:	$400,000

Operation & Maintenance Costs

Operation & Maintenance: Extraction/Treatment	$143,308
Operation & Maintenance: Ground Water Monitoring	$160,000

GOVERNMENT EXHIBIT 18

COST ANALYSIS WORKSHEET
GROUND WATER EXTRACTION SYSTEM - 600 GPM - REINJECTION
WATER TREATMENT WITHOUT ION EXCHANGE FOR METALS REMOVAL; INCLUDES MONITORING WELL COSTS

COST COMPONENT	COST/YEAR	COST OCCURS					
	0	1	2	3	4	5	6
Capital Costs	1425244						
O&M Costs	0	303308	303308	303308	303308	303308	303308
Annual Expenditures	1425244	303308	303308	303308	303308	303308	303308
Discount Factor (5%)	1	0.952	0.907	0.863	0.822	0.783	0.746
Present Worth	1425244	288749.2	275100.3	261754.8	249319.1	237490.1	226267.7

7	8	9	10	11	12	13	14	15	16	17
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
0.711	0.677	0.645	0.614	0.585	0.557	0.53	0.505	0.481	0.458	0.436
215651.9	205339.5	195633.6	186231.1	177435.1	168942.5	160753.2	153170.5	145891.1	138915.0	132242.2

18	19	20	21	22	23	24	25	26	27	28
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
0.416	0.396	0.377	0.359	0.342	0.326	0.31	0.295	0.281	0.268	0.255
126176.1	120109.9	114347.1	108887.5	103731.3	98878.40	94025.48	89475.86	85229.54	81286.54	77343.54

TOTAL PRESENT WORTH COST

29	30	
303308	303308	
303308	303308	
0.243	0.231	
73703.84	70064.14	6087391.

COST ANALYSIS WORKSHEET
GROUND WATER EXTRACTION SYSTEM - 600 GPM - REINJECTION
WATER TREATMENT INCLUDES ION EXCHANGE FOR METALS REMOVAL; INCLUDES MONITORING WELL COSTS

COST COMPONENT	COST/YEAR	COST OCCURS					
	0	1	2	3	4	5	6
Capital Costs	1672294						
O&M Costs	0	303308	303308	303308	303308	303308	303308
Annual Expenditures	1672294	303308	303308	303308	303308	303308	303308
Discount Factor (5%)	1	0.952	0.907	0.863	0.822	0.783	0.746
Present Worth	1672294	288749.2	275100.3	261754.8	249319.1	237490.1	226267.7

7	8	9	10	11	12	13	14	15	16	17
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
0.711	0.677	0.645	0.614	0.585	0.557	0.53	0.505	0.481	0.458	0.436
215651.9	205339.5	195633.6	186231.1	177435.1	168942.5	160753.2	153170.5	145891.1	138915.0	132242.2

18	19	20	21	22	23	24	25	26	27	28
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
0.416	0.396	0.377	0.359	0.342	0.326	0.31	0.295	0.281	0.268	0.255
126176.1	120109.9	114347.1	108887.5	103731.3	98878.40	94025.48	89475.86	85229.54	81286.54	77343.54

TOTAL PRESENT WORTH COST

29	30	
303308	303308	
303308	303308	
0.243	0.231	
73703.84	70064.14	6334441.

COST ANALYSIS WORKSHEET
GROUND WATER EXTRACTION SYSTEM - 600 GPM - DISCHARGE TO ARROYO
WATER TREATMENT WITHOUT ION EXCHANGE FOR METALS REMOVAL; INCLUDES MONITORING WELL COSTS

COST COMPONENT	COST/YEAR	COST OCCURS					
	0	1	2	3	4	5	6
Capital Costs	1265488						
O&M Costs	0	303308	303308	303308	303308	303308	303308
Annual Expenditures	1265488	303308	303308	303308	303308	303308	303308
Discount Factor (5%)	1	0.952	0.907	0.863	0.822	0.783	0.746
Present Worth	1265488	288749.2	275100.3	261754.8	249319.1	237490.1	226267.7

7	8	9	10	11	12	13	14	15	16	17
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
0.711	0.677	0.645	0.614	0.585	0.557	0.53	0.505	0.481	0.458	0.436
215651.9	205339.5	195633.6	186231.1	177435.1	168942.5	160753.2	153170.5	145891.1	138915.0	132242.2

18	19	20	21	22	23	24	25	26	27	28
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
0.416	0.396	0.377	0.359	0.342	0.326	0.31	0.295	0.281	0.268	0.255
126176.1	120109.9	114347.1	108887.5	103731.3	98878.40	94025.48	89475.86	85229.54	81286.54	77343.54

TOTAL PRESENT WORTH COST

29	30	
303308	303308	
303308	303308	
0.243	0.231	
73703.84	70064.14	5927635.

COST ANALYSIS WORKSHEET
GROUND WATER EXTRACTION SYSTEM - 600 GPM - DISCHARGE TO ARROYO
WATER TREATMENT INCLUDES ION EXCHANGE FOR METALS REMOVAL; INCLUDES MONITORING WELL COSTS

COST COMPONENT	COST/YEAR	COST OCCURS					
	0	1	2	3	4	5	6
Capital Costs	1512538						
O&M Costs	0	303308	303308	303308	303308	303308	303308
Annual Expenditures	1512538	303308	303308	303308	303308	303308	303308
Discount Factor (5%)	1	0.952	0.907	0.863	0.822	0.783	0.746
Present Worth	1512538	288749.2	275100.3	261754.8	249319.1	237490.1	226267.7

7	8	9	10	11	12	13	14	15	16	17
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
0.711	0.677	0.645	0.614	0.585	0.557	0.53	0.505	0.481	0.458	0.436
215651.9	205339.5	195633.6	186231.1	177435.1	168942.5	160753.2	153170.5	145891.1	138915.0	132242.2

18	19	20	21	22	23	24	25	26	27	28
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
303308	303308	303308	303308	303308	303308	303308	303308	303308	303308	303308
0.416	0.396	0.377	0.359	0.342	0.326	0.31	0.295	0.281	0.268	0.255
126176.1	120109.9	114347.1	108887.5	103731.3	98878.40	94025.48	89475.86	85229.54	81286.54	77343.54

TOTAL PRESENT WORTH COST

29	30	
303308	303308	
303308	303308	
0.243	0.231	
73703.84	70064.14	6174685.

REFERENCE

SPARTON TECHNOLOGY, INC.
EPA ID NO. NMD083212332

ADMINISTRATIVE RECORD
FOR
THE FINAL
ADMINISTRATIVE ORDER

Volume 21

009579 through 010069

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March 14, 1997

Via Hand Delivery
Ms. Lorena Vaughn, Clerk
Office of the Regional Hearings Examiner
U.S.E.P.A.
1445 Ross Avenue
Dallas, Texas 75202

Re: *In the Matter of Sparton Technology, Inc.*; U.S. EPA Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Enclosed is an original and one (1) copy of Additional Information in Support of Sparton Technology, Inc.'s Position on the Facts, The Law, and the Relief Sought by EPA. Please accept the original for filing and return the file-marked copy to the courier delivering this information to you. I understand that you do not require an additional copy for your files.

Your assistance is appreciated.

Yours very truly,

James B. Harris

JBH:lmi
Enclosures

cc: Mr. Evan Pearson, U.S.E.P.A
40310 00001 LERA 57211

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

97 MAR 14 PM 4:22
REGIONAL HEARING CLERK
EPA REGION VI

IN THE MATTER OF:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 COORS ROAD NW	)	U.S. EPA DOCKET NO.
ALBUQUERQUE, NM 87114	)	RCRA-VI-001(h)-96-H
	)	
EPA I.D. NO. NMD083212332	)	
	)	
RESPONDENT	)	

ADDITIONAL INFORMATION IN SUPPORT OF SPARTON TECHNOLOGY, INC.'S POSITION ON THE FACTS, THE LAW, AND THE RELIEF SOUGHT BY EPA

INTRODUCTORY STATEMENT

Sparton Technology, Inc. ("Sparton") was directed in an order dated December 16, 1996, to file no later than March 14, 1997, any additional information in support of its claims.

This submission is being filed subject to and without waiving any of Sparton's claims in a pending lawsuit against the Environmental Protection Agency ("EPA"), challenging the agency's authority to issue the Initial Administrative Order ("Order") that began this proceeding, and the agency's decision to select the relief provisions set forth in the Order.

The fundamental issue in this proceeding is whether impacts to the environment associated with a manufacturing plant operated by Sparton on the northeast side of Albuquerque approximately 0.75 miles north of the intersection of Coors Road and Paseo del Norte (the "Coors Road Plant") present a threat to human health or the environment and if

they do, what actions are "necessary" to "protect" human health or environment from those threats.

Region VI, which has the burden of proof on all these issues, has failed to demonstrate the existence of any threat, or that the remedy it is proposing provides any more protection than what Sparton has offered to implement.

ARGUMENT AND AUTHORITIES

A. Region VI has never refuted the finding in the CMS that impacts to the groundwater, associated with the Coors Road Plant, do not present a threat to human health or the environment.

In the CMS, at pages III-63 through III-71, the absence of any realistic pathway to the impacted groundwater was discussed. Region VI has never disagreed with that analysis. The only response by EPA is a suggestion that evaluating the existence of pathways to groundwater is irrelevant to remedy selection. (See page 24 of Region IV's Response to the Memorandum Regarding Sparton Technology, Inc.'s Position on the Facts, Law, and the Relief Sought by EPA," hereinafter referred to as Region VI's response).

Under Region VI's misguided understanding of 3008(h) of RCRA, a threat to human health or the environment exists any time substances are found in groundwater in excess of MCL's, even if there is no likelihood that such water will be consumed by humans or adversely upset any ecological system. See Region VI's Response at 16 through 24. To arrive at this conclusion, Region VI has effectively rewritten section 3008(h)(a) of RCRA to read: "the Administrator may issue an order requiring corrective action he deems necessary to remove any impact to the environment, even where unnecessary to protect human health or the environment."

Not only is the position of Region VI contrary to the plain language of the statue, but it flies in the face of the agency's most recent indication of how it intends to select corrective actions. See 61 Fed. Reg. 19432 (May 1, 1996). In that advanced notice of rulemaking, EPA makes clear that before deciding how to protect human health or the environment, there must be an identification of a risk, which in turn is a function of the presence of toxicity and exposure to that toxicity. The existence of exposure depends upon the identification of a pathway by which receptors come in contact with the toxicity. To the extent there is no pathway, there is no exposure, and there can be no risk. Logically, if there is no risk, there is no need to protect, and corrective action is unnecessary. Region VI of EPA is simply wrong, then, to suggest that any time hazardous waste or waste constituents in groundwater exceed MCLs, a corrective action is required. Only when that exceedance presents a threat, because of the existence of reasonably likely exposure pathways, is there a need to consider corrective action.

Region VI argues that any time groundwater exhibits an exceedance of MCL's there is a "potential" threat to human health. Although not set forth explicitly, the agency's reasoning to reach this conclusion must be as follows. People are not supposed to drink water with substances above MCLs. If groundwater has contained substances at concentrations above MCL's, people should not drink it. It is always possible for groundwater to be a source of drinking water. If there is any groundwater containing substances above MCLs, people might drink it, therefore, a potential threat (risk of drinking the water) exists.

Three legal fallacies and several faulty factual assumptions underlie this reasoning.

First, Region VI incorrectly reads an OSWER Policy Statement (attached as Exhibit "4" to its response), which in interpreting section 3008(h) of RCRA uses the phrase "present or potential threat" instead of just "threat," as suggesting corrective actions can address any possible risk, no matter how unlikely. But the use in the policy statement of the word "potential" with the word "present" makes it clear those adjectives were intended to explain the timing of the threat, not its likelihood. Further support for this reading is found in the fact that after using the phrase "present or potential threat" the policy statement continues with a description of how the likelihood of injury is to be evaluated, whether "present or potential." In particular, the policy statement directs that such factors as potential exposure pathways, transport and environmental fate of hazardous constituents, receptors that might be exposed, and the effects of exposure, all must be considered to justify a remedy. If the presence of toxicity by itself was sufficient to require a corrective action, evaluation of these facts would be unnecessary. As a final emphasis that a specific exposure must exist before a remedy is to be imposed, the policy statement provides that only investigations can be based on a "general" threat. The clear implication is that a specific and actual threat must exist to require remedial action.

Second, Region VI incorrectly understands that it is free to assume that all groundwater will be drunk at levels on which the MCLs were based -- namely consumption of two liters of the contaminated water per day for seventy years. See 40 Fed. Reg. 59570 (1975). Region VI is required to prove by a preponderance of creditable evidence that the groundwater for which corrective action is required will be drunk, and at the levels that

justify the MCLs. See, *Leather Industries of America, Inc. v. EPA*, 40 F. 3d 392, 402-405 (D.C. Cir. 1994).

Third, Region VI incorrectly relies upon a portion of proposed regulations, now abandoned, as supposedly requiring that MCLs must be achieved throughout the plume. The regulation identified, proposed 40 C.F.R. § 264.525(d), found at 55 Fed. Reg. 3087(8) (July 27, 1990), and superseded by a recent notice of advance rule making, 61 Fed. Reg. 19432 (May 1, 1996), was never intended to be a bright line requirement. Instead, it represented a default value for specifying toxicity, but not exposure. Analysis of exposure pathways was intended to identify whether and when such limits should be achieved.

Because the legal under-pinnings to Region VI's reasoning are incorrect, the conclusion, that any exceedance of MCLs in groundwater is a "potential threat to human health," is also wrong. As properly understood, § 3008(h) of RCRA requires that before the agency can conclude a "potential" threat exists, because of MCL exceedances in groundwater, there must be a demonstration by a preponderance of credible evidence that people will actually drink the impacted groundwater at rates that present the type of risk the MCLs were intended to prevent.[1]

That showing has not been made in this proceeding. The CMS concludes there is no reasonable likelihood that the specific groundwater impacted will be used for drinking water purposes now or in the future. In the absence of a pathway, there can be no threat.

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[1] Region VI has assumed, incorrectly, that there is a danger in drinking any amount of water that does not meet MCLs, that the water in the ground and at the point of consumption will have the same concentration of constituents of concern, and that all groundwater is accessible by anybody. There is no evidence in the record that any of these assumptions actually exist in the vicinity of the Coors Road Plant.

Even though EPA approved this conclusion in the CMS, it now tries to suggest a pathway -- namely water supply wells for the city of Albuquerque or New Mexico Utilities. Albuquerque's presumed use is supposedly established by a self-serving resolution by the city council[2] and an overly generalized and misleading affidavit by a city employee -- Norman Gaume.

While the resolution states that the city's "interest and rights in the development and use of the aquifer . . . are damaged by [Sparton's] contamination," and that the "groundwater . . . in the vicinity of the Sparton facility comprises a valuable resource . . . which the City "intends" to develop and utilize," the administrative record is devoid of any support for these generalizations. For instance, nothing in the administrative records shows any city owned infra-structure in the vicinity of the Sparton facility that would support the use of the aquifer at that location. In fact, the only evidence is that no such infra-structure exists, and it could only be installed at considerable capital cost to the city. There is no information establishing any planned expenditure of resources to develop the necessary infra-structure. There is no evidence in the record of any permits the city has that would allow it to complete wells in this area. There is no evidence in the record of any application filed by the city for permits to develop wells in this area. In fact, the only evidence in the record establishes that if the city did apply for such permits, they would be protested, making issuance highly problematic. There is no evidence in the record to suggest that even if the city received a permit that it would complete wells in the shallow portion of the aquifer impacted by Sparton

[2] The resolution was adopted after the city sent EPA a letter threatening to sue Sparton, if EPA did not act to correct a claimed imminent and substantial endangerment, supposedly presented by the Sparton plume. The resolution was clearly adopted in aid of a litigation position, and should be disregarded by EPA.

activities. In fact, the only evidence in the record establishes that all of the recently completed city water supply wells are screened at depths significantly below the first 500 feet of the aquifer, and that such deep wells would not be compromised by the groundwater impacted by Sparton.

The affidavit of Norman Gaume is likewise long on generalizations and short on specifics. Mr. Gaume does not identify any current or planned activities of the city to develop wells in the specific portion of the aquifer impacted by Sparton activities. Mr. Gaume does indicate that the city is considering a plan to use an arroyo to the north of the area overlying groundwater impacted by Sparton operations, to force surface water into the ground for later reclamation. No specifics are provided on when such a program might be implemented, if at all, at the arroyo in question. More importantly, use of the arroyo depends upon the existence of a "recharge window" at that location; something that has yet to be established. As set forth in the statement of Peter Balleau, neither the United States Bureau of Reclamation nor the New Mexico Bureau of Mines and Mineral Resources have concluded that the arroyo is in fact a "recharge window." They have simply suggested that it might provide such a function. As Mr. Balleau describes, however, recent drilling by the USGS in cooperation with the city of Albuquerque, as well as data from the Sparton site indicates that the Calabacillas Arroyo is most likely not a recharge window to the deeper portion of the aquifer. Mr. Gaume's affidavit conveniently overlooks this data. Mr. Balleau also exposes the extremely speculative position of the recharge concept to which Mr. Gaume is referring. The approach is barely in the concept stage. No money exists for its implementation, and the first efforts could be years away, at locations yet to be determined. But even if a recharge

window existed at or near the arroyo, there is no reason that the impacted groundwater associated with Sparton's activities should interfere with any such use by the city, as Mr. Balleau points out.

The city's resolution and Mr. Gaume's affidavit may lack detail because the positions set forth are not technically justified. The city through the mayor and others appears in part to be using this proceeding to further a political agenda, at the expense of Sparton. Such an ulterior motive would impact the credibility of any statements from the city. Two examples demonstrate the city's and Mr. Gaume's lack of credibility. In a February 19, 1997, news conference focused on Sparton, the mayor made false statements about the threats presented by the impacted groundwater. Mr. Gaume, while a panelist at a May 28, 1996, forum on the Albuquerque aquifer sponsored by Senator Domenici stated that the Sparton plume presented "no imminent threat to any wells; our customers don't need to worry," a position diametrically different from what he said in his affidavit. These actions demonstrate the need for Sparton to cross-examine those opposing its remedy to evaluate their credibility and test the veracity and accuracy of their positions. Sparton submits that Region VI is disregarding its statutory obligation in not critically analyzing the city's position and statements. If Region VI would do so, it would quickly determine they are without foundation and must be disregarded.

Finally, as the general manager for New Mexico Utilities has stated, that entity has no current plans to complete wells in or near groundwater impacted by the Sparton facility.[3] The one well within a few miles of the Sparton impacted groundwater is not currently nor

[3] Mr. Swartout's letter confirming that New Mexico Utilities does not intend to make use of groundwater in the vicinity of the Sparton site in the near term was left out of Sparton's previous submission, but is included with this pleading. As Mr. Gaume has noted, from the perspective of planning for water in the west "near term" describes at least a forty year period.

will it be threatened by the plume, as characterized in the RFI and modeling in the CMS and as further described in Pierce Chandler's report.

B. If Region VI's understanding of the Order is accepted, it will violate the requirements of section 3008(h)(2) of RCRA.

Congress mandated that any order EPA issues under section 3008(h) of RCRA describe, with reasonable specificity, the required corrective action. Region VI's response makes it clear that in any number of areas the agency has yet to reach a conclusion about Sparton's obligations. In the agency's view, determining the number of containment wells, the number of recovery wells, the number of new monitoring wells, the type of water treatment required, the method required for recovery of soil vapors, and where recovered and treated groundwater will be discharged, should not be specified in the Order but should be left to the complete discretion of the agency, to be exercised at some later point in time.

That position precludes this order from identifying "with reasonable specificity," what Sparton is required to do. Moreover, it would also constitute a violation of the AOC, in which it was clearly anticipated that once a remedy was selected, no further field investigations would be required. Therefore, it is necessary in this proceeding that a decision be made on each element of the remedy, namely the number of containment wells, the need for and the number of recovery wells, the type of water treatment required, the need for and the number of monitor wells, the mechanism for dealing with recovered and treated groundwater, the number of soil vapor extraction wells, and the method for dealing with recovered soil vapors. If EPA is not prepared to reach a decision on those issues, which by its pleadings it is not, then this order must be dismissed until sufficient information exists for such decisions to be made, or the Order must be modified to provide that once Region VI has

reached a conclusion, Sparton has all the procedural remedies identified in 40 C.F.R. Part 24.[4]

C. Region VI has failed to establish by a preponderance of the credible evidence that its remedy will deal any more effectively with the impacts to the groundwater associated with the Coors Road Plant, than what Sparton has proposed in the CMS, as amended.

Region VI in its response, professed some confusion about the remedy Sparton is proposing. As Region 6 is well aware from its involvement in all stages of the discussions, Sparton's remedy has been modified since submission of the draft final CMS. To avoid any confusion, Sparton is amending the CMS contemporaneously with this filing, to reflect what all parties have understood for sometime to be the company's remedy proposal:

1. Installation of one of more containment wells at the leading edge of the plume;
2. Enhancement of on-site groundwater containment to recover and treat 20 gallons per minute;
3. Development and operation of an on-site soil vapor extraction system to reduce soil vapor concentrations to 10 ppmv or below; and
4. Discharge of recovered and treated groundwater to the Calabacillas Arroyo.

EPA would apparently augment that proposal by including an undetermined number of recovery wells throughout the plume, requiring an undetermined additional number of monitor wells (but at least 20), requiring an undetermined number of additional on-site containment wells, and getting rid of all of the recovered groundwater through a mechanism to be decided at some point in the future.

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[4] EPA incorrectly identifies Sparton's complaints about lack of specificity and an unfettered right to modify the order as due process claims. In fact, Sparton's objection at this time is that the procedures it is entitled to under RCRA are improperly denied unless the Order is specific and any proposed modifications are not final unless accepted by Sparton or subject to the procedures of 40 C.F.R. Part 24.

EPA's objective, through the yet unspecified remedy, is to remove contaminants in the groundwater introduced from Sparton's operation to levels below MCLs. But, as the record in this proceeding demonstrates, if Region VI's views about the off-site subsurface geology are correct (and Sparton disputes they are) then Sparton's remedy will achieve the same objective in approximately the same period of time at lower costs, with less environmental impacts, and with greater water conservation. As set forth in the further reports of Pierce Chandler and Gary Richardson, incorporated by reference: (1) operating one containment well in the subsurface geology Region VI claims exist, will cause substances of concern in the impacted groundwater to be at or below MCLs within thirty years; (2) discharging recovered and treated groundwater to the Calabacillas Arroyo will provide greater water conservation than using reinjection wells; and (3) Region VI has seriously underestimated the difficulty of running and the cost of reinjection wells at this site.

Mr. Chandler also points out that Region VI's more aggressive pump and treat proposal will most likely result in lengthening the time to achieve restoration, if that result is even possible, will require treatment of much more groundwater than Sparton's proposal, will include greater use of other resources, such as electrical power, and will see a greater loss of water. Region VI's remedy provides no greater protection than Sparton's during the period of time that remediation is ongoing. Region VI's approach will cause Sparton to spend more money than is necessary. EPA wants Sparton to install a system capable of aggressive groundwater treatment, yet it may allow the company to discontinue that activity, if it is not working. Sparton on the other hand, would start with a containment system to determine whether more aggressive treatment is possible, thereby allowing an upgrade if warranted. Not

only is EPA's approach more costly, but it is inconsistent with the latest guidance from EPA, as identified by Mr. Chandler, that technical impracticability be addressed as early as possible in the remediation process, obviously not after the remedy has been implemented.

D. Region VI has used the wrong criteria in evaluating what is an appropriate remedy at this site.

The AOC in Task IX of the statement of work, specifies the criteria to be used in selecting a remedy. These are the same criteria set forth in the CMS, and against which each of the identified alternatives was measured. EPA has used a different set of criteria in issuing the Order. In doing so, it is violating the AOC. In this situation, that document controls. For instance, *In Re: Delco Electronics Corp.*, RCRA Appeal No. 93-10 (Sept. 28, 1994), it was made clear that the agency was not required to follow the factors identified by Region VI, if site specific conditions allow. Here, that site specific condition is the AOC, which directs the agency as to what factors are to be taken into consideration. Given that the factors EPA used are only guidance, the agency is well within its authority to disregard those requirements in this situation.

E. Sparton's claims about denial of due process, the failure of Region VI to adhere to the AOC, and the incompleteness of the Administrative Record have been foreclosed by previous decisions of the Presiding Officer.

The Presiding Officer has already concluded that Sparton has no due process claim.

The Presiding Officer has concluded that the agency has the power to unilaterally issue the Order, which finding effectively resolves Sparton's claim at least on this proceeding, that the AOC prevented EPA from moving forward with the Order.

Finally, the Presiding Officer has denied Sparton any discovery regarding the completeness of the Administrative Record, preventing Sparton from presenting its case.

It was against this background that Sparton concluded moving forward on these issues would be "futile." The agency has already made up its mind on these points, and there is no reason for Sparton to continue pressing these arguments, when there is no possibility of obtaining any relief. All these issues will be addressed in the pending lawsuit Sparton has against EPA.

CONCLUSION

Based on the foregoing, Sparton requests that the Order be dismissed, or in the alternative that the Order proposed by Sparton be adopted, or in the alternative that the Order be modified to direct Sparton to implement the remedy set forth in the CMS, as amended.

Respectfully submitted,

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ATTORNEYS FOR SPARTON
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CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing Additional Information in Support of Sparton Technology, Inc.'s Position on the Facts, the Law, and the Relief Sought by EPA was served on Evan Pearson, Esq., United States Environmental Protection Agency, Region 6, 1445 Ross Avenue, Dallas, Texas 75202-2733 via hand-delivery on March 14, 1997.

James B. Harris

009594

IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-VI-001 (H)-96-H

REPORT OF PIERCE L. CHANDLER, JR., IN TECHNICAL REPLY TO EPA'S POSITION STATEMENT RESPONDING TO THE MEMORANDUM REGARDING SPARTON TECHNOLOGY, INC.'S POSITION ON THE FACTS, THE LAW, AND THE RELIEF SOUGHT BY EPA, DATED FEBRUARY 4, 1997

The following report is my technical reply to EPA's Position Statement relative to the characterization of subsurface conditions and the "contaminant plume" and the resulting assessment of risk/threat posed to human health or the environment. The report also includes my technical reply to EPA's Position Statement regarding the technical impracticability of aquifer restoration, cost effectiveness of various remedial alternatives, management of extracted water, waste residue management/disposal, and ability of various remedial alternatives to meet remedy selection criteria.

My report is based on my training, education, and experience as a professional engineer and hydrogeologist with particular emphasis on water resource and solid/hazardous waste projects. A copy of my curriculum vitae was previously furnished in the Sparton Memorandum as part of Exhibit A.

A significant portion of my previous work has been on sites regulated under the Resource Conservation and Recovery Act (RCRA) of 1976 and subsequent amendments. With respect to the Sparton site, I was the principal investigator and author of the RCRA Facility Investigation (RFI) Report (Sparton, 1992), the Corrective Measures Study (CMS) Report (Sparton, 1996), and the Effectiveness of the Groundwater Recovery Well System in the Upper Flow Zone (Effectiveness) Report (Sparton, 1995).

On the basis of education, training, general experience, and specific experience at the Sparton Coors Road Facility, I am qualified to make the conclusions and statements expressed in the following report.

In the 64-page position summary of EPA dated February 25, 1997, and the included 18 exhibits, it is clear that there are only a few technical issues of contention. The technical issues on which Sparton and EPA differ can be generally grouped under five general categories:

1. The absence of risk and/or threat to human health and the environment under current and reasonably expected future conditions;

2. Technical impracticability (TI) of aquifer restoration;

3. Cost efficiency (quantifiable results versus cost) of various remedial alternatives;

4. Management of extracted groundwater, and

5. Ability of various remedial alternatives to meet remedy selection criteria.

Specific replies to EPA's position statement will be discussed under these categorical headings. Comments on the exhibits attached to the EPA position statement are discussed in separate attachments attached to this report. Comments on the exhibits will often be repetitive with comments on the position statement since much of the position statement was based on the exhibit information.

NO RISK/THREAT TO HUMAN HEALTH/ENVIRONMENT

Both the RFI and CMS concluded that there is no risk/threat to human health or environment under current, or reasonably foreseeable future conditions.

This position was amplified in the Reports of Chandler and Balleau (Sparton memorandum, exhibits A and B). EPA offers no factual, technical opposition, but rather offers the July 27, 1990 proposed corrective action rules (56 FR No 145 p 30804 and 30878) as "guidance" that, regardless of actual risk or threat, potentially drinkable groundwater should be restored to drinking water maximum contaminant levels (MCL's). EPA extrapolates this guidance to further assert that a release to a potential source of drinking water presents a potential threat to human health. However, EPA's stated position in their responses seems inconsistent with the umbrella statement in their same reference (p 30804) that:

> "EPA's goal in RCRA corrective action is, to the extent practicable, ... to clean up contaminated media to a level consistent with reasonably expected, as well as current, uses. The timing for reaching this goal will depend on a variety of factors, such as the complexity of the action, the immediacy of the threat, the facility's priority for corrective action, and the financial viability of the owner/operator."

EPA's guidance reference (p 30823) also indicates that the overarching RCRA standard - protection of human health and the environment requires remedies to include measures that are needed to be protective, but not necessarily related to media cleanup or source control. An example is given as providing alternative drinking water supplies. More recent "guidance", the May 1, 1996, proposed corrective action rules (61 FR No 85), elaborates on these various concepts.

TECHNICAL IMPRACTICABILITY

Based on characterization in the RFI, and subsequent updating, the CMS concluded that aquifer restoration is "Technically Impracticable" (TI). The CMS conclusion was based on the complex heterogeneous, anisotropic conditions in the subsurface including interbedded and layered gravels, sands, silts and clays. The significant presence and distribution of silts and clays not only impedes groundwater movement (dissolved phase contamination), but also

provides a fine-grained environment for both capillary held (residual DNAPL) or sorbed-phase DNAPL. In exhibit A to Sparton's memorandum, silt/clay information from the RFI/CMS was supplemented by recent on-site and off-site investigation. Further, in exhibit A, relevant case history data for similar projects was presented in summary form to further document TI.

EPA challenges the finding of TI by refusing to acknowledge the site-specific geologic/hydrogeologic characterization and the consensus of investigation and published information for the Albuquerque area. EPA has hypothesized that geologic conditions are favorable for remediation without any supporting documentation. EPA proposes that subsurface conditions are relatively homogeneous, isotropic sands and gravels readily transmissive to water and providing a poor sorptive/capillary attractive environment for DNAPL. Because of their sand and gravel hypothesis, it is interesting that EPA would believe 20 or more additional groundwater monitoring wells are needed for further characterization. EPA's uniform sand and gravel hypothesis should not require nearly as many wells as more complex geology.

EPA also challenges recent characterization as provided in the CMS and subsequently updated by installation of five additional wells in front of and/or beneath the leading edge of the plume. It is interesting that in terms of non-detect (<5µg/l) monitoring wells, the plume limits (June 1991) shown in the RFI are defined by 18 non-detect wells, whereas the 1996 CMS plume limits updated through July 1996 by the new wells are defined by 23 non-detect wells. (See Figure 5, p 17 of exhibit A to Sparton's memorandum.) Since the 1991 (RFI) and 1996 plume limits are comparable in size, it is difficult to understand the basis for EPA's challenge in the absence of any technical documentation as to why the plume is no longer adequately defined.

As a final comment to the CMS and Sparton memorandum conclusions on TI, EPA complains that the three pages of TI documentation in the CMS and the five pages in exhibit A to the Sparton memorandum are insufficient on the basis of narrative volume only. EPA offers no challenge to the summarizing analyses and conclusions in the CMS and Sparton memorandum. In fact, the

three pages in the CMS (pp VII-17 to VII-20) included a detailed evaluation summary using EPA's own TI evaluation matrix (OSWER Directive 9234.2-25, U.S. EPA 1993, p 3). Further, the characterization in both the RFI and CMS addressed the elements of EPA's site conceptual model (page 14 of the OSWER Directive).

It should be noted that EPA, in its various discussions with Sparton, has argued that it is necessary to "try the remedy first" before claiming TI. The most recent proposed corrective action rules (61 FR No 85, May 1996) at page 19451 clearly and unambiguously state that:

> "The possibility that certain remedies may be technically impracticable should be considered throughout the remediation process - from the early stages of developing a conceptual site model through all stages remedy implementation. When possible determinations of technical impracticability should be made early in the remediation process and included in RCRA corrective action remedial decision documents (permits and orders)".

Obviously, Sparton is making every attempt to follow this guidance in spite of EPA's objection.

COST EFFICIENCY

Cost effectiveness (quantifiable results versus cost) can be subdivided into two parts -- more characterization and extensive "aggressive" remedy.

More characterization includes 20 or more wells (p 19 FDRTC) and quarterly monitoring of up to 40 wells. Considering the plume was defined by 18 non-detect wells for the RFI as shown on Figure 1, and currently by 23 non-detect wells in 1996, as shown on Figure 2, with little change in plume location, it is difficult to imagine where the 20 or more wells would be located and what value they would add. Secondly, EPA has underestimated cost of these wells citing information in the CMS as their basis. Reviewing page VII-6 of the CMS,

FIGURE 1

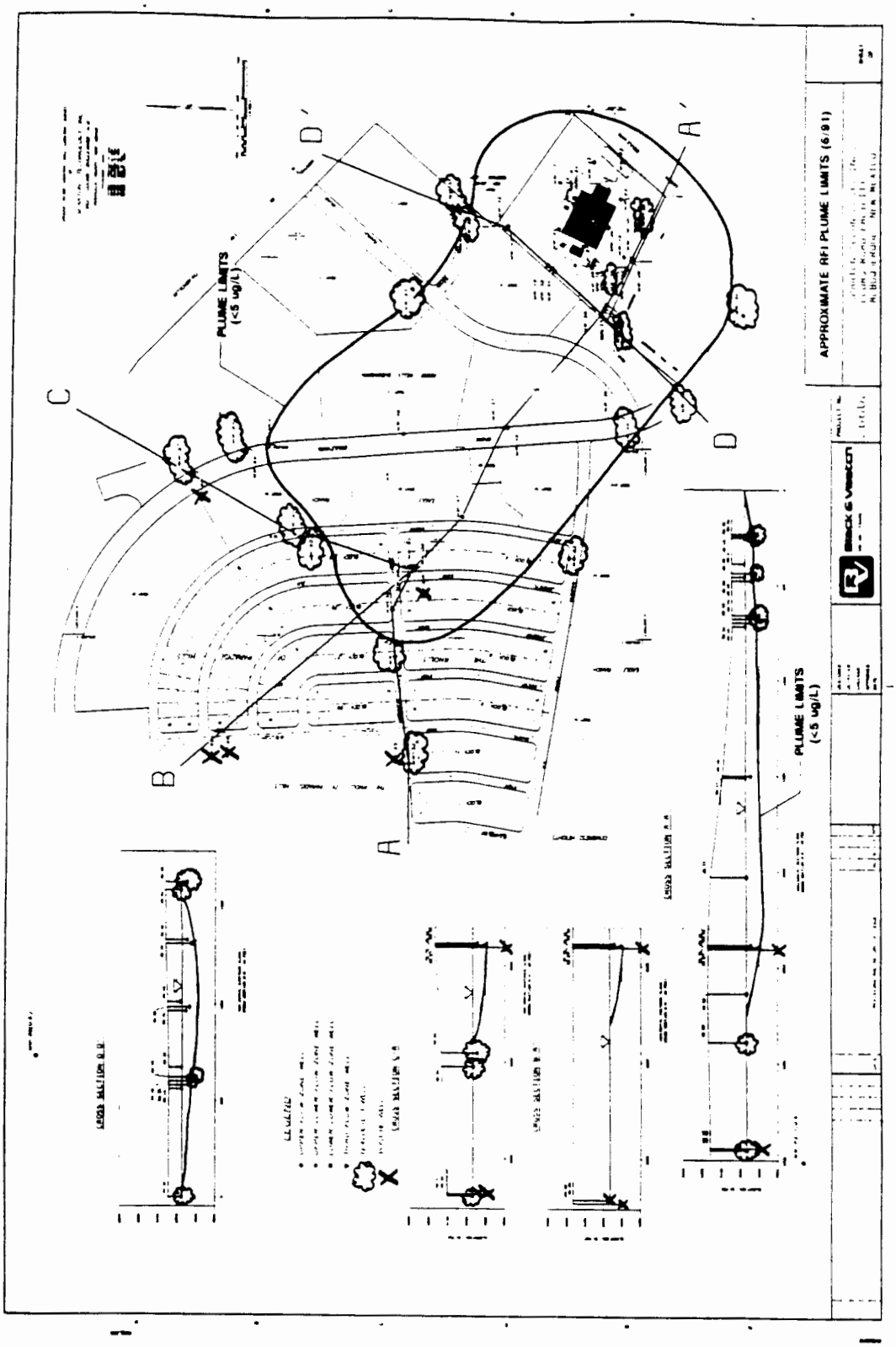
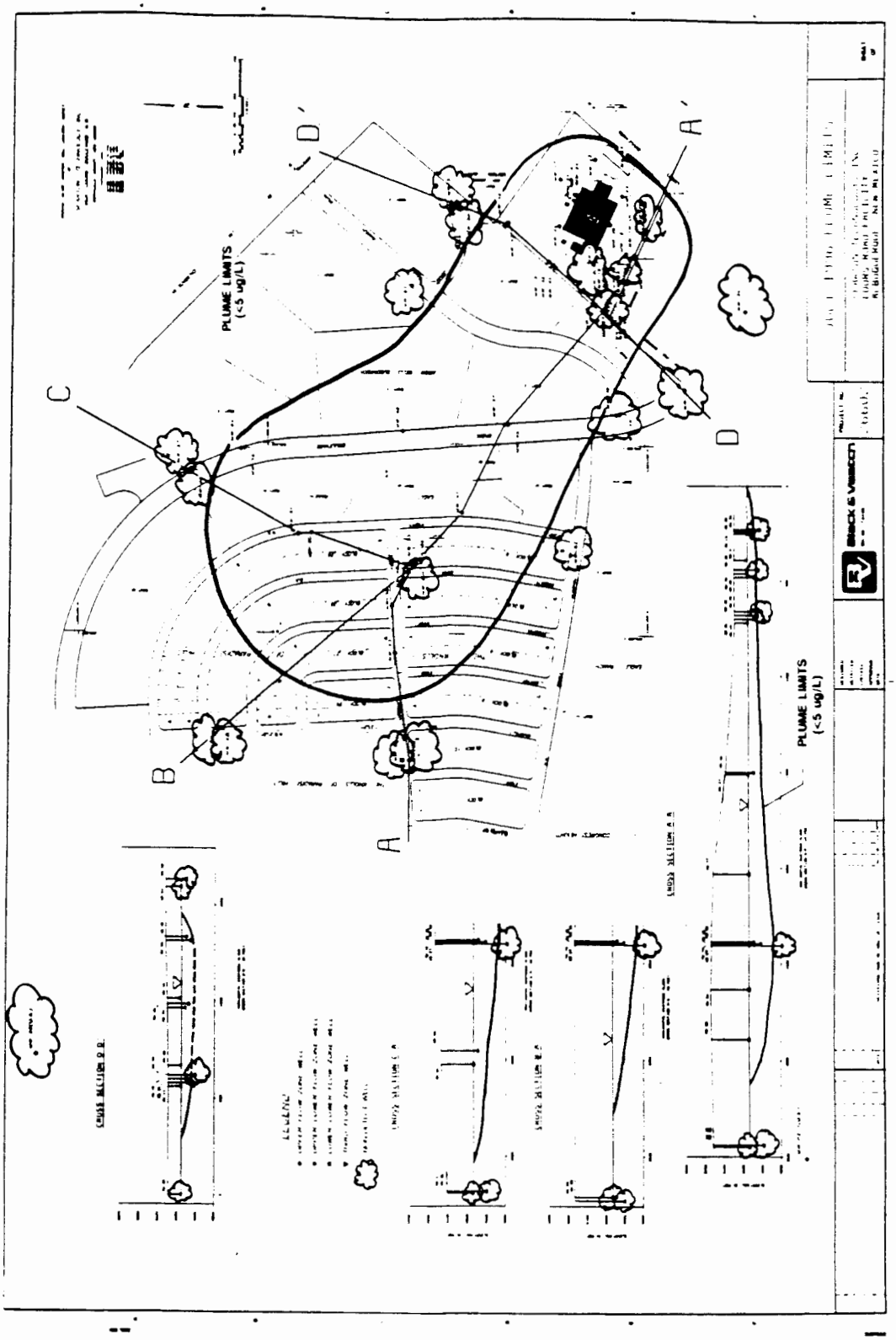

APPROXIMATE RFI PLUME LIMITS (6/91)
PLUME LIMITS (<5 ug/L)
PLUME LIMITS (<5 ug/L)
A
A'
B
C
D
D'

FIGURE 2



it is very clear (and typical experience) that "clean" wells outside the contamination are cheaper than wells installed either within or through the plume contamination. Although EPA's cost error was previously pointed out in the Sparton memorandum, they have ignored the information. Quarterly monitoring is also cost-excessive. Typical practice and 40CFR265.92 (ref 61FR No 85 p 19438 also) both indicate semi-annual to annual monitoring is more than adequate.

"Aggressive" remedy is used to describe EPA's proposal in both the EPA Position Statement (p 51) and in Malott's affidavit (exhibit 4, p2, 5, 8). In normal context (National Research Council, 1994; Cherry, et al., 1995), "aggressive" pump and treat implies pumping at high rates so that clean water from areas outside the plume will flush out the contaminated zone; however, the "aggressive" approach produces large amounts of less-contaminated water and increases treatment/disposal costs. Water velocities can actually be sufficiently high that contaminant removal efficiency is actually reduced -- particularly in heterogenous, anisotropic conditions involving DNAPL contamination such as the Sparton site. (EPA/600/8-90/003; March 1990). If EPA's hypothesis of homogeneous, coarse-grained geology and only dissolved-phase contaminants were realistic, "aggressive" pumping could be used to reduce remediation time-frame albeit at usually a higher cost.

Because of the limited vertical thickness of the plume, aggressive pumping could also pull contamination deeper -- into the aquifer. EPA's remedial proposal also requires significantly more treatment because of the proposed reinjection of treated water. The increased level of treatment on an unnecessarily larger quantity of produced water (from aggressive pumping) results in significant cost inefficiency.

EPA has gone to great lengths to show improved cost efficiency for its proposed remedy by recalculation of both capital and O&M costs. EPA states that their original cost calculations in the FDRTC were based on cost figures provided by Sparton. It should be noted that in the Protective Response and Request for Hearing, Sparton showed that EPA calculated and totaled costs

differently from the CMS. Rather than acknowledge this difference, EPA has chosen to recalculate the costs of the groundwater extraction portion of its proposed remedy. EPA, on the basis of its recalculations, states that Sparton has "greatly overestimated the costs of the groundwater extraction system." However, EPA's recalculated costs contain major errors and omissions are seriously underestimated.

EPA's recalculated capital costs are incomplete and based on a significantly reduced design. This can be clearly seen on Figure 3. Figure 3 is a comparison of costs between the FDRTC, CMS, and the position statement recalculations. As an example of the reduced design, note that EPA has chosen to use a single injection well of inferior design and construction to replace the three stainless steel wells in the FDRTC and CMS.

The recalculated O&M costs are incomplete to the point that they raise serious questions about EPA's objectivity and technical ability. EPA should have questioned the recalculated O&M costs when they recognized the significant change from previous calculations. Further, the fact that O&M costs were constant, regardless of the type and degree of treatment used, should have been sufficient reason to question their validity. The calculated EPA O&M costs in their exhibit 17 include only labor and electricity as primary costs. Other more major costs such as equipment maintenance, expendables (such as chemicals, resin, carbon, etc.), rehabilitation/redevelopment of the wells and capital recovery or depreciation to periodically replace equipment over the 30-year remediation time-frame were not included. Figure 3 clearly shows the cost impact of these omissions. In addition, costs for management and/or disposal of waste residues from the treatment processes have not been included in the recalculated O&M costs. This same error occurred in EPA's June 24, 1996, Final Decision and Response to Comments (FDRTC) costs and was pointed out numerous times by Sparton. This exclusion is notable since common references such as EPA's own 1995 Groundwater and Leachate Treatment Systems Manual (EPA/625/R-94/005) and the American Water Works Association's Water Quality and Treatment Handbook (AWWA, 1990) have multiple discussions of the significance of waste residue management and

FIGURE 3
COST COMPARISONS
600 GPM EPA FDRTC ALTERNATIVE 4

	CAPITAL COSTS				ANNUAL O&M			
ITEM (CMS REFERENCE)	EPA FDRTC ESTIMATE	VERIFICATION OF FDRTC USING CMS COSTS	EPA POSITION STATEMENT AND EXHIBIT 18	VERIFICATION OF POSITION STATEMENT USING CMS COSTS	EPA FDRTC ESTIMATE	VERIFICATION OF FDRTC USING CMS COSTS	EPA POSITION STATEMENT AND EXHIBIT 18	VERIFICATION OF POSITION STATEMENT USING CMS COSTS
GROUNDWATER MONITORING (REF CMS P VII-6)	$400,000 (20 WELLS- IMPLIED OUTSIDE PLUME)	$600,000 (20 WELLS 10 OUTSIDE PLUME,10 INSIDE PLUME)	$400,000	$600,000 (TO INCLUDE WELLS IN PLUME)	$160,000	$160,000	$160,000	$160,000
SOIL VAPOR EXTRACTION (REF CMS P VII-56)	$150,000 (ON-SITE SVE)	$150,000 (ON-SITE SVE)	EXCLUDED (POSITION STATEMENT P 62)	—	$28,000	$28,000	EXCLUDED (POSITION STATEMENT P 62)	—
IM EXPANSION (REF CMS P VII-17)	NOT INCLUDED	NOT INCLUDED	EXCLUDED (POSITION STATEMENT P 62)	—	$25,000 (OPERATION OF CURRENT IM)	$25,000 (OPERATION OF CURRENT IM)	EXCLUDED (POSITION STATEMENT P 62)	—
EXPANDED GROUNDWATER EXTRACTION (REF CMS P VII 23)	$306,250 (3 WELLS & ELECTRIC SERVICE/PIPING TO FACILITY)	$306,250 (3 WELLS & ELECTRIC SERVICE/PIPING TO FACILITY)	$346,250 (3 WELLS, LCS CASING, NO ELECTRICITY SERVICE, NO PIPING TO FACILITY)	$346,250 (LCS CASING) + $100,000 (ELECTRIC SERVICE AND PIPING TO FACILITY)	$54,410 (3 WELLS)	$54,410 (3 WELLS)	$143,308 (DOES NOT INCLUDE MAINTENANCE, DEPRECIATION, WELL REHABILITATION, COST OF EXPENDABLES, WASTE RESIDUE MANAGEMENT)	$54,410
WATER TREATMENT-VOC (REF CMS P VII-38,39)	$181,250	$181,250	$509,238	$509,238	$76,490	$76,490		$76,490
WATER TREATMENT-METALS (REF CMS P VII-49)	$587,500	$587,500	$247,050	$247,050	$700,000 (NO WASTE RESIDUE MANAGEMENT)	$710,000 (O&M) $2,000,000 (WASTE RESIDUE MANAGEMENT)		$710,000 (O&M) $2,000,000 (WASTE RESIDUE MANAGEMENT)
INJECTION WELL DISPOSAL (REF CMS P VII-30)	$1,237,500 (3 WELLS & ADDITIONAL TREATMENT)	$1,237,500 (3 WELLS & ADDITIONAL TREATMENT)	$169,756 (SINGLE WELL, LCS CASING AND FILTRATION TREATMENT)	$331,875 (LCS CASING FOR 3 WELLS) + $32,256 (FILTRATION)	$510,000	$180,000 (ADDITIONAL TREATMENT) $90,000 (REDEVELOPMENT) $240,000 (REPLACEMENT & MAINTENANCE)		$180,000 (ADDITIONAL TREATMENT) $90,000 (REDEVELOPMENT) $240,000 (REPLACEMENT & MAINTENANCE)
TOTAL COST W/O METAL TREATMENT	$2,275,000	$2,475,000	$1,425,244 ($1,375,244 w/ SVE)	$1,919,619 ($2,069,619 WITH VES)	$853,900	$853,900	$303,308 ($356,308 w/ SVE & IM)	$800,900 ($853,900 w/ SVE & IM)
TOTAL COST WITH METAL TREATMENT	$2,862,500	$3,062,500	$1,672,294 ($1,822,294 w/ SVE)	$2,166,669 ($2,316,669 WITH VES)	$1,553,900	$1,563,900	$303,308 ($356,308 w/ SVE & IM)	$3,510,900 ($3,563,900 w/ SVE & IM)

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potential cost impacts. In addition, the EPA manual shows significantly higher capital and O&M costs for water treatment as compared to the position statement cost recalculations. In fact, the EPA manual water treatment costs slightly exceed the CMS costs.

EPA should not claim improved cost efficiency for their selected remedy on the basis of recalculations that chose to ignore major cost items or were based on a reduced system. Figure 3 is an attempt to reconcile EPA's recalculated costs (to the extent possible, because of the lack of detail) with the CMS and FDRTC. Figure 3 shows that capital costs for EPA's proposed remedy range from $2,069,619 to $2,475,000 without metal removal treatment and range from $2,316,669 to $3,062,500 with metal removal treatment. Note that the high range includes an additional $200,000 of groundwater monitoring. Annual O&M costs range from $853,900 without metal treatment to $3,563,900 to include metal treatment and waste residue management/disposal. Sparton's proposal is much more cost-efficient, generates significantly less waste residues and will require essentially the same time-frame of 30 years, as estimated for EPA's proposal. Sparton's proposal also meets the requirements of conditional remedies in 55 FR No 145 p 30879 and realistic remedies in 61 FR No 85 p 19447.

MANAGEMENT OF EXTRACTED GROUNDWATER

For a variety of technical reasons, and in the interest of cost-efficiency, discharge to the surface has always been the preferred management alternative for water produced by containment/contaminant mass removal activity. In the CMS, discharge to the Rio Grande was detailed.

Subsequent to the CMS, discharge to the Calabacillas Arroyo, using existing storm drainage, has been proposed and an NPDES application filed. Use of existing storm drainage is more cost efficient than constructing a new discharge line to the Rio Grande. Contrary to EPA's statements in their Response, discharge to the Calabacillas was not rejected out of hand in the Final CMS. In the Final CMS, surficial recharge via a hypothetical "recharge window" into the

aquifer was considered speculative at best in the absence of specific hydrogeological data, and comparable to other recharge options detailed in the CMS. Recent studies by Richardson (Metric Corporation, 1997) showed that the proposed water discharge to the Calabacillas would, in fact, recharge into the vadose zone and ultimately back into the shallow portions of the aquifer. It should be noted that discharge to the Arroyo will result in significantly less water loss (1-3 percent of produced stream) than other remedial options involving reinjection, such as the treatment train proposed by EPA, could waste 5-10 percent of the produced stream (Water Quality and Treatment, A.W.W.A., 1990)

ABILITY TO MEET REMEDY SELECTION CRITERIA

EPA correctly identifies four "remedy threshold criteria" and five "balancing criteria" from both the 1990 and 1996 "guidance". EPA then asserts that it selected remedial alternative 4 as detailed in the FDRTC using those nine criteria. EPA further asserts that Sparton's currently proposed remedial alternative fails to meet one of the nine criteria -- the threshold criteria to protect human health and the environment. The apparent sole basis for EPA's rejection of Sparton's current remedial alternative proposal is their interpretation that protection of human health and the environment requires restoration (reduction of groundwater contamination to below MCL) of the aquifer.

Restoration of the aquifer would seem to be more appropriately included under the second threshold criteria -- attain media cleanup standards. Yet the May 1, 1996 "guidance" (61FR No. 85, p 19449) states that:

> "Attaining media cleanup standards does not necessarily entail removal or treatment of all contaminated material above specific constituent concentrations. Depending on the site-specific circumstances, remedies may attain media cleanup standards through various combinations of removal, treatment, engineering, and institutional controls."

And further states that:

> "The term 'media cleanup standards' typically refers to broad cleanup objectives; ...Media cleanup standards (and levels) should reflect the potential risks of the facility and media in question by considering the toxicity of the constituents of concern, exposure pathways, and fate and transport characteristics."

Regardless of which criteria restoration belongs to, and whether or not restoration is actually part of either criteria, EPA has chosen to use restoration as the basis for rejecting Sparton's proposed remedial alternative.

Will EPA's selected remedy restore the aquifer? In the header for §IV.F.4 of the position statement, EPA asserts that "the remedy selected by EPA protects human health and the environment"; yet nowhere in the following narrative in this section does EPA offer any proof, documentation, or factual, technical discussion of how or why the EPA remedy meets this criteria. Neither in the position statement nor in the previous FDRTC does EPA document or support the conclusion that their selected remedy will restore the aquifer and therefore will protect human health and the environment. EPA argues that their remedy is more "aggressive" since it will use more wells, but they fail to address the key issue of restoration.

As summarized earlier in this report, Sparton has carefully and extensively documented the technical reasons that show aquifer restoration is technically impracticable. EPA has yet to present any meaningful data to show restoration is technically practicable. In the absence of this data, it must be concluded that there is no significant difference between the EPA and Sparton proposals relative to protection of human health and the environment and, therefore, no basis for rejecting Sparton's proposal.

I state, under penalty of perjury, that the foregoing is true and correct.

Executed on March 14, 1997.

BLACK & VEATCH

Pierce L. Chandler, Jr.
Project Manager

Attachments

A - Response to EPA Exhibit 14
B - Response to EPA Exhibits 10 and 17
C - Response to EPA Exhibit 8

Attachment A to Chandler Report

Response to Report of Vincent Malott, U.S. EPA, on Feasibility of Ground Water Remediation at the Sparton Technology Site, February 25, 1997.

Background.

The Background section of the report begins with a partial summary of discussions in EPA's Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration (OSWER Directive 9234.2-25, U.S. EPA, 1993) and Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities; Proposed Rule (55FR No. 145, pp 30797-30884, July 27, 1990)

A more relevant, and recent, guidance reference would be Corrective Action for Releases from Solid Waste Management Units at Hazardous Waste Management Facilities, (61FR No. 85, pp 19432-19464, May 1, 1996). There are significant differences in approach between the guidance referenced by Malott and the most recent 1996 guidance. Specifically, the 1996 guidance offers the following on Technical Impracticability (TI):

p 19451 "The single greatest cause for technical impracticability determinations during groundwater restoration has been the presence of dense non-aqueous phase liquids (DNAPLs)."

and "The possibility that certain remedies may be technically impracticable should be considered throughout the remediation process -- from the early stages of developing a conceptual site model through all stages [of] remedy implementation. When possible, determinations of technical impracticability should be made early in the remediation process and included in RCRA corrective

action remedial decision documents (permits and orders)."

Note the significant difference between the above guidance and the "try remedy first" approach in the 1990 guidance at pages 30838 and 30880.

With respect to Selection and Timing of Remedial Action, the 1996 Guidance offers:

p 19452 "EPA's policy is that current and reasonable expected future land use and corresponding exposure scenarios should be considered in both the selection and timing of remedial actions."

and "Reasonable future land use assumptions should be assessed when developing remedial goals for any given facility and used to focus all aspects of the corrective action process."

p 19436 "The goal of the Stabilization Initiative is to increase the rate of corrective actions by focusing on near-term activities to control or abate threats to human health and the environment and prevent or minimize the further spread of contamination."

The 1996 Guidance clearly represents a shift from the previous 1990 Guidance approach quoted in the report: "Potentially drinkable groundwater would be cleaned up to levels safe for drinking throughout the contaminated plume, regardless of whether the water was in fact being consumed." at page 30804.

In the remainder of the Background section, the discussion of Sparton's recommended corrective action fails to recognize Sparton's proposals of September 18, 1996, December 6, 1996, and January 17, 1996, in addition to meetings and additional field work conducted since submission and approval of the Final CMS.

"Aggressive" is an adjective repeatedly used to describe EPA's proposed remedy in this and other sections of the report. In normal context (National Research Council, 1994; Cherry, et al., 1995), "aggressive" pump and treat implies pumping at high rates so that clean water from areas outside the plume will flush out the contaminated zone; however, the "aggressive" approach produces large amounts of less-contaminated water and increases treatment/disposal costs. Water velocities can actually be sufficiently high that contaminant removal efficiency is actually reduced -- particularly in heterogenous, anisotropic conditions involving residual DNAPL contamination such as the Sparton site. (EPA/600/8-90/003; March 1990).

Containment and Reduction of the Source Area.

The referenced quotation from EPA's Technical Impracticability (TI) guidance (U.S. EPA, 1993, p 8) and subsequent discussion seem to imply an opinion that a "DNAPL zone" containing trichloroethylene (TCE) exists at the site. This is consistent with information previously submitted. The RFI and CMS pointed out that "residual and/or sorbed-phase" DNAPL and DNAPL "vapors" are present in the subsurface in addition to the dissolved-phase in ground water. Further, the RFI pointed out that, historically, maximum dissolved-phase concentrations were approximately four percent of the solubility limit, and, thus, could indicate the presence of free-phase constituents.

However, it appears that the report is trying to differentiate between onsite and offsite plume characteristics. Yet, no technical documentation for this distinction is provided. In fact, technical documentation developed to date in

the RFI and CMS does not in any way support this distinction. The report also indicates that "characteristics of the aquifer material beneath the Sparton facility indicate that containment of the high contaminant concentrations is generally feasible". Yet, in the attached Appendix A, item 25, the report argues that calculated capture zone widths for recovery wells are minuscule, although previously submitted Sparton field testing indicated much larger capture zones.

The report is also critical of the definition of the vertical extent of a base of the plume beneath the Sparton facility -- particularly beneath the source area. The report indicates that concentrations in MW-32 and MW-43 may indicate the presence and movement of free-phase DNAPL across the site. Since VOC concentrations in MW-32 have been significantly below one percent of the solubility for over four years, and MW-43 has never been more than 0.1 percent historically (1989) and is currently in the range of 0.03 to 0.04 percent of solubility, these wells do not indicate the presence of free-phase DNAPL. It should be noted that, in the referenced Sparton proposals, a non-detect well below MW-32 is proposed. As discussed in the September 26 and 27, 1996, meetings in Santa Fe, this well would complete definition along plume cross section DD', as shown on Figure 5 in the February 4, 1997, Chandler report (exhibit A to Sparton's February 4, 1997, memorandum).

The report's criticism of vertical definition in the source area is also contradictory and opposed to standard practice of avoiding unnecessary artificial penetrations through highly contaminated areas. The statement that "the amount of contamination migrating to deeper parts of the aquifer cannot be reliably estimated" is without any supporting technical basis and completely ignores the significant subsurface heterogeneity and anisotropy documented at the Sparton site and confirmed by a variety of recent studies in the Sparton area by the USGS, Hawley, and Shomaker (Intel). Further, the report's statement ignores the physical demonstration of contamination migration as being essentially horizontal as can be easily visualized by comparing plume

horizontal and vertical limits as shown on the previously referenced Chandler report Figure 5.

Containment of the Leading Edge of the Contaminant Plume.

The report indicates that "additional information on the plume dimensions and hydraulic conductivity of the aquifer will improve the [containment] system design". However, the report provides no quantification of "improve" or elaboration on "additional information". The report further indicates that "the plume is not completely defined in the downgradient areas and the lateral dimensions are not defined in the upgradient direction" (emphasis added). Again, the report does not elaborate or explain or show why/where the current plume limit definition (reference Figure 5, exhibit A of the Sparton memorandum) is in error. However, as noted in the CMS §VII.B.3. (p VII-10) and in the various calculations attached to Sparton's proposal of September 18, 1996, single-well capture zones are much larger than the current plume limits using conservative assumptions, and both site-specific and local area parameters, and nearby demonstration at Intel. If the effects of anisotropy and partial penetration had been included, horizontal capture zone limits would have been even larger (Bair & Lahm, Groundwater, September-October 1996).

The report also asserts that hydraulic conductivity "will likely increase to the west toward the leading edge of the plume", although no technical or factual basis is given for this statement. However, Sparton has previously proposed both aquifer testing and extended term demonstration of single well capture limits in their various proposals. Further, Sparton has also proposed additional characterization in the plume leading edge area using a combination of drilling technique and additional well/piezometer installation.

Restoration of the Contaminated Aquifer

The report asserts that hydrogeologic factors and contaminant-related factors are favorable for groundwater extraction (and thus favorable for restoration). This assertion is based on several stated misassumptions which are completely unsupported and undocumented. Specifically, these misassumptions include:

- Hydrogeologic conditions are distinctly different onsite versus offsite.
- The aquifer consists only of large sand and gravel deposits.
- The sand and gravel deposits offer low sorption potential to contaminants.
- Only dissolved-phase contamination occurs offsite.
- DNAPL occurs only beneath the Sparton facility.

In essence, EPA apparently believes that the aquifer is almost homogeneous and isotropic with no significant clay/silt content or bedding. The basis for this belief is not provided in any form; however, EPA;s misassumptions would support the feasibility of groundwater restoration.

Unfortunately, EPA's misassumptions are not supported by the consensus of site-specific, local, and regional characterization. Both the RFI and CMS show that silts and clays are significantly present and heterogeneously and anisotropically distributed throughout the aquifer. The complex heterogeneous, anisotropic mix of layered and interbedded gravels, sands, silts, and clays has been defined by intrusive exploration including geophysical logging and observation of numerous exposures. The heterogeneous, anisotropic conditions have been confirmed by the historic plume movement and shape

and recent aquifer tests such as Intel. The extent of silt/clay presence was summarized in the Chandler report of February 4, 1997 (reference pages 34-35). These silts/clays restrict vertical groundwater movement and contaminant migration and also provide a sorptive environment for DNAPL contaminants. In addition, sand and gravel deposits are generally discontinuous.

The complex nature of the heterogeneous, anisotropic mixture of gravels, sands, silts, and clays and the various phases of VOC present in the subsurface were the bases that led to the finding in the CMS (p VII-18 and VII-19) that restoration of ground water in a timely and efficient manner was "technically impracticable". To further illustrate technical impracticability (TI), exhibit A to the Sparton memorandum of February 4, 1997 (p 36-37) showed that the Sparton site was very similar (in terms of contamination and geology) to the majority of the sites reviewed in EPA's Evaluation of Ground-Water Extraction Remedies: Phase II (EPA, 1992), all of which have been unable to achieve restoration.

The report repeatedly attacks plume definition although no technical reasons are offered why the plume is "not completely defined", or even if "complete definition" is desirable or necessary except from an academic standpoint. It is interesting to compare the June 1991 plume limits contained in the RFI as defined by non-detection (<5 µg/l) groundwater monitoring wells around and under the plume to the plume limits defined after additional monitoring well installation in July 1996 (reference Figure 5, exhibit A to the Sparton memorandum). According to the report, the current plume is not completely defined, yet the plumes are similar in size and extent and the current plume is defined by more non-detects (23 wells) than the RFI plume limits (18 wells). It is fundamentally difficult to accept the report's position that more definition (wells) is less complete definition -- particularly in light of the corroborating/verifying geologic/hydrogeologic data that has very recently been provided for the Albuquerque area.

The report correctly notes on page 7 that Sparton's proposed corrective action relies in part on natural gradient flushing of the plume toward the containment well located at the leading edge of the plume, and agrees that Sparton's proposed corrective action "may eventually restore the groundwater" offsite. However, EPA incorrectly asserts that the 25 to 30 year time frame for natural gradient flushing is undocumented in either the Sparton Memorandum (exhibit A) or the CMS. On page 39 of exhibit A, it clearly states that the 25 to 30 year time frame is "based on the current rate of plume migration" which was previously described on page 19 as being less than 100 feet/year. This rate is consistent with the CMS and the plume limits defined by the July 1996 sampling and additional well installation. The natural gradient flushing time frame can be easily calculated by dividing the approximately 3,000-foot horizontal length of the plume by the current leading edge velocity of 100 feet per year to result in a 30-year time frame. It is believed that the containment well may increase the gradient (velocity) slightly and thus shorten the time frame.

The report also repeatedly points out that Sparton's proposed corrective action is less "aggressive" than EPA's remedial option. As previously discussed, "aggressive" methods may be less successful and more cost inefficient. In both the original Statement of Basis and the Final Decision and Response to Comments, EPA assumed a 30-year time frame for their selected "aggressive" remedy. Sparton's approach is less aggressive by design in the interest of efficiency in containment and contaminant removal.

Conclusions.

EPA and Sparton are in agreement that groundwater extraction is a feasible option to effectively contain the plume, although Sparton disputes EPA's hypothesis that the aquifer is a relatively uniform homogeneous and isotropic mix of sands and gravels and offsite contamination consists only of dissolved-phase. However, even if the aquifer were to consist only of sands

and gravels (which it obviously does not), Sparton's proposed remedy will also achieve the same remedial goals in the same time frame proposed by EPA in their remedial alternative.

EPA and Sparton disagree that aquifer restoration is a feasible option based on the aquifer characteristics and contaminant properties. However, EPA has provided no documentation of its position, whereas Sparton has thoroughly and completely documented the technical basis why aquifer restoration is "Technically Impracticable". Even if restoration is possible, Sparton further believes that it's proposed corrective action will achieve restoration at significantly less cost in approximately the same timeframe proposed in EPA's remedial alternative.

Sparton also disagrees "there is current or reasonably expected near-term use of the groundwater" from the impacted area as asserted by EPA. Through both the RFI and CMS, Sparton has thoroughly and completely documented the absence of risk/threat and potential receptors/exposure pathways. EPA has provided no documentation to the contrary

Attachment B to Chandler Report

Response to Reports of Michael S. Raimonde (EPA Exhibit 10 and Exhibit 17) on Treated Groundwater Injection and Cost Estimate for the Groundwater Extraction and Treatment System
Sparton, Technology, Inc., February 24, 1997

EPA EXHIBIT 10

The report by Michael S. Raimonde is incomplete, factually inaccurate, and poorly documented. The report offers general handbook quality information under Considerations for Injecting Treated Groundwater; however, no references or documentation are provided. The information is very general and, with the exception of a very limited discussion of iron, non-specific to conditions at Sparton -- either geologic/hydrogeologic or groundwater quality.

The report hypothesizes that reinjection is feasible, on the basis of limited, poorly documented water quality data purportedly from Sparton and limited, pre-1965, water quality data from Albuquerque municipal wells. The hypothesis is based on a partial comparison of the Sparton and Albuquerque water quality data to water quality data from an injection project in Tucson, Arizona (no reference given). Details on the Tucson project such as a treatment train, well injection rate, well design, aquifer properties, etc., are not given. The Sparton and Tucson water data are also neither documented nor referenced. In addition, the Albuquerque water data is over 30 years old and was obtained from deep wells some distance from the Sparton facility. The report also includes no information on geology/hydrogeology at the Tucson site nor attempts any comparison to the Sparton site. It is unfortunate that comparison to injection wells used elsewhere in the Albuquerque area was not provided.

Apparently, Mr. Raimonde is unfamiliar with the Albuquerque area geology/ hydrogeology/water quality information. Specifically, water quality at shallow depths is of poorer quality than typically pumped by deeper municipal wells. An example of shallow water quality can be found in Open-File Report

95-773 (USGS, 1996) for shallow water sampled from shallow wells in the Rio Grande Valley in 1993-1994. Recent Sparton data is also available from the fourth quarter 1996 sampling event. Of particular note, the report did not address the elevated silica content, organic carbon content, or sodium, nor did the report consider the impact of manganese. In addition, the report used ranges for parameters where averages may have been more useful for comparison.

Limited design and cost data is discussed under Cost Estimate and Considerations for Injection Well Design. Without providing any analyses, calculations, or documentation specific to the Sparton site, the report assumes that a 10-inch well is adequate for 600 gpm injection and a 6-inch well is adequate for 200 gpm. Both wells are assumed to be 400 feet deep with 200 feet of screen to match designs at the South Valley Superfund Site although no technical basis (or documentation) is given. Slot size was assumed to be 0.065 for the well screen; however, other than specifying type 316 stainless steel for the screen material, the construction (i.e., wire-wrapped continuous slot, perforated, etc.) was not given. It should be noted that, in EPA's position statement (page 61), EPA indicates that three injection wells may be required for 600 gpm injection. The report also assumes that low-carbon steel casing may be used for the well riser above the type 316 stainless-steel screen. Considering the water quality at shallow depth, and the potential for galvanic action and corrosion, the riser should also be stainless steel.

The cost estimates given in the report only cover installation (capital) costs for the injection wells. Costs for any additional water treatment (capital and O&M) required for reinjection were not included in the report. Annual operation and maintenance (O&M) costs including maintenance, depreciation (capital recovery), periodic rehabilitation and redevelopment, and accelerated replacement for a 30-year time frame remediation were not included. No present value analysis is given.

EPA EXHIBIT 17

Under BACKGROUND UNDERSTANDING, the report references constituent concentrations haphazardly obtained from the RFI and/or the CMS. Assumed influent constituent concentrations are given with no documentation or supporting calculations. The assumed influent concentrations seem unconservatively high even relative to average values reported in the CMS. Costs were based on a 200-gpm and a 600-gpm system.

Under DESCRIPTION OF THE CONCEPTUAL SYSTEM, it is assumed that electric service is available as well as surface property. The conceptual treatment train includes filtration, air stripping and carbon polishing to remove VOC, ion exchange to remove metals, and pH adjustment.

The conceptual treatment train does not provide either for de-airing of the produced water to avoid gas binding and/or biofouling during reinjection, nor does it include chlorination to retard bacterial growth and other biofouling agents during reinjection.

The description, concept schematic drawing and cost estimates are for a single-path treatment train. There are no parallel elements for treatments such as filtration and ion exchange. As a consequence, routine operations such as backflushing the filter or ion-regeneration/backwashing will require shutting down the entire system including the containment wells. More common design would include parallel elements so that water treatment would be more or less continuous.

The conceptual system does not address air removal from the treated water to minimize gas binding or air entrainment and/or biofouling, nor did it address chlorination to control bacterial contamination.

Extraction wells are described in the cost estimates as 10-inch x 300-foot wells. No information is given on screen length, type, or material, but they were assumed to be similar to the previous description in the report on injection wells.

The COST ESTIMATE section provides an unusual method of calculating total cost -- capital and a single year O&M are totaled. With respect to the itemized costs, there are serious omissions and egregious underestimation of costs in the two systems. As noted above, capital costs are apparently based on a single treatment unit for each system. However, there is no discussion of transfer pumps or piping to route contaminated water from each wellhead to the single treatment plant (600 gpm system). Note that a cost was parenthetically included in the previous injection well report (exhibit 10) for up to 1000 feet of pipeline to the injection well (no transfer pumps or surge tanks).

Consistent with the concept assumptions, costs did not include property acquisition, electric service, wellhead protection and/or other security devices. However, the most serious cost underestimation occurred in annual operation and maintenance (O&M) costs. The prescribed O&M costs are essentially electricity and labor costs only. The O&M costs did not include maintenance, depreciation (capital recovery), periodic rehabilitation and redevelopment of the wells, accelerated replacement, cost of expendables (carbon, resin, acid, etc.), and, most significantly, management and/or disposal of waste residues produced by the treatment system. The treatment train will result in a concentrated liquid waste stream estimated to be 5 to 10 percent of the system throughput. Based on the input assumptions, this waste residue may be hazardous by characteristic and significant management/ disposal costs are anticipated. The carbon polishing replacement/regeneration will also have significant cost impact.

The glaring cost omissions and errors, the total exclusion of waste residue management/disposal costs, the unusual cost summary, and the absence of

present value cost information for a 30-year remediation time frame suggest that Mr. Raimonde and engineers working under his direction are totally unfamiliar with groundwater extraction, treatment, and reinjection.

Attachment C to Chandler Report

Response to Report of Richard H. Kuhlthau on Modeled Impact to New Mexico Utilities Wells, Sparton Technology, Inc.

The computer model used was a personal computer (PC) executable program by Eric Lappala of Harding Lawson Associates and was developed after the semianalytical DOE model named Analytical Transient, One, Two, Three Dimensional (AT123D). Sparton used the model to simulate the general movement of the TCE plume (CMS Appendix 3) in order to forecast if any threat might be posed to the New Mexico Utilities (NMU) municipal well based on the information currently known about the plume and the area. The model was run using distances in feet, time in days, and concentrations in micrograms per liter (µg/l). Input parameters were given in the June 3, 1996, memorandum to EPA. Neither retardation nor chemical degradation was included in the simple dispersion modeling effort in the interest of maximizing constituent mass transport. The intent of the model was to show the limit on downgradient movement for the leading edge of the plume. Interior TCE concentrations were of less interest; however, two sample data output files (used for CMS Figure 2 - Calibration, and Figure 8 - 50 years After The Source Is Stopped) illustrating concentrations at various grid points are attached. The data is in the form x: y: log concentration. Electronic data files for other figures and other runs are contained in the six computer disks in the attached envelope.

The first simulation (Figure 1) though annotated as no dispersion, actually had the longitudinal and transverse units equal and set at 1 foot (and vertical dispersion at 0.1 foot). Obviously, the long narrow plume generated was nothing like the plume seen at Sparton; therefore, it did not seem necessary to determine the interior concentrations. Because of the shape of the plume with the dispersion set at 1 foot, the model was run varying the dispersion in the longitudinal and transverse directions until a plume of the general shape and size of the TCE plume actually seen at the site was reached. Vertical

dispersivity was maintained at 0.01 foot. It was observed that the ratio between longitudinal and transverse dispersion was opposite of what would normally be expected. However, as noted earlier, no retardation or degradation was input into the model. These two items along with the heterogeneity and anisotropy of the subsurface would undoubtedly have caused the leading edge to move slower while allowing the plume to expand transversely and to a much lesser degree vertically. In this case, dispersion alone was used to account for the outer shape (limits) of the plume and though the longitudinal and transverse values appear skewed, the computer model plume limits matched closely with the actual RFI plume limits and subsequent sampling and analysis have confirmed predictions of plume movement.

The source for the model was input as a line source five feet long and five feet deep with a concentration of 10,000 µg/l. This was the approximate size of the sump that released the TCE and the concentration of TCE seen at that location. Two conservative assumptions were made regarding the source. The first was that the source continued releasing TCE at 10,000 µg/l for up to 300 years. This was depicted on Figures 3 through 7. The second assumption was that the source stopped releasing after 20 years. Since the actual amount of TCE released was not known, these assumptions were believed to range on the high side of what might actually have been released. If the source were to be enlarged but the mass of TCE held constant, then the source concentration would have to be decreased. In essence, the effect of a larger source area under the same model parameters would have been a wider plume. The transverse dispersion would then have to be decreased proportionately to match the RFI limits; however, the longitudinal dispersion would remain about the same.

It should be noted again that this modeling effort was devised to be simplistic in its approach and was never intended to represent the complex conditions of the area. In order to look at the worst case potential for contaminants to reach the NMU well at concentration above the MCL, the

inputs for source, hydraulic gradient, hydraulic conductivity, and effective porosity were either values specific to the Sparton site or conservative assumptions. The purpose of using such a simplistic model was the belief that realistic plume limit migration would be less due to the heterogeneous anisotropic nature of the aquifer and the significant silt/clay content.

Attachments:

- Data for Figure 2
- Data for Figure 8
- Electronic Data Files

DATA FOR FIGURE 2

20 50

0.000	0.000	-4.999
100.000	0.000	-4.999
200.000	0.000	-4.999
300.000	0.000	-4.999
400.000	0.000	-4.999
500.000	0.000	-4.999
600.000	0.000	-4.999
700.000	0.000	-4.999
800.000	0.000	-4.999
900.000	0.000	-4.515
1000.000	0.000	-3.965
1100.000	0.000	-3.517
1200.000	0.000	-3.145
1300.000	0.000	-2.832
1400.000	0.000	-2.566
1500.000	0.000	-2.337
1600.000	0.000	-2.138
1700.000	0.000	-1.964
1800.000	0.000	-1.811
1900.000	0.000	-1.675
2000.000	0.000	-1.554
2100.000	0.000	-1.446
2200.000	0.000	-1.348
2300.000	0.000	-1.259
2400.000	0.000	-1.179
2500.000	0.000	-1.106
2600.000	0.000	-1.039
2700.000	0.000	-0.988
2800.000	0.000	-1.154
2900.000	0.000	-2.116
3000.000	0.000	-4.264
3100.000	0.000	-4.999
3200.000	0.000	-4.999
3300.000	0.000	-4.999
3400.000	0.000	-4.999
3500.000	0.000	-4.999
3600.000	0.000	-4.999
3700.000	0.000	-4.999
3800.000	0.000	-4.999
3900.000	0.000	-4.999
4000.000	0.000	-4.999
4100.000	0.000	-4.999
4200.000	0.000	-4.999
4300.000	0.000	-4.999
4400.000	0.000	-4.999
4500.000	0.000	-4.999
4600.000	0.000	-4.999
4700.000	0.000	-4.999
4800.000	0.000	-4.999
4900.000	0.000	-4.999
0.000	165.000	-4.999
100.000	165.000	-4.999
200.000	165.000	-4.999
300.000	165.000	-4.999
400.000	165.000	-4.999
500.000	165.000	-4.999
600.000	165.000	-4.999
700.000	165.000	-4.522
800.000	165.000	-3.821
900.000	165.000	-3.278
1000.000	165.000	-2.847
1100.000	165.000	-2.497
1200.000	165.000	-2.208
1300.000	165.000	-1.966
1400.000	165.000	-1.761
1500.000	165.000	-1.585
1600.000	165.000	-1.433
1700.000	165.000	-1.301
1800.000	165.000	-1.184
1900.000	165.000	-1.081
2000.000	165.000	-0.990
2100.000	165.000	-0.908
2200.000	165.000	-0.835
2300.000	165.000	-0.769
2400.000	165.000	-0.709
2500.000	165.000	-0.655
2600.000	165.000	-0.605
2700.000	165.000	-0.570
2800.000	165.000	-0.751
2900.000	165.000	-1.727
3000.000	165.000	-3.887
3100.000	165.000	-4.999
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3600.000	165.000	-4.999
3700.000	165.000	-4.999
3800.000	165.000	-4.999
3900.000	165.000	-4.999
4000.000	165.000	-4.999
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4600.000	165.000	-4.999
4700.000	165.000	-4.999
4800.000	165.000	-4.999
4900.000	165.000	-4.999
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100.000	330.000	-4.999
200.000	330.000	-4.999
300.000	330.000	-4.999
400.000	330.000	-4.999
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700.000	330.000	-3.117
800.000	330.000	-2.584
900.000	330.000	-2.175
1000.000	330.000	-1.852
1100.000	330.000	-1.592
1200.000	330.000	-1.378
1300.000	330.000	-1.199
1400.000	330.000	-1.049
1500.000	330.000	-0.921
1600.000	330.000	-0.810
1700.000	330.000	-0.714
1800.000	330.000	-0.630
1900.000	330.000	-0.557
2000.000	330.000	-0.491
2100.000	330.000	-0.433
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2300.000	330.000	-0.335
2400.000	330.000	-0.294
2500.000	330.000	-0.256
2600.000	330.000	-0.222
2700.000	330.000	-0.200
2800.000	330.000	-0.395
2900.000	330.000	-1.383
3000.000	330.000	-3.555
3100.000	330.000	-4.999
3200.000	330.000	-4.999
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3600.000	330.000	-4.999
3700.000	330.000	-4.999
3800.000	330.000	-4.999
3900.000	330.000	-4.999
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4600.000	330.000	-4.999
4700.000	330.000	-4.999
4800.000	330.000	-4.999
4900.000	330.000	-4.999
0.000	495.000	-4.999
100.000	495.000	-4.999
200.000	495.000	-4.999
300.000	495.000	-4.999
400.000	495.000	-4.251
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800.000	495.000	-1.504
900.000	495.000	-1.214
1000.000	495.000	-0.987
1100.000	495.000	-0.805
1200.000	495.000	-0.656
1300.000	495.000	-0.533
1400.000	495.000	-0.430
1500.000	495.000	-0.343
1600.000	495.000	-0.269
1700.000	495.000	-0.205
1800.000	495.000	-0.149
1900.000	495.000	-0.101
2000.000	495.000	-0.059
2100.000	495.000	-0.021
2200.000	495.000	0.012
2300.000	495.000	0.041
2400.000	495.000	0.067
2500.000	495.000	0.090
2600.000	495.000	0.111
2700.000	495.000	0.120
2800.000	495.000	-0.086
2900.000	495.000	-1.084
3000.000	495.000	-3.267
3100.000	495.000	-4.999
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3500.000	495.000	-4.999
3600.000	495.000	-4.999
3700.000	495.000	-4.999
3800.000	495.000	-4.999
3900.000	495.000	-4.999
4000.000	495.000	-4.999
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4600.000	495.000	-4.999
4700.000	495.000	-4.999
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4900.000	495.000	-4.999
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100.000	660.000	-4.999
200.000	660.000	-4.999
300.000	660.000	-3.733
400.000	660.000	-2.437
500.000	660.000	-1.674
600.000	660.000	-1.180
700.000	660.000	-0.836
800.000	660.000	-0.586
900.000	660.000	-0.398
1000.000	660.000	-0.252
1100.000	660.000	-0.137
1200.000	660.000	-0.044
1300.000	660.000	0.032
1400.000	660.000	0.094
1500.000	660.000	0.146
1600.000	660.000	0.190
1700.000	660.000	0.227
1800.000	660.000	0.259
1900.000	660.000	0.286
2000.000	660.000	0.309
2100.000	660.000	0.329
2200.000	660.000	0.346
2300.000	660.000	0.360
2400.000	660.000	0.373
2500.000	660.000	0.384
2600.000	660.000	0.394
2700.000	660.000	0.392
2800.000	660.000	0.176
2900.000	660.000	-0.831
3000.000	660.000	-3.022
3100.000	660.000	-4.999
3200.000	660.000	-4.999
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3500.000	660.000	-4.999
3600.000	660.000	-4.999
3700.000	660.000	-4.999
3800.000	660.000	-4.999
3900.000	660.000	-4.999
4000.000	660.000	-4.999
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4500.000	660.000	-4.999
4600.000	660.000	-4.999
4700.000	660.000	-4.999
4800.000	660.000	-4.999
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100.000	825.000	-4.999
200.000	825.000	-3.413
300.000	825.000	-1.738
400.000	825.000	-0.932
500.000	825.000	-0.469
600.000	825.000	-0.175
700.000	825.000	0.025
800.000	825.000	0.167
900.000	825.000	0.272
1000.000	825.000	0.351
1100.000	825.000	0.411
1200.000	825.000	0.458
1300.000	825.000	0.495
1400.000	825.000	0.525
1500.000	825.000	0.548
1600.000	825.000	0.567
1700.000	825.000	0.582
1800.000	825.000	0.594
1900.000	825.000	0.603
2000.000	825.000	0.610
2100.000	825.000	0.616
2200.000	825.000	0.620
2300.000	825.000	0.623
2400.000	825.000	0.624
2500.000	825.000	0.625
2600.000	825.000	0.626
2700.000	825.000	0.616
2800.000	825.000	0.392
2900.000	825.000	-0.623
3000.000	825.000	-2.821
3100.000	825.000	-4.999
3200.000	825.000	-4.999
3300.000	825.000	-4.999
3400.000	825.000	-4.999
3500.000	825.000	-4.999
3600.000	825.000	-4.999
3700.000	825.000	-4.999
3800.000	825.000	-4.999
3900.000	825.000	-4.999
4000.000	825.000	-4.999
4100.000	825.000	-4.999
4200.000	825.000	-4.999
4300.000	825.000	-4.999
4400.000	825.000	-4.999
4500.000	825.000	-4.999
4600.000	825.000	-4.999
4700.000	825.000	-4.999
4800.000	825.000	-4.999

4900.000	925.000	-4.999
0.000	990.000	-4.999
100.000	990.000	-3.958
200.000	990.000	-1.068
300.000	990.000	-0.167
400.000	990.000	0.248
500.000	990.000	0.475
600.000	990.000	0.612
700.000	990.000	0.699
800.000	990.000	0.757
900.000	990.000	0.796
1000.000	990.000	0.822
1100.000	990.000	0.840
1200.000	990.000	0.851
1300.000	990.000	0.858
1400.000	990.000	0.862
1500.000	990.000	0.863
1600.000	990.000	0.862
1700.000	990.000	0.859
1800.000	990.000	0.856
1900.000	990.000	0.851
2000.000	990.000	0.846
2100.000	990.000	0.840
2200.000	990.000	0.834
2300.000	990.000	0.828
2400.000	990.000	0.821
2500.000	990.000	0.814
2600.000	990.000	0.807
2700.000	990.000	0.790
2800.000	990.000	0.560
2900.000	990.000	-0.461
3000.000	990.000	-2.564
3100.000	990.000	-4.999
3200.000	990.000	-4.999
3300.000	990.000	-4.999
3400.000	990.000	-4.999
3500.000	990.000	-4.999
3600.000	990.000	-4.999
3700.000	990.000	-4.999
3800.000	990.000	-4.999
3900.000	990.000	-4.999
4000.000	990.000	-4.999
4100.000	990.000	-4.999
4200.000	990.000	-4.999
4300.000	990.000	-4.999
4400.000	990.000	-4.999
4500.000	990.000	-4.999
4600.000	990.000	-4.999
4700.000	990.000	-4.999
4800.000	990.000	-4.999
4900.000	990.000	-4.999
0.000	1155.000	-4.999
100.000	1155.000	-0.583
200.000	1155.000	0.633
300.000	1155.000	0.967
400.000	1155.000	1.098
500.000	1155.000	1.155
600.000	1155.000	1.179
700.000	1155.000	1.185
800.000	1155.000	1.182
900.000	1155.000	1.174
1000.000	1155.000	1.163
1100.000	1155.000	1.149
1200.000	1155.000	1.135
1300.000	1155.000	1.120
1400.000	1155.000	1.105
1500.000	1155.000	1.090
1600.000	1155.000	1.074
1700.000	1155.000	1.059
1800.000	1155.000	1.045
1900.000	1155.000	1.030
2000.000	1155.000	1.016
2100.000	1155.000	1.002
2200.000	1155.000	0.989
2300.000	1155.000	0.976
2400.000	1155.000	0.963
2500.000	1155.000	0.950
2600.000	1155.000	0.938
2700.000	1155.000	0.916
2800.000	1155.000	0.682
2900.000	1155.000	-0.343

3000.000	1155.000	-2.550
3100.000	1155.000	-4.999
3200.000	1155.000	-4.999
3300.000	1155.000	-4.999
3400.000	1155.000	-4.999
3500.000	1155.000	-4.999
3600.000	1155.000	-4.999
3700.000	1155.000	-4.999
3800.000	1155.000	-4.999
3900.000	1155.000	-4.999
4000.000	1155.000	-4.999
4100.000	1155.000	-4.999
4200.000	1155.000	-4.999
4300.000	1155.000	-4.999
4400.000	1155.000	-4.999
4500.000	1155.000	-4.999
4600.000	1155.000	-4.999
4700.000	1155.000	-4.999
4800.000	1155.000	-4.999
4900.000	1155.000	-4.999
0.000	1320.000	-4.999
100.000	1320.000	1.506
200.000	1320.000	1.678
300.000	1320.000	1.664
400.000	1320.000	1.621
500.000	1320.000	1.573
600.000	1320.000	1.527
700.000	1320.000	1.484
800.000	1320.000	1.444
900.000	1320.000	1.406
1000.000	1320.000	1.372
1100.000	1320.000	1.339
1200.000	1320.000	1.309
1300.000	1320.000	1.281
1400.000	1320.000	1.254
1500.000	1320.000	1.229
1600.000	1320.000	1.205
1700.000	1320.000	1.182
1800.000	1320.000	1.161
1900.000	1320.000	1.140
2000.000	1320.000	1.121
2100.000	1320.000	1.102
2200.000	1320.000	1.084
2300.000	1320.000	1.066
2400.000	1320.000	1.050
2500.000	1320.000	1.034
2600.000	1320.000	1.018
2700.000	1320.000	0.994
2800.000	1320.000	0.756
2900.000	1320.000	-0.271
3000.000	1320.000	-2.480
3100.000	1320.000	-4.999
3200.000	1320.000	-4.999
3300.000	1320.000	-4.999
3400.000	1320.000	-4.999
3500.000	1320.000	-4.999
3600.000	1320.000	-4.999
3700.000	1320.000	-4.999
3800.000	1320.000	-4.999
3900.000	1320.000	-4.999
4000.000	1320.000	-4.999
4100.000	1320.000	-4.999
4200.000	1320.000	-4.999
4300.000	1320.000	-4.999
4400.000	1320.000	-4.999
4500.000	1320.000	-4.999
4600.000	1320.000	-4.999
4700.000	1320.000	-4.999
4800.000	1320.000	-4.999
4900.000	1320.000	-4.999
0.000	1485.000	-4.999
100.000	1485.000	2.282
200.000	1485.000	2.066
300.000	1485.000	1.922
400.000	1485.000	1.815
500.000	1485.000	1.728
600.000	1485.000	1.656
700.000	1485.000	1.595
800.000	1485.000	1.541
900.000	1485.000	1.492
1000.000	1485.000	1.449

1100.000	1485.000	1.410
1200.000	1485.000	1.374
1300.000	1485.000	1.340
1400.000	1485.000	1.309
1500.000	1485.000	1.281
1600.000	1485.000	1.253
1700.000	1485.000	1.228
1800.000	1485.000	1.204
1900.000	1485.000	1.181
2000.000	1485.000	1.159
2100.000	1485.000	1.139
2200.000	1485.000	1.119
2300.000	1485.000	1.100
2400.000	1485.000	1.082
2500.000	1485.000	1.065
2600.000	1485.000	1.048
2700.000	1485.000	1.022
2800.000	1485.000	0.784
2900.000	1485.000	-0.244
3000.000	1485.000	-2.455
3100.000	1485.000	-4.999
3200.000	1485.000	-4.999
3300.000	1485.000	-4.999
3400.000	1485.000	-4.999
3500.000	1485.000	-4.999
3600.000	1485.000	-4.999
3700.000	1485.000	-4.999
3800.000	1485.000	-4.999
3900.000	1485.000	-4.999
4000.000	1485.000	-4.999
4100.000	1485.000	-4.999
4200.000	1485.000	-4.999
4300.000	1485.000	-4.999
4400.000	1485.000	-4.999
4500.000	1485.000	-4.999
4600.000	1485.000	-4.999
4700.000	1485.000	-4.999
4800.000	1485.000	-4.999
4900.000	1485.000	-4.999
0.000	1650.000	-4.999
100.000	1650.000	1.745
200.000	1650.000	1.797
300.000	1650.000	1.743
400.000	1650.000	1.680
500.000	1650.000	1.621
600.000	1650.000	1.567
700.000	1650.000	1.518
800.000	1650.000	1.473
900.000	1650.000	1.433
1000.000	1650.000	1.395
1100.000	1650.000	1.361
1200.000	1650.000	1.329
1300.000	1650.000	1.299
1400.000	1650.000	1.271
1500.000	1650.000	1.245
1600.000	1650.000	1.220
1700.000	1650.000	1.196
1800.000	1650.000	1.174
1900.000	1650.000	1.153
2000.000	1650.000	1.133
2100.000	1650.000	1.113
2200.000	1650.000	1.095
2300.000	1650.000	1.077
2400.000	1650.000	1.060
2500.000	1650.000	1.043
2600.000	1650.000	1.027
2700.000	1650.000	1.002
2800.000	1650.000	0.765
2900.000	1650.000	-0.263
3000.000	1650.000	-2.472
3100.000	1650.000	-4.999
3200.000	1650.000	-4.999
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1100 000	1650 000	-4 999
1200 000	1650 000	-4 999
1300 000	1650 000	-4 999
1400 000	1650 000	-4 999
1500 000	1650 000	-4 999
1600 000	1650 000	-4 999
1700 000	1650 000	-4 999
1800 000	1650 000	-4 999
1900 000	1650 000	-4 871
2000 000	1650 000	-4 603
2100 000	1650 000	-4 368
2200 000	1650 000	-4 149
2300 000	1650 000	-3 948
2400 000	1650 000	-3 764
2500 000	1650 000	-3 595
2600 000	1650 000	-3 439
2700 000	1650 000	-3 304
2800 000	1650 000	-3 393
2900 000	1650 000	-4 282
3000 000	1650 000	-4 999
3100 000	1650 000	-4 999
3200 000	1650 000	-4 999
3300 000	1650 000	-4 999
3400 000	1650 000	-4 999
3500 000	1650 000	-4 999
3600 000	1650 000	-4 999
3700 000	1650 000	-4 999
3800 000	1650 000	-4 999
3900 000	1650 000	-4 999
4000 000	1650 000	-4 999
4100 000	1650 000	-4 999
4200 000	1650 000	-4 999
4300 000	1650 000	-4 999
4400 000	1650 000	-4 999
4500 000	1650 000	-4 999
4600 000	1650 000	-4 999
4700 000	1650 000	-4 999
4800 000	1650 000	-4 999
4900 000	1650 000	-4 999
0 000	1815 000	-4 999
100 000	1815 000	-4 999
200 000	1815 000	-4 999
300 000	1815 000	-4 999
400 000	1815 000	-4 999
500 000	1815 000	-4 999
600 000	1815 000	-4 999
700 000	1815 000	-4 999
800 000	1815 000	-4 999
900 000	1815 000	-4 999
1000 000	1815 000	-4 999
1100 000	1815 000	-4 999
1200 000	1815 000	-4 999
1300 000	1815 000	-4 999
1400 000	1815 000	-4 999
1500 000	1815 000	-4 999
1600 000	1815 000	-4 999

1700 000	1815 000	-4 999
1800 000	1815 000	-4 999
1900 000	1815 000	-4 968
2000 000	1815 000	-4 696
2100 000	1815 000	-4 456
2200 000	1815 000	-4 233
2300 000	1815 000	-4 028
2400 000	1815 000	-3 841
2500 000	1815 000	-3 669
2600 000	1815 000	-3 510
2700 000	1815 000	-3 373
2800 000	1815 000	-3 459
2900 000	1815 000	-4 346
3000 000	1815 000	-4 999
3100 000	1815 000	-4 999
3200 000	1815 000	-4 999
3300 000	1815 000	-4 999
3400 000	1815 000	-4 999
3500 000	1815 000	-4 999
3600 000	1815 000	-4 999
3700 000	1815 000	-4 999
3800 000	1815 000	-4 999
3900 000	1815 000	-4 999
4000 000	1815 000	-4 999
4100 000	1815 000	-4 999
4200 000	1815 000	-4 999
4300 000	1815 000	-4 999
4400 000	1815 000	-4 999
4500 000	1815 000	-4 999
4600 000	1815 000	-4 999
4700 000	1815 000	-4 999
4800 000	1815 000	-4 999
4900 000	1815 000	-4 999
0 000	1980 000	-4 999
100 000	1980 000	-4 999
200 000	1980 000	-4 999
300 000	1980 000	-4 999
400 000	1980 000	-4 999
500 000	1980 000	-4 999
600 000	1980 000	-4 999
700 000	1980 000	-4 999
800 000	1980 000	-4 999
900 000	1980 000	-4 999
1000 000	1980 000	-4 999
1100 000	1980 000	-4 999
1200 000	1980 000	-4 999
1300 000	1980 000	-4 999
1400 000	1980 000	-4 999
1500 000	1980 000	-4 999
1600 000	1980 000	-4 999
1700 000	1980 000	-4 999
1800 000	1980 000	-4 999
1900 000	1980 000	-4 999
2000 000	1980 000	-4 854
2100 000	1980 000	-4 607
2200 000	1980 000	-4 376
2300 000	1980 000	-4 166
2400 000	1980 000	-3 973
2500 000	1980 000	-3 795
2600 000	1980 000	-3 632
2700 000	1980 000	-3 490
2800 000	1980 000	-3 572
2900 000	1980 000	-4 455
3000 000	1980 000	-4 999
3100 000	1980 000	-4 999
3200 000	1980 000	-4 999
3300 000	1980 000	-4 999
3400 000	1980 000	-4 999
3500 000	1980 000	-4 999
3600 000	1980 000	-4 999
3700 000	1980 000	-4 999
3800 000	1980 000	-4 999
3900 000	1980 000	-4 999
4000 000	1980 000	-4 999
4100 000	1980 000	-4 999
4200 000	1980 000	-4 999
4300 000	1980 000	-4 999
4400 000	1980 000	-4 999
4500 000	1980 000	-4 999
4600 000	1980 000	-4 999
4700 000	1980 000	-4 999

4800 000	1980 000	-4 999
4900 000	1980 000	-4 999
0 000	2145 000	-4 999
100 000	2145 000	-4 999
200 000	2145 000	-4 999
300 000	2145 000	-4 999
400 000	2145 000	-4 999
500 000	2145 000	-4 999
600 000	2145 000	-4 999
700 000	2145 000	-4 999
800 000	2145 000	-4 999
900 000	2145 000	-4 999
1000 000	2145 000	-4 999
1100 000	2145 000	-4 999
1200 000	2145 000	-4 999
1300 000	2145 000	-4 999
1400 000	2145 000	-4 999
1500 000	2145 000	-4 999
1600 000	2145 000	-4 999
1700 000	2145 000	-4 999
1800 000	2145 000	-4 999
1900 000	2145 000	-4 999
2000 000	2145 000	-4 999
2100 000	2145 000	-4 820
2200 000	2145 000	-4 580
2300 000	2145 000	-4 361
2400 000	2145 000	-4 159
2500 000	2145 000	-3 974
2600 000	2145 000	-3 804
2700 000	2145 000	-3 656
2800 000	2145 000	-3 732
2900 000	2145 000	-4 610
3000 000	2145 000	-4 999
3100 000	2145 000	-4 999
3200 000	2145 000	-4 999
3300 000	2145 000	-4 999
3400 000	2145 000	-4 999
3500 000	2145 000	-4 999
3600 000	2145 000	-4 999
3700 000	2145 000	-4 999
3800 000	2145 000	-4 999
3900 000	2145 000	-4 999
4000 000	2145 000	-4 999
4100 000	2145 000	-4 999
4200 000	2145 000	-4 999
4300 000	2145 000	-4 999
4400 000	2145 000	-4 999
4500 000	2145 000	-4 999
4600 000	2145 000	-4 999
4700 000	2145 000	-4 999
4800 000	2145 000	-4 999
4900 000	2145 000	-4 999
0 000	2310 000	-4 999
100 000	2310 000	-4 999
200 000	2310 000	-4 999
300 000	2310 000	-4 999
400 000	2310 000	-4 999
500 000	2310 000	-4 999
600 000	2310 000	-4 999
700 000	2310 000	-4 999
800 000	2310 000	-4 999
900 000	2310 000	-4 999
1000 000	2310 000	-4 999
1100 000	2310 000	-4 999
1200 000	2310 000	-4 999
1300 000	2310 000	-4 999
1400 000	2310 000	-4 999
1500 000	2310 000	-4 999
1600 000	2310 000	-4 999
1700 000	2310 000	-4 999
1800 000	2310 000	-4 999
1900 000	2310 000	-4 999
2000 000	2310 000	-4 999
2100 000	2310 000	-4 999
2200 000	2310 000	-4 999
2300 000	2310 000	-4 943
2400 000	2310 000	-4 812
2500 000	2310 000	-4 601
2600 000	2310 000	-4 226
2700 000	2310 000	-4 227
2800 000	2310 000	-3 873

2900 000	2310 000	-3 819
3000 000	2310 000	-4 999
3100 000	2310 000	-4 999
3200 000	2310 000	-4 999
3300 000	2310 000	-4 999
3400 000	2310 000	-4 999
3500 000	2310 000	-4 999
3600 000	2310 000	-4 999
3700 000	2310 000	-4 999
3800 000	2310 000	-4 999
3900 000	2310 000	-4 999
4000 000	2310 000	-4 999
4100 000	2310 000	-4 999
4200 000	2310 000	-4 999
4300 000	2310 000	-4 999
4400 000	2310 000	-4 999
4500 000	2310 000	-4 999
4600 000	2310 000	-4 999
4700 000	2310 000	-4 999
4800 000	2310 000	-4 999
4900 000	2310 000	-4 999
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100 000	2475 000	-4 999
200 000	2475 000	-4 999
300 000	2475 000	-4 999
400 000	2475 000	-4 999
500 000	2475 000	-4 999
600 000	2475 000	-4 999
700 000	2475 000	-4 999
800 000	2475 000	-4 999
900 000	2475 000	-4 999
1000 000	2475 000	-4 999
1100 000	2475 000	-4 999
1200 000	2475 000	-4 999
1300 000	2475 000	-4 999
1400 000	2475 000	-4 999
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1600 000	2475 000	-4 999
1700 000	2475 000	-4 999
1800 000	2475 000	-4 999
1900 000	2475 000	-4 999
2000 000	2475 000	-4 999
2100 000	2475 000	-4 999
2200 000	2475 000	-4 999
2300 000	2475 000	-4 921
2400 000	2475 000	-4 697
2500 000	2475 000	-4 490
2600 000	2475 000	-4 300
2700 000	2475 000	-4 133
2800 000	2475 000	-4 193
2900 000	2475 000	-4 999
3000 000	2475 000	-4 999
3100 000	2475 000	-4 999
3200 000	2475 000	-4 999
3300 000	2475 000	-4 999
3400 000	2475 000	-4 999
3500 000	2475 000	-4 999
3600 000	2475 000	-4 999
3700 000	2475 000	-4 999
3800 000	2475 000	-4 999
3900 000	2475 000	-4 999
4000 000	2475 000	-4 999
4100 000	2475 000	-4 999
4200 000	2475 000	-4 999
4300 000	2475 000	-4 999
4400 000	2475 000	-4 999
4500 000	2475 000	-4 999
4600 000	2475 000	-4 999
4700 000	2475 000	-4 999
4800 000	2475 000	-4 999
4900 000	2475 000	-4 999
0 000	2640 000	-4 999
100 000	2640 000	-4 999
200 000	2640 000	-4 999
300 000	2640 000	-4 999
400 000	2640 000	-4 999
500 000	2640 000	-4 999
600 000	2640 000	-4 999
700 000	2640 000	-4 999
800 000	2640 000	-4 999
900 000	2640 000	-4 999

1000 000	2640 000	-4 999
1100 000	2640 000	-4 999
1200 000	2640 000	-4 999
1300 000	2640 000	-4 999
1400 000	2640 000	-4 999
1500 000	2640 000	-4 999
1600 000	2640 000	-4 999
1700 000	2640 000	-4 999
1800 000	2640 000	-4 999
1900 000	2640 000	-4 999
2000 000	2640 000	-4 999
2100 000	2640 000	-4 999
2200 000	2640 000	-4 999
2300 000	2640 000	-4 999
2400 000	2640 000	-4 999
2500 000	2640 000	-4 827
2600 000	2640 000	-4 524
2700 000	2640 000	-4 445
2800 000	2640 000	-4 494
2900 000	2640 000	-4 999
3000 000	2640 000	-4 999
3100 000	2640 000	-4 999
3200 000	2640 000	-4 999
3300 000	2640 000	-4 999
3400 000	2640 000	-4 999
3500 000	2640 000	-4 999
3600 000	2640 000	-4 999
3700 000	2640 000	-4 999
3800 000	2640 000	-4 999
3900 000	2640 000	-4 999
4000 000	2640 000	-4 999
4100 000	2640 000	-4 999
4200 000	2640 000	-4 999
4300 000	2640 000	-4 999
4400 000	2640 000	-4 999
4500 000	2640 000	-4 999
4600 000	2640 000	-4 999
4700 000	2640 000	-4 999
4800 000	2640 000	-4 999
4900 000	2640 000	-4 999
0 000	2805 000	-4 999
100 000	2805 000	-4 999
200 000	2805 000	-4 999
300 000	2805 000	-4 999
400 000	2805 000	-4 999
500 000	2805 000	-4 999
600 000	2805 000	-4 999
700 000	2805 000	-4 999
800 000	2805 000	-4 999
900 000	2805 000	-4 999
1000 000	2805 000	-4 999
1100 000	2805 000	-4 999
1200 000	2805 000	-4 999
1300 000	2805 000	-4 999
1400 000	2805 000	-4 999
1500 000	2805 000	-4 999
1600 000	2805 000	-4 999
1700 000	2805 000	-4 999
1800 000	2805 000	-4 999
1900 000	2805 000	-4 999
2000 000	2805 000	-4 999
2100 000	2805 000	-4 999
2200 000	2805 000	-4 999
2300 000	2805 000	-4 999
2400 000	2805 000	-4 999
2500 000	2805 000	-4 999
2600 000	2805 000	-4 998
2700 000	2805 000	-4 806
2800 000	2805 000	-4 841
2900 000	2805 000	-4 999
3000 000	2805 000	-4 999
3100 000	2805 000	-4 999
3200 000	2805 000	-4 999
3300 000	2805 000	-4 999
3400 000	2805 000	-4 999
3500 000	2805 000	-4 999
3600 000	2805 000	-4 999
3700 000	2805 000	-4 999
3800 000	2805 000	-4 999
3900 000	2805 000	-4 999
4000 000	2805 000	-4 999

4100.000	2805.000	-4.999
4200.000	2805.000	-4.999
4300.000	2805.000	-4.999
4400.000	2805.000	-4.999
4500.000	2805.000	-4.999
4600.000	2805.000	-4.999
4700.000	2805.000	-4.999
4800.000	2805.000	-4.999
4900.000	2805.000	-4.999
0.000	2970.000	-4.999
100.000	2970.000	-4.999
200.000	2970.000	-4.999
300.000	2970.000	-4.999
400.000	2970.000	-4.999
500.000	2970.000	-4.999
600.000	2970.000	-4.999
700.000	2970.000	-4.999
800.000	2970.000	-4.999
900.000	2970.000	-4.999
1000.000	2970.000	-4.999
1100.000	2970.000	-4.999
1200.000	2970.000	-4.999
1300.000	2970.000	-4.999
1400.000	2970.000	-4.999
1500.000	2970.000	-4.999
1600.000	2970.000	-4.999
1700.000	2970.000	-4.999
1800.000	2970.000	-4.999
1900.000	2970.000	-4.999
2000.000	2970.000	-4.999
2100.000	2970.000	-4.999
2200.000	2970.000	-4.999
2300.000	2970.000	-4.999
2400.000	2970.000	-4.999
2500.000	2970.000	-4.999
2600.000	2970.000	-4.999
2700.000	2970.000	-4.999
2800.000	2970.000	-4.999
2900.000	2970.000	-4.999
3000.000	2970.000	-4.999
3100.000	2970.000	-4.999
3200.000	2970.000	-4.999
3300.000	2970.000	-4.999
3400.000	2970.000	-4.999
3500.000	2970.000	-4.999
3600.000	2970.000	-4.999
3700.000	2970.000	-4.999
3800.000	2970.000	-4.999
3900.000	2970.000	-4.999
4000.000	2970.000	-4.999
4100.000	2970.000	-4.999
4200.000	2970.000	-4.999
4300.000	2970.000	-4.999
4400.000	2970.000	-4.999
4500.000	2970.000	-4.999
4600.000	2970.000	-4.999
4700.000	2970.000	-4.999
4800.000	2970.000	-4.999
4900.000	2970.000	-4.999
0.000	3135.000	-4.999
100.000	3135.000	-4.999
200.000	3135.000	-4.999
300.000	3135.000	-4.999
400.000	3135.000	-4.999
500.000	3135.000	-4.999
600.000	3135.000	-4.999
700.000	3135.000	-4.999
800.000	3135.000	-4.999
900.000	3135.000	-4.999
1000.000	3135.000	-4.999
1100.000	3135.000	-4.999
1200.000	3135.000	-4.999
1300.000	3135.000	-4.999
1400.000	3135.000	-4.999
1500.000	3135.000	-4.999
1600.000	3135.000	-4.999
1700.000	3135.000	-4.999
1800.000	3135.000	-4.999
1900.000	3135.000	-4.999
2000.000	3135.000	-4.999
2100.000	3135.000	-4.999
2200.000	3135.000	-4.999
2300.000	3135.000	-4.999
2400.000	3135.000	-4.999
2500.000	3135.000	-4.999
2600.000	3135.000	-4.999
2700.000	3135.000	-4.999
2800.000	3135.000	-4.999
2900.000	3135.000	-4.999
3000.000	3135.000	-4.999
3100.000	3135.000	-4.999
3200.000	3135.000	-4.999
3300.000	3135.000	-4.999
3400.000	3135.000	-4.999
3500.000	3135.000	-4.999
3600.000	3135.000	-4.999
3700.000	3135.000	-4.999
3800.000	3135.000	-4.999
3900.000	3135.000	-4.999
4000.000	3135.000	-4.999
4100.000	3135.000	-4.999
4200.000	3135.000	-4.999
4300.000	3135.000	-4.999
4400.000	3135.000	-4.999
4500.000	3135.000	-4.999
4600.000	3135.000	-4.999
4700.000	3135.000	-4.999
4800.000	3135.000	-4.999
4900.000	3135.000	-4.999

DATA FOR FIGURE 8

SPARTON PLUME — SOURCE STOPPED — 50 YEARS

20	40	
0.000	0.000	-4.999
250.000	0.000	-4.999
500.000	0.000	-4.999
750.000	0.000	-4.999
1000.000	0.000	-4.999
1250.000	0.000	-4.999
1500.000	0.000	-4.999
1750.000	0.000	-4.999
2000.000	0.000	-4.999
2250.000	0.000	-4.999
2500.000	0.000	-4.999
2750.000	0.000	-3.361
3000.000	0.000	-2.229
3250.000	0.000	-2.016
3500.000	0.000	-1.836
3750.000	0.000	-1.681
4000.000	0.000	-1.548
4250.000	0.000	-1.432
4500.000	0.000	-1.333
4750.000	0.000	-1.965
5000.000	0.000	-4.999
5250.000	0.000	-4.999
5500.000	0.000	-4.999
5750.000	0.000	-4.999
6000.000	0.000	-4.999
6250.000	0.000	-4.999
6500.000	0.000	-4.999
6750.000	0.000	-4.999
7000.000	0.000	-4.999
7250.000	0.000	-4.999
7500.000	0.000	-4.999
7750.000	0.000	-4.999
8000.000	0.000	-4.999
8250.000	0.000	-4.999
8500.000	0.000	-4.999
8750.000	0.000	-4.999
9000.000	0.000	-4.999
9250.000	0.000	-4.999
9500.000	0.000	-4.999
9750.000	0.000	-4.999
0.000	210.000	-4.999
250.000	210.000	-4.999
500.000	210.000	-4.999
750.000	210.000	-4.999
1000.000	210.000	-4.999
1250.000	210.000	-4.999
1500.000	210.000	-4.999
1750.000	210.000	-4.999
2000.000	210.000	-4.999
2250.000	210.000	-4.999
2500.000	210.000	-4.999
2750.000	210.000	-2.664
3000.000	210.000	-1.589
3250.000	210.000	-1.425
3500.000	210.000	-1.287
3750.000	210.000	-1.169
4000.000	210.000	-1.068
4250.000	210.000	-0.980
4500.000	210.000	-0.906
4750.000	210.000	-1.561
5000.000	210.000	-4.999
5250.000	210.000	-4.999
5500.000	210.000	-4.999
5750.000	210.000	-4.999
6000.000	210.000	-4.999
6250.000	210.000	-4.999
6500.000	210.000	-4.999
6750.000	210.000	-4.999
7000.000	210.000	-4.999
7250.000	210.000	-4.999
7500.000	210.000	-4.999
7750.000	210.000	-4.999
8000.000	210.000	-4.999
8250.000	210.000	-4.999
8500.000	210.000	-4.999
8750.000	210.000	-4.999
9000.000	210.000	-4.999

9250.000	210.000	-4.999
9500.000	210.000	-4.999
9750.000	210.000	-4.999
0.000	420.000	-4.999
250.000	420.000	-4.999
500.000	420.000	-4.999
750.000	420.000	-4.999
1000.000	420.000	-4.999
1250.000	420.000	-4.999
1500.000	420.000	-4.999
1750.000	420.000	-4.999
2000.000	420.000	-4.999
2250.000	420.000	-4.999
2500.000	420.000	-4.999
2750.000	420.000	-2.043
3000.000	420.000	-1.020
3250.000	420.000	-0.900
3500.000	420.000	-0.799
3750.000	420.000	-0.714
4000.000	420.000	-0.641
4250.000	420.000	-0.579
4500.000	420.000	-0.527
4750.000	420.000	-1.202
5000.000	420.000	-4.999
5250.000	420.000	-4.999
5500.000	420.000	-4.999
5750.000	420.000	-4.999
6000.000	420.000	-4.999
6250.000	420.000	-4.999
6500.000	420.000	-4.999
6750.000	420.000	-4.999
7000.000	420.000	-4.999
7250.000	420.000	-4.999
7500.000	420.000	-4.999
7750.000	420.000	-4.999
8000.000	420.000	-4.999
8250.000	420.000	-4.999
8500.000	420.000	-4.999
8750.000	420.000	-4.999
9000.000	420.000	-4.999
9250.000	420.000	-4.999
9500.000	420.000	-4.999
9750.000	420.000	-4.999
0.000	630.000	-4.999
250.000	630.000	-4.999
500.000	630.000	-4.999
750.000	630.000	-4.999
1000.000	630.000	-4.999
1250.000	630.000	-4.999
1500.000	630.000	-4.999
1750.000	630.000	-4.999
2000.000	630.000	-4.999
2250.000	630.000	-4.999
2500.000	630.000	-4.999
2750.000	630.000	-1.499
3000.000	630.000	-0.522
3250.000	630.000	-0.440
3500.000	630.000	-0.372
3750.000	630.000	-0.315
4000.000	630.000	-0.268
4250.000	630.000	-0.227
4500.000	630.000	-0.194
4750.000	630.000	-0.887
5000.000	630.000	-4.999
5250.000	630.000	-4.999
5500.000	630.000	-4.999
5750.000	630.000	-4.999
6000.000	630.000	-4.999
6250.000	630.000	-4.999
6500.000	630.000	-4.999
6750.000	630.000	-4.999
7000.000	630.000	-4.999
7250.000	630.000	-4.999
7500.000	630.000	-4.999
7750.000	630.000	-4.999
8000.000	630.000	-4.999
8250.000	630.000	-4.999
8500.000	630.000	-4.999

8750.000	630.000	-4.999
9000.000	630.000	-4.999
9250.000	630.000	-4.999
9500.000	630.000	-4.999
9750.000	630.000	-4.999
0.000	840.000	-4.999
250.000	840.000	-4.999
500.000	840.000	-4.999
750.000	840.000	-4.999
1000.000	840.000	-4.999
1250.000	840.000	-4.999
1500.000	840.000	-4.999
1750.000	840.000	-4.999
2000.000	840.000	-4.999
2250.000	840.000	-4.999
2500.000	840.000	-4.999
2750.000	840.000	-1.033
3000.000	840.000	-0.095
3250.000	840.000	-0.066
3500.000	840.000	-0.006
3750.000	840.000	0.026
4000.000	840.000	0.053
4250.000	840.000	0.075
4500.000	840.000	0.090
4750.000	840.000	-0.617
5000.000	840.000	-4.999
5250.000	840.000	-4.999
5500.000	840.000	-4.999
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6000.000	840.000	-4.999
6250.000	840.000	-4.999
6500.000	840.000	-4.999
6750.000	840.000	-4.999
7000.000	840.000	-4.999
7250.000	840.000	-4.999
7500.000	840.000	-4.999
7750.000	840.000	-4.999
8000.000	840.000	-4.999
8250.000	840.000	-4.999
8500.000	840.000	-4.999
8750.000	840.000	-4.999
9000.000	840.000	-4.999
9250.000	840.000	-4.999
9500.000	840.000	-4.999
9750.000	840.000	-4.999
0.000	1050.000	-4.999
250.000	1050.000	-4.999
500.000	1050.000	-4.999
750.000	1050.000	-4.999
1000.000	1050.000	-4.999
1250.000	1050.000	-4.999
1500.000	1050.000	-4.999
1750.000	1050.000	-4.999
2000.000	1050.000	-4.999
2250.000	1050.000	-4.999
2500.000	1050.000	-4.999
2750.000	1050.000	-0.644
3000.000	1050.000	0.261
3250.000	1050.000	0.283
3500.000	1050.000	0.299
3750.000	1050.000	0.311
4000.000	1050.000	0.320
4250.000	1050.000	0.326
4500.000	1050.000	0.328
4750.000	1050.000	-0.392
5000.000	1050.000	-4.858
5250.000	1050.000	-4.999
5500.000	1050.000	-4.999
5750.000	1050.000	-4.999
6000.000	1050.000	-4.999
6250.000	1050.000	-4.999
6500.000	1050.000	-4.999
6750.000	1050.000	-4.999
7000.000	1050.000	-4.999
7250.000	1050.000	-4.999
7500.000	1050.000	-4.999
7750.000	1050.000	-4.999
8000.000	1050.000	-4.999

5250.000	1050.000	-4.999
8500.000	1050.000	-4.999
8750.000	1050.000	-4.999
9000.000	1050.000	-4.999
9250.000	1050.000	-4.999
9500.000	1050.000	-4.999
9750.000	1050.000	-4.999
0.000	1260.000	-4.999
250.000	1260.000	-4.999
500.000	1260.000	-4.999
750.000	1260.000	-4.999
1000.000	1260.000	-4.999
1250.000	1260.000	-4.999
1500.000	1260.000	-4.999
1750.000	1260.000	-4.999
2000.000	1260.000	-4.999
2250.000	1260.000	-4.999
2500.000	1260.000	-4.999
2750.000	1260.000	-0.333
3000.000	1260.000	0.547
3250.000	1260.000	0.547
3500.000	1260.000	0.544
3750.000	1260.000	0.540
4000.000	1260.000	0.534
4250.000	1260.000	0.527
4500.000	1260.000	0.518
4750.000	1260.000	-0.212
5000.000	1260.000	-4.687
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5500.000	1260.000	-4.999
5750.000	1260.000	-4.999
6000.000	1260.000	-4.999
6250.000	1260.000	-4.999
6500.000	1260.000	-4.999
6750.000	1260.000	-4.999
7000.000	1260.000	-4.999
7250.000	1260.000	-4.999
7500.000	1260.000	-4.999
7750.000	1260.000	-4.999
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8500.000	1260.000	-4.999
8750.000	1260.000	-4.999
9000.000	1260.000	-4.999
9250.000	1260.000	-4.999
9500.000	1260.000	-4.999
9750.000	1260.000	-4.999
0.000	1470.000	-4.999
250.000	1470.000	-4.999
500.000	1470.000	-4.999
750.000	1470.000	-4.999
1000.000	1470.000	-4.999
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1500.000	1470.000	-4.999
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2000.000	1470.000	-4.999
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2500.000	1470.000	-4.999
2750.000	1470.000	-0.099
3000.000	1470.000	0.761
3250.000	1470.000	0.745
3500.000	1470.000	0.728
3750.000	1470.000	0.711
4000.000	1470.000	0.695
4250.000	1470.000	0.679
4500.000	1470.000	0.661
4750.000	1470.000	-0.076
5000.000	1470.000	-4.558
5250.000	1470.000	-4.999
5500.000	1470.000	-4.999
5750.000	1470.000	-4.999
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6750.000	1470.000	-4.999
7000.000	1470.000	-4.999
7250.000	1470.000	-4.999
7500.000	1470.000	-4.999

7750.000	1470.000	-4.999
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8500.000	1470.000	-4.999
8750.000	1470.000	-4.999
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9250.000	1470.000	-4.999
9500.000	1470.000	-4.999
9750.000	1470.000	-4.999
0.000	1680.000	-4.999
250.000	1680.000	-4.999
500.000	1680.000	-4.999
750.000	1680.000	-4.999
1000.000	1680.000	-4.999
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1500.000	1680.000	-4.999
1750.000	1680.000	-4.999
2000.000	1680.000	-4.999
2250.000	1680.000	-4.999
2500.000	1680.000	-4.999
2750.000	1680.000	0.057
3000.000	1680.000	0.905
3250.000	1680.000	0.877
3500.000	1680.000	0.851
3750.000	1680.000	0.826
4000.000	1680.000	0.803
4250.000	1680.000	0.780
4500.000	1680.000	0.757
4750.000	1680.000	0.014
5000.000	1680.000	-4.472
5250.000	1680.000	-4.999
5500.000	1680.000	-4.999
5750.000	1680.000	-4.999
6000.000	1680.000	-4.999
6250.000	1680.000	-4.999
6500.000	1680.000	-4.999
6750.000	1680.000	-4.999
7000.000	1680.000	-4.999
7250.000	1680.000	-4.999
7500.000	1680.000	-4.999
7750.000	1680.000	-4.999
8000.000	1680.000	-4.999
8250.000	1680.000	-4.999
8500.000	1680.000	-4.999
8750.000	1680.000	-4.999
9000.000	1680.000	-4.999
9250.000	1680.000	-4.999
9500.000	1680.000	-4.999
9750.000	1680.000	-4.999
0.000	1890.000	-4.999
250.000	1890.000	-4.999
500.000	1890.000	-4.999
750.000	1890.000	-4.999
1000.000	1890.000	-4.999
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1500.000	1890.000	-4.999
1750.000	1890.000	-4.999
2000.000	1890.000	-4.999
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2500.000	1890.000	-4.999
2750.000	1890.000	0.137
3000.000	1890.000	0.977
3250.000	1890.000	0.944
3500.000	1890.000	0.913
3750.000	1890.000	0.884
4000.000	1890.000	0.857
4250.000	1890.000	0.831
4500.000	1890.000	0.805
4750.000	1890.000	0.060
5000.000	1890.000	-4.428
5250.000	1890.000	-4.999
5500.000	1890.000	-4.999
5750.000	1890.000	-4.999
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6250.000	1890.000	-4.999
6500.000	1890.000	-4.999
6750.000	1890.000	-4.999
7000.000	1890.000	-4.999
7250.000	1890.000	-4.999
7500.000	1890.000	-4.999
7750.000	1890.000	-4.999
8000.000	1890.000	-4.999
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8500.000	1890.000	-4.999
8750.000	1890.000	-4.999
9000.000	1890.000	-4.999
9250.000	1890.000	-4.999
9500.000	1890.000	-4.999

250.000	2100.000	-4.999
500.000	2100.000	-4.999
750.000	2100.000	-4.999
1000.000	2100.000	-4.999
1250.000	2100.000	-4.999
1500.000	2100.000	-4.999
1750.000	2100.000	-4.999
2000.000	2100.000	-4.999
2250.000	2100.000	-4.999
2500.000	2100.000	-4.999
2750.000	2100.000	0.138
3000.000	2100.000	0.979
3250.000	2100.000	0.946
3500.000	2100.000	0.915
3750.000	2100.000	0.886
4000.000	2100.000	0.858
4250.000	2100.000	0.833
4500.000	2100.000	0.808
4750.000	2100.000	0.061
5000.000	2100.000	-4.427
5250.000	2100.000	-4.999
5500.000	2100.000	-4.999
5750.000	2100.000	-4.999
6000.000	2100.000	-4.999
6250.000	2100.000	-4.999
6500.000	2100.000	-4.999
6750.000	2100.000	-4.999
7000.000	2100.000	-4.999
7250.000	2100.000	-4.999
7500.000	2100.000	-4.999
7750.000	2100.000	-4.999
8000.000	2100.000	-4.999
8250.000	2100.000	-4.999
8500.000	2100.000	-4.999
8750.000	2100.000	-4.999
9000.000	2100.000	-4.999
9250.000	2100.000	-4.999
9500.000	2100.000	-4.999
9750.000	2100.000	-4.999
0.000	2310.000	-4.999
250.000	2310.000	-4.999
500.000	2310.000	-4.999
750.000	2310.000	-4.999
1000.000	2310.000	-4.999
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1500.000	2310.000	-4.999
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2000.000	2310.000	-4.999
2250.000	2310.000	-4.999
2500.000	2310.000	-4.999
2750.000	2310.000	0.063
3000.000	2310.000	0.910
3250.000	2310.000	0.882
3500.000	2310.000	0.855
3750.000	2310.000	0.830
4000.000	2310.000	0.806
4250.000	2310.000	0.784
4500.000	2310.000	0.760
4750.000	2310.000	0.017
5000.000	2310.000	-4.469
5250.000	2310.000	-4.999
5500.000	2310.000	-4.999
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6250.000	2310.000	-4.999
6500.000	2310.000	-4.999
6750.000	2310.000	-4.999
7000.000	2310.000	-4.999
7250.000	2310.000	-4.999
7500.000	2310.000	-4.999
7750.000	2310.000	-4.999
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8500.000	2310.000	-4.999
8750.000	2310.000	-4.999
9000.000	2310.000	-4.999
9250.000	2310.000	-4.999
9500.000	2310.000	-4.999
9750.000	2310.000	-4.999
0.000	2520.000	-4.999
250.000	2520.000	-4.999
500.000	2520.000	-4.999
750.000	2520.000	-4.999
1000.000	2520.000	-4.999
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1500.000	2520.000	-4.999
1750.000	2520.000	-4.999
2000.000	2520.000	-4.999

2250.000	2520.000	-4.999
2500.000	2520.000	-4.999
2750.000	2520.000	-0.090
3000.000	2520.000	0.770
3250.000	2520.000	0.752
3500.000	2520.000	0.735
3750.000	2520.000	0.718
4000.000	2520.000	0.701
4250.000	2520.000	0.685
4500.000	2520.000	0.667
4750.000	2520.000	-0.071
5000.000	2520.000	-4.553
5250.000	2520.000	-4.999
5500.000	2520.000	-4.999
5750.000	2520.000	-4.999
6000.000	2520.000	-4.999
6250.000	2520.000	-4.999
6500.000	2520.000	-4.999
6750.000	2520.000	-4.999
7000.000	2520.000	-4.999
7250.000	2520.000	-4.999
7500.000	2520.000	-4.999
7750.000	2520.000	-4.999
8000.000	2520.000	-4.999
8250.000	2520.000	-4.999
8500.000	2520.000	-4.999
8750.000	2520.000	-4.999
9000.000	2520.000	-4.999
9250.000	2520.000	-4.999
9500.000	2520.000	-4.999
9750.000	2520.000	-4.999
0.000	2730.000	-4.999
250.000	2730.000	-4.999
500.000	2730.000	-4.999
750.000	2730.000	-4.999
1000.000	2730.000	-4.999
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1500.000	2730.000	-4.999
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2000.000	2730.000	-4.999
2250.000	2730.000	-4.999
2500.000	2730.000	-4.999
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3000.000	2730.000	0.559
3250.000	2730.000	0.558
3500.000	2730.000	0.554
3750.000	2730.000	0.549
4000.000	2730.000	0.543
4250.000	2730.000	0.536
4500.000	2730.000	0.526
4750.000	2730.000	-0.204
5000.000	2730.000	-4.679
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5500.000	2730.000	-4.999
5750.000	2730.000	-4.999
6000.000	2730.000	-4.999
6250.000	2730.000	-4.999
6500.000	2730.000	-4.999
6750.000	2730.000	-4.999
7000.000	2730.000	-4.999
7250.000	2730.000	-4.999
7500.000	2730.000	-4.999
7750.000	2730.000	-4.999
8000.000	2730.000	-4.999
8250.000	2730.000	-4.999
8500.000	2730.000	-4.999
8750.000	2730.000	-4.999
9000.000	2730.000	-4.999
9250.000	2730.000	-4.999
9500.000	2730.000	-4.999
9750.000	2730.000	-4.999
0.000	2940.000	-4.999
250.000	2940.000	-4.999
500.000	2940.000	-4.999
750.000	2940.000	-4.999
1000.000	2940.000	-4.999
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1500.000	2940.000	-4.999
1750.000	2940.000	-4.999
2000.000	2940.000	-4.999
2250.000	2940.000	-4.999
2500.000	2940.000	-4.999
2750.000	2940.000	-0.628
3000.000	2940.000	0.277
3250.000	2940.000	0.297
3500.000	2940.000	0.312
3750.000	2940.000	0.324
4000.000	2940.000	0.331

5000.000	2940.000	-4.849
5250.000	2940.000	-4.999
5500.000	2940.000	-4.999
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6250.000	2940.000	-4.999
6500.000	2940.000	-4.999
6750.000	2940.000	-4.999
7000.000	2940.000	-4.999
7250.000	2940.000	-4.999
7500.000	2940.000	-4.999
7750.000	2940.000	-4.999
8000.000	2940.000	-4.999
8250.000	2940.000	-4.999
8500.000	2940.000	-4.999
8750.000	2940.000	-4.999
9000.000	2940.000	-4.999
9250.000	2940.000	-4.999
9500.000	2940.000	-4.999
9750.000	2940.000	-4.999
0.000	3150.000	-4.999
250.000	3150.000	-4.999
500.000	3150.000	-4.999
750.000	3150.000	-4.999
1000.000	3150.000	-4.999
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1500.000	3150.000	-4.999
1750.000	3150.000	-4.999
2000.000	3150.000	-4.999
2250.000	3150.000	-4.999
2500.000	3150.000	-4.999
2750.000	3150.000	-1.013
3000.000	3150.000	-0.076
3250.000	3150.000	-0.028
3500.000	3150.000	0.010
3750.000	3150.000	0.041
4000.000	3150.000	0.067
4250.000	3150.000	0.088
4500.000	3150.000	0.103
4750.000	3150.000	-0.605
5000.000	3150.000	-4.999
5250.000	3150.000	-4.999
5500.000	3150.000	-4.999
5750.000	3150.000	-4.999
6000.000	3150.000	-4.999
6250.000	3150.000	-4.999
6500.000	3150.000	-4.999
6750.000	3150.000	-4.999
7000.000	3150.000	-4.999
7250.000	3150.000	-4.999
7500.000	3150.000	-4.999
7750.000	3150.000	-4.999
8000.000	3150.000	-4.999
8250.000	3150.000	-4.999
8500.000	3150.000	-4.999
8750.000	3150.000	-4.999
9000.000	3150.000	-4.999
9250.000	3150.000	-4.999
9500.000	3150.000	-4.999
9750.000	3150.000	-4.999
0.000	3360.000	-4.999
250.000	3360.000	-4.999
500.000	3360.000	-4.999
750.000	3360.000	-4.999
1000.000	3360.000	-4.999
1250.000	3360.000	-4.999
1500.000	3360.000	-4.999
1750.000	3360.000	-4.999
2000.000	3360.000	-4.999
2250.000	3360.000	-4.999
2500.000	3360.000	-4.999
2750.000	3360.000	-1.475
3000.000	3360.000	-0.500
3250.000	3360.000	-0.420
3500.000	3360.000	-0.353
3750.000	3360.000	-0.298
4000.000	3360.000	-0.251
4250.000	3360.000	-0.212
4500.000	3360.000	-0.180
4750.000	3360.000	-0.873
5000.000	3360.000	-4.999
5250.000	3360.000	-4.999
5500.000	3360.000	-4.9 9
5750.000	3360.000	-4.999
6000.000	3360.000	-4.999
6250.000	3360.000	-4.999
6500.000	3360.000	-4.999
6750.000	3360.000	-4.999

7750.000	3360.000	-4.999
8000.000	3360.000	-4.999
8250.000	3360.000	-4.999
8500.000	3360.000	-4.999
8750.000	3360.000	-4.999
9000.000	3360.000	-4.999
9250.000	3360.000	-4.999
9500.000	3360.000	-4.999
9750.000	3360.000	-4.999
0.000	3570.000	-4.999
250.000	3570.000	-4.999
500.000	3570.000	-4.999
750.000	3570.000	-4.999
1000.000	3570.000	-4.999
1250.000	3570.000	-4.999
1500.000	3570.000	-4.999
1750.000	3570.000	-4.999
2000.000	3570.000	-4.999
2250.000	3570.000	-4.999
2500.000	3570.000	-4.999
2750.000	3570.000	-2.015
3000.000	3570.000	-0.995
3250.000	3570.000	-0.876
3500.000	3570.000	-0.777
3750.000	3570.000	-0.694
4000.000	3570.000	-0.622
4250.000	3570.000	-0.561
4500.000	3570.000	-0.510
4750.000	3570.000	-1.186
5000.000	3570.000	-4.999
5250.000	3570.000	-4.999
5500.000	3570.000	-4.999
5750.000	3570.000	-4.999
6000.000	3570.000	-4.999
6250.000	3570.000	-4.999
6500.000	3570.000	-4.999
6750.000	3570.000	-4.999
7000.000	3570.000	-4.999
7250.000	3570.000	-4.999
7500.000	3570.000	-4.999
7750.000	3570.000	-4.999
8000.000	3570.000	-4.999
8250.000	3570.000	-4.999
8500.000	3570.000	-4.999
8750.000	3570.000	-4.999
9000.000	3570.000	-4.999
9250.000	3570.000	-4.999
9500.000	3570.000	-4.999
9750.000	3570.000	-4.999
0.000	3780.000	-4.999
250.000	3780.000	-4.999
500.000	3780.000	-4.999
750.000	3780.000	-4.999
1000.000	3780.000	-4.999
1250.000	3780.000	-4.999
1500.000	3780.000	-4.999
1750.000	3780.000	-4.999
2000.000	3780.000	-4.999
2250.000	3780.000	-4.999
2500.000	3780.000	-4.999
2750.000	3780.000	-2.632
3000.000	3780.000	-1.561
3250.000	3780.000	-1.399
3500.000	3780.000	-1.262
3750.000	3780.000	-1.146
4000.000	3780.000	-1.047
4250.000	3780.000	-0.960
4500.000	3780.000	-0.887
4750.000	3780.000	-1.543
5000.000	3780.000	-4.999
5250.000	3780.000	-4.999
5500.000	3780.000	-4.999
5750.000	3780.000	-4.999
6000.000	3780.000	-4.999
6250.000	3780.000	-4.999
6500.000	3780.000	-4.999
6750.000	3780.000	-4.999
7000.000	3780.000	-4.999
7250.000	3780.000	-4.999
7500.000	3780.000	-4.999
7750.000	3780.000	-4.999
8000.000	3780.000	-4.999
8250.000	3780.000	-4.999
8500.000	3780.000	-4.999
8750.000	3780.000	-4.999
9000.000	3780.000	-4.999
9250.000	3780.000	-4.999
9500.000	3780.000	-4.999

3500.000	3990.000	-1.808
3750.000	3990.000	-1.656
4000.000	3990.000	-1.524
4250.000	3990.000	-1.410
4500.000	3990.000	-1.311
4750.000	3990.000	-1.945
5000.000	3990.000	-4.999
5250.000	3990.000	-4.999
5500.000	3990.000	-4.999
5750.000	3990.000	-4.999
6000.000	3990.000	-4.999
6250.000	3990.000	-4.999
6500.000	3990.000	-4.999
6750.000	3990.000	-4.999
7000.000	3990.000	-4.999
7250.000	3990.000	-4.999
7500.000	3990.000	-4.999
7750.000	3990.000	-4.999
8000.000	3990.000	-4.999
8250.000	3990.000	-4.999
8500.000	3990.000	-4.999
8750.000	3990.000	-4.999
9000.000	3990.000	-4.999
9250.000	3990.000	-4.999
9500.000	3990.000	-4.999
9750.000	3990.000	-4.999
0.000	0.000	-4.999
250.000	0.000	-4.999
500.000	0.000	-4.999
750.000	0.000	-4.999
1000.000	0.000	-4.999
1250.000	0.000	-4.999
1500.000	0.000	-4.999
1750.000	0.000	-4.999
2000.000	0.000	-4.999
2250.000	0.000	-4.999
2500.000	0.000	-4.999
2750.000	0.000	-3.741
3000.000	0.000	-2.579
3250.000	0.000	-2.339
3500.000	0.000	-2.137
3750.000	0.000	-1.963
4000.000	0.000	-1.813
4250.000	0.000	-1.681
4500.000	0.000	-1.568
4750.000	0.000	-2.189
5000.000	0.000	-4.999
5250.000	0.000	-4.999
5500.000	0.000	-4.999
5750.000	0.000	-4.999
6000.000	0.000	-4.999
6250.000	0.000	-4.999
6500.000	0.000	-4.999
6750.000	0.000	-4.999
7000.000	0.000	-4.999
7250.000	0.000	-4.999
7500.000	0.000	-4.999
7750.000	0.000	-4.999
8000.000	0.000	-4.999
8250.000	0.000	-4.999
8500.000	0.000	-4.999
8750.000	0.000	-4.999
9000.000	0.000	-4.999
9250.000	0.000	-4.999
9500.000	0.000	-4.999
9750.000	0.000	-4.999
0.000	210.000	-4.999
250.000	210.000	-4.999
500.000	210.000	-4.999
750.000	210.000	-4.999
1000.000	210.000	-4.999
1250.000	210.000	-4.999
1500.000	210.000	-4.999
1750.000	210.000	-4.999
2000.000	210.000	-4.999
2250.000	210.000	-4.999
2500.000	210.000	-4.999
2750.000	210.000	-3.044
3000.000	210.000	-1.939
3250.000	210.000	-1.749
3500.000	210.000	-1.588
3750.000	210.000	-1.451
4000.000	210.000	-1.332
4250.000	210.000	-1.230
4500.000	210.000	-1.142
4750.000	210.000	-1.785
5000.000	210.000	-4.999
5250.000	210.000	-4.999

6500.000	210.000	-4.999
6750.000	210.000	-4.999
7000.000	210.000	-4.999
7250.000	210.000	-4.999
7500.000	210.000	-4.999
7750.000	210.000	-4.999
8000.000	210.000	-4.999
8250.000	210.000	-4.999
8500.000	210.000	-4.999
8750.000	210.000	-4.999
9000.000	210.000	-4.999
9250.000	210.000	-4.999
9500.000	210.000	-4.999
9750.000	210.000	-4.999
0.000	420.000	-4.999
250.000	420.000	-4.999
500.000	420.000	-4.999
750.000	420.000	-4.999
1000.000	420.000	-4.999
1250.000	420.000	-4.999
1500.000	420.000	-4.999
1750.000	420.000	-4.999
2000.000	420.000	-4.999
2250.000	420.000	-4.999
2500.000	420.000	-4.999
2750.000	420.000	-2.423
3000.000	420.000	-1.370
3250.000	420.000	-1.223
3500.000	420.000	-1.100
3750.000	420.000	-0.996
4000.000	420.000	-0.906
4250.000	420.000	-0.828
4500.000	420.000	-0.762
4750.000	420.000	-1.425
5000.000	420.000	-4.999
5250.000	420.000	-4.999
5500.000	420.000	-4.999
5750.000	420.000	-4.999
6000.000	420.000	-4.999
6250.000	420.000	-4.999
6500.000	420.000	-4.999
6750.000	420.000	-4.999
7000.000	420.000	-4.999
7250.000	420.000	-4.999
7500.000	420.000	-4.999
7750.000	420.000	-4.999
8000.000	420.000	-4.999
8250.000	420.000	-4.999
8500.000	420.000	-4.999
8750.000	420.000	-4.999
9000.000	420.000	-4.999
9250.000	420.000	-4.999
9500.000	420.000	-4.999
9750.000	420.000	-4.999
0.000	630.000	-4.999
250.000	630.000	-4.999
500.000	630.000	-4.999
750.000	630.000	-4.999
1000.000	630.000	-4.999
1250.000	630.000	-4.999
1500.000	630.000	-4.999
1750.000	630.000	-4.999
2000.000	630.000	-4.999
2250.000	630.000	-4.999
2500.000	630.000	-4.999
2750.000	630.000	-1.879
3000.000	630.000	-0.872
3250.000	630.000	-0.763
3500.000	630.000	-0.673
3750.000	630.000	-0.597
4000.000	630.000	-0.532
4250.000	630.000	-0.476
4500.000	630.000	-0.430
4750.000	630.000	-1.111
5000.000	630.000	-4.999
5250.000	630.000	-4.999
5500.000	630.000	-4.999
5750.000	630.000	-4.999
6000.000	630.000	-4.999
6250.000	630.000	-4.999
6500.000	630.000	-4.999
6750.000	630.000	-4.999
7000.000	630.000	-4.999
7250.000	630.000	-4.999
7500.000	630.000	-4.999
7750.000	630.000	-4.999
8000.000	630.000	-4.999

250.000	840.000	-4.999
500.000	840.000	-4.999
750.000	840.000	-4.999
1000.000	840.000	-4.999
1250.000	840.000	-4.999
1500.000	840.000	-4.999
1750.000	840.000	-4.999
2000.000	840.000	-4.999
2250.000	840.000	-4.999
2500.000	840.000	-4.999
2750.000	840.000	-1.413
3000.000	840.000	-0.444
3250.000	840.000	-0.369
3500.000	840.000	-0.307
3750.000	840.000	-0.255
4000.000	840.000	-0.212
4250.000	840.000	-0.175
4500.000	840.000	-0.145
4750.000	840.000	-0.841
5000.000	840.000	-4.999
5250.000	840.000	-4.999
5500.000	840.000	-4.999
5750.000	840.000	-4.999
6000.000	840.000	-4.999
6250.000	840.000	-4.999
6500.000	840.000	-4.999
6750.000	840.000	-4.999
7000.000	840.000	-4.999
7250.000	840.000	-4.999
7500.000	840.000	-4.999
7750.000	840.000	-4.999
8000.000	840.000	-4.999
8250.000	840.000	-4.999
8500.000	840.000	-4.999
8750.000	840.000	-4.999
9000.000	840.000	-4.999
9250.000	840.000	-4.999
9500.000	840.000	-4.999
9750.000	840.000	-4.999
0.000	1050.000	-4.999
250.000	1050.000	-4.999
500.000	1050.000	-4.999
750.000	1050.000	-4.999
1000.000	1050.000	-4.999
1250.000	1050.000	-4.999
1500.000	1050.000	-4.999
1750.000	1050.000	-4.999
2000.000	1050.000	-4.999
2250.000	1050.000	-4.999
2500.000	1050.000	-4.999
2750.000	1050.000	-1.025
3000.000	1050.000	-0.088
3250.000	1050.000	-0.040
3500.000	1050.000	-0.002
3750.000	1050.000	0.030
4000.000	1050.000	0.056
4250.000	1050.000	0.077
4500.000	1050.000	0.092
4750.000	1050.000	-0.616
5000.000	1050.000	-4.999
5250.000	1050.000	-4.999
5500.000	1050.000	-4.999
5750.000	1050.000	-4.999
6000.000	1050.000	-4.999
6250.000	1050.000	-4.999
6500.000	1050.000	-4.999
6750.000	1050.000	-4.999
7000.000	1050.000	-4.999
7250.000	1050.000	-4.999
7500.000	1050.000	-4.999
7750.000	1050.000	-4.999
8000.000	1050.000	-4.999
8250.000	1050.000	-4.999
8500.000	1050.000	-4.999
8750.000	1050.000	-4.999
9000.000	1050.000	-4.999
9250.000	1050.000	-4.999
9500.000	1050.000	-4.999
9750.000	1050.000	-4.999
0.000	1260.000	-4.999
250.000	1260.000	-4.999
500.000	1260.000	-4.999
750.000	1260.000	-4.999
1000.000	1260.000	-4.999
1250.000	1260.000	-4.999
1500.000	1260.000	-4.999
1750.000	1260.000	-4.999
2000.000	1260.000	-4.999

6500.000	1260.000	-4.999
6750.000	1260.000	-4.999
7000.000	1260.000	-4.999
7250.000	1260.000	-4.999
7500.000	1260.000	-4.999
7750.000	1260.000	-4.999
8000.000	1260.000	-4.999
8250.000	1260.000	-4.999
8500.000	1260.000	-4.999
8750.000	1260.000	-4.999
9000.000	1260.000	-4.999
9250.000	1260.000	-4.999
9500.000	1260.000	-4.999
9750.000	1260.000	-4.999
0.000	1470.000	-4.999
250.000	1470.000	-4.999
500.000	1470.000	-4.999
750.000	1470.000	-4.999
1000.000	1470.000	-4.999
1250.000	1470.000	-4.999
1500.000	1470.000	-4.999
1750.000	1470.000	-4.999
2000.000	1470.000	-4.999
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2500.000	1470.000	-4.999
2750.000	1470.000	-0.479
3000.000	1470.000	0.412
3250.000	1470.000	0.421
3500.000	1470.000	0.427
3750.000	1470.000	0.430
4000.000	1470.000	0.430
4250.000	1470.000	0.430
4500.000	1470.000	0.425
4750.000	1470.000	-0.300
5000.000	1470.000	-4.771
5250.000	1470.000	-4.999
5500.000	1470.000	-4.999
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6000.000	1470.000	-4.999
6250.000	1470.000	-4.999
6500.000	1470.000	-4.999
6750.000	1470.000	-4.999
7000.000	1470.000	-4.999
7250.000	1470.000	-4.999
7500.000	1470.000	-4.999
7750.000	1470.000	-4.999
8000.000	1470.000	-4.999
8250.000	1470.000	-4.999
8500.000	1470.000	-4.999
8750.000	1470.000	-4.999
9000.000	1470.000	-4.999
9250.000	1470.000	-4.999
9500.000	1470.000	-4.999
9750.000	1470.000	-4.999
0.000	1680.000	-4.999
250.000	1680.000	-4.999
500.000	1680.000	-4.999
750.000	1680.000	-4.999
1000.000	1680.000	-4.999
1250.000	1680.000	-4.999
1500.000	1680.000	-4.999
1750.000	1680.000	-4.999
2000.000	1680.000	-4.999
2250.000	1680.000	-4.999
2500.000	1680.000	-4.999
2750.000	1680.000	-0.323
3000.000	1680.000	0.555
3250.000	1680.000	0.554
3500.000	1680.000	0.550
3750.000	1680.000	0.545
4000.000	1680.000	0.538
4250.000	1680.000	0.531
4500.000	1680.000	0.521
4750.000	1680.000	-0.209
5000.000	1680.000	-4.684
5250.000	1680.000	-4.999
5500.000	1680.000	-4.999
5750.000	1680.000	-4.999
6000.000	1680.000	-4.999
6250.000	1680.000	-4.999
6500.000	1680.000	-4.999
6750.000	1680.000	-4.999
7000.000	1680.000	-4.999
7250.000	1680.000	-4.999
7500.000	1680.000	-4.999
7750.000	1680.000	-4.999
8000.000	1680.000	-4.999
8250.000	1680.000	-4.999

2000.000	1890.000	-4.999
2250.000	1890.000	-4.999
2500.000	1890.000	-4.999
2750.000	1890.000	-0.243
3000.000	1890.000	0.628
3250.000	1890.000	0.621
3500.000	1890.000	0.612
3750.000	1890.000	0.603
4000.000	1890.000	0.593
4250.000	1890.000	0.582
4500.000	1890.000	0.570
4750.000	1890.000	-0.163
5000.000	1890.000	-4.641
5250.000	1890.000	-4.999
5500.000	1890.000	-4.999
5750.000	1890.000	-4.999
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6250.000	1890.000	-4.999
6500.000	1890.000	-4.999
6750.000	1890.000	-4.999
7000.000	1890.000	-4.999
7250.000	1890.000	-4.999
7500.000	1890.000	-4.999
7750.000	1890.000	-4.999
8000.000	1890.000	-4.999
8250.000	1890.000	-4.999
8500.000	1890.000	-4.999
8750.000	1890.000	-4.999
9000.000	1890.000	-4.999
9250.000	1890.000	-4.999
9500.000	1890.000	-4.999
9750.000	1890.000	-4.999
0.000	2100.000	-4.999
250.000	2100.000	-4.999
500.000	2100.000	-4.999
750.000	2100.000	-4.999
1000.000	2100.000	-4.999
1250.000	2100.000	-4.999
1500.000	2100.000	-4.999
1750.000	2100.000	-4.999
2000.000	2100.000	-4.999
2250.000	2100.000	-4.999
2500.000	2100.000	-4.999
2750.000	2100.000	-0.242
3000.000	2100.000	0.630
3250.000	2100.000	0.622
3500.000	2100.000	0.614
3750.000	2100.000	0.604
4000.000	2100.000	0.594
4250.000	2100.000	0.583
4500.000	2100.000	0.571
4750.000	2100.000	-0.162
5000.000	2100.000	-4.640
5250.000	2100.000	-4.999
5500.000	2100.000	-4.999
5750.000	2100.000	-4.999
6000.000	2100.000	-4.999
6250.000	2100.000	-4.999
6500.000	2100.000	-4.999
6750.000	2100.000	-4.999
7000.000	2100.000	-4.999
7250.000	2100.000	-4.999
7500.000	2100.000	-4.999
7750.000	2100.000	-4.999
8000.000	2100.000	-4.999
8250.000	2100.000	-4.999
8500.000	2100.000	-4.999
8750.000	2100.000	-4.999
9000.000	2100.000	-4.999
9250.000	2100.000	-4.999
9500.000	2100.000	-4.999
9750.000	2100.000	-4.999
0.000	2310.000	-4.999
250.000	2310.000	-4.999
500.000	2310.000	-4.999
750.000	2310.000	-4.999
1000.000	2310.000	-4.999
1250.000	2310.000	-4.999
1500.000	2310.000	-4.999
1750.000	2310.000	-4.999
2000.000	2310.000	-4.999
2250.000	2310.000	-4.999
2500.000	2310.000	-4.999
2750.000	2310.000	-0.317
3000.000	2310.000	0.560
3250.000	2310.000	0.558
3500.000	2310.000	0.554
3750.000	2310.000	0.549

8250.000	2310.000	-4.999
8500.000	2310.000	-4.999
8750.000	2310.000	-4.999
9000.000	2310.000	-4.999
9250.000	2310.000	-4.999
9500.000	2310.000	-4.999
9750.000	2310.000	-4.999
0.000	2520.000	-4.999
250.000	2520.000	-4.999
500.000	2520.000	-4.999
750.000	2520.000	-4.999
1000.000	2520.000	-4.999
1250.000	2520.000	-4.999
1500.000	2520.000	-4.999
1750.000	2520.000	-4.999
2000.000	2520.000	-4.999
2250.000	2520.000	-4.999
2500.000	2520.000	-4.999
2750.000	2520.000	-0.470
3000.000	2520.000	0.420
3250.000	2520.000	0.429
3500.000	2520.000	0.434
3750.000	2520.000	0.436
4000.000	2520.000	0.437
4250.000	2520.000	0.436
4500.000	2520.000	0.431
4750.000	2520.000	-0.295
5000.000	2520.000	-4.765
5250.000	2520.000	-4.999
5500.000	2520.000	-4.999
5750.000	2520.000	-4.999
6000.000	2520.000	-4.999
6250.000	2520.000	-4.999
6500.000	2520.000	-4.999
6750.000	2520.000	-4.999
7000.000	2520.000	-4.999
7250.000	2520.000	-4.999
7500.000	2520.000	-4.999
7750.000	2520.000	-4.999
8000.000	2520.000	-4.999
8250.000	2520.000	-4.999
8500.000	2520.000	-4.999
8750.000	2520.000	-4.999
9000.000	2520.000	-4.999
9250.000	2520.000	-4.999
9500.000	2520.000	-4.999
9750.000	2520.000	-4.999
0.000	2730.000	-4.999
250.000	2730.000	-4.999
500.000	2730.000	-4.999
750.000	2730.000	-4.999
1000.000	2730.000	-4.999
1250.000	2730.000	-4.999
1500.000	2730.000	-4.999
1750.000	2730.000	-4.999
2000.000	2730.000	-4.999
2250.000	2730.000	-4.999
2500.000	2730.000	-4.999
2750.000	2730.000	-0.700
3000.000	2730.000	0.209
3250.000	2730.000	0.234
3500.000	2730.000	0.253
3750.000	2730.000	0.268
4000.000	2730.000	0.278
4250.000	2730.000	0.287
4500.000	2730.000	0.290
4750.000	2730.000	-0.428
5000.000	2730.000	-4.892
5250.000	2730.000	-4.999
5500.000	2730.000	-4.999
5750.000	2730.000	-4.999
6000.000	2730.000	-4.999
6250.000	2730.000	-4.999
6500.000	2730.000	-4.999
6750.000	2730.000	-4.999
7000.000	2730.000	-4.999
7250.000	2730.000	-4.999
7500.000	2730.000	-4.999
7750.000	2730.000	-4.999
8000.000	2730.000	-4.999
8250.000	2730.000	-4.999
8500.000	2730.000	-4.999
8750.000	2730.000	-4.999
9000.000	2730.000	-4.999
9250.000	2730.000	-4.999
9500.000	2730.000	-4.999
9750.000	2730.000	-4.999
0.000	2940.000	-4.999

4750.000	2940.000	-0.606
5000.000	2940.000	-4.999
5250.000	2940.000	-4.999
5500.000	2940.000	-4.999
5750.000	2940.000	-4.999
6000.000	2940.000	-4.999
6250.000	2940.000	-4.999
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6750.000	2940.000	-4.999
7000.000	2940.000	-4.999
7250.000	2940.000	-4.999
7500.000	2940.000	-4.999
7750.000	2940.000	-4.999
8000.000	2940.000	-4.999
8250.000	2940.000	-4.999
8500.000	2940.000	-4.999
8750.000	2940.000	-4.999
9000.000	2940.000	-4.999
9250.000	2940.000	-4.999
9500.000	2940.000	-4.999
9750.000	2940.000	-4.999
0.000	3150.000	-4.999
250.000	3150.000	-4.999
500.000	3150.000	-4.999
750.000	3150.000	-4.999
1000.000	3150.000	-4.999
1250.000	3150.000	-4.999
1500.000	3150.000	-4.999
1750.000	3150.000	-4.999
2000.000	3150.000	-4.999
2250.000	3150.000	-4.999
2500.000	3150.000	-4.999
2750.000	3150.000	-1.393
3000.000	3150.000	-0.426
3250.000	3150.000	-0.352
3500.000	3150.000	-0.291
3750.000	3150.000	-0.240
4000.000	3150.000	-0.198
4250.000	3150.000	-0.162
4500.000	3150.000	-0.133
4750.000	3150.000	-0.829
5000.000	3150.000	-4.999
5250.000	3150.000	-4.999
5500.000	3150.000	-4.999
5750.000	3150.000	-4.999
6000.000	3150.000	-4.999
6250.000	3150.000	-4.999
6500.000	3150.000	-4.999
6750.000	3150.000	-4.999
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7500.000	3150.000	-4.999
7750.000	3150.000	-4.999
8000.000	3150.000	-4.999
8250.000	3150.000	-4.999
8500.000	3150.000	-4.999
8750.000	3150.000	-4.999
9000.000	3150.000	-4.999
9250.000	3150.000	-4.999
9500.000	3150.000	-4.999
9750.000	3150.000	-4.999
0.000	3360.000	-4.999
250.000	3360.000	-4.999
500.000	3360.000	-4.999
750.000	3360.000	-4.999
1000.000	3360.000	-4.999
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3500.000	3360.000	-0.654
3750.000	3360.000	-0.579
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6000.000	3360.000	-4.999
6250.000	3360.000	-4.999
6500.000	3360.000	-4.999

8250.000	3360.000	-4.999
8500.000	3360.000	-4.999
8750.000	3360.000	-4.999
9000.000	3360.000	-4.999
9250.000	3360.000	-4.999
9500.000	3360.000	-4.999
9750.000	3360.000	-4.999
0.000	3570.000	-4.999
250.000	3570.000	-4.999
500.000	3570.000	-4.999
750.000	3570.000	-4.999
1000.000	3570.000	-4.999
1250.000	3570.000	-4.999
1500.000	3570.000	-4.999
1750.000	3570.000	-4.999
2000.000	3570.000	-4.999
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2500.000	3570.000	-4.999
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3000.000	3570.000	-1.344
3250.000	3570.000	-1.200
3500.000	3570.000	-1.078
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4500.000	3570.000	-0.745
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5250.000	3570.000	-4.999
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6000.000	3570.000	-4.999
6250.000	3570.000	-4.999
6500.000	3570.000	-4.999
6750.000	3570.000	-4.999
7000.000	3570.000	-4.999
7250.000	3570.000	-4.999
7500.000	3570.000	-4.999
7750.000	3570.000	-4.999
8000.000	3570.000	-4.999
8250.000	3570.000	-4.999
8500.000	3570.000	-4.999
8750.000	3570.000	-4.999
9000.000	3570.000	-4.999
9250.000	3570.000	-4.999
9500.000	3570.000	-4.999
9750.000	3570.000	-4.999
0.000	3780.000	-4.999
250.000	3780.000	-4.999
500.000	3780.000	-4.999
750.000	3780.000	-4.999
1000.000	3780.000	-4.999
1250.000	3780.000	-4.999
1500.000	3780.000	-4.999
1750.000	3780.000	-4.999
2000.000	3780.000	-4.999
2250.000	3780.000	-4.999
2500.000	3780.000	-4.999
2750.000	3780.000	-3.012
3000.000	3780.000	-1.910
3250.000	3780.000	-1.722
3500.000	3780.000	-1.563
3750.000	3780.000	-1.428
4000.000	3780.000	-1.311
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4750.000	3780.000	-1.766
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5500.000	3780.000	-4.999
5750.000	3780.000	-4.999
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6500.000	3780.000	-4.999
6750.000	3780.000	-4.999
7000.000	3780.000	-4.999
7250.000	3780.000	-4.999
7500.000	3780.000	-4.999
7750.000	3780.000	-4.999
8000.000	3780.000	-4.999
8250.000	3780.000	-4.999
8500.000	3780.000	-4.999
8750.000	3780.000	-4.999
9000.000	3780.000	-4.999
9250.000	3780.000	-4.999
9500.000	3780.000	-4.999
9750.000	3780.000	-4.999
0.000	3990.000	-4.999
3750.000	3990.000	-1.937
4000.000	3990.000	-1.788
4250.000	3990.000	-1.659
4500.000	3990.000	-1.547
4750.000	3990.000	-2.169
5000.000	3990.000	-4.999
5250.000	3990.000	-4.999
5500.000	3990.000	-4.999
5750.000	3990.000	-4.999
6000.000	3990.000	-4.999
6250.000	3990.000	-4.999
6500.000	3990.000	-4.999
6750.000	3990.000	-4.999
7000.000	3990.000	-4.999
7250.000	3990.000	-4.999
7500.000	3990.000	-4.999
7750.000	3990.000	-4.999
8000.000	3990.000	-4.999
8250.000	3990.000	-4.999
8500.000	3990.000	-4.999
8750.000	3990.000	-4.999
9000.000	3990.000	-4.999
9250.000	3990.000	-4.999
9500.000	3990.000	-4.999
9750.000		

SPARTON PLUMES

100 yrs (Move)

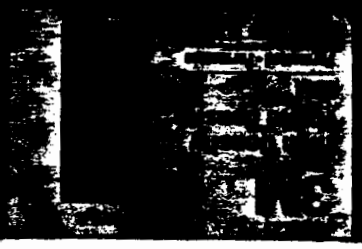
150 yrs (Move 1)

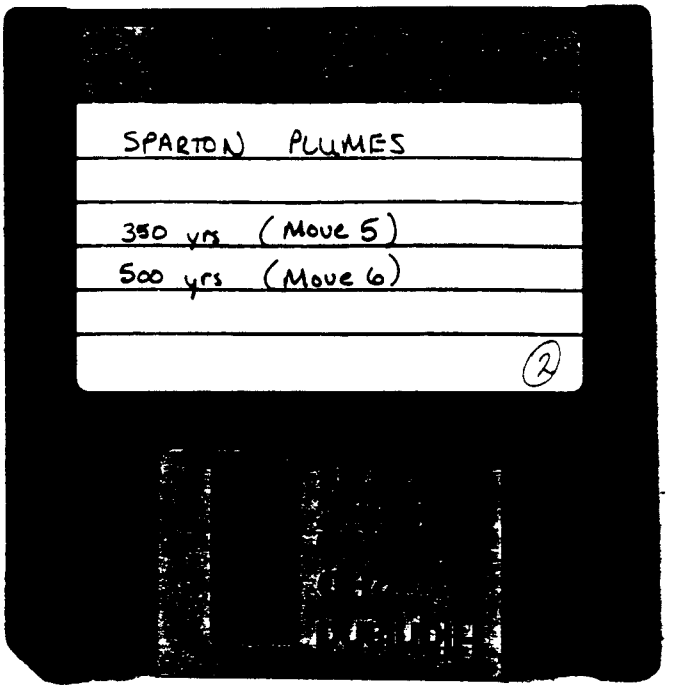
180 yrs (Move2)

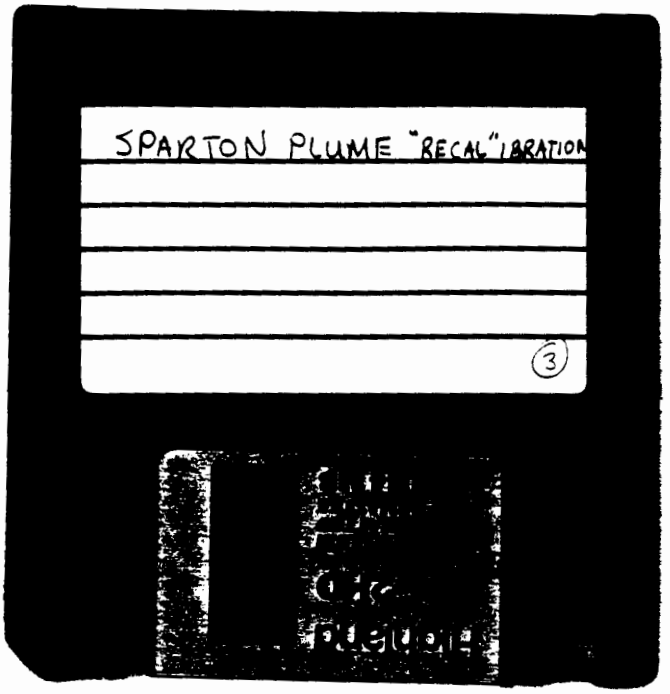
200 yrs (Move 3)

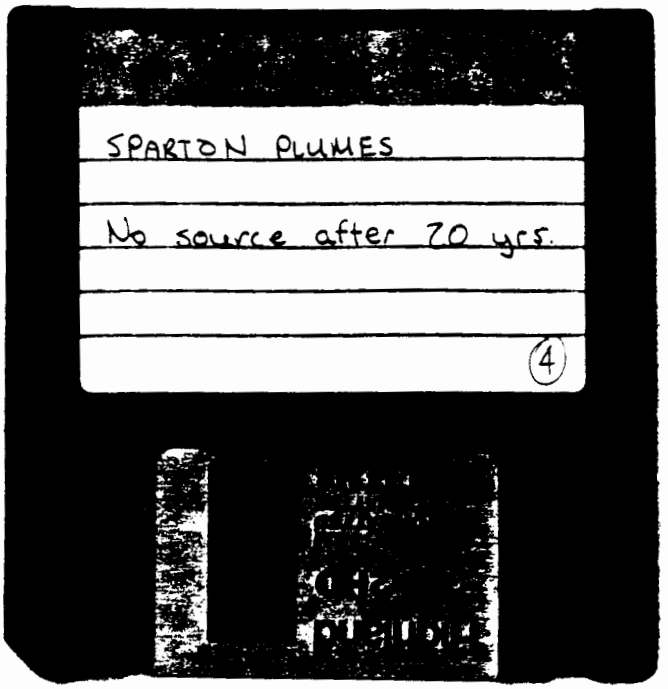
250 yrs (Move 4)

1




SPARTON PLUMES
350 yrs (Move 5)
500 yrs (Move 6)
2


SPARTON PLUME "RECAL"IBRATION
3


SPARTON PLUMES
No source after 20 yrs.
4

SPARTON PLUMES
(AT3DVER 6)

No dispersion plumes

5

009646

Print WP File Navigator List
3/14/97 11:05AM

WP File Navigator - a:\

move
move.grd
move.opt
move.plt
move.txt
move1.dat
move1.grd
move1.opt
move1.plt
move1.txt
move2.dat
move2.grd
move2.opt
move2.plt
move2.txt
move3.dat
move3.grd
move3.opt
move3.plt
move3.txt
move4.dat
move4.grd
move4.opt
move4.plt
move4.txt

Print WP File Navigator List
3/14/97 11:06AM

(2)

WP File Navigator - a:\

move5.dat
move5.grd
move5.opt
move5.plt
move5.txt
move6.dat
move6.grd
move6.opt
move6.plt
move6.txt
recal1.dat
recal1.grd
recal1.plt
recal1.txt
recal2.dat
recal2.grd
recal2.opt
recal2.plt
recal2.txt
recal3.dat
recal3.grd
recal3.opt
recal3.plt
recal3.txt

Print WP File Navigator List
3/14/97 11:06AM

3

WP File Navigator - a:\

recal10.grd
recal10.txt
recal4
recal4.dat
recal4.grd
recal4.opt
recal4.plt
recal4.txt
recal5.dat
recal5.grd
recal5.opt
recal5.plt
recal5.txt
recal6.dat
recal6.grd
recal6.opt
recal6.plt
recal6.txt
recal7.dat
recal7.grd
recal7.opt
recal7.plt
recal7.txt
recal8.dat
recal8.grd
recal8.opt
recal8.plt
recal8.txt
recal9.grd
recal9.txt

Print WP File Navigator List
3/14/97 11:04AM

WP File Navigator - a:\

remove1.txt
remove2.txt
remove3.txt
remove4.txt
remove5.txt
stop1.grd
stop1.txt
stop2.grd
stop2.txt
stop3.grd
stop3.opt
stop3.plt
stop3.txt
stop4.grd
stop4.txt
stop5.grd
stop5.txt

Print WP File Navigator List
3/14/97 11:04AM

WP File Navigator - a:\

spart2.grd
spart2.opt
spart2.plt
spart3
spart3.grd
spart3.opt
spart3.plt
spart4
spart4.grd
spart4.opt
spart4.plt
spart5
spart5.grd
spart5.opt
spart5.plt
sparton1.dat
sparton2
sparton3.dat
sparton4.dat
sparton5.dat

Print WP File Navigator List
3/14/97 11:05AM

WP File Navigator - a:\

plume.grd
plume.opt
plume.plt
plume.txt
plume1.dat
plume1.grd
plume1.opt
plume1.plt
plume1.txt
plume2.dat
plume2.grd
plume2.opt
plume2.plt
plume2.txt
plume2a.grd
plume2a.opt
plume2a.plt
plume2a.txt
plume3.dat
plume3.grd
plume3.opt
plume3.plt
plume3.txt
plume4.dat
plume4.grd
plume4.opt
plume4.plt
plume4.txt

REPORT TO SPARTON TECHNOLOGY, INC.

SHEEHAN, SHEEHAN & STELZNER, P.A.

You asked us to analyze the following question for Sparton Technology: What institutional or other barriers would impede attempts by the City of Albuquerque to drill a water supply well in the vicinity of Sparton's plant? The following are barriers we have identified.

New Mexico Utilities ("NMU") would undoubtedly protest any application for a permit by the City of Albuquerque ("City") in the NMU service area which surrounds the Sparton facility. In addition to potential protests from NMU, the City of Rio Rancho is apt to protest any City well west of the Sparton facility as a potential impairment to its wellfield. To the east of the Sparton facility lies the Middle Rio Grande Conservancy District which is likely to protest any City attempt to develop a new wellfield within its boundaries. The Pueblo of Sandia also has a history of protesting City wells in the Sparton vicinity.

As far as infrastructure is concerned, the City's system is based on a myriad of interconnected wellfields with associated pumping stations and reservoirs for storage capacity. The 1982 Master Plan depicts the City's system as divided into ten service areas or "trunks." (Figure 3). The "trunk" which would ostensibly serve the Sparton vicinity is denoted in the 1982 Master Plan as the Corrales trunk. Currently, no City wellfield, pumping station or reservoir capacity exists in the Corrales Trunk. As stated previously, the City's distribution system completely ends approximately .75 mile from the Sparton facility. Given this lack of infrastructure, drilling of a well by the City in the vicinity of Sparton would require a large capital expenditure. The City's and EPA's assertion that the City could somehow, tomorrow, drop a well in the vicinity of Sparton does not account for the practical realities of the City's water-supply system in that area. Moreover, City long-term planning documents do not anticipate such a capital expenditure.[1] While the City's capital improvement plans through the year 2005, do show the development of the Zamora wellfield in the Volcano Cliffs Trunk, the plans do not indicate that the City is planning capital improvements for the water-related infrastructure in the vicinity of Sparton.[2]

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[1]Decade Plan for Capital Improvements 1995-2004.

[2]It is possible that the Corrales Trunk could be served by the City's developed Zamora wellfield in the Volcano Cliffs Trunk. However, this is a different question and service from this trunk would not entail drilling a well in the vicinity of Sparton. Rather, the issue vis-a-vis Sparton's contamination would be whether it threatened, via migration, a wellfield located 4 miles south.

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The City itself represents in its 1995 Management Study that, Citywide, there are in fact nine trunks, not ten. Significantly, the Management Study lists all trunks depicted in the 1982 Master Plan with the exception of the Corrales Trunk.[3] The omission of the Corrales Trunk as part of the City's service area in its 1995 Study manifests the City's intent to limit its service area to its current boundaries, or at the very least, to forgo development of infrastructure within the Corrales trunk.

If the City sought a new appropriation, that is, to drill a well in the vicinity of Sparton which would increase the City's consumptive use right, demand would be a prerequisite.[4] While the westside of Albuquerque is the fastest growing part of the City,[5] growth rates do not appear to create sufficient demand on the westside, above and beyond current actual capacity, before the year 2010. This is especially true in light of the City's projected savings from recently implemented conservation measures.

It appears that the City currently lacks the requisite demand for water on the westside to support drilling new wells, either supplemental or new appropriations. This conclusion would seem especially applicable to new wells in the vicinity of Sparton, an area that is already served by NMU. However, statistics utilized by BBER and the City's Management Study project the highest population growth for the Volcano Cliffs and College Trunks. When examined in terms of water demand, these statistics do not necessarily translate into additional wells.

In its Management Study, the City represents that it has 18 functioning production wells on the westside with a total of 55,000 afy capacity.[6] The projected demand for the City's westside service area in the year 2000 is 42,494 afy, still well below peak capacity, albeit above the denoted "firm capacity" of 41,000 afy. The projected demand for the westside for the year 2010 is 51,561 afy, and demand will reach 66,133 afy by the year 2020. Based on these projections, the westside would reach peak capacity in 2000, if one looked to the alleged "firm capacity" of westside wells, but peak capacity would not be reached based on actual capacity, until sometime after 2010. Moreover, the City has recently received a permit to drill Zamora No. 2 which will add approximately 4,034 afy additional capacity to the westside. In addition, Gonzales No. 3, proposed to be located at approximately I-40 and Coors, will provide approximately 1,000 afy additional capacity if approved by the State Engineer. Accordingly,

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[3]Management Study at A-6 ("The trunk areas on the west side of the Rio Grande from north to south include Volcano Cliffs, College, Atrisco and Pajarito."), see also Management Study, Figure A-2.

[4]The City is currently approaching the limit of its consumptive use right at which time it would have to pursue a new appropriation.

[5]BBER Projections, 1991 - 2002.

[6]Management Study at B-56. However, the Management Study does indicate that the "firm capacity" of the wells may only be 41,000 afy.

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taking a conservative view of the situation on the westside, the City will need additional capacity sometime between 2000 and 2010. Taking into account the actual capacity on the westside and assuming a slightly lower population growth, additional capacity should not be needed until sometime after 2010.

Under the current statutory framework, conservation plans are a required aspect of any well application.[7] While not pulled together in a single document, in 1994, the City adopted conservation measures which it projects will conserve 30% per capita per day in water usage in the next six to ten years. Obviously, a 30% cut in demand will impact where wells are placed and how many additional wells are necessary. Nothing in the City's public documents indicates that conservation on the westside will not reduce demand in a manner concordant with Citywide conservation savings.

The SEO has adopted critical management areas on the westside. While the Sparton facility is not currently depicted as falling within a critical management area, those areas of the City's current service area closest to Sparton are within the critical zone. Hence, the City's ability to drill a well in its existing service area and in the vicinity of Sparton could be hindered by SEO regulation. The City's 1995 Management Study acknowledges that if the "SEO Task force recommendations [were] adopted, [it] would effectively halt all new well drilling."[8] Moreover, the City's 1995 Management Study acknowledges that "areas of highly productive aquifer are scarce west of the river."[9]

The City cannot unilaterally determine that it desires to drill a well "anywhere" on the westside. Rather, the City would have to apply to, and receive permission from, the State Engineer prior to drilling any well. The City is approaching the limit of its permitted consumptive use right of approximately 130,000 afy, having pumped approximately 123,000 afy in 1994. Although the City has applied to the State Engineer to increase its consumptive use right to 155,000 afy, the City recently requested that this application be placed in abeyance.

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[7]N.M. Stat. Ann. 1978 §§ 72-12-3, 72-12-7 (1985 Repl. Pamph.).

[8]Management Study at 6. Dave Stone, Chief of the State Engineer Water Rights Division, indicated that the CMAs are currently being informally administered until more information about the USGS model is acquired. He emphasized that his office will take a "hard look at all well applications in the basin." Personal communication, Dave Stone, March, 1996.

[9]Management Plan at 1-7; see also Management Blan at B-10 ("aquifer west of the river is less productive."); Management Plan at 1-9 ("studies confirm that heavy aquifer pumping can cause large declines in the water table and that there are few remaining locations within City limits where highly productive wells can be drilled without interfering with exiting wells.") Also, recent hydrologic studies performed by NMU confirm that the areas of productive ground water on the west side are limited. Personal communication, Bob Swartwout, March 1996.

RECEIVED TIME MAR.14. 2:07PM PRINT TIME MAR.14. 2:10PM

The foregoing analysis is based on over 20 years of experience within our firm with regard to water rights and water related issues in Albuquerque and the vicinity, and our specific investigation of the above facts was accomplished over a period of approximately three months.

E:\90396071\DS031497.001

009656

03/14 97 13:08 ☎505 842 8890 SHEEHAN/STELZNER 005/005

New Mexico Utilities Inc.

February 5, 1997

Ms. Maria O'Brien, Esq.
Sheehan, Sheehan & Stelzner
Suite 300
707 Broadway, NE
Albuquerque, NM 87103

Dear Ms. O'Brien:

Pursuant to our recent telephone conversations, this is confirm that New Mexico Utilities does not plan to drill any wells in the immediate vicinity of the Sparton facility or the associated contaminant plume in the near future. In particular, we have no near term plan to drill the already State Engineer permitted well location which is near the Sparton facility.

Very truly yours,

Robert L. Swartwout
President

009657

4700 Irving Blvd., N.W., Suite 201
Albuquerque, New Mexico 87114
Telephone (505) 898-2661 Fax (505) 898-6379

IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-V1-001 (h)-96-H

REPORT OF GARY L. RICHARDSON, P.E.
IN TECHNICAL REPLY TO EPA'S RESPONSES
TO THE MEMORANDUM REGARDING
SPARTON TECHNOLOGY, INC.'S POSITION
ON THE FACTS, THE LAW, AND THE
RELIEF SOUGHT BY EPA DATED
FEBRUARY 4, 1977

MARCH 14, 1997

The following report is my technical reply to EPA responses relative to the performance of injection wells at groundwater remediation sites in New Mexico.

Response to Report of Michael S. Raimonde on Sparton Technology, Inc. Treated Groundwater Injection, February 24, 1997 (EPA Exhibit 10).

In item 8 Mr. Raimonde states that, "The reinjection water will be of very similar chemical composition because it is derived from the same aquifer."

At issue is the relative sodium vs. calcium plus magnesium concentrations of the water to be injected compared to the existing water in the aquifer. If the injected water has higher relative sodium concentration, it will tend to disperse the clay particles in the aquifer thus reducing the hydraulic conductivity of the aquifer. During the past 20 years I have drilled or supervised construction of and sampled about 200 monitoring wells in the Albuquerque Basin. Based on that experience, the water quality within the Rio Grande Basin aquifer varies both spatially and with depth. The groundwater nearer the flood plain is generally more saline, and the shallower water is also generally more saline. The sodium vs. calcium plus magnesium ratio also varies spatially and with depth. I believe that these variations could likely cause a decrease in the hydraulic conductivity of the aquifer in the vicinity of a proposed injection well if water is pumped from the top of the aquifer and injected deeper in the aquifer. This would decrease the capacity of the injection well to accept water.

In item 12, Mr. Raimonde states that "slight temperature differences will exist between the injected water and the groundwater...".

I believe that the air stripping process will cool or heat the treated water (depending on air temperature) significantly below or above the existing aquifer water temperature.

Under the casing material item, Mr. Raimonde states that low carbon steel will give a satisfactory service life. I believe that high dissolved oxygen concentration levels in the

treated groundwater from the air stripper, will corrode low-carbon steel casing in much less than a 30-year service life. I believe that stainless steel will be required to achieve an acceptable casing life.

Response to Affidavit of Baird Hemingway Swanson, February 24, 1997 (EPA Exhibit 11).

In item 8 Mr. Swanson states, while discussing problems with an injection well at the General Electric Site, "Such confining layers and silty to clayey units do not exist at the Sparton site."

I have enclosed sample logs for the two wells at the Sparton site which reach deepest below the water table. MW-49 (ATTACHMENT 1) is located on the plant site, and MW-67 (ATTACHMENT 2) is located toward the leading edge of the contaminant plume. The static water level at MW-49 is about 70 ft., and the static water level at MW-67 is about 210 ft. In both logs, thick sections of silty and clayey sands and gravels and clay are reported.

In item 9 Mr. Swanson states that the nine 8" injection wells at the General Electric site have injection capacities of 300 gpm each. ATTACHMENT 3 shows the "Average Rate of Flow During Operation" for the injection wells ranges from 24 gpm to 144 gpm with an average of 82 gpm. I do not believe that General Electric would operate 10 injection wells if 3 wells have the capacity to reinject the treated water. This suggests that at the Sparton site we may not get effective injection well capacity greater than 80 gpm from an 8" well.

Response to Affidavit of Dennis Martin McQuillan, February 24, 1977 (EPA Exhibit 12).

In item 10 Mr. McQuillan states the "Atex/Fina is located in a chemically reducing inner-valley hydrogeologic environment, while Sparton is located outside of the inner valley in an oxidizing environment;".

The Sparton site is located within 1000 feet of the Rio Grande valley flood plain. Based on sample logs from about 70 monitoring wells drilled at the Sparton site, valley fill sediments appear to extend to the west under the site to a depth of about 100 feet below the water table. Based on the proximity of the Sparton site to the flood plain and the existence of more valley fill sediments under the site, I believe that reducing conditions could exist in the shallow groundwater at the site either now or in the future as the population density increases in the flood plain. Mr. McQuillan has presented no data to the contrary.

In items 11, 12 and 13 Mr. McQuillan discusses the successful operation of injection wells at the Singer/Digital site. Without additional site specific information, I cannot judge whether this site is comparable to the Sparton site.

Response to Report of Michael S. Raimonde, Sparton Technology, Inc., Cost Estimate for the Groundwater Extraction and Treatment System, February 24, 1997 (EPA Exhibit 17).

Under "Description of the Conceptual System", I believe that additional costs need to be included for chlorination of the water prior to injection. The experience at the General Electric site indicates that chlorination was required to help control biological fouling of the well screens and aquifer.

I also believe that Mr. Raimonde's quantities and unit capital costs for injection wells are unrealistically low. I believe the following quantities and unit costs are more realistic.

<u>200 gpm System</u>

Quantity of Wells	1 - 3
Size of Wells	8" x 400'
Unit Cost of Well	$100,000 each *
Total Cost of Wells	$100,000 to $300,000

<u>600 gpm System</u>

Quantity of Wells	3 - 8
Size of Wells	8" x 400'
Unit Cost of Well	$100,000 each *
Total Cost of Wells	$300,000 to $800,000

In conclusion, I believe that the use of injection wells at the Sparton site is a waste of money when the treated groundwater can be discharged to the Calabacillas Arroyo through existing storm drains, and as much or more of the water will infiltrate back into the aquifer at a significant cost savings. See ATTACHMENT 4.

My previous estimate of $500,000 capital cost to reinject 200 gpm included $100,000 for one injection well and $400,000 for water treatment equipment.

* The injection wells at the G.E. site ranged in cost from $65,000 to $98,000. I have used $100,000 each for the construction cost of injection wells at the Sparton site because the depth to water at the Sparton site is about 50 feet greater than at the G.E. site, and to allow for increases in construction costs.

I state under penalty of perjury that the foregoing is true and correct.

Executed on March 14, 1997

METRIC Corporation

Gary L. Richardson, P.E.
Executive Vice President

RECEIVED TIME MAR.14. 12:46PM PRINT TIME MAR.14. 12:47PM

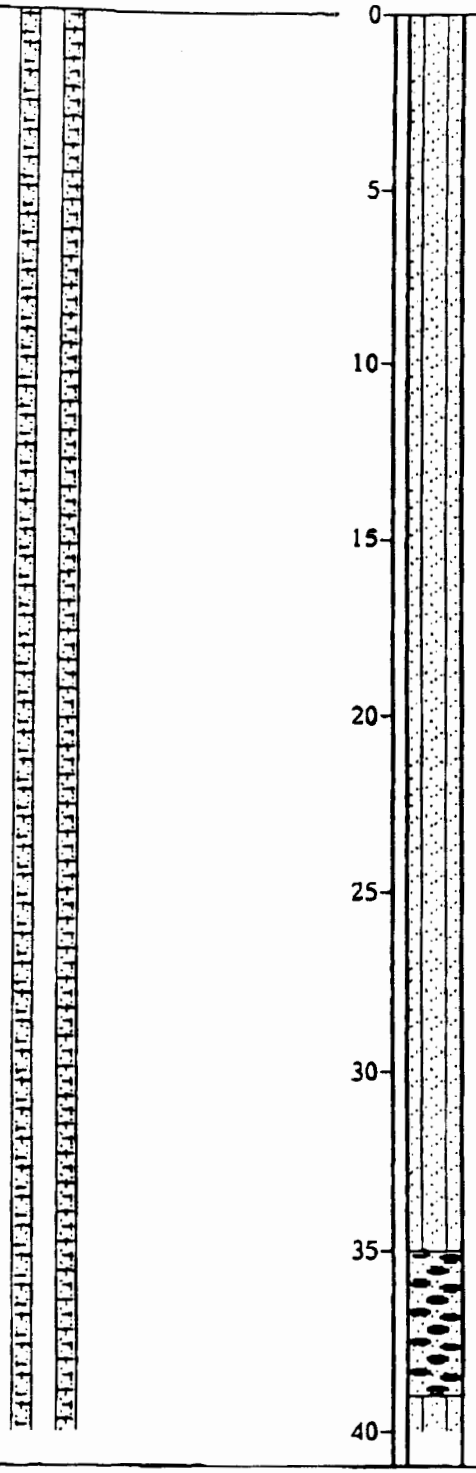
ATTACHMENT 1

Top of PVC Casing
Elevation 5043.68

Equipment GD-1500

Elevation ft Date 1/11/90

GROUND SURFACE



LIGHT BROWN SILTY FINE TO MEDIUM SAND (SM)

Cement/Bentonite Grout

4" PVC Casing to 56.4 feet

12-1/4" Borehole to 128 feet

8-5/8" steel casing to 127.7 feet

BROWN & GRAY SANDY GRAVEL (GP)

LIGHT BROWN SILTY FINE TO

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-49

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE 009663

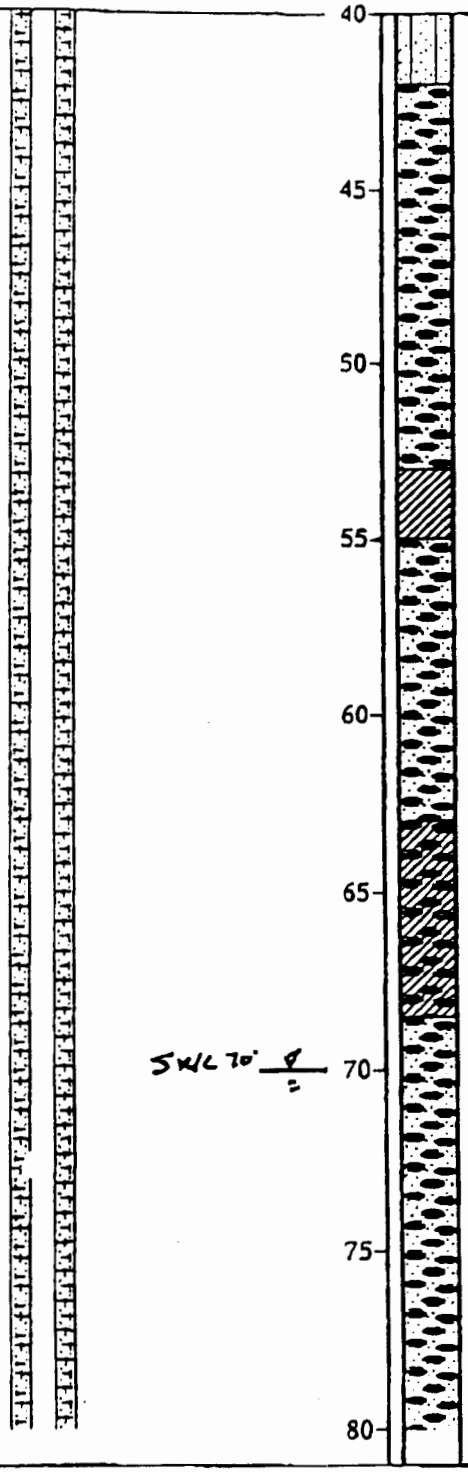
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310.039.12		12/90		

Top of PVC Casing
Elevation 5043.68

Equipment GD-1500

Elevation ft Date 1/11/90

GROUND SURFACE



MEDIUM SAND (SM)

BROWN & GRAY SANDY GRAVEL (GP)

LIGHT BROWN SANDY CLAY (CL)

BROWN, GRAY, & BLACK GRAVEL (GP)

LIGHT BROWN CLAYEY GRAVEL (GC)

BROWN, GRAY, & BLACK SANDY GRAVEL (GP)

009664

PLATE

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-49

Sparton Technology Inc.
Albuquerque, New Mexico

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310.039.12		12/90		

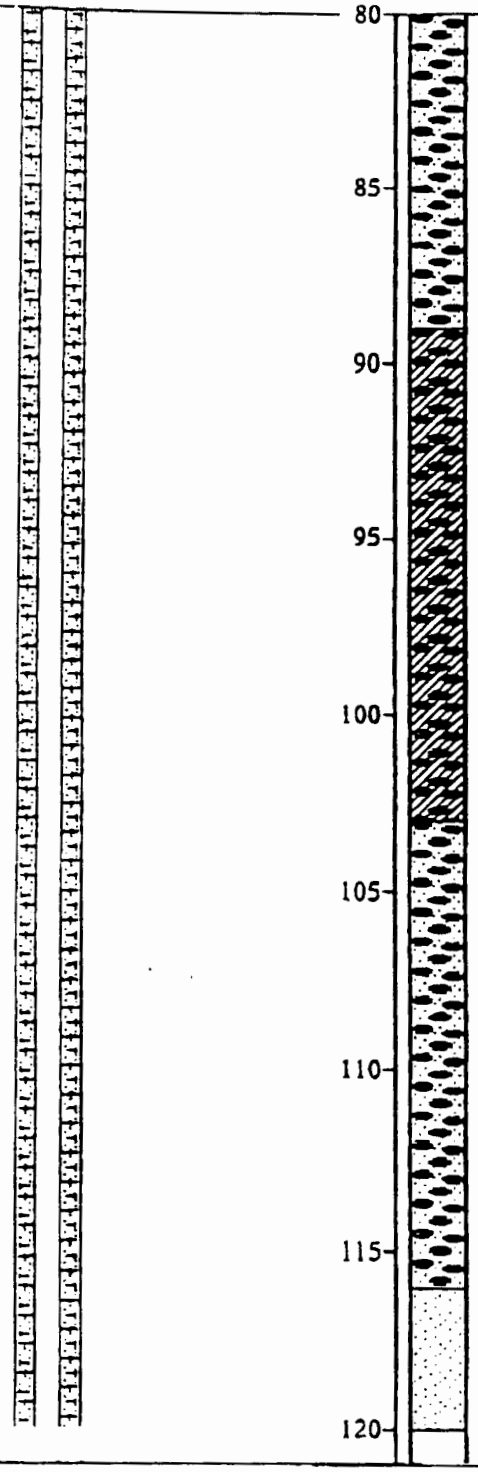
Top of PVC Casing Elevation 5043.68

Equipment GD-1500

Elevation ft Date 1/11/90

GROUND SURFACE

Stainless Steel casing from 56.4-137.8 feet



BROWN CLAYEY GRAVEL (GC)

BROWN, GRAY, & BLACK SANDY GRAVEL (GP)

BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with gravel

009665

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-49

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

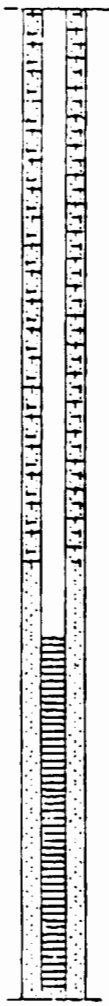
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310.039.12		12/90		

Top of PVC Casing Elevation 5043.68

Equipment GD-1500

Elevation ft Date 1/11/90

GROUND SURFACE



Sandpack:
20x40 sand
(134.7-135.8)
10x20 sand
(135.8-147.9)

7-7/8" Borehole
from 128-148 feet

4" Stainless Steel
Screen (Slot size 0.02")
from 137.7 to 147.7
feet

Bottom Cap

120 — LIGHT BROWN CLAYEY FINE TO COARSE SAND (SC)

125 — -loss of coarse sand from 126 to 128 feet

130 — BROWN SILTY FINE SAND (SM)

135 — BROWN SILTY FINE SAND (SM)
with clay laminations and embedded gravel

140 — BROWN & GRAY MEDIUM TO COARSE SAND (SP)
with gravel

145 — BROWN, GRAY, & BLACK COARSE SANDY GRAVEL (GP)
with occasional sandy clay

End of Boring at 148.00 feet.

150

155

160

009666

Harding Lawson Associates
Engineers and Environmental Services

MONITORING WELL DETAIL MW-49

Sparton Technology Inc.
Albuquerque, New Mexico

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	06310.039.12		12/90		

ATTACHMENT 2

RECEIVED TIME MAR.14. 12:28PM PRINT TIME MAR.14. 12:44PM

METRIC
Corporation

SAMPLE LOG

Borehole Number MW-67 Borehole Location N1525220.38 E375352.47

Property Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner, Metric Corporation

Driller Rodgers Environmental Services, Inc.

Drilling Medium Mud Rotary

Date of Completion 7-15-96 Ground Elevation 5169.21

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 5	5.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, fine sand to small pebble gravel.
5 - 15	10.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to granule gravel.
15 - 40	25.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to very coarse sand with some clay..
40 - 55	15.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to pebble gravel with some clay.
55 - 60	5.0	Pale yellowish brown (10YR 6/2) sandy clay.
60 - 80	20.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to small pebble gravel.

METRIC
Corporation

SAMPLE LOG
Continued

Borehole Number MW-67 Borehole Location N1525220.38 E375352.47

Depth (feet)	Thickness (feet)	Stratigraphic Description
80 - 105	25.0	Pale yellowish brown (10YR 6/2), medium sorted, sub-angular to sub-rounded, clayey very fine sand to coarse sand.
105 - 110	5.0	Pale yellowish brown (10YR 6/2), medium sorted, sub-rounded, medium sand to very coarse sand.
110 - 140	30.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to granule gravel and clay.
140 - 145	5.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, fine sand to very coarse sand.
145 - 170	25.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular, very fine sand to granule gravel and clay.
170 - 190	20.0	Pale yellowish brown (10YR 6/2), medium sorted, sub-angular, medium sand to very coarse sand.
190 - 200	10.0	Pale yellowish brown (10YR 6/2), medium sorted, angular to sub-angular, very coarse sand to small pebble gravel.
WL. 209 ▽ 200 - 210	10.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, very fine sand to granule gravel.

009669

METRIC
Corporation

SAMPLE LOG
Continued

Borehole Number MW-67 Borehole Location N1525220.38 E375352.47

Depth (feet)	Thickness (feet)	Stratigraphic Description
210 - 230	20.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clay y very fine sand to granule gravel.
230 - 255	25.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to granule gravel and clay.
255 - 275	20.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular, fine sand to small pebble gravel.
275 - 310	35.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, fine sand to small pebble gravel and clay.
310 - 320	10.0	Pinkish gray (5YR 8/1), poorly sorted, sub-angular to sub-rounded, fine sand to granule gravel.
320 - 330	10.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, medium sand to small pebble gravel.
330 - 360	30.0	Pale yellowish brown (10 YR 6/2), medium sorted, sub-rounded to rounded, fine sand to coarse sand.
360 - 363	3.0	Pale yellowish brown (10YR 6/2) clay.
363 - 390	27.0	Pale yellowish brown (10 YR 6/2), medium sorted, sub-rounded to rounded, fine sand to coarse sand.

ATTACHMENT 3

RECEIVED TIME MAR. 14. 12:28PM PRINT TIME MAR. 14. 12:43PM

OLU OF V R D ITEI R W

MONTHLY LOG
DEEP ZONE GROUND WATER REMEDIATION SYSTEM
PLANT 83/GE OPERABLE UNIT
ALBUQUERQUE, NEW MEXICO

PERIOD of 12-1-96 to 12-31-96 (recorded in Access File and the Operators Log Book)

...te of New Mexico Well Designation (file No.)	Smith Environmental GEAE Well Designation	Well Status	Average Rate of Flow During Operation (gallons per minute)	Volume of Ground Water Diverted (gallons)
RG-6279-S	EW-001	Installed; consistent with permit	427	19,082,737
RG-6279-S2	EW-002	Installed; consistent with permit	200	8,933,877
RG-6279	EW-003	Installed; consistent with permit	191	8,543,306
			Total Volume Diverted	36,559,720 gallons

...te of new Mexico ...scharge Plan No.	Smith Environmental GEAE Well Designation	Well Status	Average Rate of Flow During Operation (gallons per minute)	Volume of Treated Water Injected (gallons)
1065	IW-631	Installed; consistent with permit	123	6,495,683
1065	IW-632	Installed; consistent with permit	24	1,074,454
1065	IW-633	Installed; consistent with permit	94	4,173,859
1065	IW-634	Installed; consistent with permit	56	2,509,548
1065	IW-635	Installed; consistent with permit	58	2,588,906
1065	IW-636	Installed; consistent with permit	55	2,469,682
1065	IW-637	Installed; consistent with permit	91	4,074,910
1065	IW-638	Installed; consistent with permit	82	3,681,857
1065	IW-639	Installed; consistent with permit	92	4,085,609
1065	IW-640	Installed; consistent with permit	144	6,425,838
			Total Volume Injected	36,580,346 gallons

009672

...oximate Monthly Totals ...o Date (gallons)	Apr-96	May-96	Jun-96	Jul-96	Aug-96	Sep-96	Oct-96	Nov-96	Dec-96
	3,868,073	16,511,846	16,626,710	22,222,155	25,626,386	29,223,162	34,548,446	33,779,695	36,559,720

...OXIMATE TOTAL VOLUME OF ...OUND WATER DIVERTED TO DATE: 218,963,182 gallons
... of December 31, 1996)

SMITH

ATTACHMENT 4

CALABACILLAS ARROYO INFILTRATION INVESTIGATION

PREPARED FOR

SPARTON TECHNOLOGY, INC.
ALBUQUERQUE, NEW MEXICO

PREPARED BY

METRIC CORPORATION
ALBUQUERQUE, NEW MEXICO

MARCH 1997

009674

CALABACILLAS ARROYO INFILTRATION INVESTIGATION

On November 5 and 6, 1996, an infiltration test was conducted in the Calabacillas Arroyo bottom to aid in determination of the portion of a proposed discharge of treated groundwater to the arroyo that might be consumed by evaporation, and the portion that might infiltrate back to the aquifer. Sparton Technology, Inc. Has proposed a containment well, having a capacity of up to 200 gpm, as part of a groundwater abatement plan.

The infiltration test was conducted at an average discharge of 203 gpm for a period of 24 hours. The water was discharged from a New Mexico Utilities fire hydrant into a City of Albuquerque storm sewer (reinforced concrete pipe) which discharges into the Calabacillas Arroyo about 3300 feet upstream from Coors Road (see PLATE 1). The storm sewer discharge point is the discharge point for the proposed containment well.

The Calabacillas Arroyo bottom was moist prior to the test, and no natural runoff occurred during the test.

During the course of the 24-hour infiltration test, the width of the water surface in the arroyo was measured at the cross section locations shown on PLATE 1. The water surface widths and distances between the cross sections were used to calculate the water surface areas as shown in TABLES 1 through 5.

The data is summarized in TABLE 6. It can be noted that the water surface area increased to 17,438 sq. ft.. (0.400 ac.) At time 15 hours, and then decreased to 16,117 sq. ft. (0.370 ac.) At time 24 hours.

Using the maximum exposed water surface of 17,438 sq. Ft. which equals 0.400 ac., and an average annual evaporation rate of 73.18 inches per year which equals 6.09 ft/yr. (see TABLE 7), the average annual evaporation from a 200 gpm discharge can be

TABLE 1
SPARTON TECHNOLOGY, INC.
CALABACILLAS ARROYO INFILTRATION TEST
11/5/96 @ 11:35AM
1 HOUR

STATION	LENGTH (ft.)	WETTED WIDTH (ft.)	AVERAGE WIDTH (ft.)	DISTANCE (ft.)	AREA (sq. ft.)
10+00	0				
			2.5	33	82.5
10+33	33	5			
			6	67	402
11+00	100	7			
			5.15	112	576.8
12+12	212	3.3			
			4.4	92	404.8
13+04	304	5.5			
			7	82	574
13+86	386	8.5			
			10	104	1040
14+90	490	11.5			
			10.45	119	1243.55
16+09	609	9.4			
			8.7	77	669.9
16+86	686	8			
			4.7	99	465.3
17+85	785	1.4			
			0.7	89	62.3
18+74	874	0			

TOTAL AREA 5521.15 sq. ft.

009676

TABLE 2
SPARTON TECHNOLOGY, INC.
CALABACILLAS ARROYO INFILTRATION TEST
11/5/96 @ 01:35PM
3 HOURS

STATION	LENGTH (ft.)	WETTED WIDTH (ft.)	AVERAGE WIDTH (ft.)	DISTANCE (ft.)	AREA (sq. ft.)
10+00	0				
			3.05	33	100.65
10+33	33	6.1			
			7.85	67	525.95
11+00	100	9.6			
			7.2	112	806.4
12+12	212	4.8			
			4.9	92	450.8
13+04	304	5			
			7.5	82	615
13+86	386	10			
			10.7	104	1112.8
14+90	490	11.4			
			12	119	1428
16+09	609	12.6			
			10.75	77	827.75
16+86	686	8.9			
			7.3	99	722.7
17+85	785	5.7			
			6.15	89	547.35
18+74	874	6.6			
			6.9	83	572.7
19+57	957	7.2			
			4.55	97	441.35
20+54	1054	1.9			
			0.95	44	41.8
20+98	1098	0			

TOTAL AREA 8193.25 sq. ft.

009677

TABLE 3
SPARTON TECHNOLOGY, INC.
CALABACILLAS ARROYO INFILTRATION TEST
11/5/96 @ 05:35PM
7 HOURS

STATION	LENGTH (ft.)	WETTED WIDTH (ft.)	AVERAGE WIDTH (ft.)	DISTANCE (ft.)	AREA (sq. ft.)
10+00	0				
			4.15	33	136.95
10+33	33	8.3			
			9.3	67	623.1
11+00	100	10.3			
			6.95	112	778.4
12+12	212	3.6			
			4.15	92	381.8
13+04	304	4.7			
			8.15	82	668.3
13+86	386	11.6			
			9.4	104	977.6
14+90	490	7.2			
			9.25	119	1100.75
16+09	609	11.3			
			12.75	77	981.75
16+86	686	14.2			
			13.95	99	1381.05
17+85	785	13.7			
			13.6	89	1210.4
18+74	874	13.5			
			12.95	83	1074.85
19+57	957	12.4			
			11.35	97	1100.95
20+54	1054	10.3			
			7.6	44	334.4
20+98	1098	4.9			
			4.6	28	128.8
21+26	1126	4.3			
			3.05	86	262.3
22+12	1212	1.8			
			1.5	98	147
23+10	1310	1.2			
			1.85	105	194.25
24+15	1415	2.5			
			2.15	93	199.95
25+08	1508	1.8			
			1.75	88	154
25+96	1596	1.7			

TOTAL AREA 11836.6 sq. ft.

009678

TABLE 4
SPARTON TECHNOLOGY, INC.
CALABACILLAS ARROYO INFILTRATION TEST
11/6/96 @ 01:35AM
15 HOURS

STATION	LENGTH (ft.)	WETTED WIDTH (ft.)	AVERAGE WIDTH (ft.)	DISTANCE (ft.)	AREA (sq. ft.)
10+00	0				
			4.1	33	135.3
10+33	33	8.2			
			9.35	67	626.45
11+00	100	10.5			
			7.65	112	856.8
12+12	212	4.8			
			4.6	92	423.2
13+04	304	4.4			
			4.65	82	381.3
13+86	386	4.9			
			6.05	104	629.2
14+90	490	7.2			
			14.4	119	1713.6
16+09	609	21.6			
			16.4	77	1262.8
16+86	686	11.2			
			9.25	99	915.75
17+85	785	7.3			
			9.85	89	876.65
18+74	874	12.4			
			11.6	83	962.8
19+57	957	10.8			
			10.55	97	1023.35
20+54	1054	10.3			
			11	44	484
20+98	1098	11.7			
			7.55	28	211.4
21+26	1126	3.4			
			4.8	86	412.8
22+12	1212	6.2			
			8.8	98	862.4
23+10	1310	11.4			
			9.3	105	976.5
24+15	1415	7.2			
			5.55	93	516.15
25+08	1508	3.9			
			7.7	88	677.6
25+96	1596	11.5			
			11.05	97	1071.85
26+93	1693	10.6			
			9.95	107	1064.65
28+00	1800	9.3			
			7.1	104	738.4
29+04	1904	4.9			
			3.9	103	401.7
30+07	2007	2.9			
			2.05	104	213.2
31+11	2111	1.2			

TOTAL AREA **17437.85** **sq. ft.**

009679

TABLE 5
SPARTON TECHNOLOGY, INC.
CALABACILLAS ARROYO INFILTRATION TEST
11/6/96 @ 10:30AM
24 HOURS

STATION	LENGTH (ft.)	WETTED WIDTH (ft.)	AVERAGE WIDTH (ft.)	DISTANCE (ft.)	AREA (sq. ft.)	
10+00	0					
			3.1	33	102.3	
10+33	33	6.2				J
			7.6	67	509.2	
11+00	100	9				I
			5.95	112	666.4	
12+12	212	2.9				H
			2.85	92	262.2	
13+04	304	2.8				G
			2.8	82	237.8	
13+86	386	3				F
			3.9	104	405.6	
14+90	490	4.8				E
			10.5	119	1249.5	
16+09	609	16.2				D
			13.25	77	1020.25	
16+86	686	10.3				C
			8.25	99	816.75	
17+85	785	6.2				B
			6.3	89	560.7	
18+74	874	6.4				A
			6.85	83	734.55	
19+57	957	11.3				X-SEC-1
			10.8	97	1047.6	
20+54	1054	10.3				X-SEC-2
			10.95	44	481.8	
20+98	1098	11.6				X-SEC-3
			6.9	28	193.2	
21+26	1126	2.2				G9
			4.55	86	391.3	
22+12	1212	8.9				G8
			9.65	98	945.7	
23+10	1310	12.4				G7
			8.9	105	934.5	
24+15	1415	5.4				G6
			5.1	93	474.3	
25+08	1508	4.8				G5
			4.6	88	404.8	
25+96	1596	4.4				G4
			5.25	97	509.25	
26+93	1693	6.1				R14
			6	107	642	
28+00	1800	5.9				R13
			5.5	104	572	
29+04	1904	5.1				R12
			4.55	103	468.65	
30+07	2007	4				R11
			3.4	104	353.6	
31+11	2111	2.8				R10
			2.75	122	335.5	
32+33	2233	2.7				P10
			2.7	125	337.5	
33+58	2358	2.7				P9
			2.6	122	317.2	
34+80	2480	2.5				P8
			1.75	113	197.75	
35+93	2593	1				P7
			1.7	112	190.4	
37+05	2705	2.4				P6
			1.95	87	169.65	
37+92	2792	1.5				P5
			1.55	126	195.3	
39+18	2918	1.6				P4
			1.4	97	135.8	
40+15	3015	1.2				P3
			1.25	124	155	
41+39	3139	1.3				P2
			0.95	104	98.8	
42+43	3243	0.6				P1

009680

TOTAL AREA 16116.85 sq. ft.

TABLE 6
SPARTON TECHNOLOGY, INC.
TIME VERSUS WATER SURFACE AREA

Time Since Test Began	Water Surface Area	
(Hrs)	(Sq. Ft.)	(Acres)
1	5,521	0.127
3	8,193	0.188
7	11,837	0.272
15	17,438	0.400
24	16,117	0.370

TABLE 7
SPARTON TECHNOLOGY, INC.
PAN EVAPORATION
AVERAGE MONTHLY TOTAL EVAPORATION
Record of Date 1962 - 1996

Source: Western Region Climate Center
NOAA Reno, Nevada
Jim Ashby (702) 677-3106
Location: Los Lunas Experiment Farm

MONTH	INCHES	RECORD (YRS.)
January	1.87	1
February	2.81	3
March	5.27	35
April	7.86	35
May	9.73	35
June	10.40	35
July	10.10	35
August	8.74	35
September	6.57	35
October	4.60	35
November	2.78	35
December	2.45	1

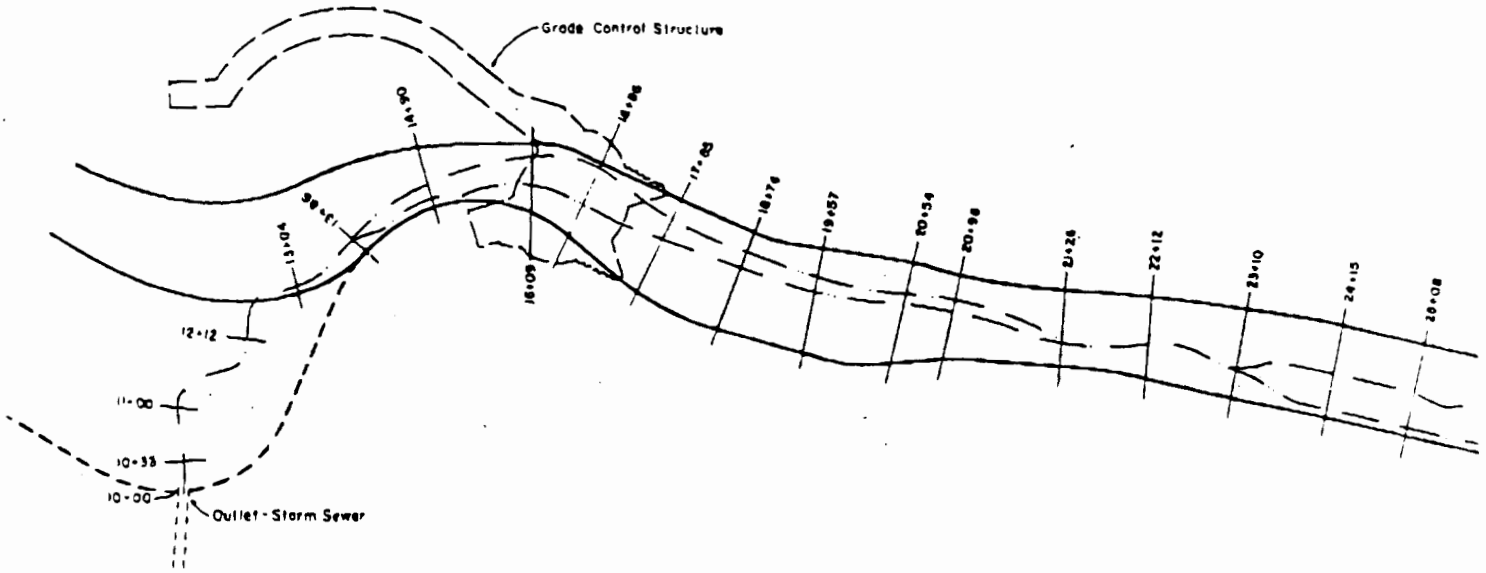
009682

estimated as follows:

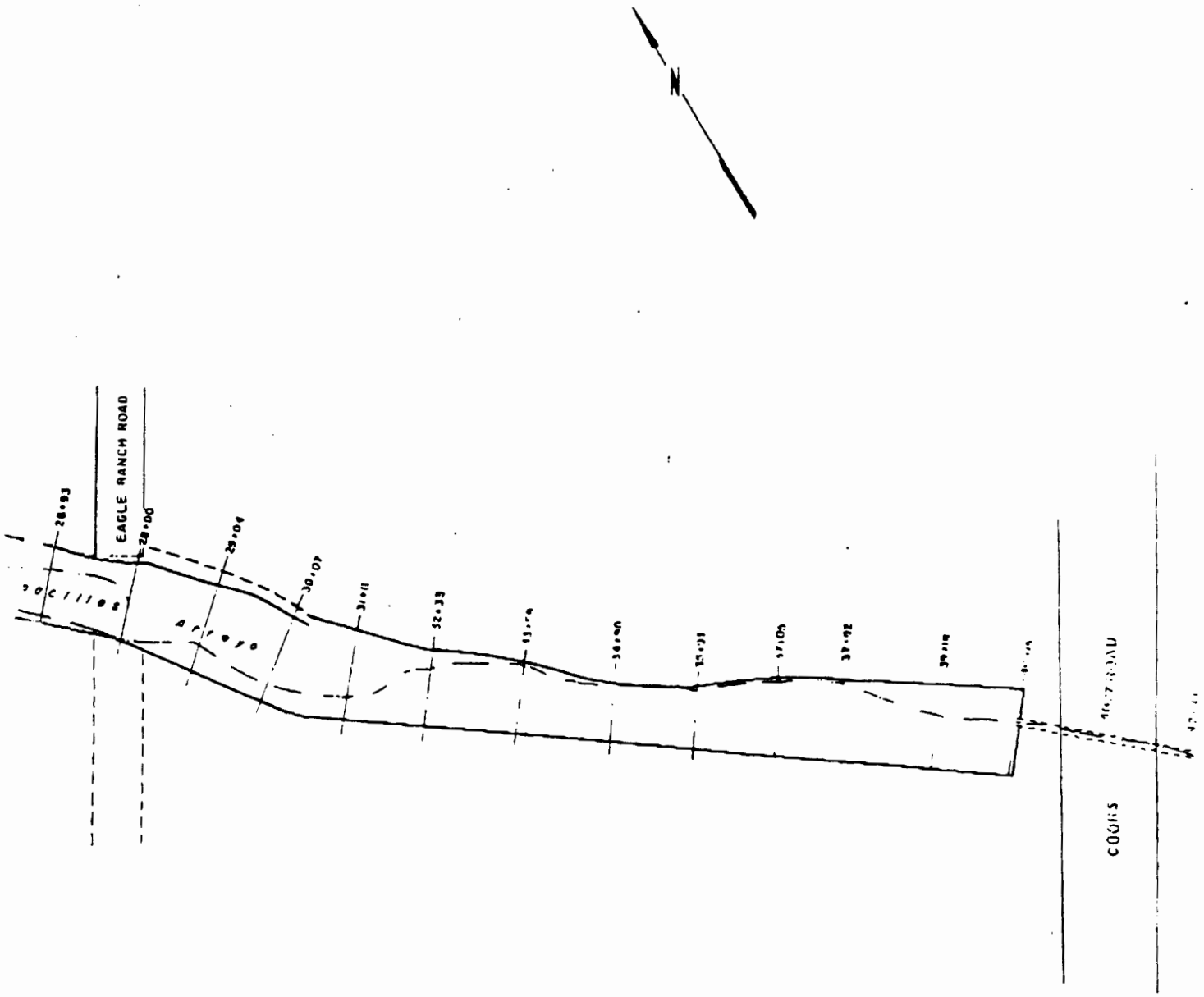
Discharge = 200 gpm = 322.6 ac. ft./yr.
Estimated Exposed Water Surface = 17,438 sq. Ft. = 0.400 ac.
Average Annual Evaporation Rate = 73.18 in./yr. = 6.09 ft./yr.
Average Annual Evaporation = 0.400 ac. X 6.09 ft./yr. = 2.44 ac. ft./yr.
Evaporation as Percentage of Discharge = 2.44 ac. ft. ÷ 322.6 ac. ft. = 1%

The actual percentage of evaporation resulting from the proposed 200 gpm discharge might be more or less than 1%. Development of a saturated zone beneath the arroyo bottom would increase the effective hydraulic conductivity of the zone between the arroyo bottom and the water table, which would tend to decrease the percentage of evaporation. Conversely, possible plugging of the arroyo bottom by salts or fine grained sediment particles would tend to increase the percentage of evaporation.

Based on the results of the infiltration testing described in this report, it is estimated that 97 to 99% of a 200 gpm discharge from the storm sewer outlet located 3300 feet upstream from Coors Road on the Calabacillas Arroyo would ultimately infiltrate back into the aquifer and 1 to 3% of discharge would evaporate.


Grade Control Structure
12+12
11+00
10+33
10+00
Outlet - Storm Sewer

009684



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METRIC

CROSS SECTION LOCATION MAP

CALABACILLAS ARROYO
INFILTRATION INVESTIGATION

Spartan Technology, Inc.

PLATE 1

IN THE MATTER OF SPARTON TECHNOLOGY, INC.
U.S. EPA DOCKET NO. RCRA-VI-001 (h)-96-H

REPORT OF W. PETER BALLEAU, CPG, P.Hg., ON SPARTON TECHNOLOGY, INC. SITE IMPACT ON POTENTIAL CALABACILLAS RECHARGE REACH

March 14, 1997

The Sparton Technology, Inc. (Sparton) site plume of trichloroethene (TCE) in shallow groundwater is said to prevent any water-resource development in the area of Calabacillas Arroyo, according to an affidavit by Mr. Norman Gaume of 24, Feb, 1996(sic). I have prepared the following information to supplement my February 3, 1997, statement titled "Report of W. Peter Balleau, CPG, P.Hg. on Sparton Technology, Inc. (Sparton) Site Impact on Groundwater-Resource Availability" and to address the issue raised by Mr. Gaume's affidavit.

The thrust of my February 3, 1997, report was to present the following points:

- That the volume of impacted groundwater at the Sparton site is planned to be contained from further migration,
- That the disturbance of flow that might be created by other water-supply operations at any distance outside a three-dimensional buffer zone around the contained Sparton plume can be compensated for by adjusting the Sparton recovery system to maintain containment and avoid affecting the water-supply source,
- That the background water quality at the Sparton site is undesirable for public water supply even without TCE, and

009686

- That the foreseeable quantity and cost of water delivered to the public in the Albuquerque Basin is unaltered by the presence of the TCE plume at the Sparton site.

Among other items, Mr. Gaume's affidavit raised an issue of impacts at the nearby Calabacillas Arroyo recharge window in his paragraph 5q which stated

> "q. Recent developments include the identification by the U.S. Bureau of Reclamation and the New Mexico Bureau of Mines and Mineral Resources of the Calabacillas Arroyo as one of the region's rare *recharge windows* where the surface materials are permeable and are in good hydraulic connection with the good-quality deep-aquifer system. This led to the development of an alternative, considered in the City's recently completed evaluation of water supply alternatives, that combined recharge of the City's San-Juan-Chama surface water in the arroyo with nearby production wells to effect a sustainable supply in this area. It turned out to a very favorable alternative from both cost and technical considerations - except of course for the uncontrolled Sparton contamination in the area which prevents any water resources development in the area."

In my opinion, the Sparton TCE plume will not prevent any water-resources development in the Calabacillas Arroyo area outside of a one-quarter-mile buffer zone around the Sparton site. My conclusion depends on the assumption, which differs from Mr. Gaume's, that the Sparton contamination is not to be "uncontrolled."

To clarify the hydrogeologic situation at Calabacillas Arroyo, I have examined the New Mexico Bureau of Mines and Mineral Resources (NMBMMR) Open-File Report 402-D[1] and the "Lithologic and Geophysical Logs, Construction Details and Water Levels from Hunter's Ridge Park" data sheet prepared by the U.S. Geological Survey (USGS) (hand delivered, Conde Thorn, March 10, 1997), that document the identification and drilling of the Calabacillas Recharge Corridor. The test drilling site is about one and one-quarter mile northwest of the Sparton facility as shown on attached Figure 1.

[1] Hawley, J.W. and Whitworth, T.M. 1996, "Hydrogeology of Potential Recharge Areas for the Basin- and Valley-Fill Aquifer Systems, and Hydrogeochemical Modelling of Proposed Artificial Recharge of the Upper Santa Fe Aquifer, Northern Albuquerque Basin, New Mexico," New Mexico Bureau of Mines and Mineral Resources, Open-File Report 402-D.

009687

The NMBMMR report Appendix H defines recharge reaches as

> "... channels of major ephemeral streams with watershed areas commonly exceeding 20 square miles. Coarse-grained channel deposits of large arroyos and washes are separated from Santa Fe Group aquifers by permeable (lithofacies) units in vadose zones that are usually less than 200 to 300 ft thick."

The lower valley of Arroyo de las Calabacillas (lower Unser Blvd.) is one such reach. Appendix H describes the Calabacillas Arroyo Recharge Reach as

> "The channel reaches (RR's) identified in this study are in the lower valleys of Arroyo de los Montoyas and Arroyo de las Calabacillas (Plate 20A; Fig. 1-10a; Appendix H). ... both directly overlie productive aquifer zones in the Upper Santa Fe Group fluvial deposits (USF-2; facies I and II). The general area that includes these potential recharge sites, also appears to be one of the best areas west of the Rio Grande for locating future recharge wells."

The NMBMMR report also provides context on the reliability of the identification of recharge reaches in their recommendation (page 64) that the investigations

> "...provide only general information on the character of the recharge windows, corridors and reaches identified in this chapter. Actual recharge mechanisms are still very poorly understood in most parts of the Basin. ... interpretations based on field-scale hydrogeologic investigations must, therefore, be considered as inferential until on-site investigations of actual recharge systems are completed."

I conclude that the feasibility of use of such sites remains uncertain.

The USGS data sheet on the Hunter Ridge drillhole provides specific stratigraphic and water-level data that can be compared to the Sparton site data. The data lead me to conclude that the hydrogeologic system is similar in character at both sites. The vertical hydraulic gradients across the well nests are about 0.06 feet/foot at each site indicating a similar degree of resistance to vertical movement of water. The rate of vertical movement of any future water recharged artificially at the Calabacillas Arroyo probably will not be greater than observed for the plume at Sparton, i.e., a few feet per year. Field data,

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therefore, do not indicate a "good hydraulic connection with the good-quality deep-aquifer system" described by Mr. Gaume.

The planning status of the alternative for recharge of San Juan-Chama surface water to effect a sustainable supply from nearby production wells is indicated in the recent City of Albuquerque Water Resources Management Strategy[2], quoted as follows:

> "The steps required to implement a small-scale aquifer storage and recovery demonstration program, as well as its long-term operation, include the following:
> - Draft and obtain state legislature adoption of enabling legislation. (Current state law does not provide for aquifer storage and recovery.)
> - Obtain state and federal permits.
> - Complete preliminary and final design, bidding, construction, and ongoing operation."

The plan is for a demonstration project. The feasibility of aquifer storage and recovery via the Calabacillas Recharge Reach has not been demonstrated. There is no infrastructure in place for such a project, the timing and cost of which is not given in the City of Albuquerque's (City) management strategy report. In my opinion, limited vertical hydraulic conductivity will impede the hydraulic connection to deep wells and will make passive recharge through Calabacillas Arroyo to the deep aquifer technically infeasible.

If recharge of water at the Calabacillas Arroyo is attempted, the TCE plume at Sparton would not interfere with such activity if the buffer zone and appropriate adjustments in recovery well placement and rates are provided as described in my February 3, 1997, report, or if such recharge occurs at an appropriate distance from the TCE plume at Sparton. A properly managed flow system with TCE capture zones can prevent the mutual interference between two adjacent water management operations. For example, the City of Albuquerque South Valley Superfund site is currently operated in a similar way to hydraulically isolate the remediation of separate plumes.

---

[2] City of Albuquerque, 1997, "City of Albuquerque Water Resources Management Strategy," Public Works Department, Water Resources.

009689

A sustainable recharge and recovery operation as described by Mr. Gaume, by definition, does not rely on stored sources such as the body of water at the Sparton plume. The disturbance of Sparton water levels would be very small from a self-sustaining neighboring system that was in long-term balance with its own sources of recharged water.

Natural or artificial recharge from Calabacillas Arroyo that might reach the TCE containment zone would be contained and treated in future remediation. Arroyo recharge that might reach the water table outside the TCE containment zone would remain available for other uses including recovery for public supply. Good water management operations must recognize that artificial recharge storage and recovery should be designed to use aquifer space outside a Sparton buffer zone, where there would be less need for management response to interactions between the two operations.

The need for a buffer zone around a contained plume is recognized by Mr. Gaume (his paragraph 5t). The size of the buffer zone depends on the ability of the Sparton containment and recovery system to respond to the effects of any adjacent operation in accordance with the formula in paragraph 4 of my earlier report. I agree with Mr. Gaume that the buffer zone should be sized to be practical and prudent. I have estimated that size to be a distance of the half-width of the plume and 500-feet deep. Recent City well construction has been designed to withdraw water at depths below 500 feet to avoid the less desirable shallow water quality. Such wells would not be affected by the recommended buffer zone.

The cost of City supply is thought to be impacted by the TCE plume, according to Mr. Gaume's paragraph 5v, on the basis that water must be imported to customers in this part of the City service area in the lack of a sustainable local supply. I question that importation cost is a factor of significant difference, because water also must be treated and imported to a recharge and recovery site. My evaluation of the cost effect of the Sparton plume relies on the principle that any future City water management action can proceed outside of the buffer zone as the City may decide while being unaffected by an on-going Sparton containment and recovery system operating simultaneously inside the buffer zone.

009690

In my opinion, the plume water body and buffer zone water is not an advantageous or desirable source for public supply, even without TCE being present.

CONCLUSIONS

I make the following conclusions from hydrogeologic review of the prospect for Sparton site interference with an aquifer storage and recovery project at the Calabacillas Arroyo recharge reach.

1. Controlled containment of the Sparton TCE plume will allow other water management and supply activities to use the groundwater remaining available outside a three-dimensional buffer zone around the Sparton site.

2. The identification of Calabacillas Arroyo recharge reach is a general one that should be considered "inferential," but not one of demonstrated feasibility.

3. Vertical hydraulic gradients are similar at the Sparton site and at the Hunter Ridge drillhole designed to investigate Calabacillas Arroyo recharge reach. The vertical and horizontal movement of the TCE water body indicates that the hydraulic connection with the good-quality deep aquifer at both sites is poor.

4. A small-scale demonstration project of aquifer storage and recovery is planned for implementation by the City, but the timing, cost, permitting and legislation to support the plan is not in place.

5. A sustainable recharge and recovery operation would rely on its own imported sources of water, not on water stored in the aquifer such as at the Sparton TCE plume.

6. The importation cost of water for the local service area in the lack of sustainable local supplies is not sensitive to Sparton's impacts. Water must be imported, and treated, to create a sustainable local supply with or without Sparton.

Alternatively, abundant local good-quality deep-aquifer water remains available in excess of foreseeable local demand with or without Sparton's impacts.

I state under penalty of perjury that the foregoing is true and correct.

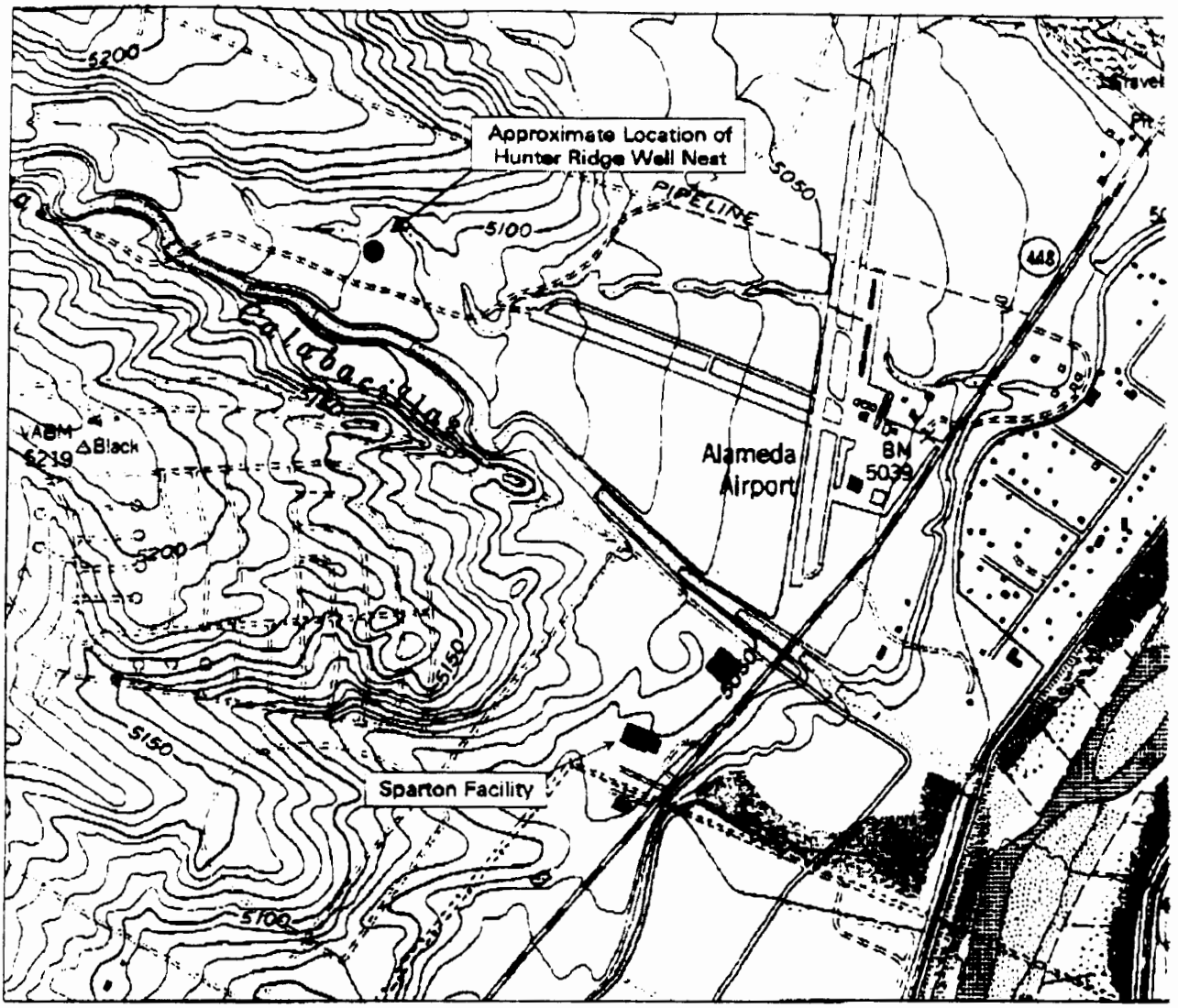
Executed on March 14, 1997.

BALLEAU GROUNDWATER, INC.

W. Peter Balleau, CPG, P.H.
President

Attachment: 1 Figure

009692



0 0.5 1

Approximate Scale (Miles)

N

SHEEHAN, SHEEHAN,
& STELZNER, P.A./ SPARTON

WELL NEST LOCATION MAP

FIGURE 1

BALLEAU GROUNDWATER, I

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

March 17, 1997

HAND DELIVERED

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Please file the enclosed document in the above-entitled matter.

Sincerely,

Evan L. Pearson
Senior Enforcement Counsel

Enclosure

cc: Honorable George Malone, III
James B. Harris

009694

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REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

REQUEST TO SET AGENDA FOR HEARING

The U.S. Environmental Protection Agency, Region 6 (EPA), by and through its attorney, Evan Pearson, hereby requests, pursuant to 40 C.F.R. § 24.14(a), that the Presiding Officer set an agenda for March 27, 1997 hearing. Setting an agenda before the hearing will allow the parties to focus on the most important issues that the Presiding Officer has identified.

Dated this 17th day of March, 1997.

Respectfully submitted,

Evan L Pearson

Evan L. Pearson
Senior Enforcement Counsel
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX - (214) 665-3177

CERTIFICATE OF SERVICE

I hereby certify that on the 17th day of March, 1997, the original of the foregoing was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by the methods indicated below:

HAND DELIVERED

Honorable George Malone, III
Acting Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

FAX AND FIRST CLASS MAIL

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

1700 PACIFIC AVENUE • SUITE 3300
DALLAS, TEXAS 75201-4693
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AUSTIN
FORT WORTH
HOUSTON
MONTERREY, MEXICO

DIRECT DIAL (214) 969-1[illegible]

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97 [illegible] PM 2:49
REGIONAL HEARING CLERK
EPA REGION VI

March 17, 1997

VIA HAND DELIVERY

Lorena Vaughn, Clerk
Office of the Regional Hearings Examiner
United States EPA
1445 Ross Avenue
Dallas, Texas 75202

Re: *In the Matter of Sparton Technology, Inc.*; U.S. EPA Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Enclosed is a copy of the revisions to the Corrective Measures Study, mentioned in Sparton's pleading filed on Friday, March 14, 1997. This copy is being provided for the convenience of the presiding officer. A courtesy copy is also being provided to Evan Pearson. Finally, enclosed with this letter is correspondence transmitting the revisions to EPA, in accordance with the terms of the AOC.

Yours very truly,

James B. Harris

JBH/eshd
Enclosure

cc: Evan Pearson
40310 00001 LERA 57277

BLACK & VEATCH

[redacted] 300, Dallas, Texas 75240, (972) 770-1500, Fax: (972) 770-1549

B&V Project 26602.100
March 14, 1997

Mr. Ronald Crossland, Chief
Technical Section (6H-CX)
RCRA Enforcement Branch
U.S. EPA Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-27733

Subject: Revised Final Corrective Measures Study Report
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico

Dear Mr. Crossland:

Transmitted herewith is Sparton's revision to the May 13, 1996 Draft Final Corrective Measures Study Report approved by U.S. EPA on June 24, 1996. This revision consists of revised pages and a new Appendix 5. These pages revise and supersede information given in the May 13, 1996 Report. Please insert these pages as replacements to those in the previous Report.

This revision is based on additional investigations conducted since May 1996 and meetings and discussions with U.S. EPA, State of New Mexico, City of Albuquerque, and New Mexico Utilities. This revision is being submitted on behalf of Mr. Richard D. Mico, Vice-President and General Manager of Sparton Technologies, Inc. Additional copies are being transmitted to parties indicated on the Distribution List contained in the Report.

Sincerely,

BLACK & VEATCH

Pierce L. Chandler, Jr.
Senior Project Manager

cs
Enclosure

009698

REVISED FINAL
CORRECTIVE MEASURE STUDY
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico

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REGIONAL HEARING CLERK
EPA REGION VI

A Report Prepared for:

Sparton Technology, Inc.
4901 Rockaway Boulevard, SE
Rio Rancho, New Mexico

REVISED FINAL CORRECTIVE MEASURE STUDY
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico

Prepared by HDR Engineering, Inc.
12700 Hillcrest Avenue, Suite 125
Dallas, Texas 75230-2096

Revised by Black & Veatch
5728 LBJ Freeway, Suite 300
Dallas, Texas 75240

March 14, 1997

Pierce L. Chandler, Jr.
Senior Project Manager
Black & Veatch

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pathways with respect to the contamination characterization for the Sparton Facility. As noted in Section III, some 43 groundwater wells have extensive time-histories. Of the 32 wells that have detection histories, 24 wells (75%) exhibit decreasing concentration with time and 7 wells (22%) show increasing concentration. These trends are consistent in the UFZ, ULFZ, and LLFZ with decreasing/increasing percentages of 82/18, 64/27 and 75/25 respectively. The plume has continued to expand at the extreme western (down-gradient) end; however, as of July 1996, there are nine non-detect downgradient monitoring wells around the leading edge of the plume -- UFZ wells MW-50, MW-52, MW-57, MW-62, and MW-68; LLFZ wells MW-65, MW-66, and MW-69; and TFZ well MW-67.

Under the NFA alternative, quarterly monitoring of selected wells would continue. Confirming vertical plume limits in the vicinity of well cluster No. 4 (MW-15, MW-41, MW-32) could be accomplished by installing a fourth well in the Third Flow Zone (TFZ). It should be noted that well cluster No. 4 is the only onsite cluster showing an increase in TCE concentration with depth. This new well would also be monitored on a quarterly basis.

The results of the continued groundwater monitoring and changes in land use/development would be monitored by requesting notices of proposed subdivision

groundwater gradient by injection in the vicinity of the downgradient edge may cause the plume to disperse over a larger area and spread the contamination.

- Infiltration galleries and injection wells are used primarily for small groundwater plumes. The areal extent of the plume makes the use of these alternatives infeasible. Furthermore, these alternatives require a steady flow of water to be effective. Under typical groundwater extraction plans, wells are pumped in a pulse format, i.e., a several week pumping period followed by a similar recovery period. This type of pumping scheme will not supply either sufficient quantities, or a continuous supply, of water to the injection wells or infiltration galleries for them to be effective.

3. Extraction Wells for Containment

EPA has directed that groundwater extraction wells be evaluated for containment of the contaminant plume (US EPA, 1996). Based on understanding of the current plume, containment could be provided by a single extraction well located in the western end (leading edge) of the plume. The partially penetrating well would be screened through the entire vertical of the plume as defined during installation activities. Using aquifer properties given in the RFI Report and confirmed by the USGS, a pumping rate of 50 to 100 gpm would give a capture zone width (at the well) of approximately 1,500 to 2,000 feet which would adequately cover the width of the

plume. Calculations for these capture zones and other confirming calculations are given in Appendix 5. Alternatively, capture zone width could be based on the 600-foot-plus radius of influence demonstrated in pumping tests reported in the RFI. The pumping rate would give a drawdown in the range of six to ten feet. The pumping rate should be adjusted to provide sufficient drawdown for containment but not so much drawdown to pull shallow contamination deeper into the aquifer.

Extracted water would either be treated near the wellhead or conveyed through a buried pipeline installed in the public right-of-way to the Sparton facility for treatment. It should be noted that bringing contaminated water to the surface in off-site areas poses some risk to the general public, off-site landowners and the environment.

Costs for a single well extraction system are given in Figure 24.

C. Restoration of the Dissolved Groundwater Phase (Saturated Zone)

Groundwater remediation alternatives for this project would include no further action, groundwater extraction and treatment system, vapor extraction system, in situ air stripping, and in situ bioremediation. Treatment of the water effluent pumped from the ground may utilize air stripping, granular activated carbon (GAC), advanced oxidation, aerobic bioreactors, or a combination of all the above to treat volatile organics. The treatment train may include ion exchange and chemical precipitation for metal treatment. Vapor obtained from vapor extraction and/or in situ air stripping may be treated with granular activated carbon (GAC) or thermally destructed. Bioremediation provides total treatment in place.

Figure 23 Screening of Corrective Measure Technologies, this technology, if previously considered, would have been eliminated for several reasons. First, lining of the canal would be relatively ineffective since the majority of the recharge is coming from the irrigated fields supplied by the canal. The canal represents only a small fraction of the recharge area and lining would have little impact. Secondly, seasonal fluctuation of the groundwater levels in the UFZ onsite probably enhances both the performance of the IM and in situ bioremediation by alternatively saturating and then exposing and aerating a portion of the UFZ.

3. Expansion of Interim Measure

This alternative is similar to the previous discussion in Item 2 with the exception of adding two or more groundwater recovery wells to the existing IM system. On-site lower lower flow zone well 32 and upper lower flow zone well 42 would be added to the IM to address the high concentrations of VOC in these wells. Additional wells would be included in the expanded IM as necessary to achieve a total combined extraction rate of 20 gpm. Any additional wells would be selected based on their potential yield and the presence of elevated VOC concentration. Based on historical data, wells to be considered for expanded IM purposes would include MW-43 and MW-19. Capital costs would be approximately $10,000. Operation and maintenance costs would be unchanged from Item 2.

4. Large-Scale Groundwater Extraction and Treatment System

Extracting groundwater with pumped wells on a large scale and treating it at the surface has been retained as a corrective measure alternative at the Sparton site for

groundwater remediation. Use for containment was previously discussed in VII.B.3. This technology is more suitable in high permeability materials such as the subsurface gravelly sands and less effective in the clays and silts at the Sparton site. It should be noted that groundwater extraction and treatment is limited in its ability to reduce groundwater

Section VII.C.4.a.(1). Costs for pumping to the golf course from extraction wells on the Sparton facility (source control) would be approximately doubled due to the increased distance and increased elevation difference.

Other options are currently being explored with both the City of Albuquerque and New Mexico Utilities. Beneficial reuse requires some suitable site that can accept and use the water year round. In the absence of a potential user year round, the extraction system would either require seasonal suspension or alternative disposal.

(6) Calabacillas Arroyo Recharge

EPA also directed that surficial recharge in the Calabacillas Arroyo be considered (U.S. EPA, 1996). A "Calabacillas Recharge Window" was described by Mr. Steve Hansen of the USDOI Bureau of Reclamation (BuRec) during the public meeting on February 1, 1996, and in a subsequent memorandum furnished to EPA. The memorandum provided little meaningful or area-specific information on hydrogeological features to allow evaluation of this alternative. The memorandum further referenced several reports published through 1996 (by author and date); however, review of these referenced reports did not provide any specific information. However, in November 1996, Metric Corporation conducted a 24-hour, 200-gpm infiltration test in the Calabacillas Arroyo, approximately 3,300 feet upstream from Coors Road. Water was discharged from a New Mexico Utilities fire hydrant into a City of Albuquerque storm sewer that feeds into the Calabacillas Arroyo. The test demonstrated that 97 to 99 percent of the discharge

infiltrated into the arroyo bottom. Based on this test, discharge to the Calabacillas Arroyo is technically feasible.

(7) Summary

Legal issues related to injection wells and beneficial reuse include: potential liability for the creation of toxic conditions not present not from use of the

For highly porous subsurface conditions with high VOC concentrations observed in the uppermost portion of an aquifer, operation of vapor recovery systems installed immediately above the water table can significantly impact the groundwater dissolved-phase VOC concentrations. Removal of soil gas from above the water table reduces the vapor phase VOC concentrations resulting in off-gassing (dissolution) from the groundwater in accordance with Henry's Law. To be most effective, vapor recovery systems should be operated in a pulsed mode similar to groundwater extraction systems. Vapor extraction is also useful in removing adsorbed phase VOC from soil materials dewatered during groundwater extraction.

Soil gas surveys and groundwater sample analyses indicate highest soil gas (and groundwater) VOC concentrations occur under the facility. In April 1996, soil gas immediately above the saturated zone was sampled from on-site and off-site UFZ wells. Results are discussed in the Section III.B.1.c. Deep Soil Gas and included in Appendix 2. This deep soil gas information indicates that : elevated soil gas concentrations are found only in the immediate, original source area; significant off-gassing from the groundwater is not occurring since soil gas concentrations are generally below equilibrium conditions; and subsurface gas transmissivity is not has high as expected. In fact, significant negative pressures were required to produce gas flow rates in the order of one standard cubic foot per minute (scfm).

In June 1996, a six-probe cluster VP-1 was installed near the old closed sump. Soil-gas TCE concentrations ranged from 24000 mg/m^3 (5376 ppmv) at 30 feet bgs to 8200

mg/m^3 (1837 ppmv) near the aquifer (50 feet bgs). In February 1997, five soil gas monitoring/recovery wells VR-1 through VR-5 were installed in and around the original source area in accordance with the proposals included in Appendix 5. TCE concentrations ranged from 7400 mg/m^3 (1658 ppmv) in the closed sump area to 870 mg/m^3 (195 ppmv) approximately 100 feet to the north. This latest data suggests that soil gas concentrations above 10 ppmv extend out less than 200 feet from the closed sump area.

Based on the characterization discussed in the RFI, an average radius of influence of approximately 150 feet was anticipated for SVE recovery wells. SVE pilot testing conducted by AcuVac Remediation, Inc., in February 1997 at well VR-1 indicates an actual radius of influence of approximately 200 feet.

Depending on the overlap between vapor extraction wells, and well-specific radius of influence, between ten and twenty wells will be required to cover the area showing elevated soil gas concentration in the most recent (1991) soil-gas survey. Recent deep soil gas investigation indicates that the area and number of wells will be much less. The 1997 SVE pilot testing and sampling indicate that recovery well VR-1 is probably sufficient to cover the area of elevated soil-gas VOC. Combined extraction rate would thus range from 50 standard cubic feet per minute (scfm) to 200 scfm (or 5 to 10 scfm per well). Extracted vapor would be routed to a central vacuum unit. The effluent from the vacuum unit would then be treated using GAC air polishing or thermal destruction as required by applicable regulations to remove VOC. Estimated costs for VES installation and operation are given in Figure 40.

The benefits of using vacuum extraction include:

- Implementation can be conducted in situ and requires relatively little disturbance to existing facilities or operations.
- The process reduces contaminant concentration and mobility at the treated area.
- Implementation can be flexible, allowing for adaptation to changing site conditions or as additional analytical and subsurface data is developed.
- In situ installation and operation requires little handling of contaminated materials, limiting the risk of exposure to workers and the public.
- Vacuum extraction has few secondary impacts.

Based on the subsurface characterization detailed in the RFI Report, the observed decrease in surface soil gas concentration, the April 1996 deep soil gas sampling, the June 1996 cluster probe sampling and the February 1997 recovery well sampling, and pilot testing, the following observations are pertinent:

- The subsurface is a layered, heterogeneous and anisotropic sequence of gravelly sands, silts, and clays.
- Highest VOC concentrations are associated with clay layers.
- The subsurface directly above the aquifer is not as gas transmissive as previously thought.
- Soil gas concentrations are highest in the closed sump area and decrease exponentially with distance.
- Significant off-gassing from the groundwater is apparently not occurring.
- Effective radius of influence is approximately 200 feet.

As discussed in Section VII.C.2., lining of the Corrales Main Canal has no technical basis and, in fact, would defeat the synergy of a VES with a fluctuating water level as described above.

6. <u>In Situ Air Stripping (Air Sparging)</u>

An innovative technology for treatment of volatile organic compounds in groundwater is in situ air stripping or sparging. This technology is an enhanced version of vapor recovery and utilizes air injection wells installed in the aquifer in addition to the

vapor extraction system (VES). Dissolved-phase VOC are stripped from the groundwater by the mechanics of the rising air bubbles around the air injection wells. The vapor-phase VOC are then removed by the VES. Typical operation utilizes standard VES operation until a tailing phenomenon is observed in soil-gas VOC concentrations. Air injection is then

VIII JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE

A. General

The recommended corrective action alternative consists of three elements: plume leading edge containment through groundwater extraction; a phased approach to soil vapor extraction; and expansion of the current onsite Interim Measure (IM) groundwater recovery and treatment system. Included in the three elements is additional characterization of soil, soil-gas, and groundwater contamination and further evaluation of subsurface characteristics through aquifer testing and vapor extraction system pilot testing. The recommended corrective action alternative utilities efficient and environmentally friendly discharge of produced water to the Calabacillas Arroyo. This recommendation has evolved from further study/characterization and various meetings/correspondence with local, state, and federal agencies. This recommendation was based on the following:

- Lack of risk from current conditions considering both current and potential receptors and exposure pathways identified at the site.
- Lack of impact on use of the affected groundwater considering potential use of that resource.
- Inability of available technologies to restore groundwater quality to Maximum Contaminant Levels (MCLs) within any reasonable time period or at a reasonable cost.
- Constituent concentrations in much of the plume area have already dropped

below technology application levels.

- Effectiveness of previous corrective actions (i.e., closure and capping of the ponds/sump).
- Effectiveness of the currently operating IM system to prevent migration off-site.
- Cost effectiveness of the IM system relative to other alternatives retained from the Initial Screening.
- Discharge to the Calabacillas Arroyo will result in beneficial recharge to the shallow portions of the aquifer.

Detailed background information for the recommended alternative can be found in Sparton's proposals dated September 18, 1996, Sparton's revised proposals dated December 7, 1996, and Sparton's revised proposals dated January 17, 1997. Copies of these proposals are included in Appendix 5. It should be noted that an application for an NPDES permit was filed on January 31, 1997, and other permits, including water rights, are being obtained. Further, proposed field work for soil gas characterization and the VES pilot test was completed in February 1997.

B. Description of the Recommended Alternative

Based on the characterization in the RFI, and subsequent confirming investigations and analyses completed to date, corrective action consisting of plume leading edge containment, a phased approach to soil vapor extraction, and expansion of the existing IM is recommended. The recommended corrective action would be supported by additional

investigation/characterization consisting of additional monitor wells/piezometers, aquifer testing, and soil-gas investigation.

Plume leading edge containment would be provided by one or more extraction wells located near the leading edge of the plume. Recovered water will be air-stripped to remove VOC and discharged to the Calabacillas Arroyo. Any extraction well would be screened through the entire vertical interval of the plume as detailed in the December 6, 1996, proposal in Appendix 5, and further discussed in §VII.B.3. on page VII-10. Capture zone calculations were furnished in the September 18, 1996, proposal in Appendix 5. Containment (capture) will be demonstrated by a series of pumping tests in the installed well.

Based on current information, soil vapor extraction will be conducted, as a minimum, from installed vapor recovery well VR-1 in the closed sump area. Continuing analyses and further investigation, as necessary, will be used in a phased approach to evaluate the need for further soil vapor extraction. Details of the VES are detailed in the proposals in Appendix 5 and discussed in §VII.C.5.. Through the current date, additional vapor recovery wells have been installed, additional soil gas sampling, and VES pilot testing have been conducted as detailed in the proposals. Additional phases of investigation, and additional VES, will be utilized as necessary to reduce soil vapor concentrations to less than 10 ppm$_v$.

The existing IM would be expanded to include pumping from existing wells MW-32 and MW-42 and potentially wells MW-43 and MW-19 to achieve a production rate of

approximately 20 gpm as detailed in the proposals in Appendix 5 and §VII.c.3.. Water will be treated in the existing onsite air stripping system. Treated water will be discharged to the Calabacillas Arroyo.

Additional monitoring/characterization of groundwater contamination would be provided by two additional non-detect monitoring wells and the containment well as detailed in the December 6, 1996, proposal in Appendix 5.

As part of this recommendation, groundwater monitoring wells at selected locations would be sampled and analyzed on a semi-annual to annual (40CFR265.92) basis to confirm plume characteristics. The results of groundwater monitoring and evaluations of any changes in land use/development would be monitored by requesting notices of proposed subdivision approvals and zoning changes within two miles of the Sparton facility be provided to Sparton. An annual evaluation would be conducted to determine the need, if any, for further corrective measure studies, based on changes in land use.

Applications for permits to drill and complete private or public drinking water wells in groundwater impacted by Sparton's operations will be monitored on at least an annual basis. Notice will be given to the State Engineer's Office of the area impacted by Sparton's operations and that Sparton should be notified in the event that any applications are received for the drilling and completion of wells within that area. Sparton will, on an annual basis, update its description of the impacted area to take into consideration any expansion or contraction of the impacted groundwater as shown by the quarterly monitoring and other data. Sparton will participate in any permit proceedings, and to the extent a permit is

granted that will allow a well to be drilled in the impacted area, Sparton will undertake an additional corrective measure study to determine what response is appropriate in order to address any threat that may be presented.

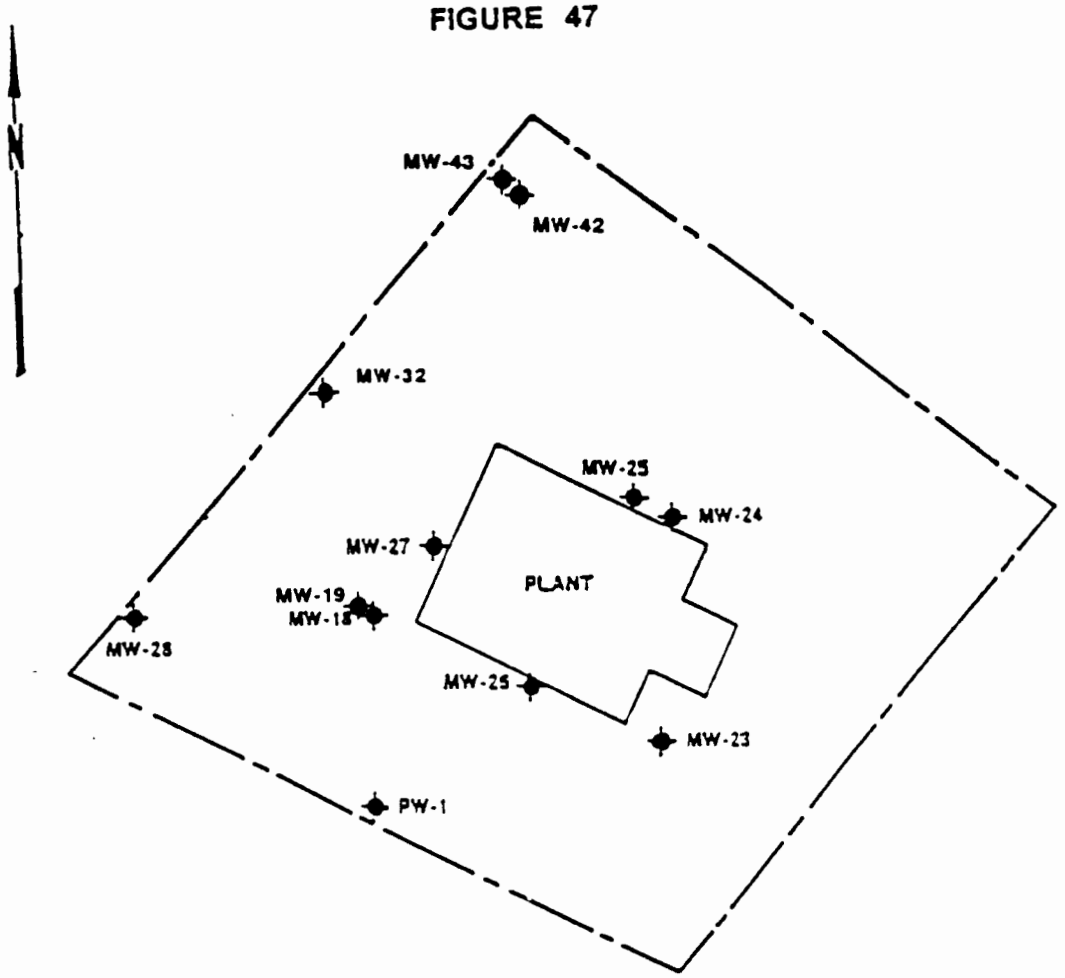
The IM consists of groundwater extraction wells and treatment in a packed tower aeration unit. The current IM groundwater recovery network is comprised of eight wells (PW-1, MW-18, MW-23, MW-24, MW-25, MW-26, MW-27, and MW-28) installed in the upper flow zone at the on-site locations shown on Figure 47 (Figure 5, Effectiveness Report). The wells are set in the upper flow zone (UFZ) with screened interval depths ranging from 60 to 78 feet below the existing ground surface. Figure 48 (Table 1, Effectiveness Report) lists the pertinent construction details for each of the eight wells.

Compressed-air-operated, positive-displacement pumps were installed at or near the bottom of each well. The compressed air is supplied by an air compressor located in the central control building. Air is pumped through piping to the well pumps and pump controllers. Four controllers are provided to control pump operations. Two pumps are controlled by each controller. Each well pump is equipped with a remote well operator to allow independent adjustment of pumping rates for each well. Each well pump discharges through flexible tubing into a common gravity drain or header. Each discharge line is equipped with a two-way sampling valve for sample collection and flow measurement.

The enhanced IM system would include pumping from onsite lower lower flow zone (LLFZ) monitoring well MW-32 and upper lower flow zone (ULFZ) monitoring well MW-42. Drilling records indicate reasonable water production can be obtained from these wells.

Well MW-32 has historically exhibited erratic and anomalously high concentrations of VOC relative to surrounding adjacent wells. Well MW-42 has also exhibited elevated concentrations of VOC. If additional extraction is needed to fully utilize the 20 gpm treatment capacity of the existing IM system, consideration will be given to including LLFZ well MW-43 and ULFZ well 19 into the enhanced IM. These wells have a history of VOC detection and should produce some quantity of water. All of these wells are located onsite and relatively close to the IM treatment unit. Well locations are shown on Figure 47 and construction details are given on Figure 48.

FIGURE 47



LEGEND

MW-23 RECOVERY WELL LOCATION AND NUMBER

0 200 400

SCALE FEET

HDR ENGINEERING, INC.
DALLAS, TEXAS

Recovery Well Location Plan
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico

Date 8/92

Revised 3/97

FIGURE 48

IM GROUNDWATER RECOVERY NETWORK WELL CONSTRUCTION DETAILS						
Well No.	Well Diameter (inches)	Well Screen Material	Riser Material	Depth of Screened Interval (feet)	Elevation at top of Screen (ft., MSL)	Construction Date
PW-1	10	PVC (1)	PVC	60-70	4984.54	9/84
MW-18	4	PVC	PVC	68-78	4977.58	5/86
MW-19	4	SS	PVC	97-107	4949.25	5/86
MW-23	2	SS(2)	PVC	72-77	4976.51	8/86
MW-24	2	SS	PVC	68.4-73.4	4980.30	12/86
MW-25	2	SS	PVC	67.7-72.7	4981.30	12/86
MW-26	2	SS	PVC	73-78	4972.71	5/88
MW-27	2	SS	PVC	67-72	4978.50	5/88
MW-28	2	SS	PVC	65-70	4977.69	5/88
MW-32	4	SS	PVC	108-118	4940.05	6/88
MW-42	4	SS	PVC	105-115	4952.33	10/89
MW-43	4	SS	PVC	127-137	4930.74	11/89

(1) Polyvinyl chloride
(2) Stainless Steel

Groundwater extracted simultaneously at each well location is piped to an air stripper system for treatment and ultimate beneficial use in the Sparton Facility. The collection piping system consists of discharge lines encased in secondary piping to provide leak detection and containment. Figure 49 (Table 2, Effectiveness Report) describes the pumping flow rate for each recovery well as of late February 1992.

The produced groundwater is collected in a 550-gallon fiberglass-coated steel tank. The double wall tank has a leak detection system with a visual and audible alarm in the control building. A centrifugal transfer pump, which is controlled by the water level in the collection tank, transports water from the collection tank to the top of the packed tower (air stripper).

The twenty-gallon-per-minute packed tower aeration unit receives untreated water from the transfer pump and discharges to the storage tank. A 400-cfm blower provides a counter-current flow of air through the packed tower to remove volatile organic constituents (VOC) from the water. A recirculation line is provided on the packed tower discharge to allow a portion of the flow to be recirculated to the collection tank. The recirculation shortens the time between pumping cycles of the transfer pump. This procedure maintains the tower packing in a wet condition, thus improving treatment efficiency. The rate of recirculation may be adjusted by setting the butterfly valve on the recirculation line.

Effluent from the packed tower is discharged to a 15,000-gallon fiberglass-coated steel tank for storage. The double-walled tank has a leak detection system with a visual and audible alarm in the control building. Water from the storage tank is used in the main plant building as cooling and flushing water and eventually discharged into the sewer system.

FIGURE 49

CURRENT RECOVERY WELL NETWORK FLOW RATES	
Well No.	Flow Rate (gal/hr)
PW-1	3.7
MW-18	10.0
MW-23	21.3
MW-24	1.0
MW-25	1.8
MW-26	2.0
MW-27	13.4
MW-28	2.9
TOTAL	56.1

To date, approximately 3.82 million gallons of water have been treated in the packed tower. The air stripping system has demonstrated an average VOC removal efficiency of 99 percent for the measured indicators, which include 1,1-dichloroethylene (DCE), methylene chloride (MeCl), 1,1,1-trichloroethane (TCA), and trichloroethylene (TCE). Total influent concentrations have exceeded 1000 micrograms per liter (µg/l). Air stripper treatment is producing effluent concentrations in the range of one µg/l for each constituent being monitored. Demonstrated reliability and performance to date indicate a remaining useful life of at least ten years.

C. Justification of Recommended Corrective Measure

1. Human Health/Environmental

The recommended corrective actions are consistent with the requirements of 40 CFR 264.100. The RFI, and subsequently obtained data, indicates that the groundwater plume is expanding slowly to the west-northwest; however, in the majority of monitoring wells, constituent concentrations are decreasing. Highest concentrations of TCE and TCA are present in the immediate vicinity of the source at the Sparton Facility.

As previously discussed, the plume does not present a risk of injury to potential receptors and will not cause the loss of any reasonably foreseeable use of the aquifer. Therefore, neither containment of the plume nor restoration of the aquifer are necessary to achieve the corrective action objectives of implementing those measures necessary to protect public health or the environment.

Even if restoration was necessary to protect public health or the environment, which it is not, that goal cannot be achieved. Given the conditions of this site, the most reasonable technical conclusion about the effectiveness of a pump and treat remedy is that it might achieve health-based standards within hundreds of years. NMED has concurred with this conclusion. The remedy proposed in this study should achieve the same result within approximately the same time period.

2. Performance

Groundwater extraction, combined with PTA treatment, is considered a best demonstrated available technology (BDAT) for volatile organic constituents (VOC) such as TCE and TCA. Further, over 7-1/2 years successful experience with the current IM consisting of groundwater extraction and PTA treatment confirms the applicability of this technology to the Sparton site. Any containment well near the plume leading edge will be screened through the entire vertical interval of the plume to provide effective vertical capture. In addition, previous RFI pump testing and a number of recent studies/investigations show that a single well will have horizontal capture capabilities exceeding the current width of the plume (see calculations in September 18, 1996, proposal in Appendix 5). However, horizontal and vertical capture of the containment well will be verified by extended demonstration as discussed in the proposals in Appendix 5. Long-term performance of the containment well can be monitored through the existing groundwater monitoring network.

The ability of the IM system to achieve significant reduction in contaminant concentration coupled with the location in the area of maximum constituent concentration should provide an effective source removal/groundwater remediation tool. As previously demonstrated, the IM system performance can also be easily monitored through the numerous available sampling points existing at the Sparton site.

Soil vapor extraction (SVE), using a vapor extraction system (VES), is a well-established methodology for remediating both soil-sorbed (residual NAPL) phase and groundwater-dissolved phase VOC contamination. For the subsurface conditions existing at the Sparton site, SVE would be considered a BDAT for unsaturated zone VOC remediation. SVE performance has been confirmed through recent implementation in the Albuquerque area in similar hydrogeologic conditions and by recently completed onsite pilot testing.

3. Reliability

The recommended corrective actions consists of proven, state-of-the-art technologies that have been designated BDATS. It should be noted that the IM has been operated for over 8 years without any significant difficulty or breakdown. There has been no evidence of any decrease in system performance.

SVE has been widely implemented and proven to be reliable. Components of a VES are generally "off-the-shelf" and commonly available as modular units. Operation can be easily monitored. Recently completed pilot testing confirms the applicability of the technology to this site.

4. Implementability

As detailed in the proposals in Appendix 5, groundwater extraction from a containment wells near the plume leading edge and from an expanded IM can be efficiently implemented. Air stripping to remove VOC has been demonstrated by over 8 years' experience with the IM. Discharge of the treated water to the Calabacillas Arroyo is feasible and provides for beneficial use of the water with minimal losses as compared to other disposal alternatives.

Any containment well will be installed on a developed lot to provide security for the wellhead and site screening. Treatment can be provided either at the wellhead or at the Sparton facility. Storm sewers accessing the Calabacillas Arroyo are available at both locations.

Since the IM system is already in operation, there are no implementability concerns or restrictions for the enhanced IM. Based on recent study, it is anticipated that any implementation of VES would be on-site in localized areas near the original source. The combination of on-site location and wide documented usage confirms implementability of VES. BDAT designation for technologies incorporated in the recommended alternative further confirms the implementability.

5. Summary

The recommended corrective measure alternative is a synergistic combination of proven technologies capable of containing plume movement and achieving reductions in contaminant levels in the source area and limiting, if not preventing, further migration from

on-site areas in an efficient, cost-effective manner. Continued operation of the enhanced IM and implementation of SVE will meet the requirements for source control and removal and reduction of VOC in the most heavily impacted areas on-site. However, SVE implementation and continued operation of the enhanced IM will not achieve MAC/MCL within any reasonable time period. The plume containment well will also remove VOC from ground water; however, based on current rate of movement within the plume, containment will not achieve MAC/MCL within any reasonable time period. Continued monitoring over the operation period of this alternative will provide ample opportunity to assess the need, if any, for additional measures beyond the recommended system. Any new development in off-site areas will also be periodically evaluated during the operational period relative to potential receptor/exposure pathways. Any significant increase in risk or threat resultant from unexpected off-site development may require additional corrective measure studies.

APPENDIX 5

CORRECTIVE ACTION PROPOSALS

a) September 18, 1996
b) December 7, 1996
c) January 17, 1997

BLACK & VEATCH

~~5728 LBJ Freeway, Suite 300, Dallas, Texas 75240, (214) 770-1500, Fax (214) 770-1549~~

5728 LBJ Freeway, Suite 300, Dallas, Texas 75240, (972) 770-1500, Fax: (972) 770-1549

Sparton Technology
Coors Road Facility

B&V Project 26602.0100
B&V File B
September 18, 1996

Ms. Ana Marie Ortiz
Assistant General Counsel
State of New Mexico Environment Department
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Re: Corrective Action Proposals
Sparton Technology, Inc.
Coors Road Facility

Dear Ms. Ortiz:

On behalf of Sparton Technology, we are submitting the enclosed proposals for three corrective actions. These proposals cover:

1. Plume leading edge containment;

2. Vapor extraction system pilot testing; and

3. Expansion of Interim Measures.

We are also attaching copies of pertinent backup information for the submitted proposals. This backup information includes:

1. Updated corrective action recommendations (Black & Veatch letter of July 10, 1996);

2. Vapor extraction system pilot testing outline (Black & Veatch letter of August 12, 1996);

3. Calculations of hydraulic influence for groundwater containment wells (Black & Veatch letter of August 22, 1996);

Sparton Technology
Ms. Ana Marie Ortiz

B&V Project 26602.0100
September 18, 1996

These proposals are being submitted in response to your letter of September 12, 1996, and our continuing discussion and correspondence with NMED staff. Copies of these proposals are being sent by facsimile to expedite your review. Actual proposal documents and backup information are being transmitted by overnight mail.

If you have any questions or need further information, please call. Further note that as of September 14, 1996, our area code changed from 214 to 972.

Sincerely,

BLACK & VEATCH

Pierce L. Chandler, Jr.
Project Manager

bk
enclosures

cc: Mr. R. Jan Appel, Sparton Technology, Inc.
Mr. Jim Harris, Thompson and Knight
Mr. Gary Richardson, Metric Corporation

PROPOSAL

Plume Leading Edge Containment Well
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

Sparton Technology, Inc.
Rio Rancho, New Mexico

Prepared by:

Black & Veatch
Dallas, Texas

in Association With

Metric Corporation
Albuquerque, New Mexico

September 17, 1996

Objectives

The objectives for installation and operation of the plume leading edge containment well are:

1. To intercept or capture the leading edge of the contaminant plume to prevent further down-gradient migration.

2. To recover contaminated groundwater, treat and dispose to reduce the quantity of contamination.

3. To demonstrate/document the performance of the containment well in achieving the first two objectives.

4. To provide (through pump testing) confirmation of aquifer characteristics.

Definition of Plume Leading Edge

In the RCRA Facility Investigation (RFI) Report submitted to USEPA on May 21, 1992, and subsequently approved on July 1, 1992, the horizontal and vertical limits of the plume were defined by sampling and analysis through June 1991 using both on- and off-site groundwater monitoring wells. In particular, the leading edge of the plume was defined by a number of non-detect groundwater monitoring wells outside the perimeter of the plume.

Subsequent to the RFI completion, plume movement continued beyond the existing groundwater monitoring system. However, based on historic movement, groundwater gradient, and relatively constant geologic conditions, the limits of the leading edge of the plume were estimated in the May 1996 Corrective Measure Study (CMS) Report approved by USEPA on June 24, 1996. To further define the limits of the plume, five additional groundwater monitoring wells (MW-65 through MW-69) were installed around and outside the predicted limits of the plume. Well locations were chosen to provide additional definition of the horizontal and vertical extent of the leading (down-gradient) edge of the plume through non-detection. These and other non-detect wells around the leading edge provide good definition of the plume. The new well installations and subsequent sampling and analysis of these and other existing monitoring wells confirm

that the plume limits shown in the CMS Report are reasonable and that the CMS conclusions about direction and rate of movement are also reasonable.

Based on the currently defined plume limits and characteristics, a single well located along Buckeye, some 500 feet north of Arrowhead (see Figure 1) is proposed for plume leading edge containment. (This is the same location shown in the July 10 B&V proposal.) Calculations of predicted well containment performance based on various methodologies and examples of field demonstrations of radius of influence were previously furnished to NMED in the B&V letter of August 22, 1996. These calculations show that a single well is capable of containing the leading edge of the plume.

Available Groundwater Monitoring Network

The attached Table 1 is a summary of monitoring points available to verify the performance (containment function) of a groundwater recovery well installed to contain the leading edge of the plume.

With respect to the attached summary (see Table 1), there are 21 groundwater monitoring wells (including 7 clusters) within 1,500 feet of the proposed recovery well (see Figure 1). These wells include 12 in the upper flow zone (UFZ), three in the upper lower flow zone (ULFZ), five in the lower lower flow zone (LLFZ), and one in the third flow zone (TFZ). There are four down-gradient, three cross-gradient, and 14 up-gradient wells.

The available monitoring network includes all wells that currently define the limits of the leading edge of the plume. The network includes all non-detect monitoring wells outside the plume and detection wells inside the plume. This combination of wells was used to define the plume and is, therefore, capable of showing successful containment performance by demonstrating inward flow (toward the recovery well) across the entire leading edge of the plume. Conversely, the existing groundwater monitoring network is also capable of detecting any deficiency of the proposed recovery well relative to containing the entire leading edge of the plume. Containment performance can be monitored thorough continuing water level observations and water quality sampling and analyses in the groundwater monitoring well network.

Groundwater Containment/Recovery Well Design

Our recommendations on groundwater recovery are similar to those in the CMS Report. The recovery well should be screened at least into the upper 30 to 35 feet of the saturated zone. Screen depth should be adjusted downward, as necessary, based on pilot hole logging to ensure screen placement into a transmissive zone. Due to the geologic anisotropy, the plume depth is very shallow (<100 ft) whereas the width (≈1,500 ft), and length (≈3,000 ft) are large. Thus, a well screened to approximately 50 percent of the plume thickness should be effective. Further, the bulk of the contamination occurs in the top of the aquifer. As a consequence, very deep well penetrations (greater screen length) are undesirable due to the potential for contaminant migration from the upper flow zone (UFZ) to the lower lower flow zone (LLFZ). For similar reasons, a pumping rate of 50 to 100 gpm (drawdown in the range of 6 to 10 feet) is also desirable. All available information indicates that this pumping rate should be more than adequate to achieve containment of the plume. The design intent is to provide sufficient drawdown to achieve containment yet avoid pulling shallow contamination deeper into the aquifer. A second design intent is to minimize the amount of "clean" water recovered by the well.

Produced water from the recovery well would be treated to meet discharge permit requirements for both air and water effluents. Treatment is proposed at the well head. This proposal assumes that treated water can be economically disposed by either discharge to the Rio Grande River by NPDES permit or through some other economic alternative such as discharge to a sanitary sewer.

Containment Demonstration

Demonstration of containment will be established by conducting a series of pumping tests during the initial startup of the groundwater recovery well. The first pump test would be a two to three day test (with a temporary pump) used to determine the required size (pumping rate) for the production pump. Time-drawdown data would be obtained from a constant-rate test at approximately 100 gpm to evaluate produced drawdown and impact to the closer monitoring wells. The resulting time-drawdown and distance-drawdown data would be analyzed to verify the design pumping rate needed to produce approximately 10 feet of drawdown in the recovery well. The data would also be used to project the edge or limit of the recovery well influence relative to plume capture/containment. The temporary pump test would also be used to establish produced water quality by sampling

and laboratory analysis on a daily frequency. Flow rate, total quantity, and monitor well levels will be recorded during the pumping test.

After the production pump is installed, a long-term (approximately one month) pumping test would be conducted using the production well and the monitoring network described in Table 1. Closer monitoring wells (<750 feet horizontal distance) would be read two to four times daily for the first several days, and once daily for the rest of the first week. More distant wells would be read daily for the first week. Thereafter, all well levels would be recorded once per week for the duration of the test. This second pump test would be used to demonstrate both the performance of the recovery well/treatment system and the plume area impacted by the pumping.

Contingency

There are at least two possible scenarios that could be identified during the pumping test. The first of these is that the chosen well location may have atypical or non-representative geology such as an absence of coarser, transmissive material in the uppermost saturated zone. Such a condition has been encountered in several monitoring wells.

Pilot hole procedures and installation of a temporary pump are two ways to minimize the effect of an unexpected geologic condition. As previously noted, screen length would be extended as a first solution. In the highly unlikely event the geologic condition was vertically extensive (tens of feet), consideration would have to be given to an alternate location.

The second scenario is that the long-term pumping test of the recovery well indicates that portions of the leading edge of the plume are not being effectively intercepted. (Effective interception would be defined as demonstration of flow toward the recovery well using water level data from various monitoring wells to show an inward gradient to the recovery well, i.e., to show a cone of depression over the horizontal and vertical extent of the plume.) This scenario is also unlikely and the solution, in all probability, would be to increase the pumping rate (increase stress in the aquifer).

There is a third scenario that could appear months or years into recovery well operation. This scenario would be the appearance of contamination in a currently non-detect monitor

well outside the influence area of the recovery well. The solution could involve the installation of additional monitoring wells and subsequent characterization/evaluation.

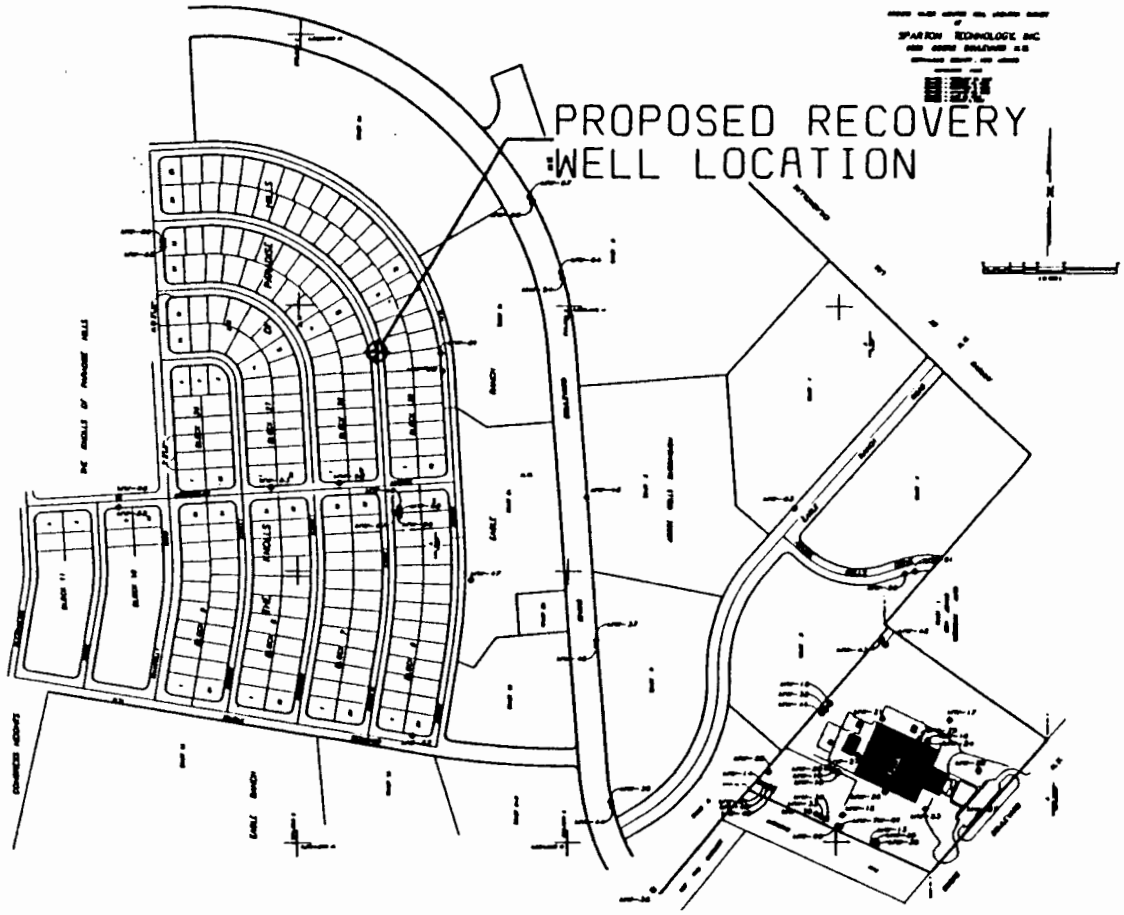
Schedule

The schedule for implementing the plume leading edge containment is a dual concurrent track. The first track is the process of obtaining the necessary permits for installing and operating the containment well system. The permits include air quality, well installation, groundwater rights, variance from zoning, public right-of-way use, and discharge (including NPDES). This first track would begin immediately upon authorization to proceed and is considered the critical path. Schedule estimates for this track are at least six months.

The second track is the actual installation and testing of the containment well system. The second track also presumes that track one will be successfully completed. Elements (and schedule estimates) for this second track are as follows:

1. Select and purchase property for the wellhead (four to six weeks).
2. Review permits status.
3. Drill and install recovery well (two months).
4. Review permits status.
5. Construct building/shelter for treatment unit (four months).
6. Acquire and install treatment equipment and discharge pipeline (one month).
7. Verify completion of permits.
8. Conduct temporary pump test and install production pump (one month).
9. Conduct production pump test (one month).
10. Evaluate and report installation and test data (two months).

Based on the above estimates, it will take at least eight months to actually begin pumping water with the permit process being the critical impact on the schedule.



LEGEND

- UPPER FLOW ZONE WELL
- UPPER LOWER FLOW ZONE WELL
- LOWER LOWER FLOW ZONE WELL
- THIRD FLOW ZONE WELL

Black & Veatch

PROJECT NO. 26602

FIGURE 1

RECOVERY WELL AND MONITORING NETWORK

009744

Table 1 Summary of Groundwater Monitoring Wells Within 1500 Feet of Proposed Containment Well Location						
Monitor Well	Flow Zone	Approx. Radial Distance ft	Gradient Position	Inside Plume*	Recent Contamination History**	Cluster Well
MW 37	UFZ	1,350	Up	Yes	High, Decr	Yes
MW 45	ULFZ	1,350	Up	Yes	Low, Decr	Yes
MW 46	ULFZ	950	Up	Yes	V. High	No
MW 47	UFZ	925	Up	Yes	Low, Decr	No
MW 48	UFZ	600	Up	Yes	High, Decr	Yes
MW 52	UFZ	1,100	Down	No	ND	Yes
MW 53	UFZ	650	Cross	Yes	Low	No
MW 54	UFZ	750	Up	NA	NA	Yes
MW 55	LLFZ	600	Up	Yes	High	Yes
MW 56	ULFZ	600	Up	Yes	High	Yes
MW 57	UFZ	825	Cross	No	ND	Yes
MW 58	UFZ	500	Up	Yes	High	No
MW 60	ULFZ	250	Up	Yes	High	Yes
MW 61	UFZ	250	Up	Yes	V. High, Decr	Yes
MW 62	UFZ	1,425	Up	No	<5 µg/l	No
MW 64	ULFZ	750	Up	Yes	Low, Incr	Yes
MW 65	LLFZ	1,100	Down	No	<5 µg/l	Yes
MW 66	LLFZ	825	Cross	No	ND	Yes
MW 67	TFZ	600	Up	No	ND	Yes
MW 68	UFZ	875	Down	No	ND	Yes
MW 69	LLFZ	875	Down	No	ND	Yes

* Inside 5 µg/l contour

** Very high=>1,000 µg/l, high=>100 µg/l, low=<100 µg/l
ND=no detect, Incr=increasing trend, Decr=decreasing trend

PROPOSAL

Vapor Extraction System Pilot Testing
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

Sparton Technology, Inc.
Rio Rancho, New Mexico

Prepared by:

Black & Veatch
Dallas, Texas

in Association With

Metric Corporation
Albuquerque, New Mexico

September 17, 1996

Objective

The following proposal is a discussion of specific details and operating procedures to conduct and analyze a VES pilot test and to define the limits of elevated soil-gas volatile organic constituent (VOC) concentrations (i.e., the "soil vapor cloud") in the unsaturated subsurface at the Sparton facility. This discussion of technical details and definition of level of effort is a logical extension from the existing data base and should provide sufficient information to determine what, if any, additional work will be needed.

Soil-Gas Monitoring System

A number of monitoring points for both subsurface soil-gas characterization and for vapor extraction pilot test/production purposes have been previously proposed (B&V letter of August 12, 1996). The monitoring system included both existing groundwater monitor wells (with exposed screen) and the existing vapor cluster probe (VP-1) as well as new vapor recovery wells installed in and around the source area. Previous studies had identified highest VOC concentrations in the soil gas in the closed sump area. Concentrations dropped off by orders of magnitude with increasing horizontal distance from the sump/pond (source area).

The proposed monitoring system additions are designed to characterize the soil gas VOC concentration with respect to distance/location relative to the closed sump area. In addition, the monitoring points would be useful in evaluating the effective influence of a vapor recovery well centrally located in the closed sump (source) area. The monitoring system is shown on the attached Figure 1 and includes four existing groundwater monitoring wells (MW-17, MW-21, MW-24, MW-25, and, perhaps, MW-16 depending on seasonal water level (fluctuation), existing six-well vapor probe cluster (VP-1) and five new vapor recovery wells (VR-1 through VR-5).

The new vapor recovery wells are designed to function as both monitoring points and as potential vapor extraction/air injection wells. The new central vapor recovery well (VR-1) would be a four-inch well; the remaining new vapor recovery wells (VR-2 through VR-5) would be two-inch wells. Wells would consist of 60 feet of 0.040-inch machine slotted PVC screen surrounded by a #6 to #9 coarse sand filter. The uppermost 10 feet of each well would be a grouted surface seal to minimize air intrusion or bypassing. New wells would be installed using hollow-stem auger drilling procedures. As part of the characterization work, drilling would be monitored using field screening instruments to

provide a relative comparison of soil gas VOC as a function of location, depth, and soil type. Completed wells would also be sampled and analyzed using EPA method 8010/8020 for specific VOC presence/concentration.

The proposed monitoring system is expected to confirm the significant dropoff in soil gas VOC concentration with increasing distance from the closed sump area. In addition, it should also define the area where vapor extraction and treatment would be appropriate.

The need for any additional monitoring/characterization data outside the proposed network would be based on a combination of perimeter soil-gas VOC concentrations above 10 ppm and projected edge (shape and distribution) of the "vapor cloud" extending out beyond the definition interval of the proposed network. The proposed network has maximum interwell horizontal spacings of ±100 feet in the outer perimeter. Projected vapor cloud edges extending outward less than this interwell spacing should be adequately defined.

Updated Soil-Gas Characterization

Soil-gas data from the additional new wells would be combined with the existing data base to provide a three-dimensional picture of the soil-gas "vapor cloud". This analysis and related data would be presented in the form of an update to the soil contamination characterization presented in the May 6, 1996 Corrective Measure Study (CMS) Report approved by U.S.EPA on June 24, 1996. The updated soil-gas characterization would also be used to confirm the application area for vapor extraction and the selection of the pilot test location.

Pilot Test Design

All data obtained to date and the history of the facility indicate that the closed solvent sump is the probable source of VOC observed in the soil gas. Highest soil-gas VOC concentrations occur in the immediate area of the sump with significant VOC concentration decrease observed with increasing horizontal distance from the source area. As a minimum, vapor extraction will be implemented in the sump area. Thus, the sump area is the most logical location for pilot testing.

The pilot test is proposed to define the relationship between VOC concentrations and extraction vacuum and extraction flow rates from a recovery well located directly under

the sump area (see Figure 1). Monitoring points (proposed and existing) are located at varying horizontal distances and depths to allow evaluation of effective influence of the centrally located recovery well.

The pilot test is also designed as a prototype demonstration of the planned VES system to show capability for extraction and ability to meet City/County air quality requirements. Further, the pilot test will show probable production rates and estimates of required operation time.

Pilot Test Equipment

For the pilot test, we are proposing AcuVac as the subcontractor to provide necessary equipment. AcuVac is experienced in soil vapor recovery pilot testing in the Albuquerque area and they have demonstrated the ability to successfully conduct meaningful pilot tests and to meet stringent City/County emission requirements. Further, the AcuVac procedure utilizes an environmentally friendly destructive technology to efficiently remove VOC from the extracted soil gas.

The proposed extraction/destruction unit is based around a 300 cubic inch in-line six cylinder internal combustion (I.C.) engine fueled by the extracted soil-gas VOC and supplemental fuel as required. Emissions are controlled by the I.C. process and redundant catalytic converters.

A vacuum blower propelled by the I.C. engine is capable of producing well flow rates of up to 120 cfm and negative pressures of up to 15 inches of mercury. AcuVac-furnished pilot test equipment also includes: a data recording system; magnehelic pressure gauges capable of reading to 0.01 inches of water; soil gas flow measuring devices; real-time field screening/analytical equipment; temperature and barometric measurement; and sampling ports for recovery of influent samples.

Pilot Test Procedure

The pilot test is proposed to be conducted using the central four-inch recovery well (VR-1). The remaining recovery wells (VR-2 through VR-5), UFZ groundwater monitoring wells (MW-17, MW-21, MW-24, and MW-25), and vapor probe cluster (VP-1) would be used as observation points for the pilot testing (see Figure 1). The pilot testing will be conducted at several different rates of vacuum and flow (up to the

maximum capability of the extraction unit) to determine the performance characteristics of the vapor recovery well/adjacent subsurface.

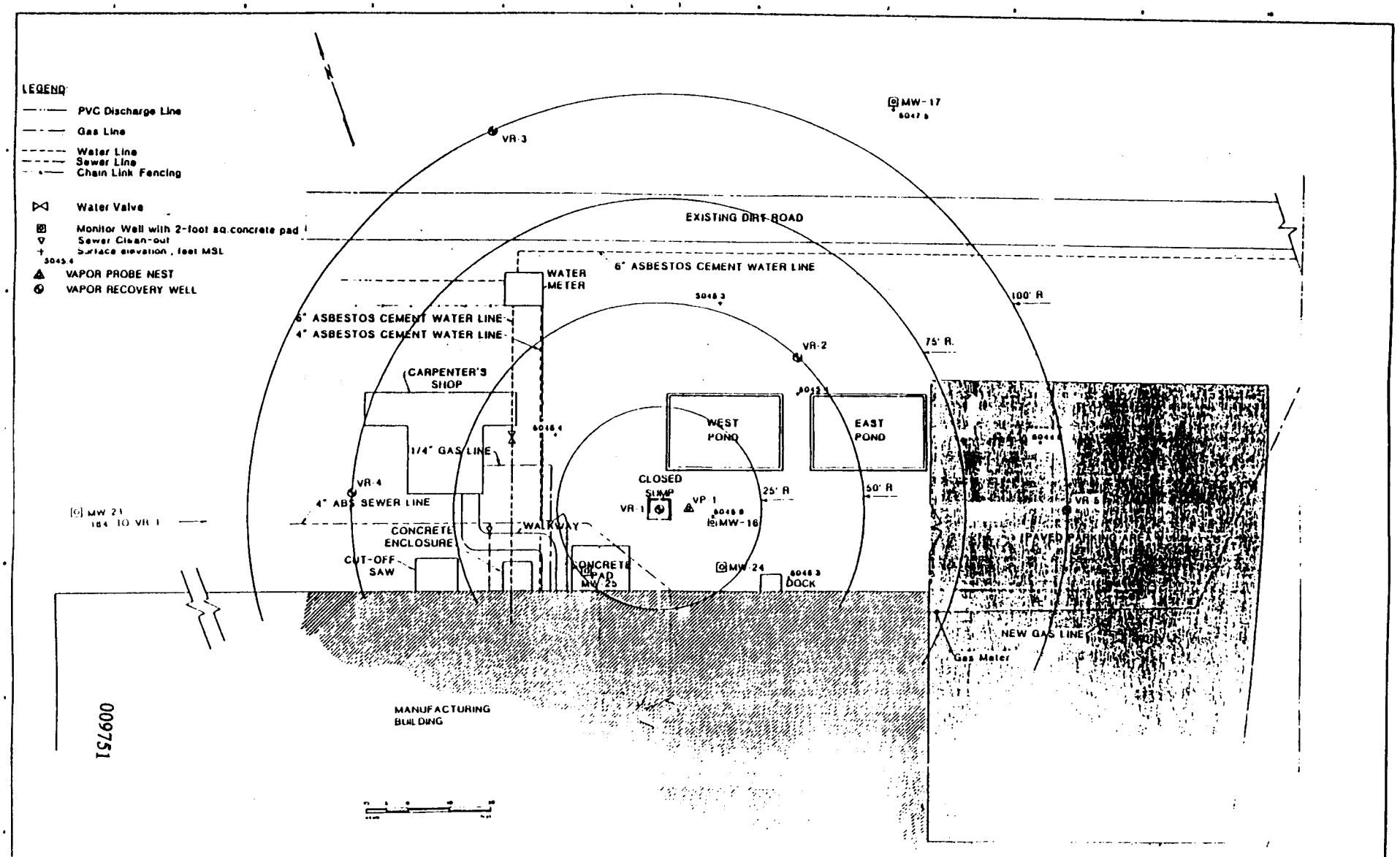
Prior to each individual test, depth to water, temperature and barometric pressure, and magnehelic pressure gauge readings at each monitoring point would be recorded. After the pilot test is started, extraction well vacuum and flow and extraction system operating data (including supplemental fuel flow) will be recorded. Pressure instrumentation at each of the observation wells will be monitored and recorded to determine vacuum communication with the recovery well (demonstration of radius of influence).

The produced vapor stream (influent) will be analyzed (on a real-time basis) using field screening instruments to determine variation in influent VOC concentration. At selected intervals, influent samples will also be obtained for confirmatory laboratory analyses (EPA Method 8010 and 8020). At least one confirmatory sample will be obtained for each extraction rate test. The purpose of the screening/testing will be to determine VOC concentration variation as a function of both pumping rate/vacuum and elapsed pumping duration.

Based on previous experience, the pilot test should require no more than two days of actual vapor extraction. It is anticipated that two to four extraction rates will be tested. Each extraction rate test will nominally take three to four hours. Upon completion of testing, a detailed pilot test report, including all operating and analytical data and recommendations for operating parameters and effective vacuum radius of influence, will be compiled and provided to NMED.

Pilot Test Schedule

Upon authorization to proceed, it will take from two weeks to over a month to schedule a drilling contractor to install the five vapor recovery wells. Approximately one week will be required to install the wells. Sampling and analytical testing will require several more weeks. Pilot testing can then be arranged in accordance with the subcontractor's schedule. Currently, several weeks are required to mobilize the pilot test equipment; however, once equipment is on site, the actual pilot testing can be conducted in several days. Interference with the schedule could be caused by the holiday season and possibly weather.



MAP SOURCE RCRA POST CLOSURE PERMIT APPLICATION
HARDING LAWSON ASSOCIATES MARCH 1986

Black & Veatch
Engineers Architects
Dallas, Texas

PROJECT NO

SPARTON TECHNOLOGY, INC.

COORS ROAD FACILITY
VES PILOT TEST

FIG 1

CONTRACT NO

SHEET NO

009751

PROPOSAL

Expansion of Interim Measures (IM)
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

Sparton Technology, Inc.
Rio Rancho, New Mexico

Prepared by:

Black & Veatch
Dallas, Texas

in Association With

Metric Corporation
Albuquerque, New Mexico

September 17, 1996

Objectives

The objectives of this proposal are two-fold:

1. To address high volatile organic constituent (VOC) concentrations in groundwater at the location of MW-32.

2. To evaluate the cause of erratic VOC detections historically observed during periodic sampling of groundwater monitoring well MW-32.

Lower lower flow zone (LLFZ) groundwater monitoring well MW-32 has historically exhibited erratic detections of volatile organic constituents (VOC). Periodically, it exhibits anomalously high concentrations relative to surrounding adjacent wells and also periodically exhibits anomalous constituents. Further, out of 13 cluster well locations, well MW-32 is the bottom well in the only cluster showing an increase in VOC concentration with depth.

The source of the erratic detections is a matter of speculation, but would include completion problems such as a defective grout seal or a cracked well casing allowing intrusion of shallow contamination. Sampling procedures have been ruled out as a cause through detailed resampling and multiple split procedures.

One procedure to determine the cause of the erratic behavior would be to pump the well for an extended period and observe the effect on sampled water quality. If well MW-32 does represent a zone or area of higher VOC concentration, the extended pumping from this well would also be a form of source control and containment. It should be noted that MW-32 is also immediately downgradient of the source area.

Proposed IM Expansion

The current IM system recovers a total of approximately 2 gpm from the upper portion of the aquifer. The treatment capacity of the IM system is 20 gpm. Well installation data for MW-32 indicate that pumping rates of 10 to 15 gpm could possibly be achieved. Actual production rate would be determined by installing a temporary pump and conducting a limited pumping test to determine production pumping rate and drawdown. A production pump would then be sized and installed. Discharge would be routed to the

existing onsite treatment unit. It should be noted that MW-32 is located almost adjacent to the treatment unit -- allowing economical, secure connection.

Production and impact on water quality would be evaluated on a periodic basis and furnished as a part of the site operation reporting.

Schedule

The current IM system is permitted for a production of 20 gpm. Adding well MW-32 to the IM system is simply a matter of conducting a limited pumping test for sizing purposes, and then installing the pump, controls, and connecting piping. It is estimated that well MW-32 could be recovering water within two months of authorization to proceed.

BLACK & VEATCH

5728 LBJ Freeway, Suite 300, Dallas, Texas 75240, (214) 770-1500, Fax: (214) 770-1549

Sparton Technology
Coors Road Facility

B&V Project 26602.0100
B&V File B
July 10, 1996

Mr. R. Jan Appel
Vice President and General Counsel
Sparton Corporation
2400 East Ganson Street
Jackson, Michigan 49202

Re: Updated Corrective Action Recommendations

Dear Mr. Appel:

As part of the continuing, phased investigation at the Coors Road facility, we have obtained additional preliminary data on the extent of soil gas and groundwater VOC concentration. In response to your request, the purpose of this letter is to briefly outline three corrective actions set forth as follows:

1. Install and operate a vapor extraction system (VES) in the immediate source area to reduce VOC concentration in the unsaturated zone.

2. Install and operate a groundwater extraction well to contain the leading edge of the defined plume.

3. Expand the existing onsite Interim Measure (IM) pump and treat system to include LLFZ well MW-32.

These recommended actions are described more fully in following sections of this letter. All of these actions are consistent with information given in the Corrective Measure Study (CMS) Report.

Vapor Extraction Systems (VES)

Preliminary analytical results from the recently installed vapor probe in the center of the source area (adjacent to the solvent sump) and the April 1996 deep soil gas investigation confirmed the findings of the RFI and CMS Reports. Specifically, elevated soil gas concentrations (above 10 ppmv) of TCE and 1,1,1-TCA are found in the immediate source area and negligible soil gas VOC concentrations are found

offsite. The elevated soil gas VOC concentrations are believed to be the result of adsorption to fine-grained silts and clays in the upper 40 feet or so of the unsaturated zone.

The elevated soil gas VOC concentrations indicate that VES should be considered in the source area. As many as seven soil gas extraction wells (as shown in the attached figure) may be necessary to cover the source area with elevated soil-gas VOC concentration. The areal coverage provided by these wells indicates that further vapor probe installation in the interior source area is not warranted. Any additional soil gas monitoring, if necessary, could be provided by the individual extraction wells.

Detailed information of VES is given in the CMS Report. Extraction rates are expected to be in the range of 5 to 10 scfm per well. It is anticipated that the VES would be operated on a pulsed basis for up to three years to obtain maximum practical reduction in VOC concentration in the unsaturated zone.

Plume Containment

Based on preliminary sampling and analyses at the three new groundwater monitoring well locations that have been drilled so far -- specifically, UFZ wells MW-66 and MW-68 and TFZ well MW-67 (Sparton correspondence 5/14/96) -- the 1996 TCE plume contours given in the CMS Report seem reasonable. Based on the plume configuration, a single groundwater extraction well located along Buckeye (as shown in the attached figure) should be capable of containing the defined plume. For security, it would be advantageous to install the well on a vacant residential lot.

The partially penetrating well should be screened at least into the upper thirty to thirty-five of the saturated zone. (Upper and Lower Flow Zones). Screen depth should be adjusted, based on pilot hole logging, to assume placement in a transmissive zone. Very deep penetrations are undesirable due to the potential for contaminant migration to the Lower Lower Flow Zone (LLFZ).

Using aquifer properties given in the RFI Report and confirmed by the USGS, a pumping rate of 50 to 100 gpm would give a capture zone width (at the well) of approximately 1,500 to 2,000 feet which would adequately cover the width of the plume. Alternatively, capture zone width could be based on the 600-foot-plus radius of influence demonstrated in pumping tests reported in the RFI. The pumping rate would give a drawdown in the range of six to ten feet. The pumping rate should be

adjusted to provide sufficient drawdown for containment but not so much drawdown to pull shallow contamination deeper into the aquifer.

Extracted water would be treated at the well head on the residential lot to avoid any problem with transmission of untreated water along public right-of-way. It is anticipated that the only required treatment would be air stripping to remove VOC. Air polishing of air effluent should not be required since the total VOC emissions will be less than 5 pounds per day.

Treated water could be routed from the well head treatment site to the Rio Grande in a pipeline buried in the public right-of-way. An NPDES permit would be necessary for such a discharge, as discussed in the CMS Report.

Enhanced IM Recovery

We continue to recommend that LLFZ groundwater monitoring well MW-32 be added to the existing onsite IM pump and treat system as detailed in the CMS Report § VIII.B.

We appreciate the opportunity to provide this information. If you have any questions, please call.

Sincerely,

BLACK & VEATCH

Pierce L. Chandler, Jr.
Project Manager

bk
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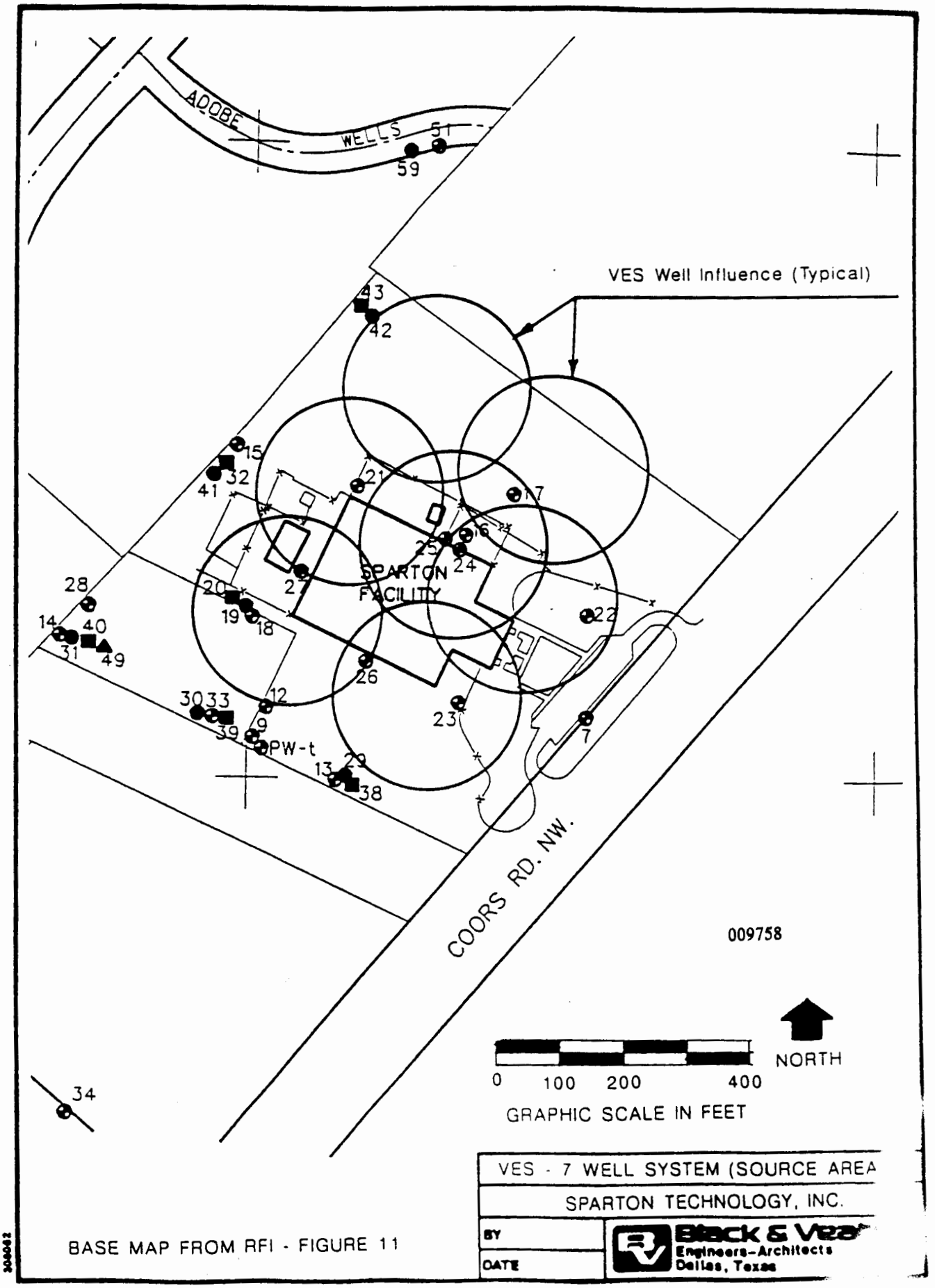

VES - 7 WELL SYSTEM (SOURCE AREA

SPARTON TECHNOLOGY, INC.

BY

DATE

Black & Veatch
Engineers-Architects
Dallas, Texas

BASE MAP FROM RFI - FIGURE 11

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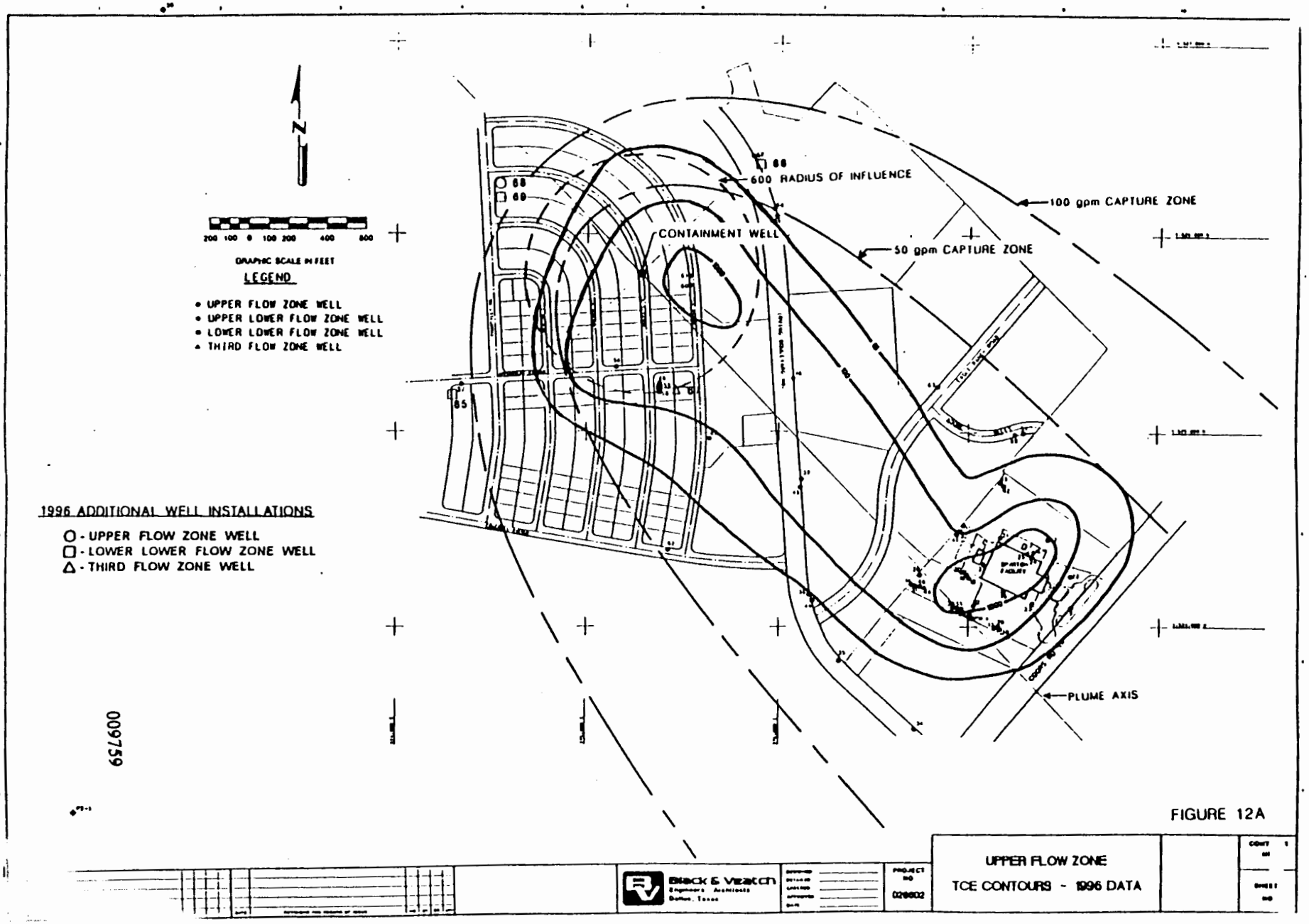

FIGURE 12A

UPPER FLOW ZONE
TCE CONTOURS - 1996 DATA

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Dallas, Texas

PROJECT NO 026602

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5728 LBJ Freeway, Suite 300, Dallas, Texas 75240, (214) 770-1500, Fax: (214) 770-1549

Sparton Technology
Coors Road Facility

B&V Project 26602.0100
B&V File B
August 12, 1996

Ms. Anna Marie Ortiz
Assistant General Counsel
State of New Mexico Environment Department
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 887502

Re: Vapor Extraction System Pilot Testing
Coors Road Facility

Dear Ms. Ortiz:

In our teleconference on August 5, 1996, we had discussions with you, Dennis McQuillan, and Rob Pine concerning pilot testing for the proposed VES. Based on those discussions, we are submitting this additional information on VES pilot testing as indicated in Jim Harris' letter of August 6, 1996. Specifically, this information covers the installation of additional vapor observation/recovery wells and pilot testing of a centrally located vapor recovery well in the sump area.

The centrally located vapor recovery well would be a 4-inch well installed in the sump area as described in our July 22, 1996, revised proposal. Additional 2-inch vapor wells (as previously described) would be installed at varying radial distances of 50 to 100 feet from the central well. A minimum of four wells would be installed at the approximate locations shown on the attached base map. These wells would be utilized as observation wells (together with the existing soil gas vapor probe VP-1 and existing groundwater monitoring wells with screen exposure above the water table) in a pilot test to evaluate production rates, radius of influence, and VOC concentration in the produced vapor stream. The additional vapor wells would also be used to further define the extent of VOC concentration in the soil gas. These wells could also be potentially used in the VES for vapor recovery and/or air introduction.

We anticipate that the pilot test would use a locally experienced subcontractor such as AcuVac to recover soil vapor from the central vapor recovery well and monitor the

surrounding observation network. It is our opinion that several days of pilot testing would be required to determine recovery rates and VOC concentrations for permit purposes. Once we have reached agreement on the location and number of pilot test wells and observation points, we will submit a more detailed description of the actual pilot test procedure. At the conclusion of the pilot testing, analyses would be provided relative to the extended VES implementation.

As shown in the following table, there are potentially four groundwater monitoring wells that could be utilized in the pilot test for vapor observation wells.

GROUNDWATER MONITOR WELLS IN VAPOR RECOVERY AREA (PILOT TEST)			
	Elevation Top of Screen (ft)	July 1996 Water Level Elevation (ft)	Screen Exposure (ft)
MW-16	4979.50	4979.45	.05
MW-17*	4982.28	4979.44	2.84
MW-21*	4983.86	4979.18	4.68
MC-22	4976.06	4979.06	(3)
MW-24**	4980.30	4975.72	4.58
MW-25**	4981.31	4977.64	3.67

* Vapor sampled successfully April 1996.
** IM groundwater recovery wells.

The four wells with good screen exposure (MW-17, MW-21, MW-24, and MW-25) were tested in April 1996 for the presence of VOC above the water table; however, VOC concentration in two of the wells, MW-24 and MW-25, could not be confirmed by laboratory analyses due to the water level being drawn above the top of the screen. It should be noted that photoionization detector readings during purging were significantly lower than comparable readings in MW-17. The locations of these four groundwater monitoring wells relative to the central vapor recovery well are shown on the attached base map. Note that two of the wells are within a 25-foot radial distance

Sparton Technology
Ms. Anna Marie Ortiz

B&V Project 26602.0100
August 12, 1996

Two-inch vapor wells as previously described in the July 22, 1996 proposal would be installed at four locations around the central vapor well. Radial distance ranges from 50 to 100 feet as shown on the base map. The locations and radial distances conform to our previous discussion of pilot testing as described in the August 6, 1996 letter.

We trust this pilot testing information is sufficient for your needs.

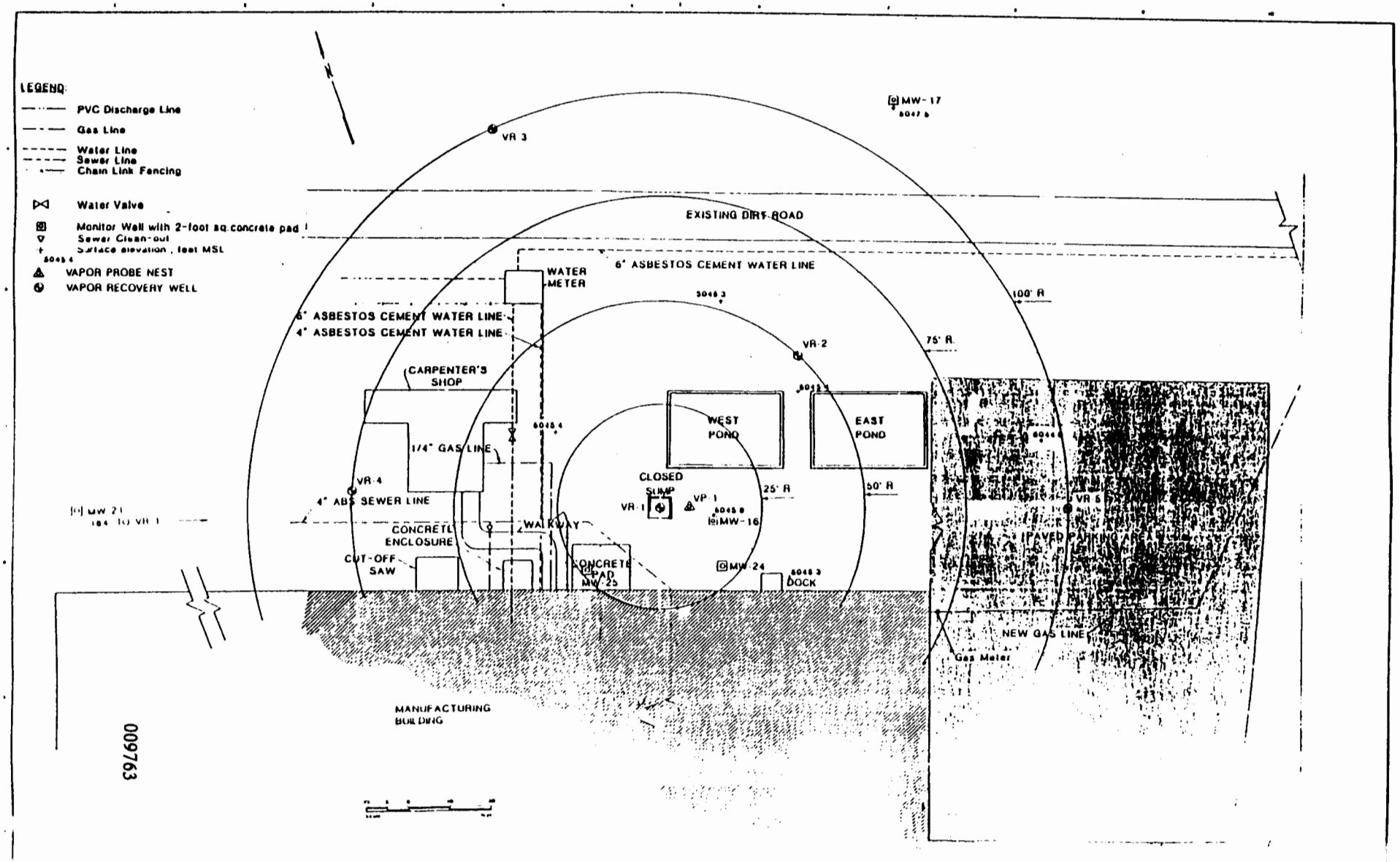
Sincerely,

BLACK & VEATCH

Pierce L. Chandler, Jr.
Project Manager

bk
enclosures

cc: Mr. James B. Harris
Mr. R. Jan Appel



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MAP SOURCE RCRA POST CLOSURE PERMIT APPLICATION
HARDING LAWSON ASSOCIATES MARCH 1986

Black & Veatch
Engineers Architects
Dallas Texas

PROJECT NO

SPARTON TECHNOLOGY, INC.

COORS ROAD FACILITY
VES PILOT TEST

FIG 1

CONTRACT NO

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Sparton Technology
Coors Road Facility

B&V Project 26602.0100
B&V File B
August 22, 1996

Ms. Anna Marie Ortiz
Assistant General Counsel
State of New Mexico Environment Department
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 887502

Re: Calculations of Hydraulic Influence
Groundwater Containment Wells
Coors Road Facility

Dear Ms. Ortiz:

In recent discussions with you, Dennis McQuillan, and Rob Pine, copies of our calculations of predicted groundwater containment well performance were requested. Attached to this letter are copies of the requested calculations. The calculations include:

1. Site-specific calculations of radius of influence using pump test data from the U.S. EPA-approved RFI Report (RFI Attachment 10).

2. Illustration of containment well radius of influence based on RFI pump test data and pumping duration of one day superposed on the January 1996 plume configuration from the CMS Report.

3. Confirmatory calculations of radius of influence using data from the 1995 U.S.G.S. Albuquerque Basin Model.

4. Field demonstrations of radius of influence from Intel Production wells approximately 2.5 miles north of the Sparton Facility.

Sparton Technology
Ms. Anna Marie Ortiz

B&V Project 26602.0100
August 22, 1996

5. Calculations of capture zone using conventional methodology (Fetter 1994, Grubb 1993, and others) using a range of site-specific parameters and containment pumping rates. Note that transmissivity values are from the RFI/CMS Reports and hydraulic gradient is from third quarter 1996 water level data including the recently installed monitoring wells outside the leading edge of the plume.

6. Copy of site-specific 50- and 100-gpm capture zones (T=18,000 gpd/ft) for a potential containment well superposed over the January 1996 plume configuration from CMS report.

7. Calculations of capture zone using USGS-based parameters.

8. Copy of USGS-based capture zones superposed on the January 1996 Plume footprint from the CMS Report.

We trust that the attached information will be helpful in your review.

Sincerely,

BLACK & VEATCH

Pierce L. Chandler, Jr.
Project Manager

bk
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cc: Mr. James B. Harris
Mr. R. Jan Appel

BLACK & VEATCH

Owner SPARTON TECHNOLOGY Computed By PLC (1)

Plant COORS ROAD Unit _____ Date 8/6 19 __

Project No. 026602.0100 File No. _____ Verified By _____

Title RADIUS OF INFLUENCE Date _____ 19 __

USING RFI PUMP TEST VALUES Page 1 of 3

1) PUMP TEST WAS CONDUCTED IN EARLY OCTOBER 1984.

2) PUMP TEST WAS CONDUCTED NEAR END OF IRRIGATION SEASON WHICH RUNS FROM MID-APRIL TO MID-NOVEMBER

3) IRRIGATION IS PROVIDED BY CORRALES MAIN CANAL AND RESULTS IN A TWO TO THREE FOOT INCREASE IN POTENTIOMETRIC ELEVATION

4) THE UNLINED CORRALES MAIN CANAL IS LESS THAN 700 FEET SOUTHEAST OF THE PUMPED WELL PW-1 USED IN THE PUMP TEST.

5) PUMP TEST WAS A 180-GPM CONSTANT RATE TEST WITH A 25-HOUR DURATION PRODUCING DRAWDOWN OF 24 FEET IN THE PUMPED WELL

6) NOT SURPRISINGLY, PUMP TEST DATA EXHIBITED AN "EQUILIBRIUM" SIGNATURE (CONDITION OF RECHARGE EQUAL TO PUMPING RATE) AFTER SOME 200 MINUTES OF CONSTANT RATE PUMPING

7) PUMP TEST WAS MONITORED BY THREE OBSERVATION WELLS LOCATED AT RADIAL DISTANCES OF 45, 150, AND 350 FEET FROM THE PUMPED WELL.

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8) DISTANCE-DRAWDOWN DATA FROM THE OBSERVATION WELLS DEMONSTRATED A RADIUS OF INFLUENCE OF APPROXIMATELY 600 FT

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Page 2 of 3

9) PREDICTABLY, THE RADIUS OF INFLUENCE OF 600 FEET IS ALSO THE APPROXIMATE DISTANCE TO THE CORRALES MAIN CANAL AND IRRIGATED FARM LAND (DEMONSTRATED SOURCE OF RECHARGE)

10) IN THE ABSENCE OF THIS CLOSE SOURCE OF RECHARGE, THE CONE OF DEPRESSION WOULD HAVE CONTINUED TO DEEPEN AND EXPAND DURING THE PUMP TEST

11) ANALYSIS OF THE PUMP TEST DATA RESULTED IN THE FOLLOWING RECOMMENDED DESIGN PARAMETERS:

TRANSMISSIVITY, T = 18,000 gpd/ft *

STORAGE COEFFICIENT, S = 0.0025 *

12) THE RFI AND SUBSEQUENT STUDIES HAVE CONFIRMED THAT HYDROGEOLOGIC CONDITIONS DEFINED BY THE PUMP TEST ARE RELATIVELY CONSTANT OVER THE PLUME AREA.

13) THE LEADING EDGE OF THE PLUME IS SEVERAL THOUSAND FEET FROM THE RECHARGE AREA, SO RADIUS OF INFLUENCE CAN BE CALCULATED FROM THE DESIGN PARAMETERS USING NON-EQUILIBRIUM METHODS

* SEE ATTACHED CONCLUSIONS & CALCULATIONS FROM RFI ATTACHMENT 10

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Page 3 of 3

14) USING THE COOPER-JACOB APPROXIMATIONS OF THE THEIS NON-EQUILIBRIUM EQUATION, THE RADIUS OF INFLUENCE CAN BE CALCULATED FROM THE FOLLOWING:

$$R_o = \sqrt{\frac{0.3\,T t}{S}}$$

WHERE R_o = RADIUS OF INFLUENCE (ft)
T = TRANSMISSIVITY (gpd/ft)
t = PUMPING DURATION (days)
S = STORAGE COEFFICIENT

15) SUBSTITUTING THE PUMP TEST VALUES INTO THE ABOVE EQUATION YIELDS

$$R_o = \sqrt{\frac{0.3\,(18{,}000\ \text{gpd/ft})(t)}{0.0025}}$$

$$R_o = 1469.7\sqrt{t}$$

WHEN t = 1 day	R_o = 1470 ft
= 2 days	= 2078 ft
= 7 days	= 3,888 ft
= 30 days	= 8,050 ft
= 365 days	= 28,078 ft

16) IN CONCLUSION, RADIUS OF INFLUENCE IS AT LEAST 600 FEET ON SITE (DUE TO CORRALES MAIN CANAL). OFF-SITE, RADIUS OF INFLUENCE WILL BE LARGER.

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ROI Attachment 1 (From RFI Attachment 10, p 1 of 6

steady solution. However equilibrium or steady-state conditions provide a higher level of confidence in analytical results.

10. As noted in the analysis section, there is considerable ambiguity as to whether the aquifer is unconfined, partially confined or confined. However, considering the saturated thickness of the aquifer (approximately 75 feet), relatively small drawdowns at the observation wells (1.5 feet to 6 feet), and the apparent equilibrium or steady-state conditions that developed during the pumping tests, there is no significant analytical difference between confined or unconfined conditions. Indeed analysis showed differences in the order of 5% in the calculation of transmissivity. However, the calculated storage coefficient values in the range of 0.002 to 0.003 indicate essentially confined conditions. In any case, the more critical parameter, radius of influence, is well documented and not dependent on aquifer confinement evaluation.

CONCLUSIONS AND RECOMMENDATIONS

Aquifer parameters for the lower flow zones obtained from current analysis of the 1984 pumping test data are adequate for the evaluation of various remedial alternatives to be included in the Corrective Measure Study (CMS). Although these aquifer parameters were developed from on-site pumping tests, geologic correlation off-site indicates general application to the entire plume area.

A radius of influence, R_o, of approximately 600 feet has been demonstrated by both

analytical methods (see Figure 23) and remote observation points during actual pumping. This value should be used in future calculations of capture area, etc. The 600-ft radius of influence reflects steady-state or equilibrium conditions; i.e., it is not a time-dependent value. It should also be noted that this radius of influence will not be affected by pumping rate.

A transmissivity, T, of 18,000 gpd/ft has generally been calculated for the data base as a whole, with lesser values in the order of 12,000 to 14,000 gpd/ft considering only PW-1 data. For conservative design, a transmissivity of 18,000 gpd/ft is recommended.

Both the HLA Report and current analysis indicate a storage coefficient, S, value in the range of 0.002 to 0.003. Some individual analyses indicate a storage coefficient an order of magnitude less. However, considering that radius of influence is well defined, a storage coefficient of 0.0025 is recommended as a conservative measure.

Finally, it should be recognized in any pumping system design that the aquifer is significantly stratified with significant anisotropy. As a result, fully penetrating pumped wells with significant drawdowns could cause downward vertical movement of contaminants from near-water-surface (UFZ) high-constituent-concentration areas.

Analysis by Pierce L. Chandler, Jr., P.E.

HDR Engineering, Inc.

May 1, 1992

p 30 + 6

SAMPLE CALCULATIONS

I. LOWER FLOW ZONES

A. Steady radial flow without vertical movement

1. Using distance-drawdown data given on Figure 23, the Transmissivity, T, may be calculated from:

$$T = \frac{2.30\ Q}{2\pi\ \Delta s/\Delta \log_{10} r}$$

(Lohman, Eq 34, units of $L^2\ T^{-1}$)

with appropriate conversions for T expressed in gallons per day per foot, the equation becomes

$$T = \frac{528\ Q}{\Delta s/\Delta \log_{10} r}$$

where Q = 180 gallons per minute and

$\Delta s/\Delta \log_{10} r$ = 5.2 feet/cycle

T = 18277 gallons per day per foot

The Storage Coefficient, S, may be determined from the calculated T; the radial distance to zero drawdown, r_o = 600 feet extrapolated from the data in Figure 23; and, the nominal time to equilibrium, t_o, of 200 minutes (0.139 days) using:

$$S = 2.25\ T \left(\frac{t}{r^2}\right)_o \qquad \text{(Lohman, Eq 59, Dimensionless)}$$

with appropriate conversion factors for T in gallons per day per foot

$$S = \frac{0.3\ T\ t_o}{r_o^2} = \frac{0.3\ (18277\ \text{gal/day/ft})\ (0.139\ \text{days})}{(600\ \text{ft})^2}$$

S = 0.0021

p 4 of 6

note that if $t_e \approx 300$ minutes

$$S \cong 0.003$$

2. Using data from MW-12 and MW-13, and assuming <u>confined</u> conditions, Transmissivity was checked using:

$$T = \frac{2.30\ Q \log_{10}(r_2/r_1)}{2\pi\ (s_1 - s_2)} \quad \text{(Lohman, Eq 32, } L^2T^{-1} \text{ units)}$$

in typical units,

$$T = \frac{528\ Q \log_{10}(r_{MW\text{-}13}/r_{MW\text{-}12})}{s_{MW\text{-}12} - s_{MW\text{-}13}}$$

For $Q = 180$ gpm
$r_{MW\text{-}12} = 45$ feet
$r_{MW\text{-}13} = 150$ feet
$s_{MW\text{-}12} = 5.9$ feet
and $s_{MW\text{-}13} = 3.1$ feet,
the calculation of T is:

$$T = \frac{528\ (180\ \text{gpm})\ \log_{10}(150\ \text{ft}/45\ \text{ft})}{5.9\ \text{ft} - 3.1\ \text{ft}}$$

$$T = 17{,}748\ \text{gal/day/ft}$$

3. Using the MW-12 and MW-13 data, but assuming <u>unconfined</u> conditions; a saturated thickness, b, equal to 75 feet; and the base of the aquifer at an elevation of 4900 feet, T may be calculated using:

$$K = \frac{2.30\ Q \log_{10}(r_2/r_1)}{\pi\ (h^2_2 - h^2_1)} \quad \text{(Lohman, Eq 31, } LT^{-1} \text{ units)}$$

and $T = Kb$

with appropriate conversion factors, the combined equation becomes:

$$T = \frac{1055\ b\ Q\ \log_{10}(r_{MW\text{-}13}/r_{MW\text{-}12})}{(h_{MW\text{-}13})^2 - (h_{MW\text{-}12})^2}$$

For $Q = 180$ gpm
$b = 75$ ft
$r_{MW\text{-}12} = 45$ ft
$r_{MW\text{-}13} = 150$ ft
$h_{MW\text{-}12} = 69.1$ ft (75 ft - 5.9 ft)
$h_{MW\text{-}13} = 71.9$ ft (75 ft - 3.1 ft)

$$T = \frac{1055\ (75\ \text{ft})\ (180\ \text{gpm})\ \log_{10}(150\ \text{ft}/45\ \text{ft})}{(71.9\ \text{ft})^2 - (69.1\ \text{ft})^2}$$

T = 18863 gal/day/ft

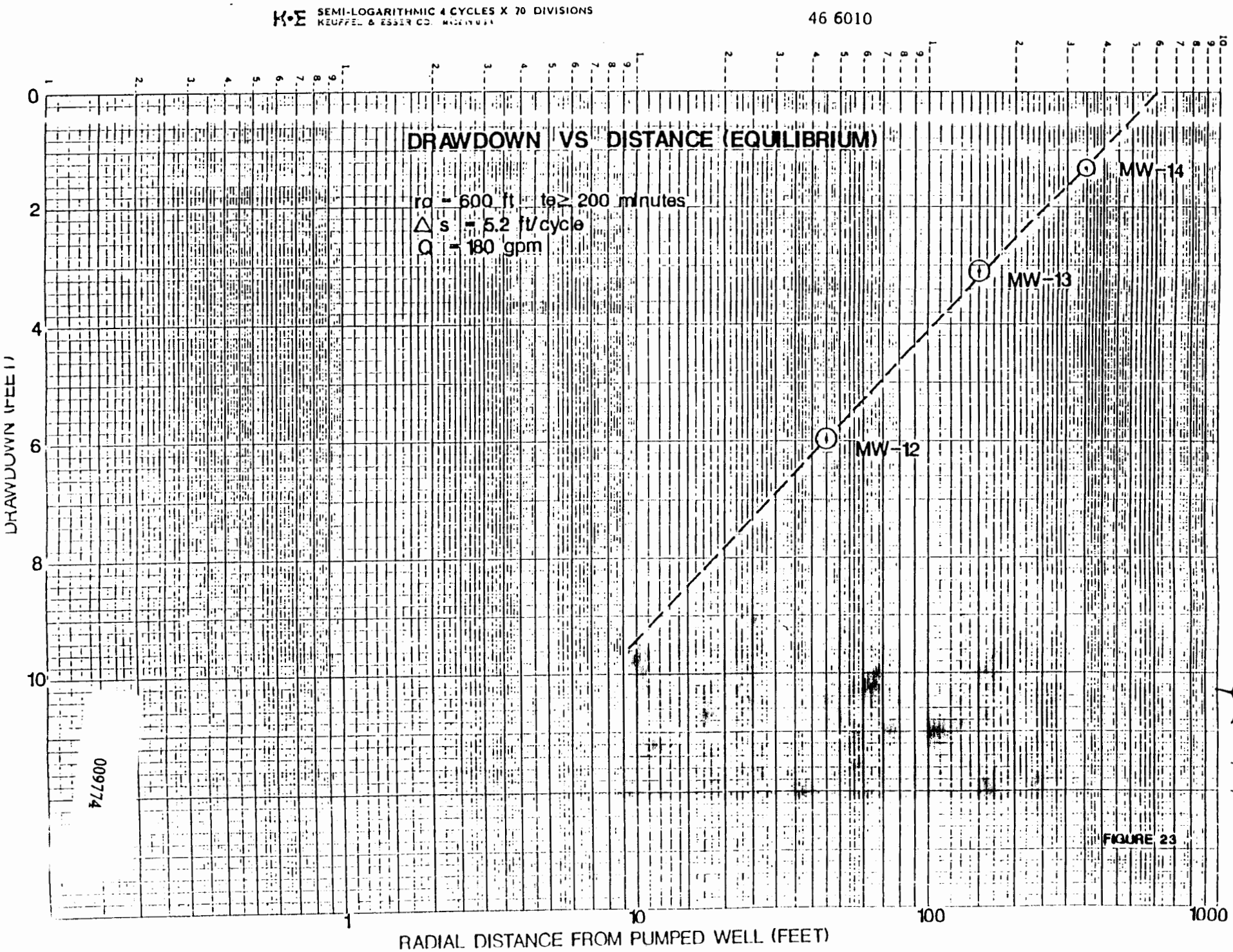
K•E SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO.
46 6010
DRAWDOWN VS DISTANCE (EQUILIBRIUM)
ro = 600 ft te ≥ 200 minutes
Δs = 5.2 ft/cycle
Q = 180 gpm
MW-14
MW-13
MW-12
DRAWDOWN (FEET)
0
2
4
6
8
10
1
10
100
1000
RADIAL DISTANCE FROM PUMPED WELL (FEET)
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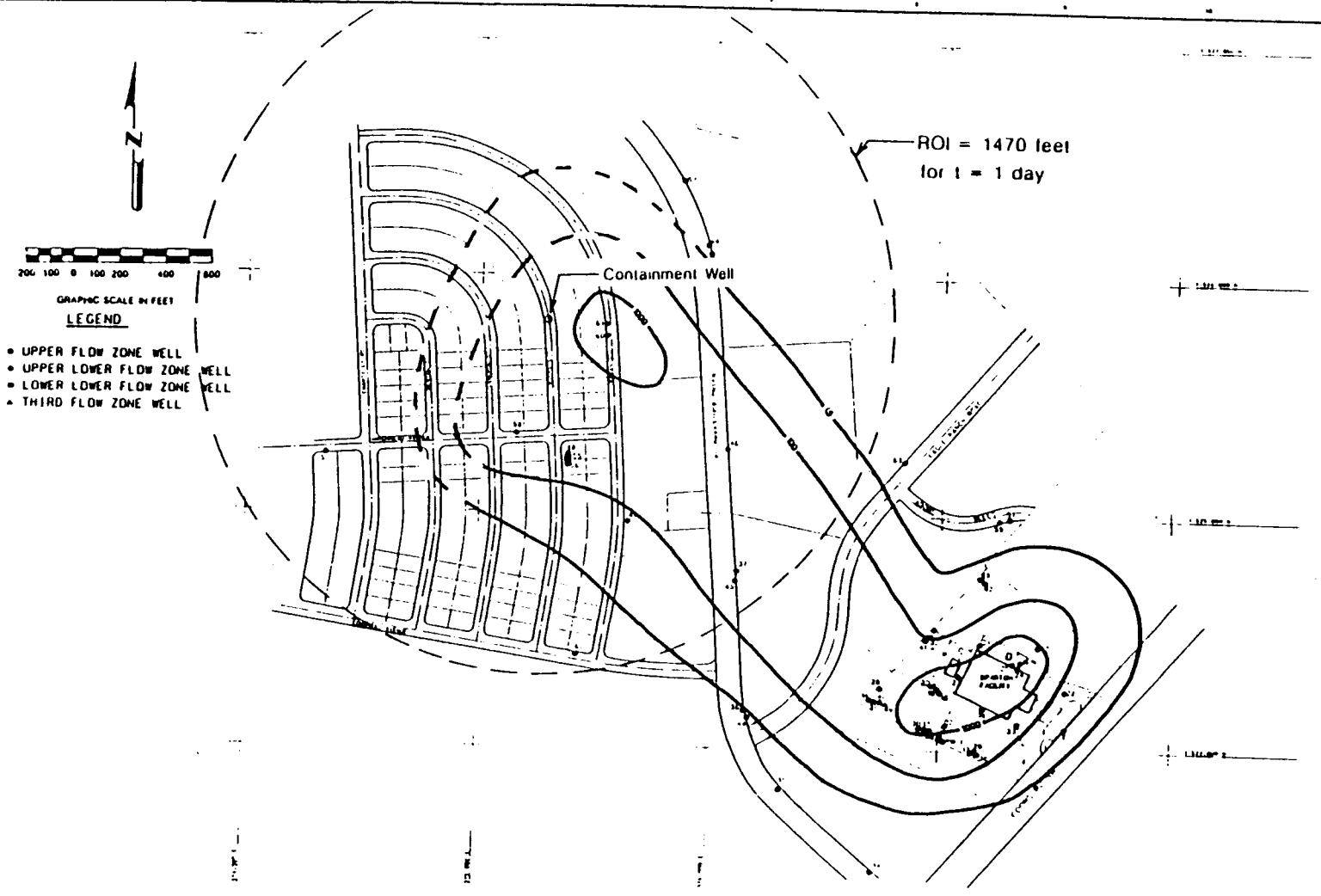
FIGURE 23



RADIUS OF INFLUENCE
Site Specific Parameters

FIGURE 12A

			Black & Veatch Engineers Architects Dallas Texas		PROJECT NO 026602	UPPER FLOW ZONE TCE CONTOURS - 1996 DATA	CONTRACT NO / SHEET NO

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Title RADIUS OF INFLUENCE USING 1995 USGS MODEL VALUES Date _____ 19 ____

Page 1 of 1

1) THE 1995 U.S.G.S. ALBUQUERQUE BASIN MODEL COVERS THE UPPER 1730 FEET OF THE SANTA FE GROUP AQUIFER SYSTEM USING ELEVEN LAYERS.

2) IN THE SPARTON AREA, HORIZONTAL HYDRAULIC CONDUCTIVITY, K, OF 15 FEET/DAY IS USED IN THE FIRST EIGHT MODEL LAYERS (580 TOTAL FEET) WITH ISOLATED POCKETS OF UP TO 25 FEET/DAY (SEE PAGES 26-33, USGS 1995)

3) STORAGE COEFFICIENTS IN THE MODEL WERE ESTIMATED USING A SPECIFIC STORAGE OF 2×10^{-6} PER FOOT BASED ON LOHMAN (USGS 1979)

4) RADIUS OF INFLUENCE CAN BE CALCULATED FROM THE ABOVE VALUES USING THE RELATIONSHIP:

$$R_o = \sqrt{\frac{2.25\,Tt}{S}}$$

AND REMEMBERING $T = Kb$ AND $S = S_s b$

5) SUBSTITUTING THE USGS MODEL VALUES

$$R_o = \sqrt{\frac{2.25\,(15\ \text{Feet/Day})(\cancel{b})(t)}{(2\times10^{-6}/\text{Feet})(\cancel{b})}}$$

$$R_o = 4108\sqrt{t}$$

WHEN $t = 1$ day	$R_o = 4108$ feet
$t = 2$ days	$R_o = 5810$ feet
$t = 7$ days	$R_o = 10{,}869$ feet
$t = 30$ days	$R_o = 22{,}500$ feet
$t = 365$ days	$R_o = 78{,}483$ feet

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Plant COORS ROAD Unit _____ Date 8/6 19 96
Project No. 026602.0100 File No. _____ Verified By _____
Title RADIUS OF INFLUENCE Date _____ 19 ____
INTEL WELL DEMONSTRATION Page 1 of 6

1) THE IMPACT OF THE INTEL PRODUCTION WELLS ON THE AQUIFER IS MONITORED BY A NETWORK OF 3 CLUSTER WELLS (15 TOTAL WELLS) AND 15 DOMESTIC WELLS. SEE FIGURE 1 FOR LOCATION (JOHN SHOMAKER & ASSOC, MARCH 1996)

2) INTEL HAS BEEN PUMPING FROM THE THREE PRODUCTION WELLS ON A SUSTAINED BASIS SINCE EARLY SEPTEMBER 1995. COMBINED PUMPING RATE IS APPROXIMATELY 3 MGD (2080 GPM) – PRIMARILY FROM WELLS 2 AND 3. SEE FIGURE 40 (SHOMAKER, 1996)

3) PRODUCTION WELLS ARE SCREENED FROM 730 TO 2000 FEET BGS (CORRESPONDS TO USGS 1995 BASIN MODEL LAYERS 8 to 11)

4) ALL THREE CLUSTER WELL LOCATIONS SHOW INFLUENCE OF PUMPING. SEE FIGURES 22–24 (SHOMAKER, 1996). NOTE THAT CLUSTER B IS OVER 4000 FOOT DISTANT AND CLUSTER C IS OVER 8000-FOOT DISTANT.

5) INTEL HYDROGEOLOGIC CONDITIONS ARE MODELLED SIMILARLY TO SPARTON (USGS 1995)

6) RADIUS OF INFLUENCE IS MUCH LARGER THAN 8,000 FEET

009777

ENCLOSURES

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Explanation

- Intel production well location
  1. Intel Production Well No. 1
  2. Intel Production Well No. 2
  3. Intel Production Well No. 3
- domestic monitor well
  1. Betsill
  2. Betsill
  3. Hutchinson
  4. Campbell
  5. Tice
  6. Sheppard
  7. King
  8. Passage
  9. Goering
  10. Walker
  11. Corrales
  12. Rockwell
  13. Swanson
  14. Joseph
  15. Allen
- Intel monitor wells site
  A. Intel monitor wells A1, A2, A3, A4, A5, A6
  B. Intel monitor wells B1, B2, B3
  C. Intel monitor wells C1, C2, C3, C4, C5, C6

N

0 .5 1 mile

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Figure 1. Map showing locations of Intel production wells, Intel monitor wells, and domestic monitor wells.

osorig1

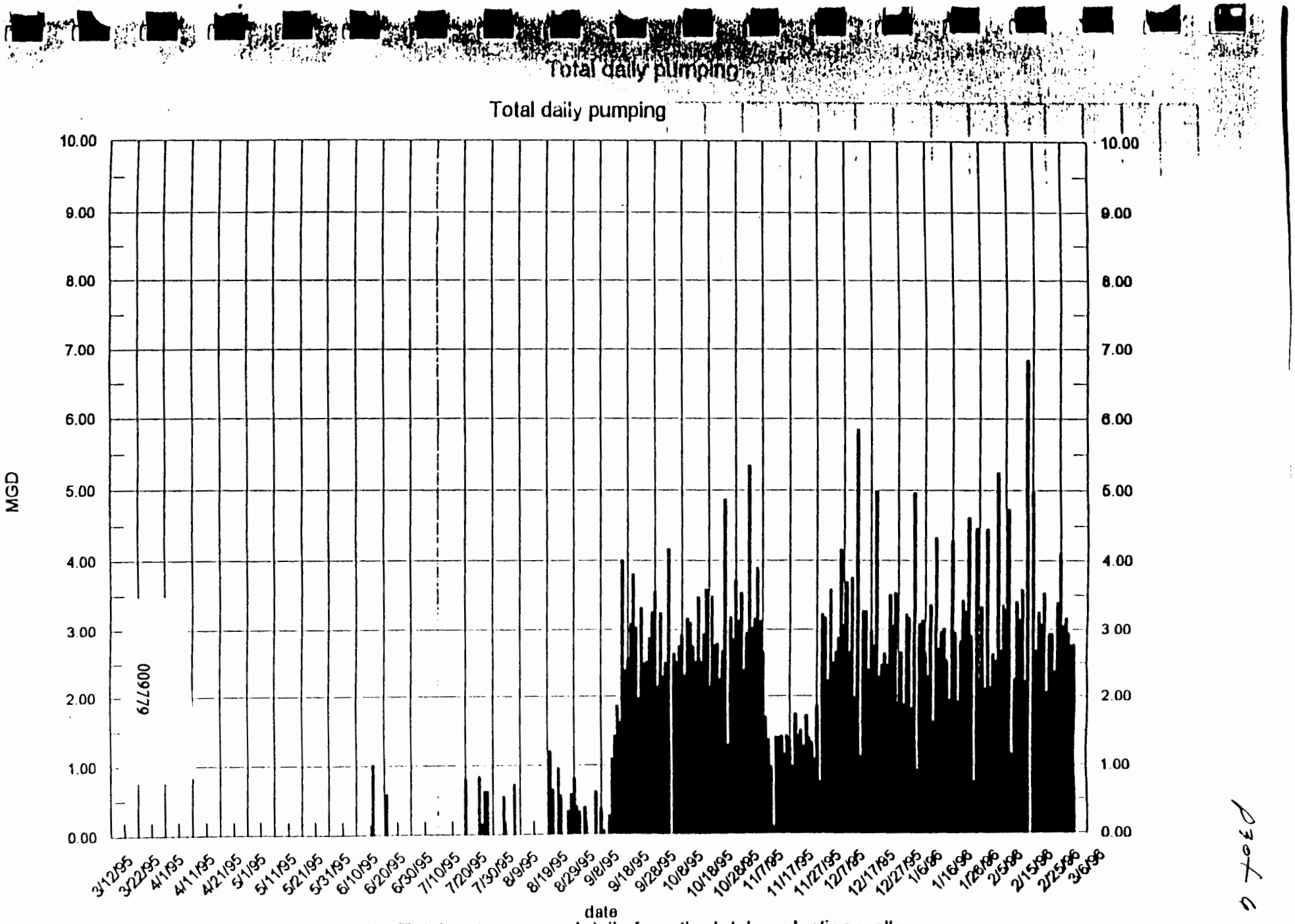

Figure 40. Total water pumped daily from the Intel production wells.

page 6

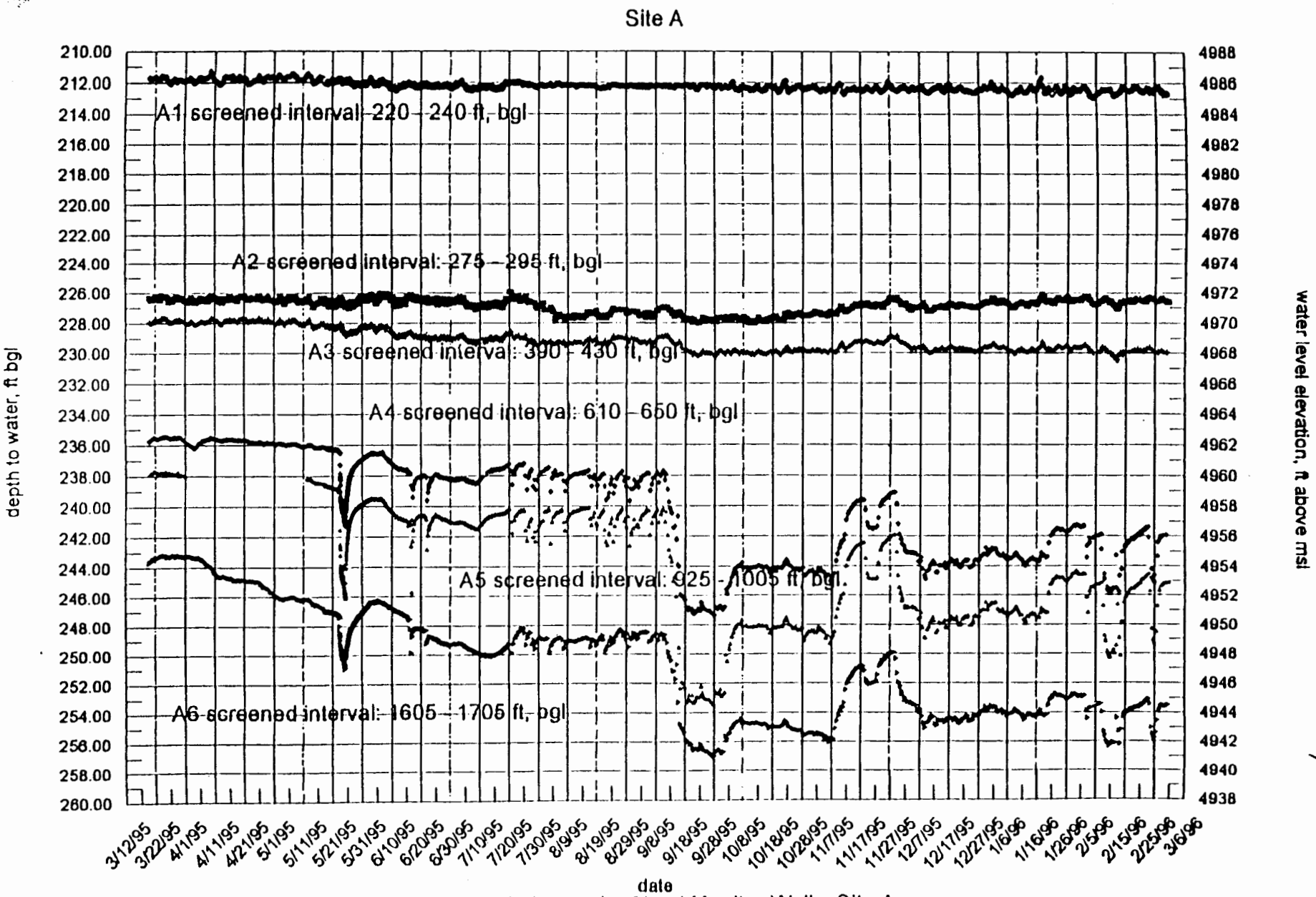

Figure 22. Hydrograph of Intel Monitor Wells, Site A.

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P4 of 6

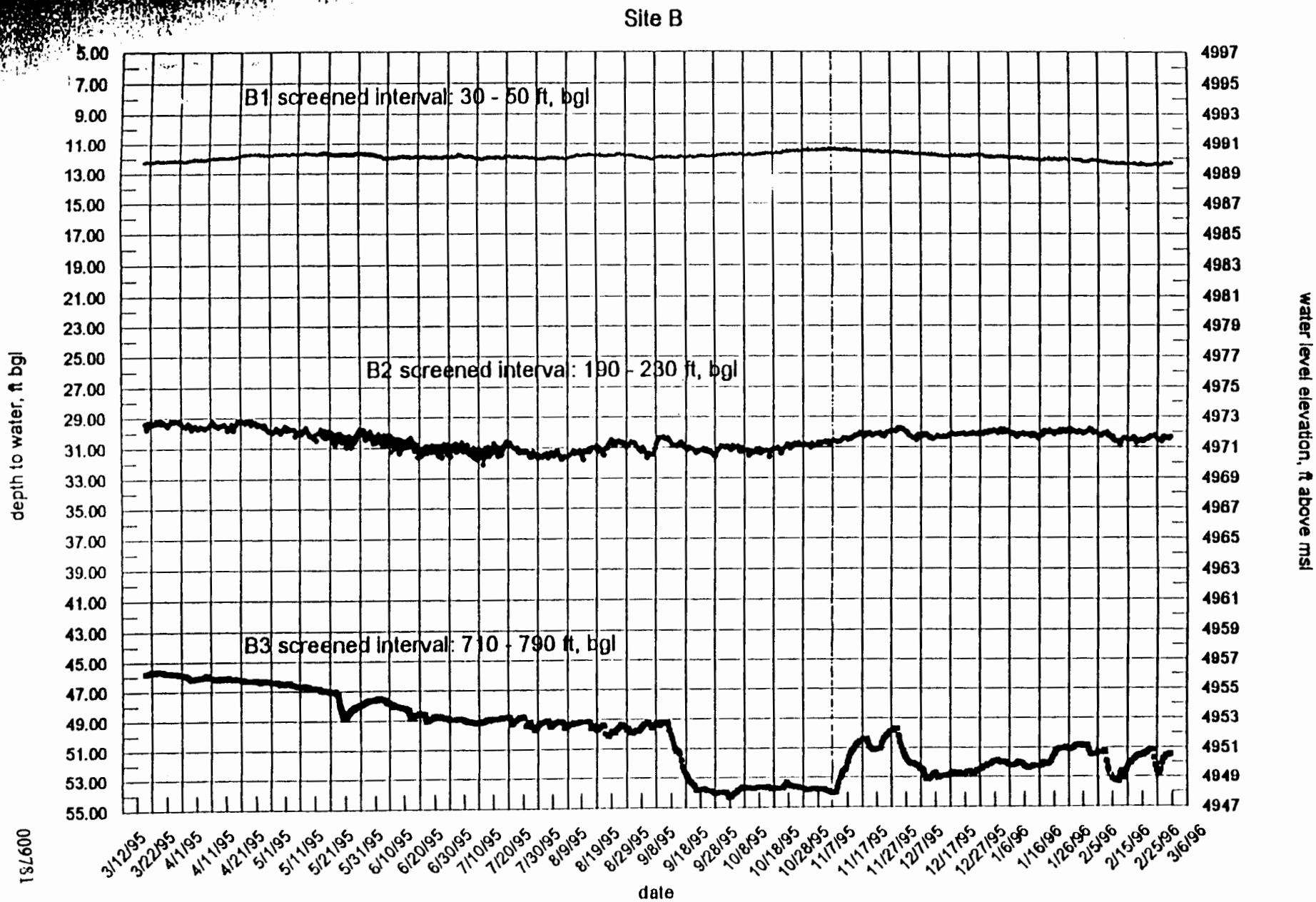

Figure 23. Hydrograph of Intel Monitor Wells, Site B.

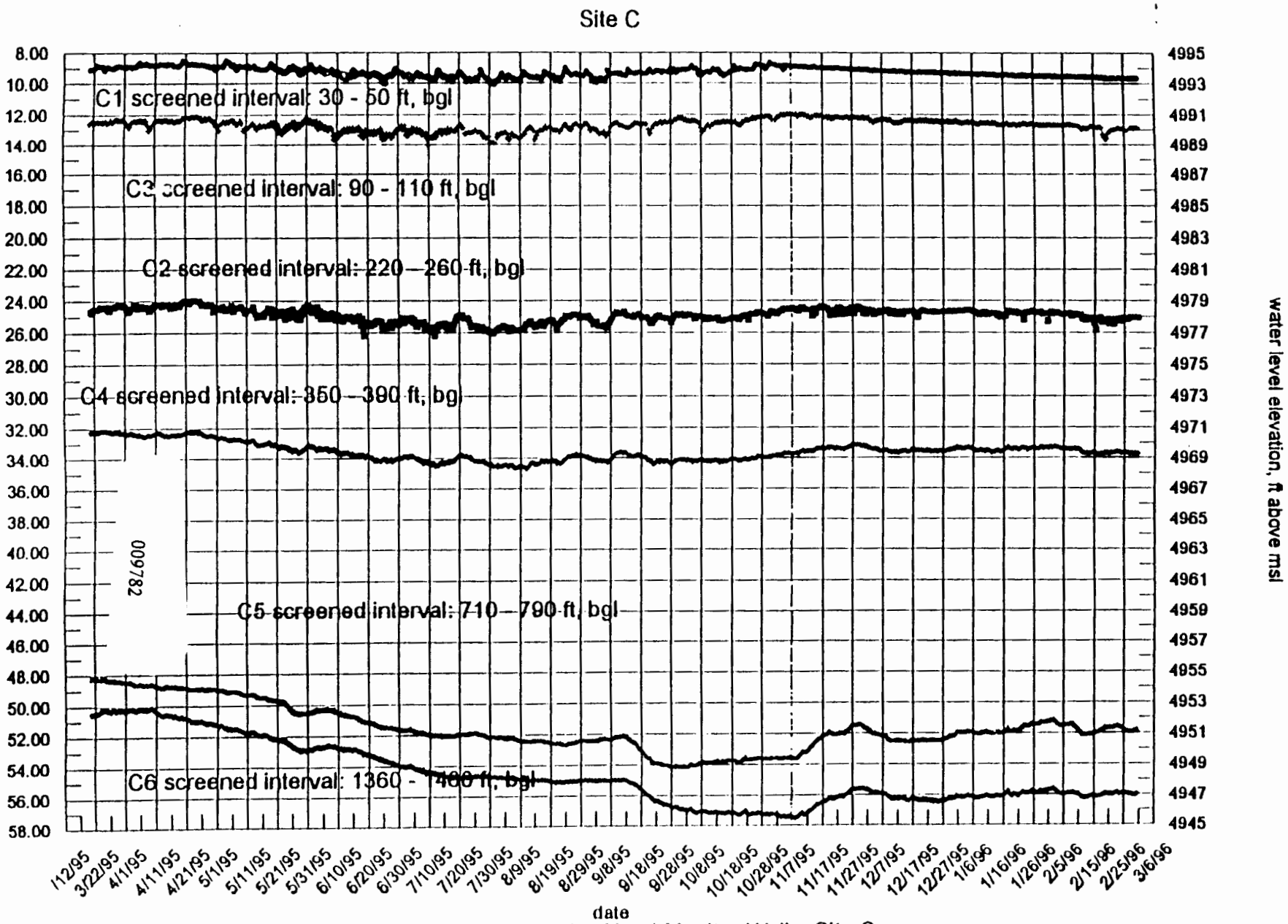

Figure 24. Hydrograph of Intel Monitor Wells, Site C.

009782

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SPARTON TECHNOLOGY, INC.

Coors Road Facility

Capture Zone Definition

Definition for the Edge of Capture Zone	Stagnation Point	Maximum width of capture Zone
x=(-y)/[tan(2*PI*K*b*i*y/Q)] - in radians	x(0) = -Q/(2*PI*K*b*i)	y(max) = (+/-)Q/(2*K*b*i)

*

x = distance from pumping well (feet) - parallel to flow
y = distance from pumping well (feet) - perpendicular to flow
PI = 3.141593
K = hydraulic conductivity (feet / minute)
b = initial saturated thickness of aquifer (feet)
i = hydraulic gradient of flow field in absence of pumping (feet / feet)
Q = pumping rate (cubic feet / minute)
T = K*b = Transmissivity (square feet / minute)

Solve for Q = 10,20,50,100,200 gallons per minute
K*b = 12,000 - 18,000 gallons per day per foot (From RFI/CMS Reports)
i = 0.002 feet / feet (third Quarter 1996 water level data)

		K*b (gpd/ft) =		12,000	K*b (gpd/ft) =		15,000	K*b (gpd/ft) =		18,000
		K*b (SF/min) =		1.114	K*b (SF/min) =		1.392	K*b (SF/min) =		1.671
Q		x(0)	y(max)	y@x=0	x(0)	y(max)	y@x=0	x(0)	y(max)	y@x=0
GPM	CF/min		+/-							
10	1.34	(95.49)	300	150	(76.39)	240	120	(63.66)	200	100
20	2.67	(190.99)	600	300	(152.79)	480	240	(127.32)	400	200
50	6.68	(477.46)	1,500	750	(381.97)	1,200	600	(318.31)	1,000	500
100	13.37	(954.93)	3,000	1,500	(763.94)	2,400	1,200	(636.62)	2,000	1,000
200	26.73	(1,909.86)	6,000	3,000	(1,527.89)	4,800	2,400	(1,273.24)	4,000	2,000

Calculate edge of Capture Zone

K*b =	12,000	gpd/ft =	1.114	SF/min						
	GPM	CF/min	GPM	CF/min	GPM	CF/min	GPM	CF/min	GPM	CF/min
Q =	10	1.34	20	2.67	50	6.68	100	13.37	200	26.73
	Y	X	Y	X	Y	X	Y	X	Y	X
	1	(95.49)	1	(190.98)	1	(477.46)	1	(954.93)	1	(1,909.86)
	10	(95.14)	50	(186.60)	200	(449.21)	250	(933.01)	1,000	(1,732.05)
	100	(57.74)	100	(173.21)	400	(360.16)	500	(866.03)	2,000	(1,154.70)
	150	0.00	200	(115.47)	600	(194.95)	1,000	(577.35)	2,500	(669.87)
	200	115.47	300	0.00	750	0.00	1,500	0.00	3,000	0.00
	300	3E+06	400	230.94	800	84.08	2,000	1,154.70	4,000	2,309.40
			500	866.03	1,000	577.35	2,500	4,330.13	5,000	8,660.25
			600	1E+07	1,500	7E+07	3,000	3E+08	6,000	1E+09

K*b =	15,000	gpd/ft =	1.392	SF/min						
	GPM	CF/min	GPM	CF/min	GPM	CF/min	GPM	CF/min	GPM	CF/min
Q =	10	1.34	20	2.67	50	6.68	100	13.37	200	26.73
	Y	X	Y	X	Y	X	Y	X	Y	X
	1	(76.39)	1	(152.79)	1	(381.97)	1	(763.94)	1	(1,527.89)
	10	(75.96)	50	(147.30)	200	(346.41)	250	(736.48)	1,000	(1,303.23)
	100	(26.79)	100	(130.32)	400	(230.94)	500	(651.61)	2,000	(535.90)
	120	0.00	200	(53.59)	600	0.00	1,000	(267.95)	2,400	0.00
	200	346.41	240	0.00	750	310.66	1,200	0.00	3,000	1,242.64
	240	2E+06	400	692.82	800	461.88	1,600	923.76	3,500	3,069.42
			450	2,262.30	1,000	1,732.05	2,000	3,464.10	4,000	6,928.20
			480	7E+06	1,200	5E+08	2,400	2E+08	4,800	7E+08

K*b =	18,000	gpd/ft =	1.671	SF/min						
	GPM	CF/min	GPM	CF/min	GPM	CF/min	GPM	CF/min	GPM	CF/min
Q =	10	1.34	20	2.67	50	6.68	100	13.37	200	26.73
	Y	X	Y	X	Y	X	Y	X	Y	X
	1	(63.66)	1	(127.32)	1	(318.31)	1	(636.62)	1	(1,273.24)
	10	(63.14)	50	(120.71)	200	(275.28)	250	(603.55)	500	(1,207.11)
	50	(50.00)	100	(100.00)	400	(129.97)	500	(500.00)	1,000	(1,000.00)
	100	0.00	200	0.00	500	0.00	1,000	0.00	2,000	0.00
	150	150.00	300	300.00	600	194.95	1,250	517.77	2,500	1,035.53
	200	9E+20	400	2E+21	800	1,101.11	1,500	1,500.00	3,000	3,000.00
					900	3E+03	1,600	2E+03	3,500	8,449.75
					1,000	5E+21	2000	9E+21	4,000	2E+22

* C.W. Fetter, Applied Hydrogeology, pp 501 - 504, 1994.

Attachment 1 To Capture Zone Definition
p 1 of 3

SPARTON TECHNOLOGY, INC.
Offsite Monitoring Well Water Level Elevations
08/02/96

MPE = Measuring Point Elevation in feet above sea level.
SR = Sounder Reading in feet.
WLE = Water Level Elevation in feet above sea level. MPE-SR=WLE.

Well No.	MPE(ft)	SR(ft)	WLE(ft.)	Date	
PZ-1	5142.22	183.75	4958.47	07/23/96	
MW-34	5034.49	58.85	4975.64	07/23/96	
MW-35	5042.50	69.70	4972.80	07/23/96	*3
MW-36					*1
MW-37					*1
MW-44	5058.75	87.43	4971.32	07/23/96	
MW-45	5089.65	120.00	4969.65	07/23/96	
MW-46	5118.98	150.46	4968.52	07/16/96	
MW-47	5155.83	187.59	4968.24	07/15/96	
MW-48	5168.31	200.79	4967.52	07/15/96	
MW-50	5211.21	249.81	4961.40	07/23/96	
MW-52	5156.79	191.70	4965.09	07/15/96	*2
MW-53	5164.24	197.48	4966.76	07/15/96	
MW-54	5097.64	130.47	4967.17	07/23/96	
MW-55	5168.61	201.79	4966.82	07/15/96	
MW-56	5168.61	201.13	4967.48	07/15/96	
MW-57	5103.54	136.78	4966.76	07/16/96	
MW-58	5168.89	201.71	4967.18	07/15/96	
MW-59	5059.18	88.55	4970.63	07/23/96	
MW-60	5134.87	167.71	4967.16	07/15/96	*2
MW-61	5135.23	168.05	4967.18	07/15/96	*2
MW-62					*1
MW-63	5065.74	90.05	4975.69	07/24/96	*3
MW-64	5097.84	130.56	4967.28	07/15/96	
MW-65	5156.45	191.60	4964.85	07/18/96	
MW-66	5103.03	137.21	4965.82	07/18/96	
MW-67	5169.21	209.11	4960.10	07/18/96	
MW-68	5165.53	201.11	4964.42	07/26/96	
MW-69	5165.46	201.15	4964.31	07/26/96	
MW-65	5156.45	191.48	4964.97	08/02/96	
MW-66	5103.03	137.28	4965.75	08/02/96	
MW-67	5169.21	209.08	4960.13	08/02/96	
MW-68	5165.53	201.11	4964.42	08/02/96	
MW-69	5165.46	201.12	4964.34	08/02/96	

*1 Airlines were installed in MW-36, 37 and 62 on 9-15-95 see AR report for WLE.

*2 New surveyed MPE for MW-52 5156.79 survey date = 6-10-96.

*3 WLE below top of pump, pull pump, SR taken next day.

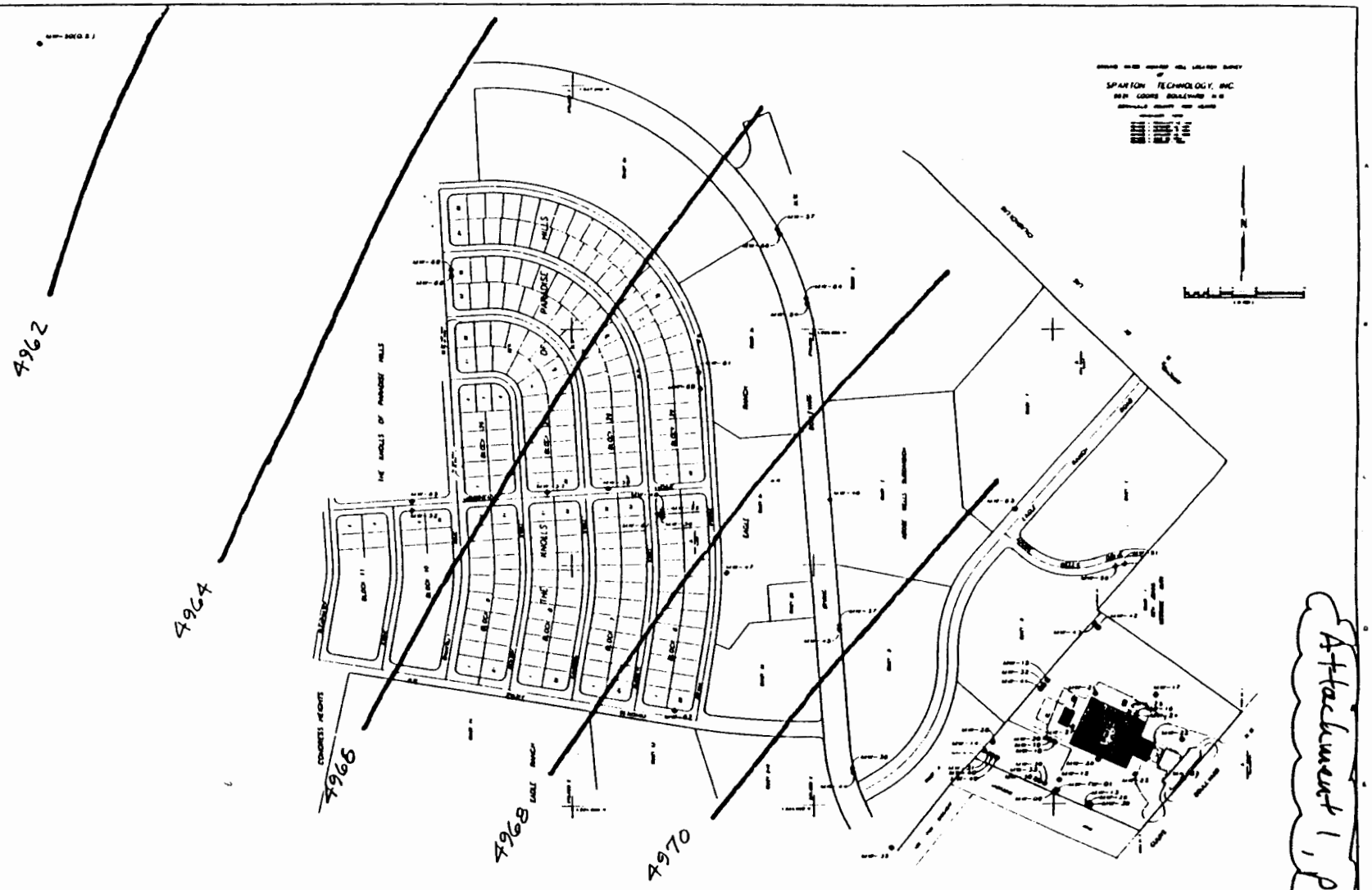
Attachment 1
p 2 of 3

SPARTON TECHNOLOGY, INC.
Onsite Monitoring Well Water Level Elevations
08/01/96

AE = Airline Elevation in feet above sea level.
AR = Airline Reading in inches of water
WLE = Water Level Elevation in feet above sea level. AE+AR/12=WLE.

Well No.	AE (ft)	AR (in)	WLE (ft.)	Date
MW-7	4973.07	67	4978.65	07/23/96
MW-9	4969.41	60	4974.41	07/17/96
MW-12	4968.17	71	4974.09	07/23/96
MW-13	4972.09	46	4975.92	07/23/96
MW-14	4970.39	27	4972.64	07/17/96
MW-15	4974.27	dry	dry	07/17/96
MW-16	4977.28	26	4979.45	07/17/96
MW-17	4978.36	13	4979.44	07/23/96
MW-19	4968.66	54	4973.16	07/17/96
MW-20	4968.07	56	4972.74	07/17/96
MW-21	4978.01	14	4979.18	07/17/96
MW-22	4975.64	41	4979.06	07/17/96
MW-29	4970.24	56	4974.91	07/23/96
MW-30	4968.89	56	4973.56	07/23/96
MW-31	4967.81	57	4972.56	07/23/96
MW-32	4968.54	46	4972.37	07/16/96
MW-33	4972.36	17	4973.78	07/23/96
MW-38	4969.14	68	4974.81	07/23/96
MW-39	4968.97	57	4973.72	07/23/96
MW-40	4968.43	51	4972.68	07/23/96
MW-41	4968.46	47	4972.38	07/23/96
MW-42	4970.34	19	4971.92	07/16/96
MW-43	4970.48	17	4971.90	07/16/96
MW-49	4967.66	55	4972.24	07/16/96
MW-36 OS	4969.19	27	4971.44	07/16/96
MW-37 OS	4967.57	27	4969.82	07/16/96
MW-51 OS	4977.04	44	4980.71	07/16/96
MW-62 OS	4966.94	27	4969.19	07/16/96
Recovery Wells *1				
PW-1	4964.71	7	4965.29	07/23/96
MW-18	4968.07	15	4969.32	07/23/96
MW-23	4973.42	30	4975.92	07/23/96
MW-24	4974.89	10	4975.72	07/23/96
MW-25	4976.06	19	4977.64	07/23/96
MW-26	4965.88	13	4966.96	07/23/96
MW-27	4972.23	13	4973.31	07/23/96
MW-28	4971.62	12	4972.62	07/23/96

*1. AE on Recovery Wells needs recalibration
OS = Offsite



Attachment 1, p 3 of 3

009786

POTENTIOMETRIC LEVELS
JULY 1996 DATA
SPARTON TECHNOLOGY
COORS ROAD FACILITY

Black & Veatch

PROJECT NO

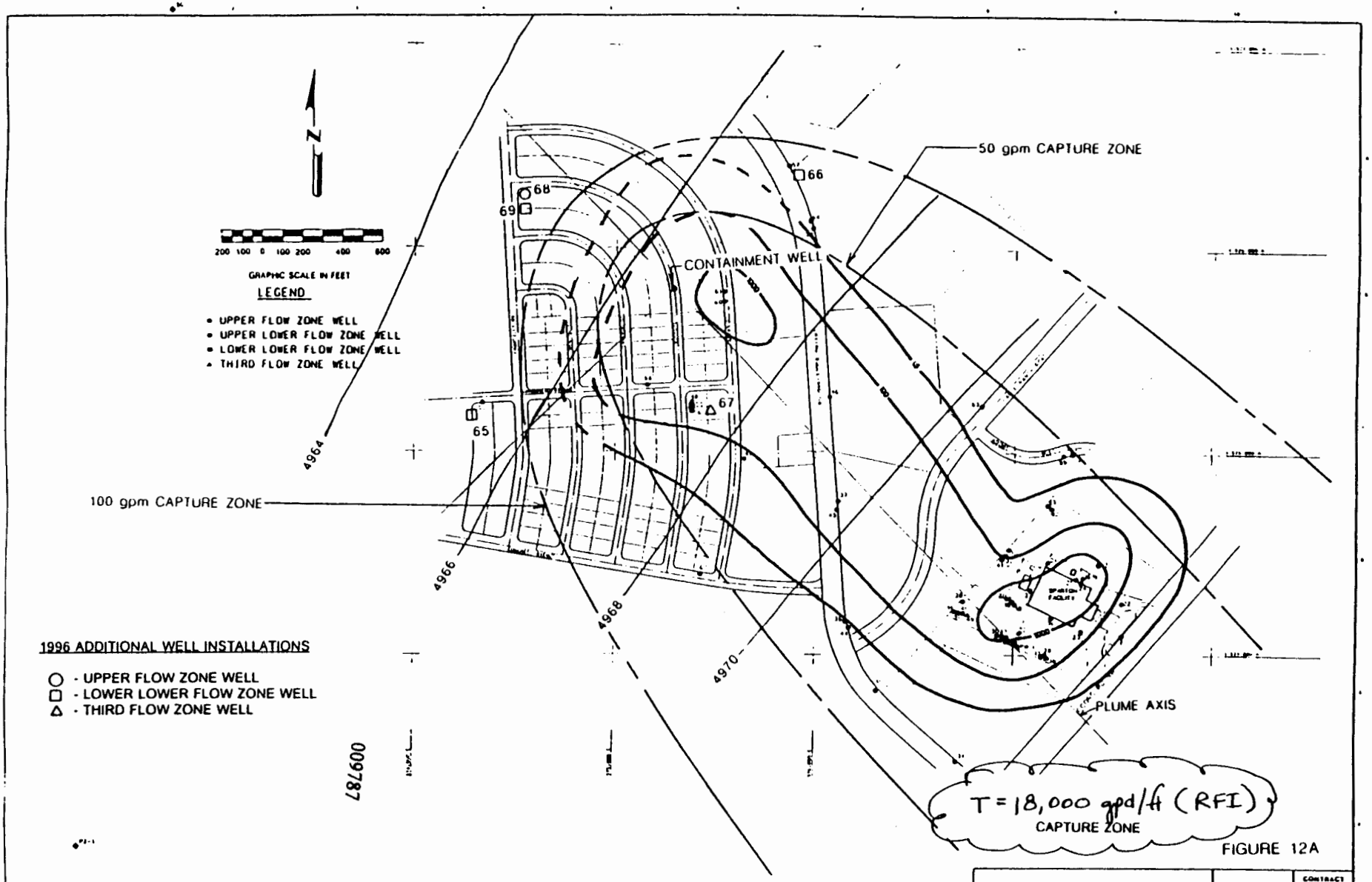


FIGURE 12A

009787

Black & Veatch Engineers Architects Dallas Texas	PROJECT NO 020602	UPPER FLOW ZONE TCE CONTOURS - 1996 DATA		CONTRACT NO SHEET NO	

6

SPARTON TECHNOLOGY, INC.

Coors Road Facility

Capture Zone Definition - USGS Conditions

Definition for the Edge of Capture Zone	Stagnation Point	Maximum width of capture Zone
x=(-y)/[tan(2*PI*K*b*i*y/Q)] - in radians	x(0) = -Q/(2*PI*K*b*i)	y(max) = (+/-)Q/(2*K*b*i)

x = distance from pumping well (feet) - parallel to flow
y = distance from pumping well (feet) - perpendicular to flow
PI = 3.141593
K = hydraulic conductivity (feet / minute)
b = initial saturated thickness of aquifer (feet)
i = hydraulic gradient of flow field in absence of pumping (feet / feet)
Q = pumping rate (cubic feet / minute)
T = K*b = Transmissivity (square feet / minute)

K =	15	feet per day - per USGS
b =	75	feet - per approved RFI
T = K*b =	8,416	gallons per day per foot

Solve for Q = 10,20,50,100,200 gallons per minute

i = 0.002 feet / feet (third Quarter 1996 water level data)

		K*b (gpd/ft) =		8,416
		K*b (SF/min) =		0.781
Q		x(0)	y(max)	y@x=0
GPM	CF/min		+/-	
10	1.34	(136.16)	428	214
20	2.67	(272.31)	856	428
50	6.68	(680.79)	2,139	1,070
100	13.37	(1,361.57)	4,278	2,139
200	26.73	(2,723.14)	8,555	4,278

Calculate edge of Capture Zone

K*b =	8,416	gpd/ft =	0.781	SF/min						
	GPM	CF/min	GPM	CF/min	GPM	CF/min	GPM	CF/min	GPM	CF/min
Q =	10	1.34	20	2.67	50	6.68	100	13.37	200	26.73
	Y	X	Y	X	Y	X	Y	X	Y	X
	1	(136.15)	1	(272.31)	1	(680.79)	1	(1,361.57)	1	(2,723.14)
	100	(110.75)	100	(259.96)	400	(600.58)	600	(1,272.28)	1,000	(2,599.62)
	150	(76.03)	200	(221.49)	800	(334.17)	1,200	(989.32)	2,500	(1,911.34)
	200	(20.45)	300	(152.06)	1,000	(102.26)	2,000	(204.52)	3,500	(1,027.38)
	214	0.20	400	(40.90)	1,070	0.20	2,139	0.39	4,000	(409.04)
	250	7E+01	428	(0.39)	1,250	339.65	2,500	679.31	4,278	(0.00)
	300	2E+02	500	135.86	1,500	1,099.52	3,000	2,199.04	4,500	368.50
	350	5E+02	600	4E+02	2,100	4E+04	4,000	2E+04	6,000	4E+03

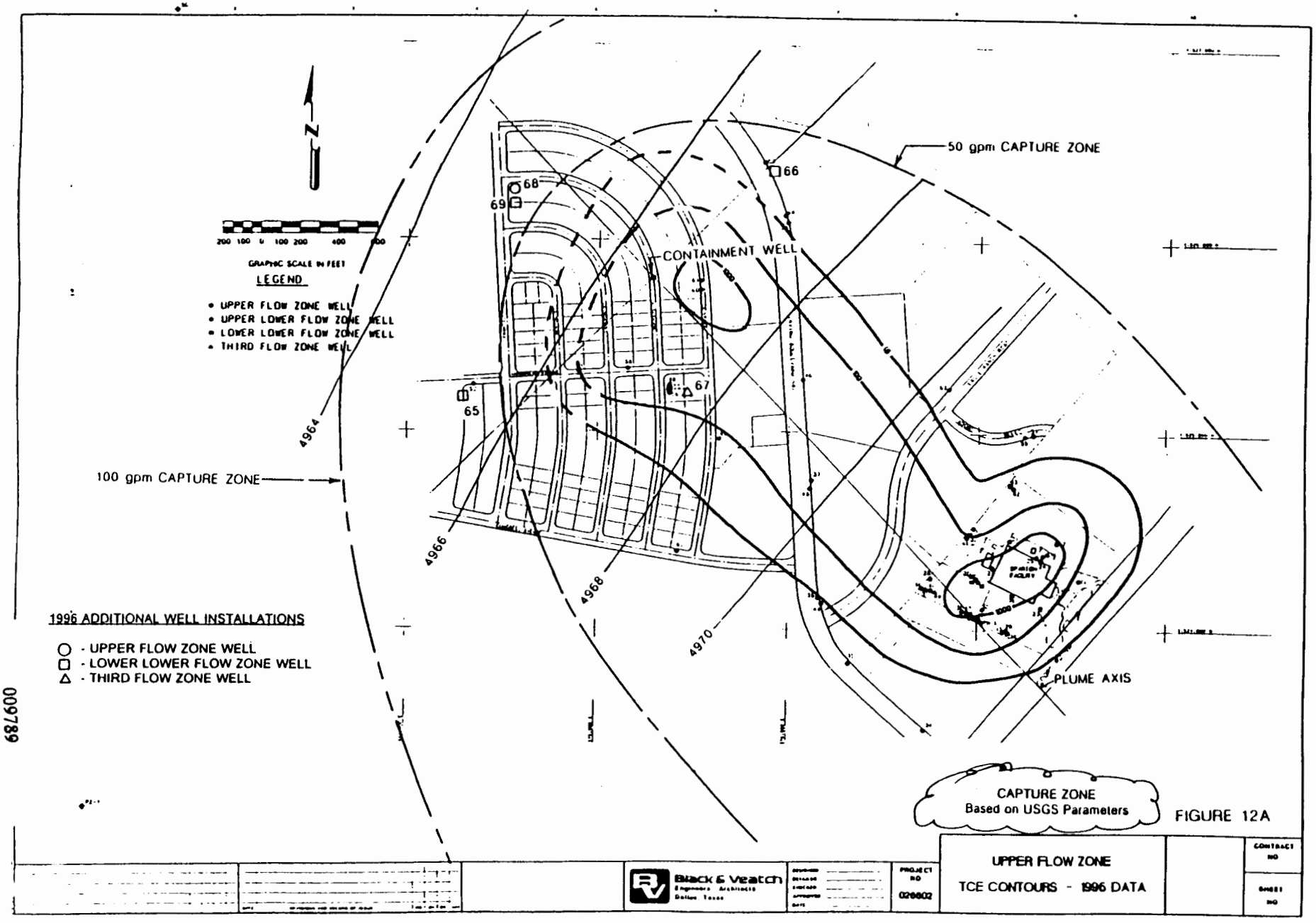


FIGURE 12A

009789

(00)

THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

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AUSTIN
FORT WORTH
HOUSTON
MONTERREY, MEXICO

December 7, 1996

Ana Marie Ortiz
Assistant General Counsel
State of New Mexico
Environment Department
Harold Runnels Building
1190 St. Francis Drive
P. O. Box 26110
Santa Fe, New Mexico 87502

Re: Proposals for: (1) Aquifer Test/Extraction Demonstration/Additions to Monitoring Network; (2) Vapor Extraction System Pilot Testing; and (3) Expansion of Interim Measures

Dear Ana:

I am pleased to enclose with this letter the above-referenced proposals, subject to the following conditions.

With respect to the proposal to conduct an aquifer test/extraction demonstration/additions to monitoring network, Sparton must have authorization from NMED, EPA, or both to allow long term discharge of recovered and treated groundwater to the Calabacillas Arroyo or feel comfortable before implementing that proposal that it will receive such authorization.

When Jan and I met with you in Santa Fe in October to discuss obtaining discharge plan approval, we left that meeting with the understanding that the state would be unwilling to approve a discharge plan until a final remediation plan had been agreed to by all interested parties. Based on subsequent telephone conversations and letters, including your most recent letter of December 2, 1996, we now understand that NMED is willing to consider approving a discharge plan, in the absence of a completed and approved remediation plan for our facility at Coors Road.

If you will confirm to me in writing that our understanding is correct, Sparton is willing to proceed to develop and submit, hopefully in the next 30 days, a discharge plan. If we are comfortable such an application will be: (1) processed as promptly as possible; (2) considered without reference to whether final agreement has been reached on remediation, by all interested parties; and (3) will result in an authorization that will allow

us to operate a containment system without final resolution of all remediation issues, we would be prepared to implement our proposal.

Additionally, we are planning to meet with EPA on Monday to discuss whether an NPDES permit is necessary. Any action by us to move forward in seeking an NPDES permit, would be with the understanding that approval of such an application will be expedited. If EPA issues Sparton an NPDES permit to discharge to the arroyo, will we need to obtain approval of a discharge plan, or is the process for obtaining approval of a discharge plan merely simplified?

With respect to the proposal to expand the interim measure, we cannot take any action until we have some place to discharge the greater volume of water generated through that activity. The city of Albuquerque has unequivocally said we cannot put the new volume into the sanitary sewer system. The only economical way for us to handle that water is through a discharge to the Calabacillas Arroyo. To do so we must have either an approved discharge plan, an NPDES permit or both. Without one or both of these we are not in a position to recover any more water. We are willing to put together the necessary applications, if we are comfortable that NMED or EPA or both intend to expeditiously process such applications, will not condition the issuance of any such authorizations on agreement about final remedy selection associated with our Coors Road facility, and support our proposal to discharge to the arroyo.

I also want to make it clear that as requested in your letter of October 17, 1996, all three proposals are subject to the following conditions:

(1) NMED reserves the right to disapprove the adequacy or accuracy of the results of any tests we conduct.

(2) It is NMED's position that the horizontal and vertical extent of the plume has yet to be adequately defined.

(3) That NMED's approval of our proposal shall in no way constitute an approval, expressed or implied, of any remediation or containment system design.

(4) That NMED does not currently consider the on-site interim pump-and-treat system, even as expanded in our proposal, to necessarily provide on-site groundwater containment.

(5) That discretionary field decisions shall be agreed to by NMED and Sparton at the time a decision is needed.

We understand that within seven (7) days after receiving these proposals, we will hear from Rob Pine as to whether they have been approved or disapproved. If disapproved, we will be provided NMED's specific concerns.

Within 90 days from the date Sparton receives NMED's approval of the soil vapor pilot test proposal, we will submit a report.

Setting a more definitive schedule for the other two proposals is a bit problematic, given that they are dependent upon either receiving authorizations to discharge recovered and treated water to the arroyo, or Sparton obtaining sufficient comfort to believe that such authorizations will be received. We intend to use our best efforts to obtain all federal, state and local approvals necessary to implement these proposals, including but not limited to discharge plans, permits and necessary zoning changes, but those approvals are largely out of our control.

Upon approval of our proposals for the aquifer test/extraction demonstration/additions to monitoring network, and expansion of interim measures, we will provide you a flowchart identifying the authorizations we need, whether they have been sought or the time in which they will be sought, and an estimate of when they might be received. As set forth in our proposals for activities other than soil vapor extraction, we believe the field work required by those proposals can be completed within five (5) months of the date we either have necessary authorizations to discharge recovered and treated water to the arroyo or comfort that they will be issued. A report on the pump test activities could be submitted one month later.

I add that in conjunction with any field work, we will provide NMED with one week prior notice. We will allow you to take split samples. We will provide you a copy of all final analytical data and final deliverable reports.

I have taken the liberty to send, by federal express, a copy of this letter and our proposal to Rob and to Dave Fishel at DOJ. I suggest that we schedule a conference call when Rob is prepared to discuss any comments he may have on the proposals, and at that time we also see if we can reach closure on the discharge issue.

Yours very truly,

James B. Harris

JBH/eshd

cc: Mark Weidler, NMED Secretary
Rob Pine, NMED
David Fishel, DOJ
R. Jan Appel, Sparton
Pierce Chandler, Black & Veatch

40310 00001 LERA 53980

PROPOSAL

Aquifer Testing/Extraction Demonstration/ Additions to Monitoring Network
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

Sparton Technology, Inc.
Rio Rancho, New Mexico

Prepared by:

Black & Veatch
Dallas, Texas

in Association With

Metric Corporation
Albuquerque, New Mexico

Revised, December 6, 1996

Objectives

The objectives are:

1. To verify aquifer characteristics (through multiple well pump testing) in the vicinity of the leading edge of the plume.

2. To demonstrate/document the ability of a single well to intercept or capture the leading edge of the contaminant plume to prevent further down-gradient migration above MCL.

3. To install additional groundwater monitoring wells and a piezometer to further define plume limits and provide additional pump test data.

Definition of Plume Leading Edge

In the RCRA Facility Investigation (RFI) Report submitted to USEPA on May 21, 1992, and subsequently approved on July 1, 1992, the horizontal and vertical limits of the plume were defined by sampling and analysis through June 1991 using both on- and off-site groundwater monitoring wells. In particular, the leading edge of the plume was defined by a number of non-detect groundwater monitoring wells outside the perimeter of the plume.

Subsequent to the RFI completion, plume movement continued beyond the existing groundwater monitoring system. However, based on historic movement, groundwater gradient, and relatively constant geologic conditions (which are themselves heterogeneous and anisotropic), the limits of the leading edge of the plume were estimated in the May 1996 Corrective Measure Study (CMS) Report. This further definition was continued by five additional groundwater monitoring wells (MW-65 through MW-69) installed around and outside the predicted limits of the plume. Well locations were chosen to provide additional definition of the horizontal and vertical extent of the leading (down-gradient) edge of the plume through non-detection. These and other non-detect wells around the leading edge provide good definition of the plume.

Pump Test Location

Based on the currently defined plume limits and characteristics, a single well located along Bryan Avenue, some 250 feet north of Arrowhead Avenue (see Figure 1) is

proposed for the test well location. This location was developed during the meetings on September 26 and 27, 1996, and represents a developed building lot (Lot 46, Block 29) available for purchase by Sparton. The Paradise Hills area above the leading edge of the plume is currently undergoing significant development including major grade changes, paving, and utility installation. Location of the pump test well on an already developed lot assures that pump testing can continue without interruption. Secondly, placement of the pump test well on a private lot (as compared to the public right-of-way) increases security of the installation and allows above-ground well head completion details. Thirdly, if any pretreatment of produced water is needed, there is ample room for equipment at the well head. Finally, use of a developed lot provides access to both sanitary and storm sewers.

Available Groundwater Monitoring Network

The attached Table 1 is a summary of monitoring points available to verify the performance of a groundwater pump test well installed near the leading edge of the plume.

With respect to the attached summary (see Table 1), there are 22 existing groundwater monitoring wells (including 7 clusters) within 1,500 feet of the proposed recovery well (see Figure 1). These wells include 12 in the upper flow zone (UFZ), five in the upper lower flow zone (ULFZ), four in the lower lower flow zone (LLFZ), and one in the third flow zone (TFZ). There are five down-gradient, five cross-gradient, and 12 up-gradient wells.

The available monitoring network includes all wells that currently define the limits of the leading edge of the plume. The network includes all non-detect monitoring wells outside the plume and detection wells inside the plume. This combination of wells was used to define the plume and is, therefore, capable of showing single-well containment feasibility by demonstrating inward flow (toward the pump test well) across the entire leading edge of the plume. Conversely, the existing groundwater monitoring network is also capable of detecting any deficiency of the proposed pump test well relative to influence over the entire leading edge of the plume. Pump test well performance can be monitored thorough continuing water level observations and water quality sampling and analyses in the groundwater monitoring well network.

Pump Test Well Design

The pump test well will be screened through the entire vertical interval of the plume as defined by installation activities. Temporary casing and sampling will be used to determine the vertical limits of the plume during drilling. Screen depth may be further adjusted downward, as necessary, based on pilot hole logging to ensure screen placement into a transmissive zone.

The pump test casing/screen will be sized to accommodate a pumping rate of up to 200 gpm. Previous calculations have shown that pumping rates of half as much (100 gpm) should provide influence over the entire leading edge of the plume. Actual pumping rate will be a function of the aquifer transmissivity at the pump test location and available drawdown based on the completion depth of the well.

Water from the pump test will be routed to the sanitary sewer adjacent to Lot 46. The existing New Mexico Utilities sanitary sewer can accept up to 200 gpm discharge without difficulty. Due to the prevailing wastewater pretreatment requirements and anticipated quality of the produced groundwater, treatment will not be required for discharge to the sewer. However, if needed, produced water will be treated prior to discharge into the sewer.

Additions to Existing Groundwater-Monitoring Network

An additional groundwater monitoring well, MW-70, clustered with separate piezometer, PZ-2, will be installed in the public right-of-way along Buckeye Street northwest of the pump test well location and existing cluster 10 (MW-60/MW-61). This new piezometer/ well cluster would be located as shown on Figure 1.

The new well, MW-70, will be installed as a non-detect well to define the vertical limit of the plume. Temporary casing will be installed during drilling to allow sampling/ analysis verification of plume limits prior to well installation. The vertical plume limits at MW-70 will be compared to the vertical plume limits at the previously installed pump test well. Anticipating MW-70 will be completed to a higher excavation than the bottom of the pump test well, the piezometer will be installed deeper to the same approximate bottom elevation as the pump test well. However, if MW-70 extends to approximately the same bottom elevation as the pump test well, then the piezometer would be installed in the uppermost portion of the aquifer. The purpose for the well/piezometer cluster is

to provide (a) vertical definition of the plume, and (b) vertical coverage of that portion of the aquifer penetrated by the pump test well.

A second non-detect monitoring well, MW-71, will be installed at the location of existing well cluster 4 (MW-15/MW-32/MW-41). This monitoring well will utilize temporary casing and sampling to verify non-detect screen placement below the existing cluster screen intervals. This well is intended for confirmation of vertical plume limits in a well-documented transverse flow cross-section up gradient of the proposed test well location. The new wells will be 4 inch schedule 40 PVC with 10-foot screens similar to those previously installed. The new piezometer will be 3/4 inch PVC with a five-foot screen.

Pump Test Procedures

A series of pumping tests will be conducted using the pump test well. The first pump test would be a two to three day test (with a temporary pump) used to determine the required size (pumping rate) for a longer-term containment demonstration test. In the initial test, time-drawdown data would be obtained from a constant-rate test at approximately 100 gpm to evaluate produced drawdown and impact to the closer monitoring wells. The resulting time-drawdown and distance-drawdown data would be analyzed to verify aquifer characteristics near the plume leading edge. The data would also be used to project the edge or limit of the pump test well influence relative to plume capture/containment. The initial pump test would also be used to establish produced water quality by sampling and laboratory analysis on a daily frequency. Flow rate, total pumped quantity, and monitor well levels will be recorded during the pumping test.

There are 22 existing wells and the proposed well piezometer cluster within 1,500 feet of the proposed pump test location. (See Table 1) Sixteen of the wells are within 1,000 feet and nine wells (and the single piezometer) are within 500 feet of the pump test well. Water level readings would be taken in the closest wells (<500 feet as detailed in Table 1) at a frequency of not less than once per hour for the first 24 hours, and three to four times daily for the remainder of the test. These wells include existing MW-48, MW-55, MW-56, MW-58, MW-60, MW-61, MW-67, and new MW-70 and PZ-2. Water levels would be obtained using calibrated electronic water level indicators with manual recording of level and date/time. Wells close to the pump test well (MW-60, MW-61, and the new MW-70 and PZ-2) will have dedicated water level indicators to allow increased reading frequency during the first few hours of the pump test. The more distant wells (>500 feet)

would be read at a reduced frequency, but at least three to four times daily. After pump shutdown, recovery data will be obtained at a similar frequency.

After the initial pump test has been conducted and verification of aquifer parameters obtained, a long-term (approximately one month) pumping test would be conducted using the pump test well and the monitoring network described in Table 1. The well would be pumped at a constant rate anticipated to be in the range of 100 to 200 gpm depending on the results of the initial pump test. Closer monitoring wells (<750 feet horizontal distance) would be read two to four times daily for the first several days, and once daily for the rest of the first week. More distant wells would be read daily for the first week. Thereafter, all well levels would be recorded once per week for the duration of the test. This second pump test would be used to demonstrate the plume area impacted by the pumping and the feasibility of single-well containment near the leading edge of the plume. Produced water would be sampled at approximately weekly intervals during the long-term pump test to provide information on water quality relative to pumping duration.

Contingency

There is at least one possible problem scenario that could be identified during the pump test. The location chosen for the pump test may have atypical or non-representative geology such as an absence of coarser, transmissive material in the saturated zone. Such a condition has been encountered in several monitoring wells.

Pilot hole logging procedures and installation of a temporary pump are two ways to minimize the effect of an unexpected geologic condition. As previously noted, screen length could be extended as a first solution. In the highly unlikely event the geologic condition was vertically extensive (tens of feet), consideration would have to be given to an alternate location.

Schedule

The schedule for implementing the plume leading edge containment is a dual concurrent track. The first track is the process of obtaining the necessary permits for installing and operating the containment well system. The permits could include air quality, well installation, groundwater rights, variance from zoning, public right-of-way use, and discharge to the sanitary sewer and/or storm sewer to the Calabacillas Arroyo.

Applications for permits or authorization are either being prepared or have been submitted.

The second track is the actual installation of the pump test well and additional monitoring wells/piezometers and conducting the pump test. The second track also presumes that track one has been successfully completed. Elements (and schedule estimates) for this second track are as follows:

1. Purchase property for the pump test wellhead (four to six weeks). Note that variance from zoning is required for purchase.

2. Review permits status.

3. Drill and install pump test well (two months).

4. Drill and install additional monitor wells and piezometers (one month).

5. Review permits status.

6. Construct secure area for well head/pump protection.

7. Install discharge pipeline to sanitary sewer.

8. Verify completion of permits.

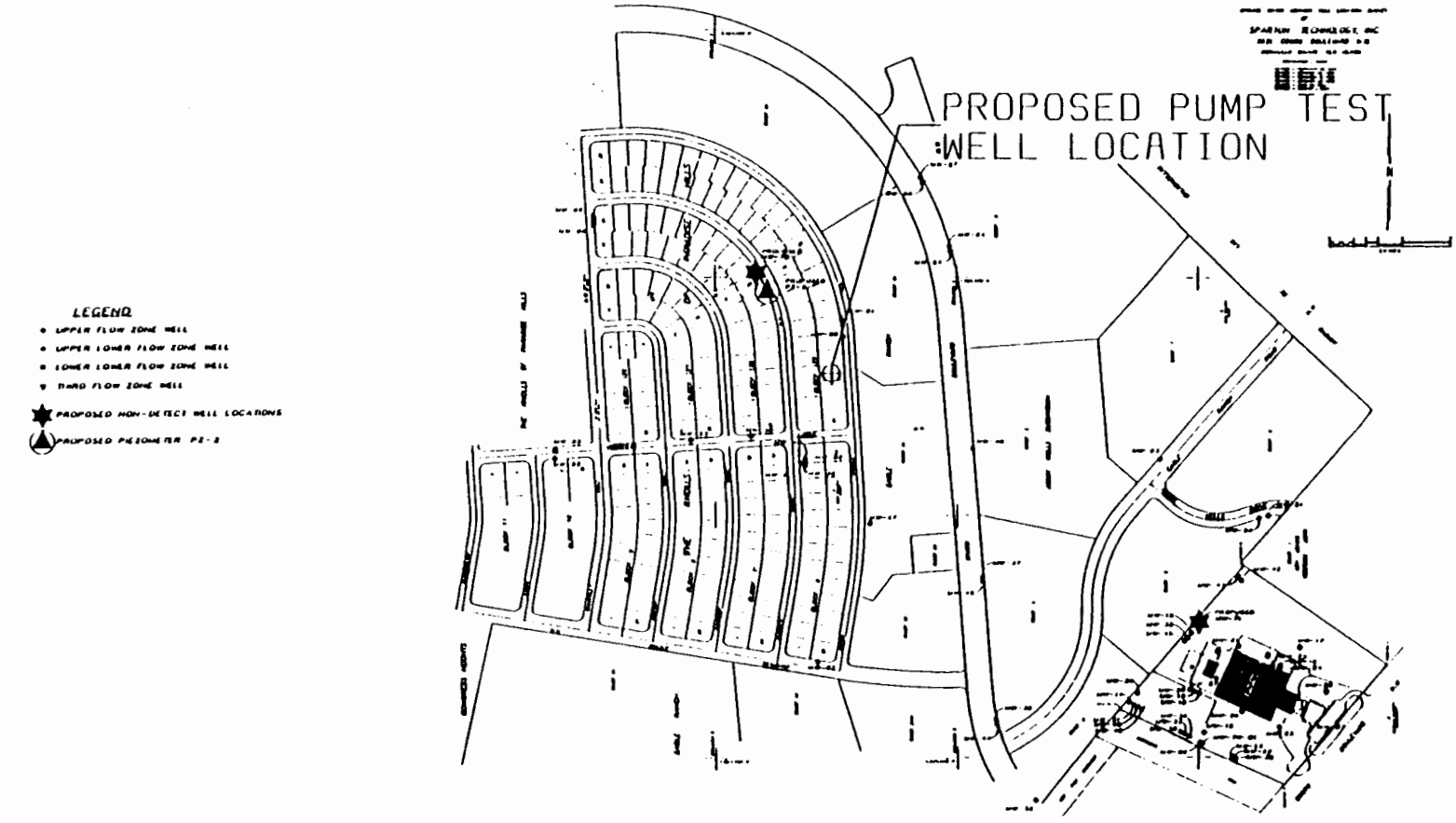
9. Conduct initial three-day pump test, verify aquifer parameters, and install long-term pumping equipment (one month).

10. Conduct long-term pump test (one month).

11. Evaluate and report installation and test data (one month).

12. Review and approval of pump test report by NMED.

Based on the above estimates, the second track will take at least four months to actually begin test pumping.



Black & Veatch

PROJECT NO. 26602

FIGURE 1

RECOVERY WELL AND MONITORING NETWORK

009801

Table 1 Summary of Groundwater Monitoring Wells Within 1500 Feet of Proposed Pump Test Well Location						
Monitor Well	Flow Zone	Approx. Radial Distance ft	Gradient Position	Inside Plume*	Recent Contamination History**	Cluster Well
MW 37	UFZ	1,075	Up	Yes	High, Decr	Yes
MW 45	ULFZ	1,075	Up	Yes	Low, Decr	Yes
MW 46	ULFZ	675	Up	Yes	V. High	No
MW 47	UFZ	650	Up	Yes	Low, Decr	No
MW 48	UFZ	375	Up	Yes	High, Decr	Yes
MW 52	UFZ	1,200	Down	No	ND	Yes
MW 53	UFZ	700	Cross	Yes	Low	No
MW 54	UFZ	700	Up	NA	NA	Yes
MW 55	LLFZ	400	Up	Yes	High	Yes
MW 56	ULFZ	400	Up	Yes	High	Yes
MW 57	UFZ	900	Cross	No	ND	Yes
MW 58	UFZ	425	Up	Yes	High	No
MW 60	ULFZ	175	Up	Yes	High	Yes
MW 61	UFZ	225	Up	Yes	V. High, Decr	Yes
MW 62	UFZ	1,200	Up	No	<5 µg/l	No
MW-63	UFZ	1400	Up	No	No	No
MW 64	ULFZ	725	Up	Yes	Low, Incr	Yes
MW 65	LLFZ	1,175	Down	No	<10 µg/l	Yes
MW 66	LLFZ	875	Cross	No	ND	Yes
MW 67	TFZ	400	Up	No	ND	Yes
MW 68	UFZ	1,150	Down	No	ND	Yes
MW 69	LLFZ	1,175	Down	No	ND	Yes
MW-70	UFZ?	350±	Down	No	Proposed Well	Yes
PZ-2	LLFZ?	350±	Down	No?	Proposed Piezometer	Yes

* Inside 5 µg/l contour

** Very high=>1,000 µg/l, high=>100 µg/l, low=<100 µg/l
ND=no detect, Incr=increasing trend, Decr=decreasing trend

PROPOSAL

Vapor Extraction System Pilot Testing
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

Sparton Technology, Inc.
Rio Rancho, New Mexico

Prepared by:

Black & Veatch
Dallas, Texas

in Association With

Metric Corporation
Albuquerque, New Mexico

Revised, December 6, 1996

Objective

The following proposal is a discussion of specific details and operating procedures to conduct and analyze a VES pilot test and to define the limits of elevated soil-gas volatile organic constituent (VOC) concentrations (i.e., the "soil vapor cloud") in the unsaturated subsurface at the Sparton facility. This discussion of technical details and definition of level of effort is a logical extension from the existing data base and should provide sufficient information to determine what, if any, additional work will be needed.

Soil-Gas Monitoring System

A number of monitoring points for both subsurface soil-gas characterization and for vapor extraction pilot test/production purposes have been previously proposed (B&V letter of August 12, 1996). The monitoring system included both existing groundwater monitor wells (with exposed screen) and the existing vapor cluster probe (VP-1) as well as new vapor recovery wells installed in and around the source area. Previous studies had identified highest VOC concentrations in the soil gas in the closed sump area. Concentrations dropped off by orders of magnitude with increasing horizontal distance from the sump/pond (source area).

The proposed monitoring system additions are designed to characterize the soil gas VOC concentration with respect to distance/location relative to the closed sump area. In addition, the monitoring points would be useful in evaluating the effective influence of a vapor recovery well centrally located in the closed sump (source) area. The monitoring system is shown on the attached Figure 1 and includes four existing groundwater monitoring wells (MW-17, MW-21, MW-24, MW-25, and, perhaps, MW-16 depending on seasonal water level (fluctuation), existing six-well vapor probe cluster (VP-1) and five new vapor recovery wells (VR-1 through VR-5).

The new vapor recovery wells are designed to function as both monitoring points and as potential vapor extraction/air injection wells. The new central vapor recovery well (VR-1) would be a four-inch well; the remaining new vapor recovery wells (VR-2 through VR-5) would be two-inch wells. Wells would consist of 60 feet of 0.040-inch machine slotted PVC screen surrounded by a #6 to #9 coarse sand filter. The uppermost 10 feet of each well would be a grouted surface seal to minimize air intrusion or bypassing. Vapor recovery wells would be screened to just above the highest seasonal water level observed in nearby groundwater wells. New wells would be installed using hollow-stem auger

drilling procedures. As part of the characterization work, drilling would be monitored using field screening instruments to provide a relative comparison of soil gas VOC as a function of location, depth, and soil type. Completed wells would also be sampled and analyzed using EPA method 8010/8020 for specific VOC presence/concentration.

The proposed monitoring system is expected to confirm the significant dropoff in soil gas VOC concentration with increasing distance from the closed sump area. In addition, it should also define the area where vapor extraction and treatment would be appropriate.

The need for any additional monitoring/characterization data outside the proposed network would be based on a combination of perimeter soil-gas VOC concentrations above 10 ppm and projected edge (shape and distribution) of the "vapor cloud" extending out beyond the definition interval of the proposed network. The proposed network has maximum interwell horizontal spacings of ±100 feet in the outer perimeter. Projected vapor cloud edges extending outward less than this interwell spacing should be adequately defined.

Updated Soil-Gas Characterization

Soil-gas data from the additional new wells would be combined with the existing data base to provide a three-dimensional picture of the soil-gas "vapor cloud". This analysis and related data would be presented in the form of an update to the current soil contamination characterization (as presented in the May 6, 1996 Corrective Measure Study (CMS) Report.) Subject to review and approval by NMED, the updated soil-gas characterization would also be used to confirm the application area for vapor extraction and the selection of the pilot test location.

Pilot Test Design

All data obtained to date and the history of the facility indicate that the closed solvent sump is the probable source of VOC observed in the soil gas. Highest soil-gas VOC concentrations occur in the immediate area of the sump with significant VOC concentration decrease observed with increasing horizontal distance from the source area. As a minimum, vapor extraction will be implemented in the sump area. Thus, the sump area is the most logical location for pilot testing.

The pilot test is proposed to define the relationship between VOC concentrations and extraction vacuum and extraction flow rates from a recovery well located directly under the sump area (see Figure 1). Monitoring points (proposed and existing) are located at varying horizontal distances and depths to allow evaluation of effective influence of the centrally located recovery well.

The pilot test is also designed as a prototype demonstration of the planned VES system to show capability for extraction and ability to meet City/County air quality requirements. Further, the pilot test will show probable production rates and estimates of required operation time.

Pilot Test Equipment

For the pilot test, we are proposing AcuVac as the subcontractor to provide necessary equipment. AcuVac is experienced in soil vapor recovery pilot testing in the Albuquerque area and they have demonstrated the ability to successfully conduct meaningful pilot tests and to meet stringent City/County emission requirements. Further, the AcuVac procedure utilizes an environmentally friendly destructive technology to efficiently remove VOC from the extracted soil gas.

The proposed extraction/destruction unit is based around a 300 cubic inch in-line six cylinder internal combustion (I.C.) engine fueled by the extracted soil-gas VOC and supplemental fuel as required. Emissions are controlled by the I.C. process and redundant catalytic converters.

A vacuum blower propelled by the I.C. engine is capable of producing well flow rates of up to 120 cfm and negative pressures of up to 15 inches of mercury. AcuVac-furnished pilot test equipment also includes: a data recording system; magnehelic pressure gauges capable of reading to 0.01 inches of water; soil gas flow measuring devices; real-time field screening/analytical equipment; temperature and barometric measurement; and sampling ports for recovery of influent samples.

Pilot Test Procedure

The pilot test is proposed to be conducted using the central four-inch recovery well (VR-1). The remaining recovery wells (VR-2 through VR-5), UFZ groundwater monitoring wells (MW-17, MW-21, MW-24, and MW-25), and vapor probe cluster

(VP-1) would be used as observation points for the pilot testing (see Figure 1). The pilot testing will be conducted at several different rates of vacuum and flow (up to the maximum capability of the extraction unit) to determine the performance characteristics of the vapor recovery well/adjacent subsurface.

Prior to each individual test, depth to water, temperature and barometric pressure, and magnehelic pressure gauge readings at each monitoring point would be recorded. After the pilot test is started, extraction well vacuum and flow and extraction system operating data (including supplemental fuel flow) will be recorded. Pressure instrumentation at each of the observation wells will be monitored and recorded to determine vacuum communication with the recovery well (demonstration of radius of influence).

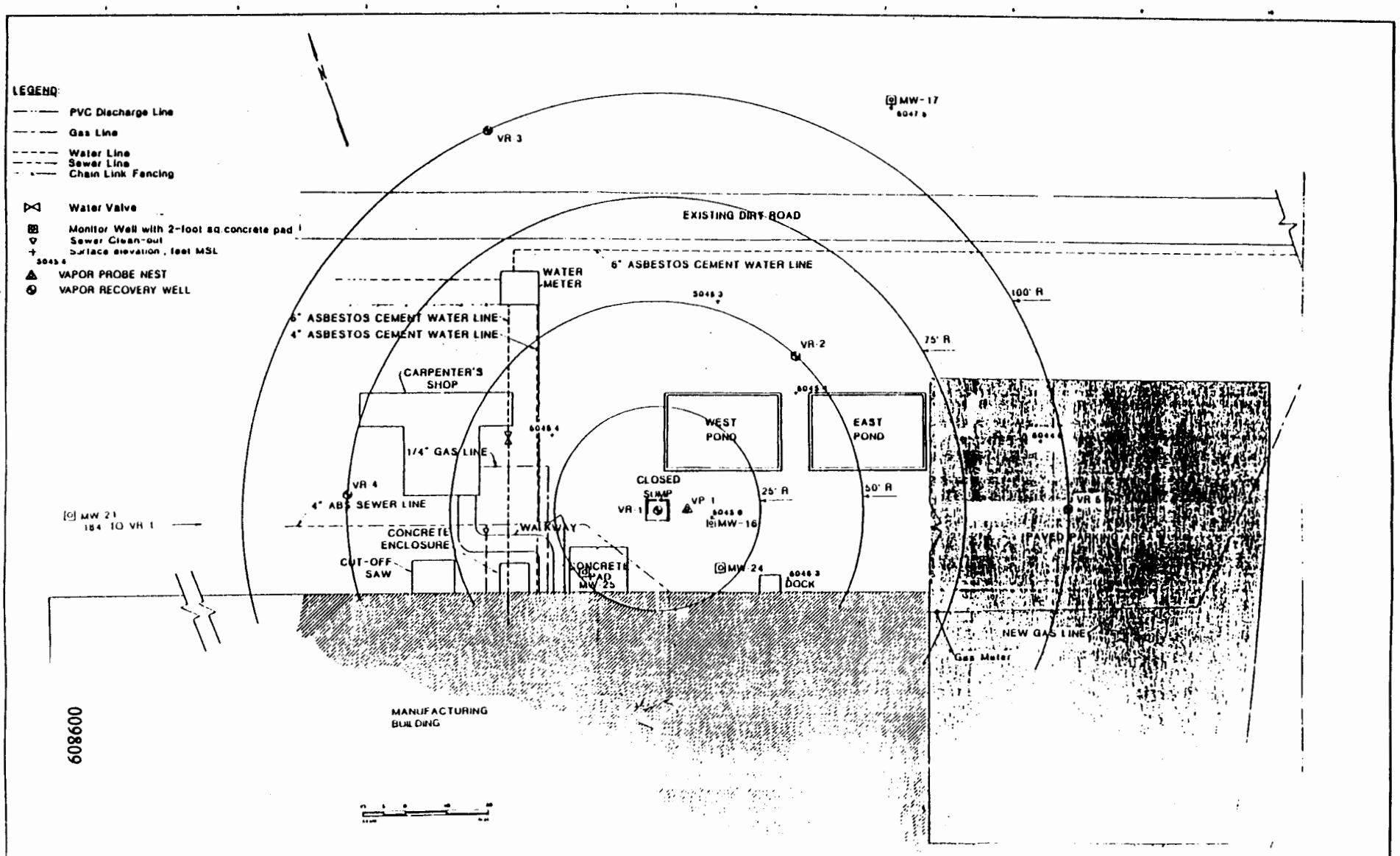
The produced vapor stream (influent) will be analyzed (on a real-time basis) using field screening instruments to determine variation in influent VOC concentration. At selected intervals, influent samples will also be obtained for confirmatory laboratory analyses (EPA Method 8010 and 8020). At least one confirmatory sample will be obtained for each extraction rate test. The purpose of the screening/testing will be to determine VOC concentration variation as a function of both pumping rate/vacuum and elapsed pumping duration.

Based on previous experience, the pilot test should require no more than two days of actual vapor extraction. It is anticipated that two to four extraction rates will be tested. Each extraction rate test will nominally take three to four hours. Upon completion of testing, a detailed pilot test report, including all operating and analytical data and recommendations for operating parameters and effective vacuum radius of influence, will be compiled and provided to NMED for their review and approval.

Pilot Test Schedule

Upon authorization to proceed, it will take from two weeks to over a month to schedule a drilling contractor to install the five vapor recovery wells. Approximately one week will be required to install the wells. Sampling and analytical testing will require several more weeks. Pilot testing can then be arranged in accordance with the subcontractor's schedule. Currently, several weeks are required to mobilize the pilot test equipment; however, once equipment is on site, the actual pilot testing can be conducted in several

days. Interference with the schedule could be caused by the holiday season and possibly weather.



MAP SOURCE RCRA POST-CLOSURE PERMIT APPLICATION
HARDING LAWSON ASSOCIATES, MARCH 1986

Black & Veatch
Engineers Architects
Dallas, Texas

PROJECT NO

SPARTON TECHNOLOGY, INC.

COOHS ROAD FACILITY
VE... PILOT TEST

FIG 1

CONTRACT NO

SHEET NO

PROPOSAL

Expansion of Interim Measures (IM)
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

Sparton Technology, Inc.
Rio Rancho, New Mexico

Prepared by:

Black & Veatch
Dallas, Texas

in Association With

Metric Corporation
Albuquerque, New Mexico

Revised, December 6, 1996

Objectives

The objectives of this proposal are three-fold:

1. To address high volatile organic constituent (VOC) concentrations in groundwater at the location of groundwater monitoring wells MW-32 and MW-42.

2. To evaluate the cause of erratic VOC detections historically observed during periodic sampling of groundwater monitoring well MW-32.

3. To enhance interim onsite mass removal.

Lower lower flow zone (LLFZ) groundwater monitoring well MW-32 has historically exhibited erratic detections of volatile organic constituents (VOC). Periodically, it exhibits anomalously high concentrations relative to surrounding adjacent wells and also periodically exhibits anomalous constituents. Further, out of 13 cluster well locations, well MW-32 is the bottom well in the only cluster showing an increase in VOC concentration with depth.

The source of the erratic detections is a matter of speculation, but would include completion problems such as a defective grout seal or a cracked well casing allowing impacts of shallow contamination. Sampling procedures have been ruled out as a cause through detailed resampling and multiple split procedures.

One procedure to determine the cause of the erratic behavior would be to pump the well for an extended period and observe the effect on sampled water quality. If well MW-32 does represent a zone or area of higher VOC concentration, the extended pumping from this well would also be a form of source control and containment. It should be noted that MW-32 is also immediately downgradient of the source area. As detailed in the pump test proposal revised December 6, 1996, an additional non-detect monitor well is proposed below MW-32 to define the lower vertical limits of the VOC plume.

Upper lower flow zone (ULFZ) groundwater monitoring well MW-42 has historically exhibited high VOC concentrations and is outside the recovery area of the existing IM system. In addition, well MW-42 is also down gradient of the source area.

Proposed IM Expansion

The current IM system recovers a total of approximately 2 gpm from the upper portion of the aquifer. The treatment capacity of the IM system is 20 gpm. Well installation data for MW-32 and MW-42 indicate that combined systems pumping rates of 15 to 20 gpm could possibly be achieved. Actual production rate would be determined by installing a temporary pump in each well and conducting a limited pumping test to determine production pumping rate and drawdown. A production pump would then be sized and installed. Discharge would be routed to the existing onsite treatment unit. It should be noted that wells MW-32 and MW-42 are located close to the treatment unit -- allowing economical, secure connection. Increasing the recovery rate to 20 gpm is conditioned to the ability to obtain permits to either discharge to the sanitary sewer or, preferably, to discharge to the Calabacillas Arroyo through the existing storm sewer system.

Installation data would be included in a report updating the current onsite groundwater recovery well system. The report would be submitted to NMED for review and approval. Production and impact on water quality would be evaluated on a periodic basis and furnished as a part of the site operation reporting.

Schedule

The current IM system is permitted for a production of 20 gpm. Adding wells MW-32 and MW-42 to the IM system is simply a matter of conducting a limited pumping test for sizing purposes, and then installing the pump, controls, and connecting piping. It is estimated that wells MW-32 and MW-42 could be recovering water within two months of authorization to discharge treated water to the storm sewer entering the Calabacillas Arroyo.

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January 17, 1997

VIA FACSIMILE

Ana Marie Ortiz
Assistant General Counsel
State of New Mexico
Environment Department
Harold Runnels Building
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, New Mexico 87502

Re: Response to NMED Comments of January 3, 1997 to December 9, 1996 Sparton Proposal

Dear Ana:

The following is Sparton Technology, Inc.'s ("Sparton") response to NMED's comments of January 3, 1997. We have followed the format and numbering of your comments in making our response. We have only responded to those items where we think there may be a difference of opinion or where you asked us to do something and we have agreed.

Aquifer Testing/Extraction Demonstration/Additions to Monitoring Network

1. Sparton intends to use a 6-inch diameter well for pump test purposes. This 6-inch well can accommodate a pumping rate of up to 250 gpm. We intended to use a pump no larger than 5 inch, which would be sufficient to achieve the 250 gpm pumping rate. We do not know whether New Mexico Utilities will be willing to accept a discharge into their service system at the 250 gpm rate.

   We agree with NMED that there may be some uncertainty about the pumping rate that will adequately contain the plume. To deal with this concern we are proposing to do a three day pump test at 100 gpm, then to analyze the results and agree for the longer term test on a rate, which could be anywhere from 50 gpm to 250 gpm. That range is our best estimate of the pumping rates that might be needed to achieve containment. Technically, changing rates during a pumping test complicates analyses and makes conclusions uncertain; that is why we would run two tests.

2. In the September 26-27, 1996, meetings, NMED initially had requested a minimum of four additional monitoring wells located along what Dennis McQuillan described as a "keel." The requested wells were located as follows:

   a. A non-detect well below existing cluster MW-15, MW-32, and MW-41;

   b. A non-detect well below existing well MW-46; and

   c. A new two-well cluster on Buckeye Street northwest of existing cluster MW-60 and MW-61.

   Sparton considered the NMED request and offered to install the following:

   a. A new no-detect well to the existing cluster MW-15, MW-32, and MW-41, (MW-71).

   b. A new piezometer/well cluster on Buckeye Street northwest of the proposed pump test location and approximately on the "keel." The new well would be installed as a non-detect well. Based on the completion depth of the well, a piezometer would be installed either above or below the well screened interval to provide water level data in the entire zone (depth) impacted by the pump test well (MW-70).

   c. A pump test well would also serve as another non-detect well, that initially would be installed across the entire plume vertical interval to provide additional definition of the bottom of the plume along the "keel," in lieu of the new deep monitoring well at the existing well MW-46 location (Pump Test Well).

   Our notes and recollections are that NMED agreed to the Sparton offer. Additionally, your October 17, 1996, letter made reference to a "nested monitor well and piezometer" that we understood to describe exactly what was proposed and what was agreed to at the September 26-27, 1996, meeting.

   Your letter suggests something other than what we agreed to. In particular, we understand you are now asking for either multiple wells or a multiple completion well in the vicinity of the location of our proposed MW-70, and a separate piezometer distant from whatever monitor well is installed. We continue to believe what we proposed and you accepted is sufficient for purposes of defining the "keel," and analyzing the effectiveness of the pump test well.

3. Sparton will resubmit a contingency plan by January 31, 1997, that will specify that in the event the initial and long-term pump tests do not produce an acceptable demonstration

of capture the long term test will be rerun at a higher pumping rate subject to the limits of the 6-inch well or any limitations imposed by New Mexico Utilities. We disagree that there is a sparsity of monitor wells.

4. As Sparton has previously communicated, the 180 days should begin when we have permits to dispose of the recovered water in the arroyo.

5. For the long term (approximately one month) pumping test, closer monitoring wells (currently assumed to be <750 feet horizontal distance pending results from the initial pump test) would be read two to four times daily for the first several days and then (with NMED concurrence) at a decreasing frequency as time-histories become defined at each well. The intent is to define the shape of the time-drawdown response at each individual monitoring well. Composite distance-drawdown analyses would be conducted on a continuing basis. When the distance-drawdown analyses show the test pumping influence is covering the closer wells, the remaining, more distant wells would be read on a daily frequency until a distinct time-drawdown response can be verified; thereafter, distant wells would be read at a reduced frequency (with NMED concurrence) as needed to define the shape of the time-drawdown response.

   Pressure transducers connected to a continuous recording data logger will be installed in wells MW-60, MW-61, and the pump test well.

6. As previously communicated, initiation of the off-site pump test should not begin until permits are issued to allow discharge of recovered water to the arroyo. We have considered reinjection wells. We identified in the CMS (pp. VII-25 - VII - 30) a host of reasons why we believed reinjection wells would not work at this site. Gary Richardson has advised us of three situations in the Albuquerque area where reinjection wells have had to be replaced, in two cases on a monthly basis. In all situations these wells have required incredibly high maintenance, and in all cases they have had frequent breakdowns. We have estimated that reinjection at a 200 gpm rate, when compared with discharge to the arroyo, would require at least an additional $500,000 in capital costs, and at least an additional $175,000 in annual O&M costs.

Vapor Extraction System Plot Testing

A drilling contractor has been scheduled to begin installation of soil vapor recovery wells VR-1 through VR-5 the first week of February 1997.

Expansion of Interim Measures (IM)

1. Sparton will monitor water levels in existing monitor wells MW-41, MW-43, MW-19, MW-20, and MW-21 in the vicinity of MW-32 and MW-42 before and after groundwater extraction beings to allow evaluation of aquifer response to expansion of the IM. Sparton will monitor discharge rates from these two wells and will sample/analyze water from these wells for VOC on a quarterly basis. Sparton will revise by January 31, 1997, the December 6, 1996, proposal to include this additional work.

2. Sparton will add one or more wells to the expanded IM as necessary to achieve a total pumping rate of 20 gpm. It is anticipated that the additional wells would be added based on yield and presence of elevated VOC concentration. Based on historical data, wells to be considered for expanded IM usage would include MW-43 and MW-19.

3. Sparton does not agree that reinjection is a reasonable alternative for disposal -- see Aquifer Testing Response 6.

4. NMED's concern with the identified statement apparently is based on the agency defining the phrase "changes in concentration with depth" differently than Sparton. As used in the December 6, 1996, proposal, Sparton intended an "increase in VOC concentration with depth" to mean that VOC concentration increases with depth in all wells in the cluster. At Cluster No. 4 (MW-15/MW-41/MW-32), the bottom well MW-32 has the highest VOC concentration. However, at Cluster No. 9 (MW-48/MW-56/MW-55/MW-67), MW-67, the deepest well, is non-detect for VOCs; thus that cluster does not exhibit an increase in all deeper wells.

Yours very truly,

James B. Harris

JBH:eshd
cc: R. Jan Appel
Pierce Chandler
Gary O'Dea

40310 00001 LERA 55222

PROPOSAL

Aquifer Testing/Extraction Demonstration/ Additions to Monitoring Network
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

Sparton Technology, Inc.
Rio Rancho, New Mexico

Prepared by:

Black & Veatch
Dallas, Texas

in Association With

Metric Corporation
Albuquerque, New Mexico

Revised, December 6, 1996
Revised, January 17, 1997

Objectives

The objectives are:

1. To verify aquifer characteristics (through multiple well pump testing) in the vicinity of the leading edge of the plume.

2. To demonstrate/document the ability of a single well to intercept or capture the leading edge of the contaminant plume to prevent further down-gradient migration above MCL.
3. To install additional groundwater monitoring wells and a piezometer to further define plume limits and provide additional pump test data.

Definition of Plume Leading Edge

In the RCRA Facility Investigation (RFI) Report submitted to USEPA on May 21, 1992, and subsequently approved on July 1, 1992, the horizontal and vertical limits of the plume were defined by sampling and analysis through June 1991 using both on- and off-site groundwater monitoring wells. In particular, the leading edge of the plume was defined by a number of non-detect groundwater monitoring wells outside the perimeter of the plume.

Subsequent to the RFI completion, plume movement continued beyond the existing groundwater monitoring system. However, based on historic movement, groundwater gradient, and relatively constant geologic conditions (which are themselves heterogeneous and anisotropic), the limits of the leading edge of the plume were estimated in the May 1996 Corrective Measure Study (CMS) Report. This further definition was continued by five additional groundwater monitoring wells (MW-65 through MW-69) installed around and outside the predicted limits of the plume. Well locations were chosen to provide additional definition of the horizontal and vertical extent of the leading (down-gradient) edge of the plume through non-detection. These and other non-detect wells around the leading edge provide good definition of the plume.

Pump Test Location

Based on the currently defined plume limits and characteristics, a single well located along Bryan Avenue, some 250 feet north of Arrowhead Avenue (see Figure 1) is proposed for the test well location. This location was developed during the meetings on

September 26 and 27, 1996, and represents a developed building lot (Lot 46, Block 29) available for purchase by Sparton. The Paradise Hills area above the leading edge of the plume is currently undergoing significant development including major grade changes, paving, and utility installation. Location of the pump test well on an already developed lot assures that pump testing can continue without interruption. Secondly, placement of the pump test well on a private lot (as compared to the public right-of-way) increases security of the installation and allows above-ground well head completion details. Thirdly, if any pretreatment of produced water is needed, there is ample room for equipment at the well head. Finally, use of a developed lot provides access to both sanitary and storm sewers.

Available Groundwater Monitoring Network

The attached Table 1 is a summary of monitoring points available to verify the performance of a groundwater pump test well installed near the leading edge of the plume.

With respect to the attached summary (see Table 1), there are 22 existing groundwater monitoring wells (including 7 clusters) within 1,500 feet of the proposed recovery well (see Figure 1). These wells include 12 in the upper flow zone (UFZ), five in the upper lower flow zone (ULFZ), four in the lower lower flow zone (LLFZ), and one in the third flow zone (TFZ). There are five down-gradient, five cross-gradient, and 12 up-gradient wells.

The available monitoring network includes all wells that currently define the limits of the leading edge of the plume. The network includes all non-detect monitoring wells outside the plume and detection wells inside the plume. This combination of wells was used to define the plume and is, therefore, capable of showing single-well containment feasibility by demonstrating inward flow (toward the pump test well) across the entire leading edge of the plume. Conversely, the existing groundwater monitoring network is also capable of detecting any deficiency of the proposed pump test well relative to influence over the entire leading edge of the plume. Pump test well performance can be monitored thorough continuing water level observations and water quality sampling and analyses in the groundwater monitoring well network.

Pump Test Well Design

The pump test well will be screened through the entire vertical interval of the plume as defined by installation activities. Temporary casing and sampling will be used to determine the vertical limits of the plume during drilling. Screen depth may be further adjusted downward, as necessary, based on pilot hole logging to ensure screen placement into a transmissive zone.

The pump test casing/screen will be sized to accommodate a pumping rate of up to 200 gpm. Previous calculations have shown that pumping rates of half as much (100 gpm) should provide influence over the entire leading edge of the plume. Actual pumping rate will be a function of the aquifer transmissivity at the pump test location and available drawdown based on the completion depth of the well.

Water from the pump test will be routed to the sanitary sewer adjacent to Lot 46. The existing New Mexico Utilities sanitary sewer can accept up to 200 gpm discharge without difficulty. Due to the prevailing wastewater pretreatment requirements and anticipated quality of the produced groundwater, treatment will not be required for discharge to the sewer. However, if needed, produced water will be treated prior to discharge into the sewer.

Additions to Existing Groundwater-Monitoring Network

An additional groundwater monitoring well, MW-70, clustered with separate piezometer, PZ-2, will be installed in the public right-of-way along Buckeye Street northwest of the pump test well location and existing cluster 10 (MW-60/MW-61). This new piezometer/ well cluster would be located as shown on Figure 1.

The new well, MW-70, will be installed as a non-detect well to define the vertical limit of the plume. Temporary casing will be installed during drilling to allow sampling/ analysis verification of plume limits prior to well installation. The vertical plume limits at MW-70 will be compared to the vertical plume limits at the previously installed pump test well. Anticipating MW-70 will be completed to a higher excavation than the bottom of the pump test well, the piezometer will be installed deeper to the same approximate bottom elevation as the pump test well. However, if MW-70 extends to approximately the same bottom elevation as the pump test well, then the piezometer would be installed in the uppermost portion of the aquifer. The purpose for the well/piezometer cluster is

to provide (a) vertical definition of the plume, and (b) vertical coverage of that portion of the aquifer penetrated by the pump test well.

A second non-detect monitoring well, MW-71, will be installed at the location of existing well cluster 4 (MW-15/MW-32/MW-41). This monitoring well will utilize temporary casing and sampling to verify non-detect screen placement below the existing cluster screen intervals. This well is intended for confirmation of vertical plume limits in a well-documented transverse flow cross-section up gradient of the proposed test well location. The new wells will be 4 inch schedule 40 PVC with 10-foot screens similar to those previously installed. The new piezometer will be 3/4 inch PVC with a five-foot screen.

Pump Test Procedures

A series of pumping tests will be conducted using the pump test well. The first pump test would be a two to three day test (with a temporary pump) used to determine the required size (pumping rate) for a longer-term containment demonstration test. In the initial test, time-drawdown data would be obtained from a constant-rate test at approximately 100 gpm to evaluate produced drawdown and impact to the closer monitoring wells. The resulting time-drawdown and distance-drawdown data would be analyzed to verify aquifer characteristics near the plume leading edge. The data would also be used to project the edge or limit of the pump test well influence relative to plume capture/containment. The initial pump test would also be used to establish produced water quality by sampling and laboratory analysis on a daily frequency. Flow rate, total pumped quantity, and monitor well levels will be recorded during the pumping test.

There are 22 existing wells and the proposed well piezometer cluster within 1,500 feet of the proposed pump test location. (See Table 1) Sixteen of the wells are within 1,000 feet and nine wells (and the single piezometer) are within 500 feet of the pump test well. Water level readings would be taken in the closest wells (<500 feet as detailed in Table 1) at a frequency of not less than once per hour for the first 24 hours, and three to four times daily for the remainder of the test. These wells include existing MW-48, MW-55, MW-56, MW-58, MW-60, MW-61, MW-67, and new MW-70 and PZ-2. Water levels would be obtained using calibrated electronic water level indicators with manual recording of level and date/time. Wells close to the pump test well (MW-60, MW-61, and the new MW-70 and PZ-2) will have dedicated water level indicators to allow increased reading frequency during the first few hours of the pump test. The more distant wells (>500 feet)

would be read at a reduced frequency, but at least three to four times daily. After pump shutdown, recovery data will be obtained at a similar frequency.

After the initial pump test has been conducted and verification of aquifer parameters obtained, a long-term (approximately one month) pumping test would be conducted using the pump test well and the monitoring network described in Table 1. The well would be pumped at a constant rate anticipated to be in the range of 100 to 200 gpm depending on the results of the initial pump test. Closer monitoring wells (<750 feet horizontal distance) would be read two to four times daily for the first several days, and once daily for the rest of the first week. More distant wells would be read daily for the first week. Thereafter, all well levels would be recorded once per week for the duration of the test. This second pump test would be used to demonstrate the plume area impacted by the pumping and the feasibility of single-well containment near the leading edge of the plume. Produced water would be sampled at approximately weekly intervals during the long-term pump test to provide information on water quality relative to pumping duration.

Contingency

There is at least one possible problem scenario that could be identified during the pump test. The location chosen for the pump test may have atypical or non-representative geology such as an absence of coarser, transmissive material in the saturated zone. Such a condition has been encountered in several monitoring wells.

Pilot hole logging procedures and installation of a temporary pump are two ways to minimize the effect of an unexpected geologic condition. As previously noted, screen length could be extended as a first solution. In the highly unlikely event the geologic condition was vertically extensive (tens of feet), consideration would have to be given to an alternate location.

In the event that the initial and long-term pump tests do not produce an acceptable demonstration of capture, the long-term pump test will be rerun at a higher pumping rate subject to the limits of the 6-inch well and/or any discharge limitations imposed by New Mexico Utilities.

Schedule

The schedule for implementing the plume leading edge containment is a dual concurrent track. The first track is the process of obtaining the necessary permits for installing and operating the containment well system. The permits could include air quality, well installation, groundwater rights, variance from zoning, public right-of-way use, and discharge to the sanitary sewer and/or storm sewer to the Calabacillas Arroyo. Applications for permits or authorization are either being prepared or have been submitted.

The second track is the actual installation of the pump test well and additional monitoring wells/piezometers and conducting the pump test. The second track also presumes that track one has been successfully completed. Elements (and schedule estimates) for this second track are as follows:

1. Purchase property for the pump test wellhead (four to six weeks). Note that variance from zoning is required for purchase.

2. Review permits status.

3. Drill and install pump test well (two months).

4. Drill and install additional monitor wells and piezometers (one month).

5. Review permits status.

6. Construct secure area for well head/pump protection.

7. Install discharge pipeline to sanitary sewer.

8. Verify completion of permits.

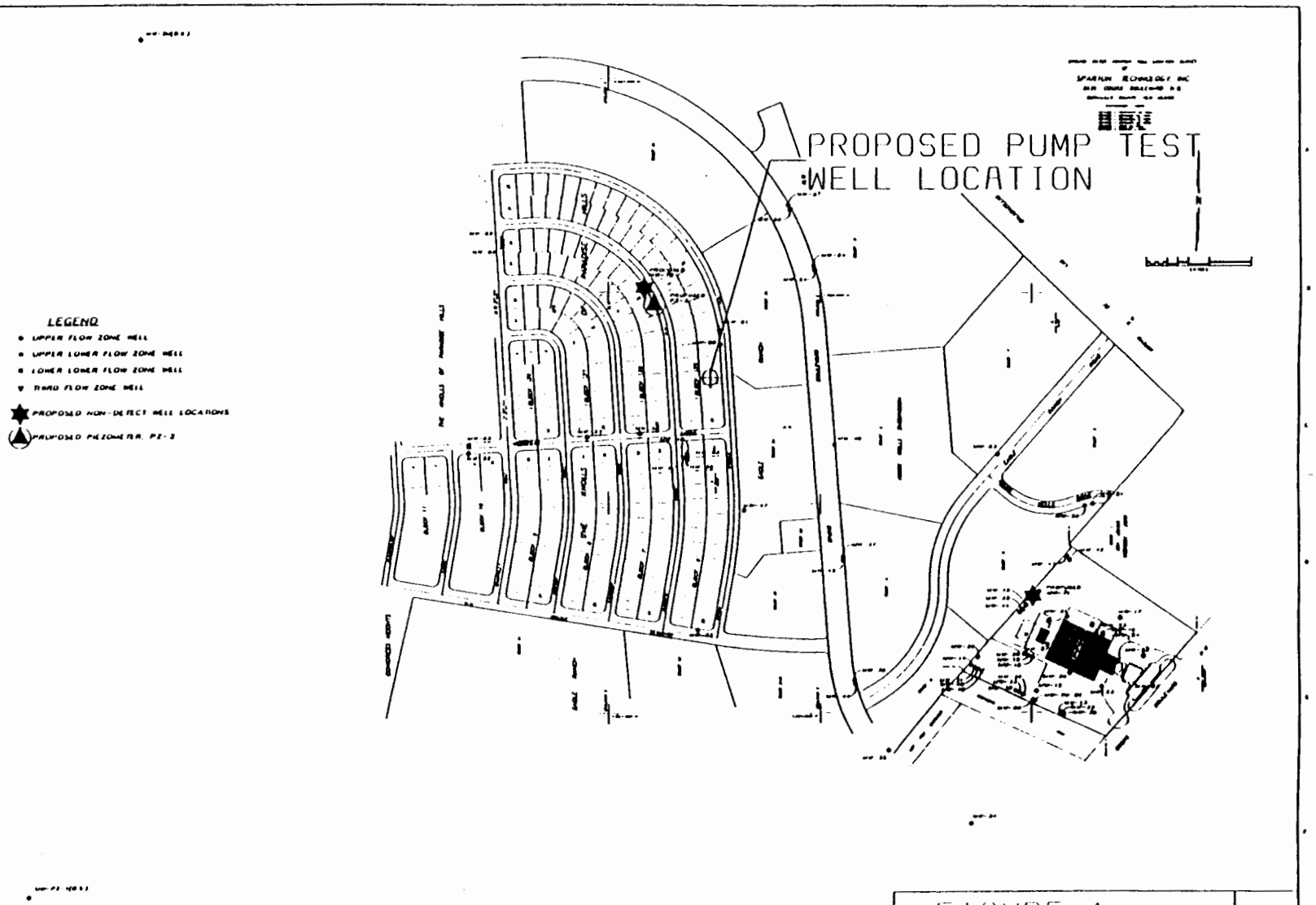
9. Conduct initial three-day pump test, verify aquifer parameters, and install long-term pumping equipment (one month).

10. Conduct long-term pump test (one month).

11. Evaluate and report installation and test data (one month).

12. Review and approval of pump test report by NMED.

Based on the above estimates, the second track will take at least four months to actually begin test pumping.



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Black & Veatch

PROJECT NO 26602

FIGURE 1

RECOVERY WELL AND MONITORING NETWORK

Table 1 Summary of Groundwater Monitoring Wells Within 1500 Feet of Proposed Pump Test Well Location						
Monitor Well	Flow Zone	Approx. Radial Distance ft	Gradient Position	Inside Plume*	Recent Contamination History**	Cluster Well
MW 37	UFZ	1,075	Up	Yes	High, Decr	Yes
MW 45	ULFZ	1,075	Up	Yes	Low, Decr	Yes
MW 46	ULFZ	675	Up	Yes	V. High	No
MW 47	UFZ	650	Up	Yes	Low, Decr	No
MW 48	UFZ	375	Up	Yes	High, Decr	Yes
MW 52	UFZ	1,200	Down	No	ND	Yes
MW 53	UFZ	700	Cross	Yes	Low	No
MW 54	UFZ	700	Up	NA	NA	Yes
MW 55	LLFZ	400	Up	Yes	High	Yes
MW 56	ULFZ	400	Up	Yes	High	Yes
MW 57	UFZ	900	Cross	No	ND	Yes
MW 58	UFZ	425	Up	Yes	High	No
MW 60	ULFZ	175	Up	Yes	High	Yes
MW 61	UFZ	225	Up	Yes	V. High, Decr	Yes
MW 62	UFZ	1,200	Up	No	<5 µg/l	No
MW-63	UFZ	1400	Up	No	No	No
MW 64	ULFZ	725	Up	Yes	Low, Incr	Yes
MW 65	LLFZ	1,175	Down	No	<10 µg/l	Yes
MW 66	LLFZ	875	Cross	No	ND	Yes
MW 67	TFZ	400	Up	No	ND	Yes
MW 68	UFZ	1,150	Down	No	ND	Yes
MW 69	LLFZ	1,175	Down	No	ND	Yes
MW-70	UFZ?	350±	Down	No	Proposed Well	Yes
PZ-2	LLFZ?	350±	Down	No?	Proposed Piezometer	Yes

* Inside 5 µg/l contour

** Very high=>1,000 µg/l, high=>100 µg/l, low=<100 µg/l
ND=no detect, Incr=increasing trend, Decr=decreasing trend

PROPOSAL

Vapor Extraction System Pilot Testing
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

Sparton Technology, Inc.
Rio Rancho, New Mexico

Prepared by:

Black & Veatch
Dallas, Texas

in Association With

Metric Corporation
Albuquerque, New Mexico

Revised, December 2, 1996

Objective

The following proposal is a discussion of specific details and operating procedures to conduct and analyze a VES pilot test and to define the limits of elevated soil-gas volatile organic constituent (VOC) concentrations (i.e., the "soil vapor cloud") in the unsaturated subsurface at the Sparton facility. This discussion of technical details and definition of level of effort is a logical extension from the existing data base and should provide sufficient information to determine what, if any, additional work will be needed.

Soil-Gas Monitoring System

A number of monitoring points for both subsurface soil-gas characterization and for vapor extraction pilot test/production purposes have been previously proposed (B&V letter of August 12, 1996). The monitoring system included both existing groundwater monitor wells (with exposed screen) and the existing vapor cluster probe (VP-1) as well as new vapor recovery wells installed in and around the source area. Previous studies had identified highest VOC concentrations in the soil gas in the closed sump area. Concentrations dropped off by orders of magnitude with increasing horizontal distance from the sump/pond (source area).

The proposed monitoring system additions are designed to characterize the soil gas VOC concentration with respect to distance/location relative to the closed sump area. In addition, the monitoring points would be useful in evaluating the effective influence of a vapor recovery well centrally located in the closed sump (source) area. The monitoring system is shown on the attached Figure 1 and includes four existing groundwater monitoring wells (MW-17, MW-21, MW-24, MW-25, and, perhaps, MW-16 depending on seasonal water level (fluctuation), existing six-well vapor probe cluster (VP-1) and five new vapor recovery wells (VR-1 through VR-5).

The new vapor recovery wells are designed to function as both monitoring points and as potential vapor extraction/air injection wells. The new central vapor recovery well (VR-1) would be a four-inch well; the remaining new vapor recovery wells (VR-2 through VR-5) would be two-inch wells. Wells would consist of 60 feet of 0.040-inch machine slotted PVC screen surrounded by a #6 to #9 coarse sand filter. The uppermost 10 feet of each well would be a grouted surface seal to minimize air intrusion or bypassing. Vapor recovery wells would be screened to just above the highest seasonal water level observed in nearby groundwater wells. New wells would be installed using hollow-stem auger

drilling procedures. As part of the characterization work, drilling would be monitored using field screening instruments to provide a relative comparison of soil gas VOC as a function of location, depth, and soil type. Completed wells would also be sampled and analyzed using EPA method 8010/8020 for specific VOC presence/concentration.

The proposed monitoring system is expected to confirm the significant dropoff in soil gas VOC concentration with increasing distance from the closed sump area. In addition, it should also define the area where vapor extraction and treatment would be appropriate.

The need for any additional monitoring/characterization data outside the proposed network would be based on a combination of perimeter soil-gas VOC concentrations above 10 ppm and projected edge (shape and distribution) of the "vapor cloud" extending out beyond the definition interval of the proposed network. The proposed network has maximum interwell horizontal spacings of ±100 feet in the outer perimeter. Projected vapor cloud edges extending outward less than this interwell spacing should be adequately defined.

Updated Soil-Gas Characterization

Soil-gas data from the additional new wells would be combined with the existing data base to provide a three-dimensional picture of the soil-gas "vapor cloud". This analysis and related data would be presented in the form of an update to the current soil contamination characterization (as presented in the May 6, 1996 Corrective Measure Study (CMS) Report.) Subject to review and approval by NMED, the updated soil-gas characterization would also be used to confirm the application area for vapor extraction and the selection of the pilot test location.

Pilot Test Design

All data obtained to date and the history of the facility indicate that the closed solvent sump is the probable source of VOC observed in the soil gas. Highest soil-gas VOC concentrations occur in the immediate area of the sump with significant VOC concentration decrease observed with increasing horizontal distance from the source area. As a minimum, vapor extraction will be implemented in the sump area. Thus, the sump area is the most logical location for pilot testing.

The pilot test is proposed to define the relationship between VOC concentrations and extraction vacuum and extraction flow rates from a recovery well located directly under the sump area (see Figure 1). Monitoring points (proposed and existing) are located at varying horizontal distances and depths to allow evaluation of effective influence of the centrally located recovery well.

The pilot test is also designed as a prototype demonstration of the planned VES system to show capability for extraction and ability to meet City/County air quality requirements. Further, the pilot test will show probable production rates and estimates of required operation time.

Pilot Test Equipment

For the pilot test, we are proposing AcuVac as the subcontractor to provide necessary equipment. AcuVac is experienced in soil vapor recovery pilot testing in the Albuquerque area and they have demonstrated the ability to successfully conduct meaningful pilot tests and to meet stringent City/County emission requirements. Further, the AcuVac procedure utilizes an environmentally friendly destructive technology to efficiently remove VOC from the extracted soil gas.

The proposed extraction/destruction unit is based around a 300 cubic inch in-line six cylinder internal combustion (I.C.) engine fueled by the extracted soil-gas VOC and supplemental fuel as required. Emissions are controlled by the I.C. process and redundant catalytic converters.

A vacuum blower propelled by the I.C. engine is capable of producing well flow rates of up to 120 cfm and negative pressures of up to 15 inches of mercury. AcuVac-furnished pilot test equipment also includes: a data recording system; magnehelic pressure gauges capable of reading to 0.01 inches of water; soil gas flow measuring devices; real-time field screening/analytical equipment; temperature and barometric measurement; and sampling ports for recovery of influent samples.

Pilot Test Procedure

The pilot test is proposed to be conducted using the central four-inch recovery well (VR-1). The remaining recovery wells (VR-2 through VR-5), UFZ groundwater monitoring wells (MW-17, MW-21, MW-24, and MW-25), and vapor probe cluster

(VP-1) would be used as observation points for the pilot testing (see Figure 1). The pilot testing will be conducted at several different rates of vacuum and flow (up to the maximum capability of the extraction unit) to determine the performance characteristics of the vapor recovery well/adjacent subsurface.

Prior to each individual test, depth to water, temperature and barometric pressure, and magnehelic pressure gauge readings at each monitoring point would be recorded. After the pilot test is started, extraction well vacuum and flow and extraction system operating data (including supplemental fuel flow) will be recorded. Pressure instrumentation at each of the observation wells will be monitored and recorded to determine vacuum communication with the recovery well (demonstration of radius of influence).

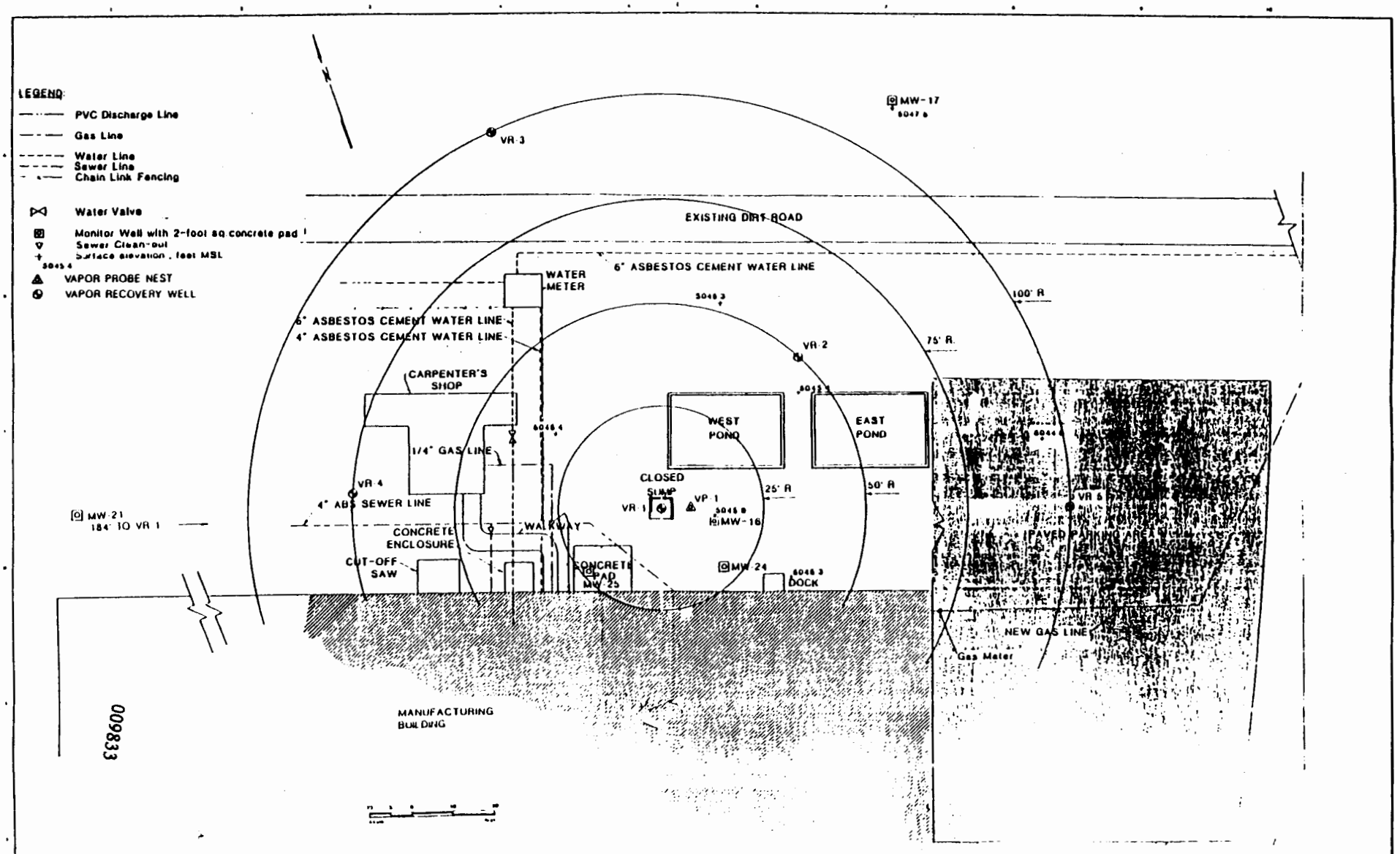
The produced vapor stream (influent) will be analyzed (on a real-time basis) using field screening instruments to determine variation in influent VOC concentration. At selected intervals, influent samples will also be obtained for confirmatory laboratory analyses (EPA Method 8010 and 8020). At least one confirmatory sample will be obtained for each extraction rate test. The purpose of the screening/testing will be to determine VOC concentration variation as a function of both pumping rate/vacuum and elapsed pumping duration.

Based on previous experience, the pilot test should require no more than two days of actual vapor extraction. It is anticipated that two to four extraction rates will be tested. Each extraction rate test will nominally take three to four hours. Upon completion of testing, a detailed pilot test report, including all operating and analytical data and recommendations for operating parameters and effective vacuum radius of influence, will be compiled and provided to NMED for their review and approval.

Pilot Test Schedule

Upon authorization to proceed, it will take from two weeks to over a month to schedule a drilling contractor to install the five vapor recovery wells. Approximately one week will be required to install the wells. Sampling and analytical testing will require several more weeks. Pilot testing can then be arranged in accordance with the subcontractor's schedule. Currently, several weeks are required to mobilize the pilot test equipment; however, once equipment is on site, the actual pilot testing can be conducted in several

days. Interference with the schedule could be caused by the holiday season and possibly weather.



MAP SOURCE RCRA POST CLOSURE PERMIT APPLICATION
HARDING LAWSON ASSOCIATES, MARCH 1986

Black & Veatch
Engineers Architects
Dallas, Texas

PROJECT NO

SPARTON TECHNOLOGY, INC.

COOHS ROAD FACILITY
VES PILOT TEST

FIG 1

CONTRACT NO

SHEET NO

PROPOSAL

Expansion of Interim Measures (IM)
Coors Road Facility
Sparton Technology, Inc.
Albuquerque, New Mexico

Prepared for:

Sparton Technology, Inc.
Rio Rancho, New Mexico

Prepared by:

Black & Veatch
Dallas, Texas

in Association With

Metric Corporation
Albuquerque, New Mexico

Revised, December 6, 1996
Revised, January 17, 19967

Objectives

The objectives of this proposal are three-fold:

1. To address high volatile organic constituent (VOC) concentrations in groundwater at the location of groundwater monitoring wells MW-32 and MW-42.

2. To evaluate the cause of erratic VOC detections historically observed during periodic sampling of groundwater monitoring well MW-32.

3. To enhance interim onsite mass removal.

Lower lower flow zone (LLFZ) groundwater monitoring well MW-32 has historically exhibited erratic detections of volatile organic constituents (VOC). Periodically, it exhibits anomalously high concentrations relative to surrounding adjacent wells and also periodically exhibits anomalous constituents. Further, out of 13 cluster well locations, well MW-32 is the bottom well in the only cluster showing an increase in VOC concentration with depth.

The source of the erratic detections is a matter of speculation, but would include completion problems such as a defective grout seal or a cracked well casing allowing impacts of shallow contamination. Sampling procedures have been ruled out as a cause through detailed resampling and multiple split procedures.

One procedure to determine the cause of the erratic behavior would be to pump the well for an extended period and observe the effect on sampled water quality. If well MW-32 does represent a zone or area of higher VOC concentration, the extended pumping from this well would also be a form of source control and containment. It should be noted that MW-32 is also immediately downgradient of the source area. As detailed in the pump test proposal revised December 6, 1996, an additional non-detect monitor well is proposed below MW-32 to define the lower vertical limits of the VOC plume.

Upper lower flow zone (ULFZ) groundwater monitoring well MW-42 has historically exhibited high VOC concentrations and is outside the recovery area of the existing IM system. In addition, well MW-42 is also down gradient of the source area.

Proposed IM Expansion

The current IM system recovers a total of approximately 2 gpm from the upper portion of the aquifer. The treatment capacity of the IM system is 20 gpm. Well installation data for MW-32 and MW-42 indicate that combined systems pumping rates of 15 to 20 gpm could possibly be achieved. Actual production rate would be determined by installing a temporary pump in each well and conducting a limited pumping test to determine production pumping rate and drawdown. A production pump would then be sized and installed. Discharge would be routed to the existing onsite treatment unit. It should be noted that wells MW-32 and MW-42 are located close to the treatment unit -- allowing economical, secure connection. Increasing the recovery rate to 20 gpm is conditioned to the ability to obtain permits to either discharge to the sanitary sewer or, preferably, to discharge to the Calabacillas Arroyo through the existing storm sewer system.

Water levels will be measured in existing monitor wells MW-4', MW-43, MW-19, MW-20, and MW-21 (in the vicinity of MW-32 and MW-42) before and after expanded groundwater extraction begins to allow evaluation of aquifer response to pumping from MW-32 and MW-42. Discharge rates from these two wells will be monitored and produced water will be sampled and analyzed on a quarterly basis.

Installation data would be included in a report updating the current onsite groundwater recovery well system. The report would be submitted to NMED for review and approval. Production and impact on water quality would be evaluated on a periodic basis and furnished as a part of the site operation reporting.

Contingency

Additional wells will be included in the expanded IM as necessary to achieve a total combined extraction rate of 20 gpm. Any additional wells would be selected based on their potential yield and the presence of elevated VOC concentration. Based on historical data, wells to be considered for expanded IM purposes would include MW-43 and MW-19.

Schedule

The current IM system is permitted for a production of 20 gpm. Adding wells MW-32 and MW-42 to the IM system is simply a matter of conducting a limited pumping test for sizing purposes, and then installing the pump, controls, and connecting piping. It is estimated that wells MW-32 and MW-42 could be recovering water within two months

estimated that wells MW-32 and MW-42 could be recovering water within two months of authorization to discharge treated water to the storm sewer entering the Calabacillas Arroyo.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

FILED
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REGIONAL HEARING CLERK
EPA REGION VI

IN THE MATTER OF:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 COORS ROAD NW	)	U.S. EPA DOCKET NO.
ALBUQUERQUE, NM 87114	)	RCRA-VI-001(h)-96-H
	)	
EPA I.D. NO. NMD083212332	)	
	)	
RESPONDENT	)	

PROTECTIVE REQUEST FOR RECEIPT OF ADDITIONAL INFORMATION

Pursuant to 40 C.F.R. § 24.13(e), Sparton Technology, Inc. ("Sparton") makes this protective request for receipt of additional information in support of its claims.

This submission is being file subject to and without waiving any of Sparton's claims in the pending lawsuit against the Environmental Protection Agency ("EPA"), challenging the agency's authority to issue the Initial Administrative Order ("Order") that began this proceeding and the agency's decision to select the relief provisions set forth in the Order.

EPA now has in its possession revisions to the final CMS. Evan Pearson has objected to the acceptance of this information, claiming it was untimely. His position is surprising. The revisions to the CMS are consistent with a proposal made to the state of New Mexico in July of 1996, were discussed with representatives of EPA, including Mr. Pearson, at a September 1996, meeting in Santa Fe, and were the bases for proposals made to NMED, the latest of which was received by that agency in December of 1996, and discussed with

representatives of EPA. In short, there is nothing in the revisions to the CMS that EPA has not been aware of for many months.

Sparton is also requesting that a letter and certain figures developed by Pete Balleau also be received as additional information. These figures graphically depict the way in which a containment well would operate in dealing with groundwater impacted by operations at the Coors Road Plant. These figures do not literally represent additional information because they describe, in graphical form, technical information already included in previous submission to the agency. These figures are being contemporaneously faxed by Mr. Balleau to the Hearings Clerk and Evan Pearson.

The Presiding Officer has the discretion to receive this information if it is received by the clerk and petitioner at least five (5) business days before the hearing. That condition is obviously satisfied in this case.

Respectfully submitted,

THOMPSON & KNIGHT
A Professional Corporation

By: _____

James B. Harris
Attorney
State Bar No. 09065400

1700 Pacific Avenue, Suite 3300
Dallas, Texas 75201-4693
(214) 969-1700 Telephone No.
(214) 969-1751 Fax No.

ATTORNEYS FOR SPARTON
TECHNOLOGY, INC.

CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing Protective Request for Receipt of Additional Information was served on Evan Pearson, Esq., United States Environmental Protection Agency, Region VI, 1445 Ross Avenue, Dallas, Texas 75202-2733 via hand-delivery on March 19, 1997.

James B. Harris

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

March 19, 1997

HAND DELIVERED

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Please file the enclosed document in the above-entitled matter.

Sincerely,

Evan L. Pearson
Senior Enforcement Counsel

Enclosure

cc: Honorable George Malone, III
James B. Harris

009841

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REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

MOTION TO EXCLUDE REVISED CORRECTIVE MEASURES STUDY OR IN THE ALTERNATIVE, FOR PERMISSION TO FILE A POST-HEARING BRIEF

The U.S. Environmental Protection Agency, Region 6 (EPA), by and through its attorney, Evan Pearson, hereby moves this Court to exclude the proposed revisions to the Corrective Measures Study (CMS) Report served on EPA on March 17, 1997, or in the alternative, for permission to file a post-hearing brief. This motion is based on the following. First of all, the document was not filed by March 14, 1997, as required by the December 16, 1996 Scheduling Order. The document was actually filed with the Regional Hearing Clerk on March 18, 1997, although the Respondent served EPA with a copy of the revised CMS Report on March 17, 1997. Therefore, the submission of additional information is untimely. Second, the Administrative Order on Consent which required the submission of the CMS Report was terminated on June 24, 1996. Therefore, the proposed revisions to the CMS Report are irrelevant. The Presiding Officer does have the authority to exclude irrelevant material at the hearing. 40 C.F.R. § 24.15(b).

However, if the Presiding Officer decides to allow the proposed revisions to the CMS Report to be considered as part of this proceeding, EPA moves, pursuant to 40 C.F.R. §§ 24.14(e) and 24.15(b), for permission to file a post hearing brief. Since EPA has the burden of proof in this matter, EPA should be able to submit the final brief.

Dated this 19th day of March, 1997.

Respectfully submitted,

Evan L. Pearson
Senior Enforcement Counsel
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX - (214) 665-3177

CERTIFICATE OF SERVICE

I hereby certify that on the 19th day of March, 1997, the original of the foregoing was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by the methods indicated below:

HAND DELIVERED

Honorable George Malone, III
Acting Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

FAX AND FIRST CLASS MAIL

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

Eva L Pico

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

March 20, 1997

HAND DELIVERED

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Please file the enclosed document in the above-entitled matter.

Sincerely,

Evan L. Pearson
Senior Enforcement Counsel

Enclosures

cc: Honorable George Malone, III
James B. Harris

009845

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

FILED
97 MAR 20 AM 7:49
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EPA REGION VI

IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	)	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

EPA'S REQUEST TO SUBMIT ADDITIONAL INFORMATION

The U.S. Environmental Protection Agency, Region 6 (EPA), by and through its attorney, Evan Pearson, hereby files this Request to Submit Additional Information.

On December 16, 1996, the Presiding Officer set a March 14, 1997 deadline for the submission of additional information. On March 14, 1997, the Respondent submitted a document entitled "Additional Information in Support of Sparton Technology, Inc.'s Position on the Facts, the Law, and the Relief Sought by EPA. In disregard of this deadline, on March 18, 1997, the Respondent filed proposed revisions to its Corrective Measures Study (CMS) Report (EPA was served on March 17, 1997), despite the fact that the Administrative Order on Consent which required the submission of the CMS Report was terminated on June 24, 1996. On March 19, 1997, the Respondent again submitted additional information (filed at 5:04 P.M.) despite the March 14, 1997 deadline.

Apparently deadlines mean nothing to the Respondent. However, EPA will waive its objection to these two submissions

provided that the Court allows the submission of the attached letter and the granting of EPA's previous motion to file a post-hearing brief. Pursuant to 40 C.F.R. § 24.14(e), the Presiding Officer has the authority to allow EPA to submit additional information either before, at, or after the hearing.

The Respondent has claimed that the City of Albuquerque cannot use the ground water in the area impacted by the contamination caused by the Respondent because the contaminated portion of the aquifer is located within the New Mexico Utilities (NMU) Service Area. However, as the attached letter shows, the City of Albuquerque has notified NMU of its intent to acquire through negotiation, the assets of NMU within the designated service area. If negotiations are unsuccessful, the City will seek to condemn the assets of NMU. If this occurs, the Sparton facility will be within the City's service area, and therefore the Respondent's claims are unfounded.

In addition, because EPA bears the burden of proof, EPA reurges its motion for permission to file a post-hearing brief, as provided for by 40 C.F.R. §§ 24.14(e) and 24.15(b).

Dated this 20th day of March, 1997.

Respectfully submitted,

Evan L. Pearson
Senior Enforcement Counsel
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX - (214) 665-3177

CERTIFICATE OF SERVICE

I hereby certify that on the 20th day of March, 1997, the original of the foregoing was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by the methods indicated below:

HAND DELIVERED

Honorable George Malone, III
Acting Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

FAX AND FIRST CLASS MAIL

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

RECEIVED
FEB 03 1997
Water Resources

CITY OF
Albuquerque

Martin J. Chavez, Mayor

February 3, 1997

Mr. Thomas C. Turney
State Engineer
3311 Candaleria NE, Suite A
Albuquerque, NM 87107

RE: Protest of NM Utilities Application of December 13, 1996: File RG-4462 et al.

Dear Mr. Turney:

By this letter, the City of Albuquerque protests State Engineer approval of the subject application. The Applicant, New Mexico Utilities (NMU), proposes to increase its appropriation under RG-4462 et al. from 10,000 acre-feet per annum to 60,500 acre-feet per annum and to add 69 supplemental wells to 14 presently permitted wells of which four are in production and a fifth drilled.

NMU is a regulated public utility that provides water and wastewater collection service to an area of about 11,000 acres bounded by the South Alameda Grant Line to the South, the Sandoval County line to the north, the Corrales Acequia to the east, and the west boundary line of Sections 5, 8 and 17 in T11NR2E to the west. About 40 of the proposed wells are west of the NMU area west boundary extending out to the Rio Puerco escarpment. Approximately 7,000 acres within the NMU service area lie within incorporated area of Albuquerque. By letter of December 18, 1996 (copy enclosed), the City of Albuquerque delivered a notice to NMU of intent to acquire through negotiation the assets of NMU within this service area. If negotiation is unsuccessful, the City will seek to condemn the assets under the authority of Sections 3-26-1 and 3-27-2 NMSA 1978.

This protest is filed on the grounds that approving the NMU application would impair City water rights under RG-960 et al., would be contrary to the conservation of water within the state, and would be detrimental to the public welfare of the state.

The numerous wells, permitted and proposed, producing the proposed appropriation of 60,500 acre-feet per annum would significantly impact the production capability, cause degradation of water quality and shorten the productive life of the nine existing and permitted City production wells located south of the Alameda Grant line and north of I-40 on the Albuquerque west side. This would result in impairment of the City's rights under RG-960 et al.

The pattern and density of the proposed 69 supplemental wells with the other permitted wells, combined with the large appropriation increase, indicate an intent that the full present NMU area plus the area west

to the Rio Puerco escarpment will fully urbanize as possible within that land area and without regard to the limits of the water resource. Full production under the proposed permit would be enough to serve several hundred thousand people, compared to the estimated some 12,000 people in the NMU area in 1995. This is close to that projected by the UNM Bureau of Business and Economic Research for the whole Albuquerque/Bernalillo County metropolitan area for that period, far in excess of any reasonable projection for the area presumably to be served under the NMU permit. Approval of the proposed permit would violate Section 72-1-9 NMSA 1978, that prohibits public utilities from acquiring water rights in excess of projected 40 year needs.

There isn't unappropriated ground water sufficient to meet the increased appropriation. There has been significant advances in the knowledge of the limits to the water resource and understanding of the geohydrology of the Albuquerque Basin with recent studies conducted by the USGS and others. Fair conclusions from this work support the proposition that the water production that would be allowed with approval of the NMU application would not be sustainable for any reasonable period of time.

For these reasons, approval of this permit would be contrary to the public interest of the state and be contrary to the conservation of water within the state as well as constitute impairment to City water rights.

The City of Albuquerque has assumed the obligation to assure the water resource future of its citizens and water customers through an active conservation program and steps to transition toward full use of its renewable water supplies and ending the massive ground water mining that is presently occurring. It has a substantial interest in the NMU application which has the potential to materially and detrimentally affect the City's ability to achieve these goals. The City's interests extend in particular to its citizens who are served by NMU. This legitimate interest is manifest in the decision that has been made to acquire NMU's assets, as noted above. Of note in this regard is that at such time as the City takes possession of the Utility, the application will be withdrawn.

Sincerely,

Lawrence Rael
Chief Administrative Officer

cc: Robert Swartwout, NMU

Enclosure

97 MAR 21 11:59
REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)	
	)	U.S. EPA DOCKET NO.
SPARTAN TECHNOLOGY, INC.	)	RCRA VI-001(h)-96-H
ALBUQUERQUE, NEW MEXICO	)	
	)	
EPA I.D. NO. NMD083212332	)	ORDER DENYING
	)	PROTECTIVE REQUEST
	)	
RESPONDENT	)	

BACKGROUND

This action before me involves a March 19, 1997, protective request for receipt of additional information filed by Spartan Technology, Inc., in connection with the March 27, 1997, public hearing. This hearing was scheduled after the Respondent, Spartan Technology, Inc., filed a request for a hearing dated October 18, 1996, in response to the EPA's issuance of a September 16, 1996, initial administrative order under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h).

The public hearing proceedings for initial administrative orders under Section 3008(h) are governed by the EPA regulations at 40 C.F.R. Part 24, the Rules Governing Issuance of and Administrative Hearings on Interim Status Corrective Action Orders. Because the September 16, 1996, initial administrative order requires specified corrective measures, Subpart C of 40

009851

C.F.R. Part 24, is applicable to this adjudicatory proceeding.

More specific to the action before me, pursuant to 40 C.F.R. § 24.14(a), the Presiding Officer establishes the schedule for public hearing proceedings. On December 16, 1996, the Presiding Officer set forth a schedule which in part, imposed a deadline for submitting additional information in support of the Respondent's position.[1] The deadline set was March 14, 1997, and it remains unchanged. The Respondent filed additional information in support of its position on March 14, 17, and 19, 1997.[2]

PROTECTIVE REQUEST

While the Respondent seeks a protective request for receipt of additional information citing the Presiding Officer's discretion to receive additional information at least five business days before the hearing, it overlooks the Respondent's responsibility to submit additional information no later than March 14, 1997, in accordance with the December 16, 1996, scheduling order set by the Presiding Officer. The Respondent

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[1] The December 16, 1996, schedule imposed deadlines for submissions made pursuant to 40 C.F.R. § 24.14(c),(d) and (e).

[2] It has come to my attention that the Respondent filed a protective order on March 19, 1997, which requested the Presiding Officer to receive the revised corrective measures study filed on March 18, 1997, and the letter regarding well interference filed on March 20, 1997, as additional information. My order addressing additional information and setting the hearing agenda dated May 21, 1997, at 8:22a.m., did not address the Respondent's protective order because I had no knowledge of such filing.

did not obtain leave from this tribunal to submit additional information after March 14, 1997. Leave may be granted from the schedule set forth on December 16, 1996, if good cause is shown per written request under 40 C.F.R. § 24.14(b).

Here, the Respondent's March 19, 1997, protective request for receipt of additional information fails to request leave from this tribunal and therefore, fails to demonstrate good cause for extending the deadline for submission of additional information in support of the Respondent's position. However, the Respondent may submit new documents at the public hearing if it demonstrates that, through no fault of its own, such documents could not have been submitted before the hearing in accordance with the December 16, 1996, scheduling order.

ORDER

Because the Respondent has failed to satisfy the requirements of 40 C.F.R. § 24.14(b), its request that the Presiding Officer receive additional information is hereby denied.

IT IS SO ORDERED this 21ST day of March 1997.

GEORGE MALONE, III
REGIONAL JUDICIAL OFFICER, ACTING

Z 049 667 707

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PS Form 3800, March 1993

009854

In the Matter of Spartan Technology, Inc., Respondent
Docket No. RCRA VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Monica E. Frazier, Acting Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing Order dated March 21, 1997, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. Thompson & Knight 1700 Pacific Avenue Suite 3300 Dallas, Texas 75201	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED
Mr. Evan Pearson, Senior Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Monica E. Frazier
Regional Hearing Clerk, Acting

Date:

97 MAR 2[illegible] [illegible] 22
REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)	
	)	U.S. EPA DOCKET NO.
SPARTAN TECHNOLOGY, INC.	)	RCRA VI-001(h)-96-H
ALBUQUERQUE, NEW MEXICO	)	
	)	
EPA I.D. NO. NMD083212332	)	ORDER ADDRESSING
	)	ADDITIONAL INFORMATION
	)	AND SETTING THE
	)	HEARING AGENDA
RESPONDENT	)	

BACKGROUND

This action before me involves a March 17, 1997, unopposed request by the Environmental Protection Agency (EPA) to set an agenda for the March 27, 1997, public hearing.[1] This hearing was scheduled after the Respondent, Spartan Technology, Inc., filed a request for a hearing dated October 18, 1996, in response to the EPA's issuance of a September 16, 1996, initial administrative order under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h).

The public hearing proceedings for initial administrative orders under Section 3008(h) are governed by the EPA regulations at 40 C.F.R. Part 24, the Rules Governing Issuance of and Administrative Hearings on Interim Status Corrective Action

---

[1] I will also address the March 19, 1997, EPA motion to exclude the revised corrective measures study submitted by Spartan Technology, Inc, and March 20, 1997, EPA motion to submit additional information.

009856

Orders. Because the September 16, 1996, initial administrative order requires specified corrective measures, Subpart C of 40 C.F.R. Part 24, is applicable to this adjudicatory proceeding.

More specific to the action before me, pursuant to 40 C.F.R. § 24.14(a), the Presiding Officer establishes the agenda for public hearings. While the agenda below reflects areas of interest to the Presiding Officer, it does not limit the Respondent's right to respond to the administrative record and offer facts, statements, and explanations or documents which bear on issues integral to the hearing request. See 40 C.F.R. § 24.15(b). During the presentation of issues at the hearing, each party may use documents filed with this tribunal on or before March 14, 1997.[2]

ADDITIONAL INFORMATION

While the EPA objects to the Respondent's submission of a revised corrective measures study filed with the Regional Hearing Clerk on March 18, 1997, and a letter regarding well interference filed with the Regional Hearing Clerk on March 20, 1997, I find these objections premature at this juncture.[3] The Respondent did

---

[2] The Respondent may submit new documents at the public hearing if it satisfies the 40 C.F.R. § 24.15(b) requirements. The Presiding Officer may grant the EPA leave to respond to any new document formally included in this adjudicatory proceeding after March 14, 1997. See 40 C.F.R. § 24.15(b).

[3] Apparently, the EPA is willing to waive its objections (See the EPA's request to submit additional information at p. 1), provided the Presiding Officer allows the Agency to submit additional information before and after the public hearing. I

not obtain leave from this tribunal to submit additional information after March 14, 1997, the final date established by the December 16, 1996, scheduling order. Leave may be granted if good cause is shown per written request under 40 C.F.R. § 24.14(b).

Here, the Respondent's cover letter to the March 18, 1997, submission indicates that the Presiding Officer received a copy of the revised corrective measures study as a matter of convenience. Furthermore, the Respondent's March 18, 1997, and March 20, 1997, submissions filed with the Regional Hearing Clerk, did not request that the Presiding Officer accept the documents as additional information in support of the Respondent's position. Neither submission requested leave from this tribunal to submit additional information pursuant to 40 C.F.R. § 24.14(b). As such, these submissions are not part of the formal record for this adjudicatory proceeding. For those reasons, there is no need to decide the EPA's motion to exclude, or request to submit additional information at this time.[4]

HEARING AGENDA

Getting back to the issue properly before me, the agenda for

---

find it inappropriate to address the qualified waiver for the reasons provided below.

[4] The March 20, 1997, EPA motion to submit additional information is premised upon the Presiding Officer's inclusion of the Respondent's submissions into the formal record for this adjudicatory proceeding. Such inclusion into the formal record has not occurred.

the public hearing includes the following:

1) Opening remarks by the Presiding Officer (9:30a.m. to 9:35a.m.);

2) Representatives for the EPA will introduce the initial administrative order and administrative record into the hearing record (9:35a.m. to 9:40a.m.);

3) Representatives for the EPA will summarize the basis of the initial administrative order. This will include the legal basis for issuing the order and the technical basis supporting the selected corrective action. I am particularly interested in hearing why the selected remedy is necessary and an explanation regarding the benefit of using a phased corrective action approach (9:40a.m. to 10:40a.m.);

4) Representatives for the Respondent may respond to the administrative record, and offer facts to support issues for which the hearing was requested. This entails, in part, an explanation regarding how the corrective action supported by the Respondent complies with RCRA Section 3008(h), and the EPA policy for remedy selection. I am particularly interested in the off-site plume corrective measures and discharge of treated ground water into the Calabacillas Arroyo (10:40a.m. to noon);

5) Representatives for the EPA may rebut issues previously presented by the Respondent (1:00p.m. to 2:00p.m.);

6) Representatives for the Respondent may respond to the EPA rebuttal (2:00p.m. to 3:00p.m.); and

7) Discussion of outstanding issues and closing remarks by the Presiding Officer (3:00p.m. to 3:30p.m.).

IT IS SO ORDERED this 21ST day of March 1997.

GEORGE MALONE, III
REGIONAL JUDICIAL OFFICER, ACTING

Z 049 667 706

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PS Form 3800, March 1993

009860

In the Matter of Spartan Technology, Inc., Respondent
Docket No. RCRA VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Monica E. Frazier, Acting Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing Order dated March 21, 1997, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. Thompson & Knight 1700 Pacific Avenue Suite 3300 Dallas, Texas 75201	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED
Mr. Evan Pearson, Senior Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Monica E. Frazier
Regional Hearing Clerk, Acting

Date:

009861

BALLEAU GROUNDWATER, INC.
901 RIO GRANDE BLVD. NW, SUITE F-
ALBUQUERQUE, NEW MEXICO 87104

FILED
97 MAR 20 AM 7:52
REGIONAL HEARING CLERK
EPA REGION VI

March 19, 1997

Mr. James B. Harris, Esq.
Thompson & Knight, P.A.
1700 Pacific Avenue, Suite 3300
Dallas, TX 75201-4693

Subject: Well Interference

Dear Mr. Harris:

Four figures are attached that illustrate how the Sparton Technology, Inc. (Sparton) and other generalized groundwater management operations at a one-mile distance west would be expected to interact.

The flow system descriptions were derived using the Theis equation and two-dimensional superposition by means of the FORTRAN program WEL.FOR, written by Dr. Nabil Shafike of this office. Program input consists of well locations and pumping rate, transmissivity and storage of the system, and ambient gradient as indicated on each figure. Streamlines and potential contours were delineated using the commercial software Tecplot. Transmissivity values are taken from the first five layers (130 feet) of the U.S. Geological Survey Albuquerque Basin Model[1] to be 1,950 square feet per day. Other input is intended to be illustrative of characteristic site conditions with generalized examples of 30-year stress scenarios.

The scenarios in each figure illustrate that the other water management operations can proceed in the "recharge window" without harmful interactions from Sparton's system. Figure 4 implies that arroyo recharge may enhance the area of Sparton's capture zone.

[1] Kernodle, J.M., McAda, D.P, Thorn, C.R., 1995, Simulation of Ground-Water Flow in the Albuquerque Basin, Central New Mexico, 1901-1994, with Projections to 2020: U.S. Geological Survey Water Resources Investigations Report 94-4251, 114 p., Albuquerque Basin Model, U.S. Geological Survey.

Please call if this needs further discussion.

Very truly yours,

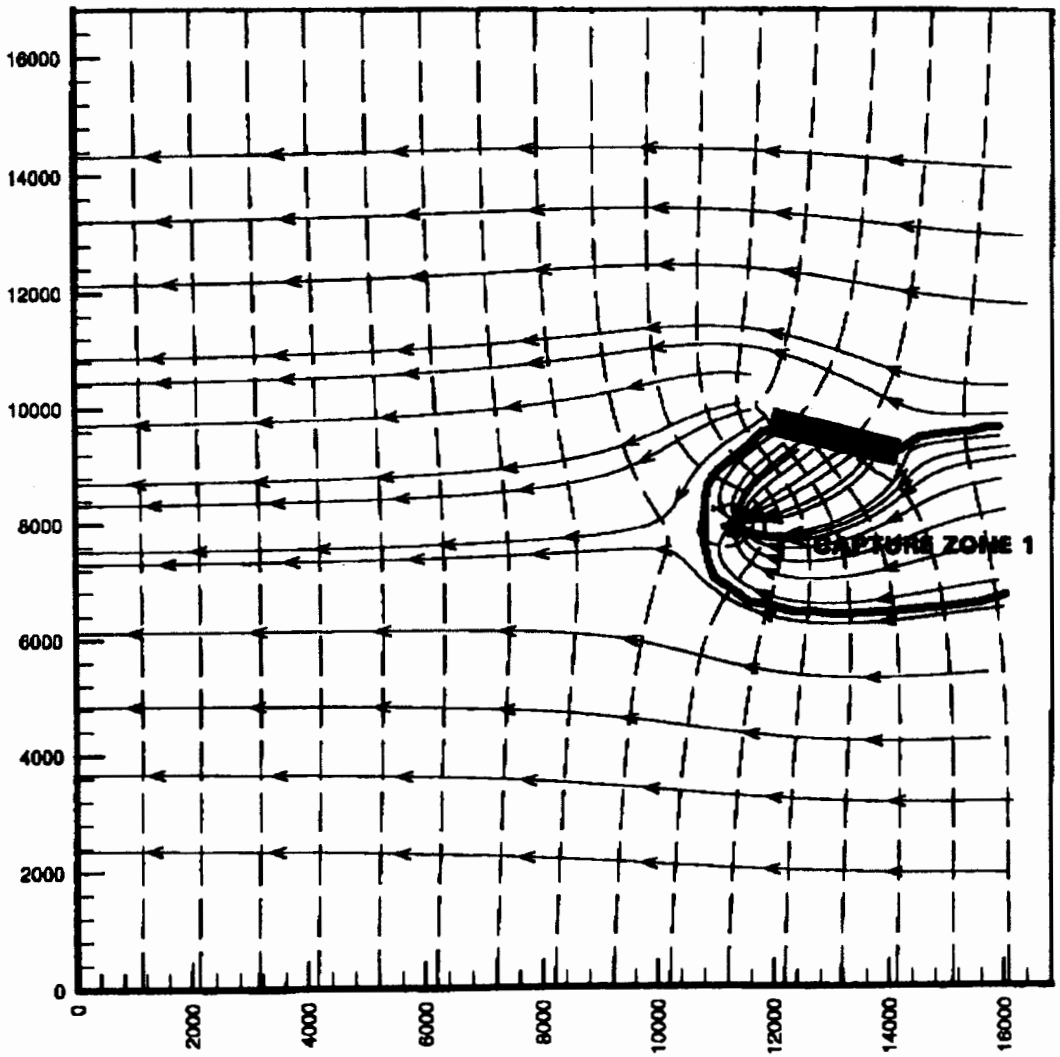
BALLEAU GROUNDWATER, INC.

W. Peter Balleau, CPG, P.Hg.
President

WPB/jh

cc: Ms. Maria O'Brien

Attachments: 4 Figures



T = 1950 ft^2/day
S = 15%
AMBIENT GRADIENT = 0.0025
CAPTURE PUMPING = 200 gpm
ARROYO RECHARGE = 200 gpm
TIME = 30 YEARS

STREAMLINE

POTENTIAL LINE

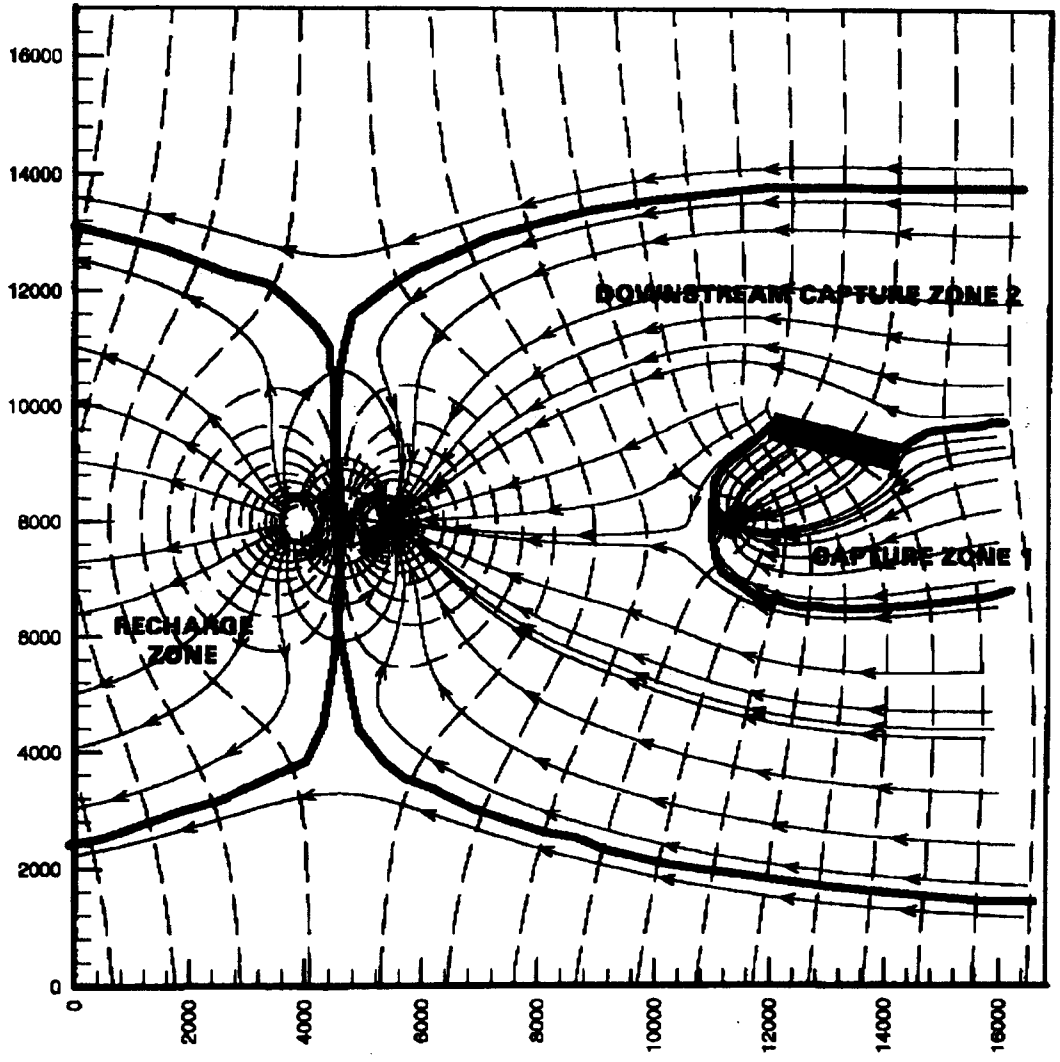
ARROYO RECHARGE LOCATION

CONCLUDE:
EFFECTIVE CAPTURE IN ZONE 1
(SPARTON CONCEPT)

SPARTON TECHNOLOGY INC.

HEAD AND STREAMLINES OF CAPTURE PUMPING

FIGURE 1



T = 1950 ft^2/day
S = 15%
AMBIENT GRADIENT = 0.0025
CAPTURE PUMPING = 200 gpm
ARROYO RECHARGE = 200 gpm
DOWN GRADIENT RECHARGE = 1240 gpm
DOWN GRADIENT PUMPING = 1240 gpm
TIME = 30 YEARS

← STREAMLINE

- - - POTENTIAL LINE

ARROYO RECHARGE LOCATION

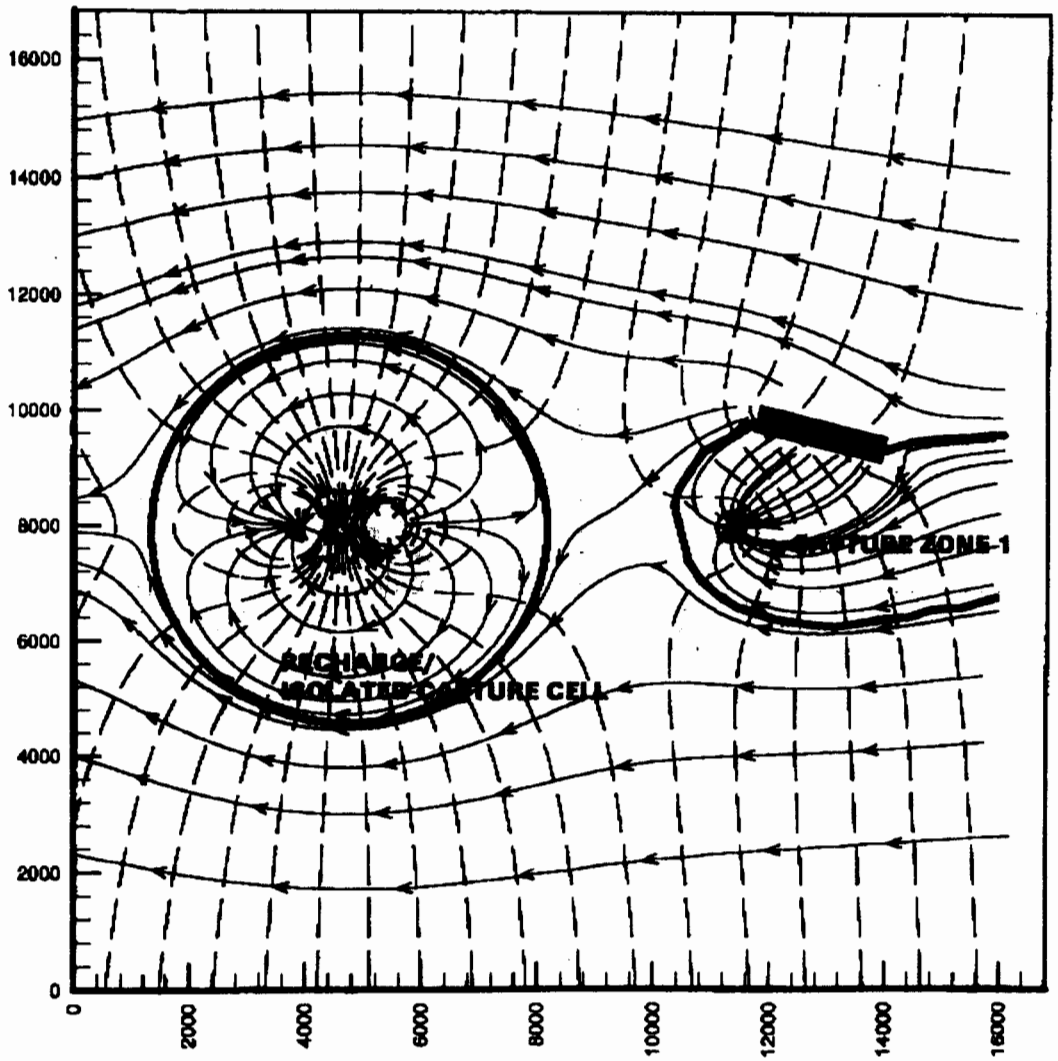
CONCLUDE:
2000 AFY RECHARGE AND RECOVERY OPERATION 1 MILE WEST DOES NOT DISTURB CAPTURE ZONE 1 (CITY CONCEPT)

SPARTON TECHNOLOGY INC.

HEAD AND STREAMLINES OF CAPTURE PUMPING AND DOWN GRADIENT RECHARGE AND PUMPING

FIGURE 2

BALLEAU GROUNDWATER



T =1950 ft^2/day
S = 15%
AMBIENT GRADIENT = 0.0026
CAPTURE PUMPING = 200 gpm
ARROYO RECHARGE = 200 gpm
DOWN GRADIENT PUMPING = 1240 gpm
DOWN GRADIENT RECHARGE = 1240 gpm
TIME = 30 YEARS

STREAMLINE

POTENTIAL LINE

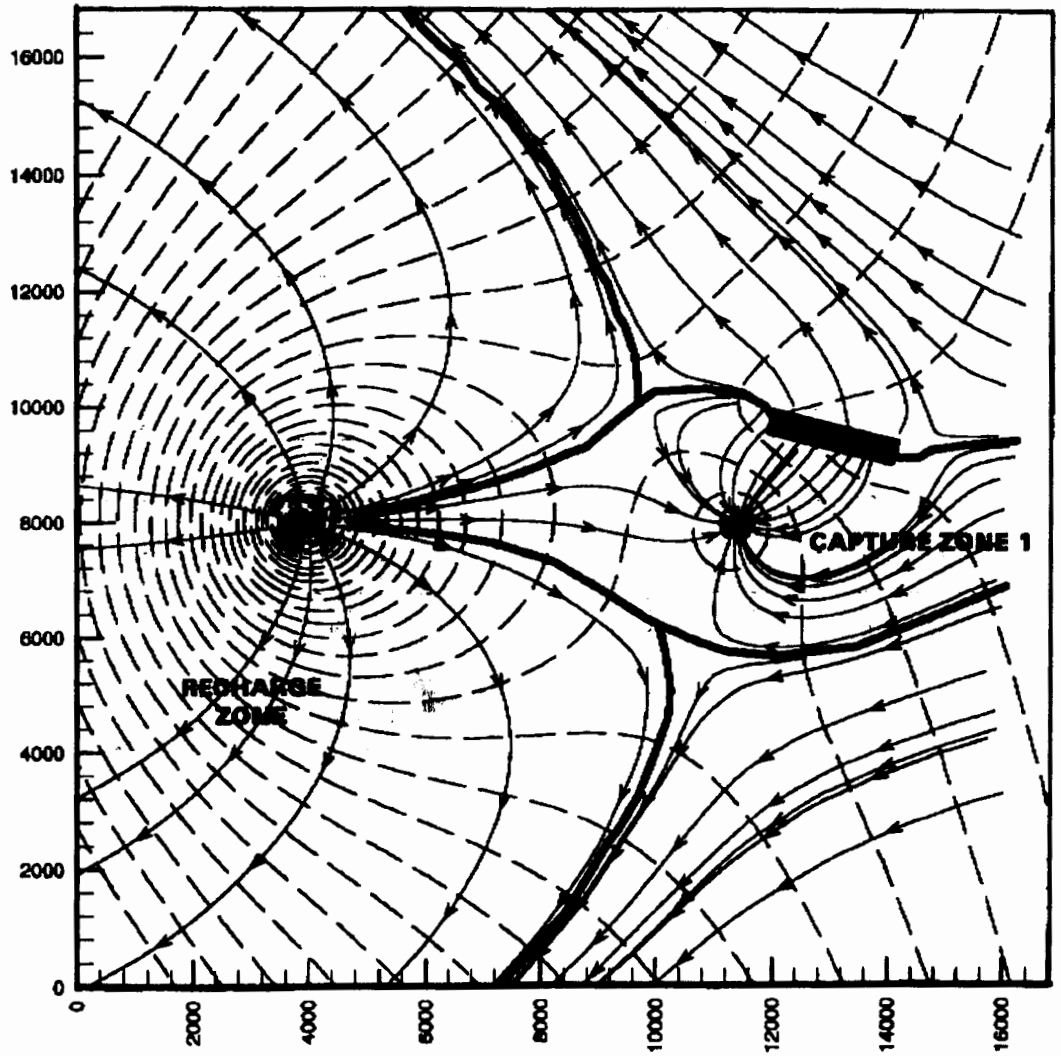
ARROYO RECHARGE LOCATION

CONCLUDE:
ALTERNATIVE LAYOUT OF RECHARGE AND RECOVERY OPERATION 1 MILE WEST DOES NOT DISTURB CAPTURE ZONE 1 (CITY CONCEPT)

SPARTON TECHNOLOGY INC.

HEAD AND STREAMLINES OF CAPTURE PUMPING AND ALTERNATIVE DOWN GRADIENT RECHARGE AND PUMPING

FIGURE 3



T = 1950 ft^2/day
S = 15%
AMBIENT GRADIENT = 0.0025
CAPTURE PUMPING = 200 gpm
ARROYO RECHARGE = 200 gpm
DOWN GRADIENT RECHARGE = 1240 gpm
TIME = 30 YEARS

STREAMLINE

POTENTIAL LINE

ARROYO RECHARGE LOCATION

CONCLUDE:
2000 AFY RECHARGE OPERATION (WITHOUT RECOVERY)
1 MILE WEST ENHANCES CAPTURE ZONE 1
(BOR CONCEPT)

SPARTON TECHNOLOGY INC.

HEAD AND STREAMLINES OF CAPTURE PUMPING AND DOWN GRADIENT RECHARGE

FIGURE 4

BALLEAU GROUNDWATER

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	
SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332, RESPONDENT	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

ORIGINAL

PROCEEDINGS OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY taken in the above-numbered cause on the 27th day of March, 1997, at 9:40 a.m., before Susan Boudin, a Certified Shorthand Reporter in and for the State of Texas, at the offices of United States Environmental Protection Agency, Region 6, located at 1445 Ross Avenue, in the City of Dallas, County of Dallas, State of Texas, 75202-2733; whereupon the following proceedings were had:

1 A P P E A R A N C E S:

2

3 Honorable George Malone
United States Environmental Protection Agency
4 Region 6
1445 Ross Avenue
5 Dallas, Texas 75202-2733

6 ADMINISTRATIVE JUDGE
UNITED STATES ENVIRONMENTAL
7 PROTECTION AGENCY

8 Mr. Evan Pearson
Senior Enforcement Counsel (GEN-LH)
9 United States Environmental Protection Agency
Region 6
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Dallas, Texas 75202-2733
11
APPEARING FOR THE
12 UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
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16 APPEARING FOR THE RESPONDENT

17 ALSO PRESENT:
Mr. Vincent Malott
18 Mr. Pierce Chandler

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(Exhibits attached at the end of the original and certified copies of the transcript.)

1 P R O C E E D I N G S

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3 MR. MALONE: Okay. Let's go on the record.
4 It is now about 9:40 on March 27th, 1997, and I
5 hereby formally open this hearing. Good morning,
6 everyone. My name is George Malone, and I have
7 been appointed by the Regional Administrator to
8 serve as the Presiding Officer in this action
9 today.
10 This action involves the Resource
11 Conservation & Recovery Act, otherwise known as
12 RCRA, Section 3008(h) Initial Administrative
13 Orderr issued by EPA Region 6 to the Respondent,
14 Sparton Technology, Incorporated. The Initial
15 Administrative Order requiring corrective action
16 was issued on September 16th, 1996, while on
17 October 18th, 1996, the Respondent, Sparton
18 Technology, requested a public hearing under
19 Subpart C of the governing federal regulations.
20 Pursuant to a December 16th, 1996, Scheduling
21 Order, this hearing was scheduled for today.
22 Prior to today's hearing, the parties have been
23 allowed the opportunity to submit information
24 supporting their respective positions on the
25 facts and the law governing this action. The

1 federal regulations governing this particular
2 action are found at 40 C.F.R., Part 24,
3 Subpart C.
4 At this point I want to provide the parties
5 with the procedures to be utilized at the hearing
6 today. The procedures are consistent with the
7 March 21, 1997, Order setting the hearing
8 agenda. The first thing to occur entails the EPA
9 representative introducing the administrative
10 record and the Initial Order into the hearing
11 record. Next the EPA representative will
12 summarize the basis for issuance of the Initial
13 Administrative Order. As mentioned in the Order
14 setting the agenda, I am particularly interested
15 in the EPA's position regarding the legal and
16 technical basis for issuance of the Order and the
17 benefits of using a phased corrective action
18 approach.
19 After such presentation by EPA, the
20 Respondent may respond to the administrative
21 record and offer facts, statements and documents
22 explaining any issue for which the hearing was
23 requested. I am particularly interested in the
24 Respondent's preferred remedy selection and how
25 it complies with RCRA and EPA's policy for remedy

1 selection. I'm also interested in the
2 Respondent's position regarding groundwater
3 treatment and reuse into the Calabacillas
4 Arroyo.
5 I want it to be clear that although I'm
6 particularly interested in certain items for both
7 parties, it does not limit the parties' scope of
8 their presentations today. The EPA may present
9 matters solely in rebuttal to issues previously
10 presented by the Respondent. In my discretion as
11 Presiding Officer, I may allow the Respondent to
12 respond to EPA's rebuttal. Today's agenda
13 includes time for such a rebuttal. Please be
14 advised that apart from questions by me, there
15 will be no direct- or cross-examination today.
16 The Respondent and EPA will only be allowed to
17 provide presentations as mentioned earlier. It
18 is my duty to conduct this hearing in a fair and
19 impartial manner, to take action to avoid undue
20 delays and to maintain order. In my discretion,
21 I may exclude repetitive or irrelevant matters.
22 As you-all can see, this hearing is being
23 transcribed by a court reporter, so I would ask
24 that whenever you speak, please speak clearly,
25 and we can only have one person speaking at any

1 given time. So at this point are there any
2 questions by either of the parties?
3 MR. HARRIS: Mr. Malone, my name is Jim
4 Harris. I'm an attorney with Thompson & Knight
5 here on behalf of Sparton Technology, Inc. We
6 have one preliminary matter we wanted to raise
7 with you, and that has to do with the request
8 that you recuse yourself. While we believe you
9 will attempt to be fair and impartial, my client
10 is concerned that institutional pressures will
11 impact your decision. In particular, you
12 obviously are an employee of EPA, you work for
13 Region 6, you answer to the regional counsel in
14 this region. You have worked with or for those
15 who are pressing a particular position in this
16 proceeding, and you probably have both a personal
17 and professional relationship with any number of
18 people that are involved in this particular
19 proceeding, and we think that puts you in a very
20 difficult position.
21 I might provide by way of an example a
22 situation that I run into in State Court where
23 there is a State Court Judge whose son is an
24 associate at my law firm. Because of that, he
25 routinely tells of what cases in which Thompson &

1 Knight is involved and provides them with an
2 opportunity to ask for a different judge because
3 he recognizes that that personal relationship,
4 that situation, would cause him or could cause
5 somebody to question whether he will be fair and
6 impartial in a situation. And I think the
7 regulations and the Regional Administrator by
8 selecting you to hear this particular proceeding
9 has put you in a very awkward and difficult, if
10 not impossible, position. We think that this
11 type of case requires that an administrative law
12 judge who operates independently of the agency be
13 allowed to hear the proceedings in this matter
14 and to hear any statements that are made in this
15 proceeding and to make a totally independent
16 determination of the factors that the statute
17 requires.
18 We would therefore request and we believe
19 that under the requirements of Part 24 the
20 appointment of an administrative law judge would
21 be entirely appropriate and consistent with those
22 requirements and would respectfully request that
23 you recuse yourself and that the regional
24 administrative or appointed administrative law
25 judge hear this matter.

1 MR. MALONE: Thank you for your concerns.
2 Does Counsel for EPA have a response?
3 MR. PEARSON: Yes, Your Honor. 40 C.F.R.,
4 Part 24, of the procedures have been upheld by
5 the Court of Appeals for the District of
6 Columbia, so they are valid on their face.
7 According to Mr. Harris's reasoning, if someone
8 was appointed -- for example, as typical, like an
9 assisting -- or a U.S. attorney is appointed as a
10 judge, by his type of theory, he could never hear
11 any cases brought by the United States Attorney's
12 office. I believe since the regulations are
13 upheld, they're valid and you have met the
14 requirements, that you have no prior connection
15 in the case and this motion should be denied.
16 MR. HARRIS: May I respond very briefly?
17 MR. MALONE: Okay.
18 MR. HARRIS: We don't know whether you have
19 any prior connection with the case. As you're
20 well aware, we had requested discovery on this
21 issue through our written questions, and in your
22 discretion you denied our ability to get into
23 that, so we don't know at this point exactly what
24 the relationship is, what involvement you have
25 had. We haven't had a chance to test any of

1 those statements by EPA. And while we have no
2 reason at this point to believe that from a
3 personal standpoint you would have bias towards
4 us, what we're saying is institutionally we have
5 very legitimate and significant concerns, and
6 secondly, we have had no opportunity to really
7 get into the issue of what your particular
8 relationship has been with any of the people
9 here, what previous positions you have had in the
10 agency.
11 I know you have just recently been appointed
12 the Regional Judicial Officer, and I think what
13 we have raised are very legitimate concerns that
14 aren't addressed by the decision that Mr. Pearson
15 makes reference to. I would point out that that
16 decision simply said, hey, look, on the face of
17 it, it appears this may work, but the Court
18 specifically reserved the question of whether, as
19 applied to any particular situation, those
20 regulations would, in fact, be constitutional,
21 and I think the bias or lack thereof of the
22 Presiding Officer is a very legitimate concern
23 under due process and one that we are concerned
24 about and wanted to raise obviously before the
25 hearing began.

1 MR. MALONE: Okay. I'm going to rule on
2 this. I'm going to deny your request, and just
3 to give you a response as to my involvement in
4 this particular action, the way that the region
5 is set up, I work within the office of regional
6 counsel. I have been appointed by the Regional
7 Administrator to preside over this proceeding. I
8 have no direct relationship with the division
9 director over this enforcement program who issued
10 the Section 3008(h) Order to you, so I have had
11 no prior involvement in that, have no involvement
12 in it other than my capacity as presiding over
13 these proceedings, so therefore I'm going to deny
14 your request.
15 Moving on, before we get started, I would
16 just like for all the parties that are going to
17 actively participate in this hearing today to
18 introduce themselves and state your capacity for
19 the record. We can start with Sparton. You have
20 already introduced yourself. If you have someone
21 else that's going to actively participate --
22 MR. CHANDLER: Sure. I'm Pierce Chandler.
23 I'm an engineer here with Black & Veatch here in
24 Dallas representing Sparton.
25 MR. MALONE: Thank you.

1 MR. PEARSON: For the record, my name is
2 Evan Pearson, and I'm an attorney with EPA.
3 MR. MALOTT: I'm Vincent Malott. I'm an
4 enforcement officer with the Compliance
5 Assurance & Enforcement Division.
6 MR. MALONE: EPA may proceed.
7 MR. PEARSON: May it please the Court,
8 Counsel. As I previously stated, my name is Evan
9 Pearson and I'm a Senior Enforcement Counsel with
10 EPA here in Dallas and, along with Vincent
11 Malott, who is an environmental scientist with
12 the technical section, will be making
13 presentations on behalf of the EPA for this first
14 portion of the hearing. I will first address the
15 legal basis for issuing the Order, Mr. Malott
16 will address the technical basis, along with some
17 of the other issues that you identified in your
18 Order, and then I'll make some concluding
19 remarks.
20 As this Court knows, on September 16th,
21 1996, EPA issued an Initial Administrative Order
22 against Sparton Technology, Inc., seeking to
23 implement the remedy that it had selected in its
24 June 24th, 1996, Final Decision and Response to
25 Comments. Concurrent with this filing, EPA filed

1 with the regional hearing clerk an administrative
2 record which consists of 19 volumes of almost
3 9,000 pages. These documents are the ones that
4 the agency considered in issuing the Order, and
5 at this time I would like to formally introduce
6 into this hearing the administrative record and
7 the Initial Administrative Order.
8 MR. HARRIS: On behalf of Sparton, we
9 object. We have already made the point that the
10 administrative record that EPA has put together
11 is a cobbled-together set of documents that do
12 not represent the basis on which the agency
13 actually made the decision. We had requested,
14 again, discovery on this particular point to
15 establish that the decision in this case was made
16 well before any administrative record was
17 developed, well in advance of the corrective
18 measure study being completed. We were denied
19 all discovery on this particular issue.
20 We have reviewed the administrative record.
21 It does not in any way, shape or form include all
22 of the correspondence, all of the communications
23 and all of the material that was shared between
24 EPA and other parties to which we were excluded
25 and which explain the true basis for the agency's

1 decision in this case, and therefore we object to
2 the acceptance of this administrative record
3 because it is not complete and does not
4 accurately reflect the reasons why the agency
5 made the decision it did make.
6 MR. MALONE: The objection is overruled. I
7 have reviewed the administrative record a number
8 of times, and I found the administrative record
9 to be adequate.
10 Counsel, you may proceed.
11 MR. PEARSON: Okay. Thank you, Your Honor.
12 Now I would like to address the legal basis for
13 issuing the Order. In order to prove our case,
14 EPA must show by a preponderance of the evidence
15 for a RCRA 3008(h) action that there has been a
16 release into the environment of hazardous waste
17 from an interim-status facility and that
18 corrective action or other response measures are
19 necessary to protect human health and the
20 environment.
21 And now I would just like to briefly
22 summarize the first portion of this requirement,
23 the release of hazardous waste into the
24 environment from an interim-status facility. And
25 it is more fully explained in my brief, and I

1 don't think I need to go into it in any detail at
2 this time, but I would like to put the situation
3 of the facility in perspective.
4 May I have the chart, please?
5 Okay. Here is a chart of the facility in
6 question here on the site. Located down here is
7 Sparton Technology, and Sparton filed a
8 notification of hazardous waste activity prior to
9 August 19, 1980, and also filed a Part A permit
10 application prior to November 19th, 1980.
11 Sparton stored hazardous waste in surface
12 impoundments after November 19th, 1980, therefore
13 meeting all the requirements for interim status,
14 and this is more fully set forth in our brief.
15 The release in question primarily occurred,
16 according to Sparton, from a solvent storage cell
17 located at the facility. The primary contaminant
18 is trichloroethylene, which is a hazardous
19 waste. What we have here -- this is the
20 approximate boundary of the trichloroethylene
21 plume, and this is indicated by a five parts per
22 billion of trichloroethylene. As far as the
23 contamination on site, as of January 19, 1996, on
24 site the concentrations were approximately 7,600
25 parts per billion TCE, the middle of the plume

1 was approximately 3,200 parts per billion, and
2 explains this indicates a five-parts-per-billion
3 limit there. The reason the five parts per
4 billion was chosen, that is the MCL or maximum
5 contaminant level for TCE. The maximum
6 contaminant level is defined as the maximum
7 allowable concentration of specific contaminants
8 in water supplied by public water systems. And
9 the MCLs are health-based standards that EPA has
10 determined that's protective of human health.
11 The plume itself extends approximately
12 one-half mile off the facility. It's
13 approximately 3,300 feet long by 1,650 feet wide.
14 It covers approximately 90 acres, and it's
15 approximately anywhere from 50 to 125 feet below
16 the water table. To get a little better
17 perspective as far as the site itself, on either
18 side of the facility is commercial development.
19 There is a day care center located approximately
20 here. We have residential properties in this
21 area here, and this is also known up here as the
22 Paradise Hill subdivision.
23 Turning to the next matter where corrective
24 actions or other response measures are necessary
25 to protect human health and the environment, EPA

1 must show either a present or a potential
2 threat. In this particular case we have a
3 potential threat to human health and a present or
4 actual threat to the environment. And as the
5 Court will see, there is going to be some
6 overlap.
7 In regard to the potential threat to human
8 health, I would like to set the scene here. The
9 aquifer that has been contaminated by Sparton is
10 part of the Santa Fe Group Aquifer System, which
11 the City of Albuquerque relies on as its sole
12 source of drinking water. More than 500,000
13 persons in the City of Albuquerque are dependent
14 solely upon groundwater for their water usage,
15 and the City of Albuquerque as the governing body
16 has a compelling interest in protecting the
17 health, safety and welfare of the citizens, and
18 this necessarily includes the vigorous protection
19 of the City's limited groundwater resources. And
20 as part of its responsibility, in 1982, the City
21 designated this area as a future well site and
22 thus a critical resource for the City.
23 Furthermore, as part of its responsibility,
24 it drafted in 1994 a Groundwater Protection
25 Policy and Action Plan which also designates the

1 area contaminated by Sparton as a critical area
2 for groundwater quality protection. The purpose
3 of this plan was to ensure the quality of the
4 City's groundwater resources so that public
5 health and the quality of life and economic
6 status will not be diminished.
7 Unless corrective action is taken, this
8 plume will continue to migrate into other areas
9 of the Santa Fe Group Aquifer System and thus
10 prevent utilization of this valuable natural
11 resource. As I previously stated, the
12 trichloroethylene contamination off-site is
13 approximately 3,200 parts per billion in the
14 middle of the plume, which is approximately a
15 half-mile off-site. The maximum contaminant
16 level, as I previously stated, is five parts per
17 billion, so we have concentrations of over 600
18 times the maximum contaminant level.
19 Now that I've set the scene here, I would
20 like to look at the situation in terms of risk
21 analysis. The pathway for the contamination is
22 the aquifer, and the receptors are the potential
23 users. And because this is a potential source of
24 drinking water and you have contamination above
25 the MCLs, we have a potential threat to human

1 health. And I refer the Court to a case I cited
2 in my brief, the State of New York vs. Shore
3 Realty Company, where the Court found that
4 released groundwater poses a threat to human
5 health even if drinking water supplies are not
6 threatened. And this analysis I outlined fits in
7 with the proposed Subpart S regulation, 40
8 C.F.R., Section 264.525(d)(1) which I cite in my
9 brief, which, contrary to the response assertion,
10 has not been superseded. This proposed
11 regulation provides that in determining the
12 cleanup levels that are protective of human
13 health for a potential source of drinking water,
14 EPA must consider MCLs in establishing cleanup
15 levels. Therefore, if there wasn't a potential
16 threat to human health due to contamination of
17 potential source of drinking water, one wouldn't
18 establish cleanup levels for the aquifer. Now,
19 Sparton has claimed that its contamination will
20 not cause any loss of any reasonable foreseeable
21 use of the aquifer.
22 MR. HARRIS: Mr. Malone, I'm a bit puzzled
23 here. I thought the opening by EPA was designed
24 to give the basis of the Order from the
25 administrative record as opposed to arguing

1 Sparton's position. Maybe I misunderstood the
2 regulations or your Order, but I thought it was
3 pretty clear that they were going to introduce
4 the record and identify from the record what
5 support they have, and it seems to me that this
6 particular line of argument is clearly outside
7 the scope of the regulations in your Order and I
8 would object to it.
9 MR. MALONE: Well, the objection is
10 overruled. And on March 21, 1997, when you read
11 that Order, I specifically stated that I was
12 interested in the legal and technical basis for
13 issuance of the Order, so I want EPA to proceed
14 with that. I mean, either I get it now or I get
15 it later, so your objection is overruled.
16 MR. HARRIS: Well, I'm just -- I'm still
17 trying to understand what their legal basis is,
18 and they have yet to supply that to me; I think,
19 in writing or now, that's not being provided, its
20 argument with respect to Sparton's position,
21 which to me is rebuttal, but I understand your
22 ruling.
23 MR. PEARSON: Well, I would like to say
24 we've clearly set forth the legal requirements in
25 our brief. We set six elements there, and I

1 think we will be addressing all the legal basis.
2 Part of the legal basis includes whether there's
3 a threat to human health and the environment, and
4 I've explained the basis for that threat.
5 Okay. Like I said, Sparton has previously
6 stated that this contamination will not cause any
7 loss of any reasonable foreseeable use of the
8 aquifer. However, the City back in 1982
9 identified this area as a potential well site,
10 and it can't be used because of the contamination
11 that Sparton caused. The City also -- Sparton
12 has also raised the issue that -- because the
13 contaminated portion of the aquifer is located
14 within the New Mexico Utilities service area. In
15 our CMS comments, we stated that the goal for
16 addressing restoring groundwater to unrestricted
17 use is so that any user can have access to the
18 resource regardless of the boundaries of the
19 service area, and the reason we put this in here
20 is because we recognize we could not predict the
21 future. No one can predict the rapid development
22 in the area surrounding the facility, and
23 economic and legal and technical factors could
24 change the situation drastically. And I would
25 like to reference just briefly our filing of

1 March 20th, 1996, in regard to that matter.
2 MR. HARRIS: I'm sorry. The March 20th
3 filing, are you referring to the letter from the
4 City?
5 MR. PEARSON: Yes.
6 MR. HARRIS: Are you accepting that?
7 MR. MALONE: I did not accept that into the
8 record, so --
9 MR. HARRIS: Well, it's being mentioned in
10 the record, so is it now part of the record?
11 MR. MALONE: It's not part of the record.
12 The letter is not part of the record. I mean, he
13 mentioned the letter, but that letter has not
14 been admitted into these proceedings, so your
15 objection is well taken.
16 MR. PEARSON: Moving on here, where the City
17 and the State Government in this particular
18 case -- or excuse me, where the City has
19 determined how the groundwater is going to be
20 used, I believe EPA must accept its
21 determination. This is a matter of drinking
22 water. As far as what aquifer is going to be
23 used is a question for the state and local
24 authorities. So in this situation we have a case
25 where the City says there's a potential source of

1 drinking water and the City says that it will use
2 it. And this also fits into EPA's stated policy
3 that it expects to return usable groundwater to
4 its maximum beneficial use.
5 Now, Sparton has made the statement in their
6 brief that Region 6 is required to prove that the
7 groundwater will be drunk and at levels that
8 justify the MCLs, citing the case of Leather
9 Industries of America vs. EPA. I would like to
10 point out there's no requirement under Section
11 3008(h) for this requirement. The Leather
12 Industries case involves challenges to proposed
13 use or disposal of sewage sludge regulation under
14 the Clean Water Act. In this particular case,
15 EPA was required to identify and set numerical
16 limits for toxic plumes which may be present in
17 sewage sludge or in concentrations which might
18 adversely affect the public health environment.
19 EPA has already done this for drinking water when
20 it established the MCLs.
21 Now, turning to the issue of whether the
22 contaminated groundwater presents a threat to the
23 environment, when you read Sparton's brief, they
24 seem to lump human health and the environment
25 together. Groundwater as defined by CERCLA --

1 excuse me, natural resource as defined by CERCLA
2 includes groundwater. Groundwater is also
3 protected as a natural resource under the New
4 Mexico Water Regulations, and therefore you do
5 not have to have, like the Respondent contends, a
6 threat to an ecosystem in order to have a threat
7 to the environment.
8 Further, I would like to point out that the
9 New Mexico definition of water pollution -- and
10 when they define water, they include
11 groundwater -- as defined as the introduction
12 into water of contaminants in such quantity and
13 duration so as to unreasonably interfere with the
14 public welfare. Also, the State of New Mexico
15 defines adverse environmental impact as an act or
16 omission that amounts to $10,000 or more in
17 damage or litigation costs to groundwater. Even
18 if you accept Sparton's proposed remedy, which in
19 the Final Decision documents is roughly three
20 million dollars, you could see that exceeds the
21 $10,000 limit.
22 And therefore, now that EPA has shown that
23 there is a threat to human health and the
24 environment, the last requirement of the statute,
25 the question then becomes how best to protect

1 human health and the environment. Mr. Malott
2 will discuss remedy selection criteria, along
3 with other issues identified by the Presiding
4 Officer. With Mr. Malott's remedy selection, he
5 will be discussing the remedy as proposed by
6 Sparton in its CMS report. We did not have a
7 containment proposal from Sparton when we made
8 our Final Decision and Response to Comments
9 document. I will then address Sparton's
10 containment proposal in my closing remarks as
11 part of this presentation. Thank you.
12 MR. MALOTT: The technical basis for this
13 remedy is based on several components, the first
14 of which is the establishment of the objectives
15 for the RCRA corrective action. These objectives
16 are based in part on criteria established under
17 Task VII of the corrective measures study and the
18 1988 Administrative Order of Consent. These
19 criteria include public health and environmental
20 criteria, the RFI, EPA guidance, state and
21 federal statutes and the regulations under 40
22 C.F.R., Part 264.
23 As previously discussed by Mr. Pearson, the
24 contaminated aquifer is potentially usable as a
25 source of drinking water. In the preamble to the

1990 Subpart S proposed rule and the 1996 Advanced Notice for Proposed Rulemaking for Subpart S for aquifers that are currently being used or potentially usable as a source of drinking water, the EPA expects to return the groundwater to its maximum beneficial uses. In addition, the State of New Mexico Water Quality Control Commission of Regulations provide for the protection of groundwater. Therefore, the corrective action objectives for this site are the following: One, containment of the source area and reduction to the extent possible, and the source area includes the contamination that remains in the soil beneath the facility as well as the high contaminant concentrations in the aquifer beneath the facility; two, containment of the contaminant plume to prevent further migration and degradation of the aquifer; and three, restoration of the contaminated aquifer to its beneficial use.

EPA provided these objectives to Sparton and the comments on the CMS report by letter dated October 3rd, 1995, and March 1, 1996. These letters are included in the administrative record. These objectives were also outlined in

1 the Statement of Basis that EPA made available
2 for public comment from December 8, 1995, to
3 February 8, 1996. These objectives are
4 protective of human health and environment by
5 reducing the source material available for
6 further contamination; secondly, by preventing
7 further migration of the contaminant plume which
8 prevents contamination of the unaffected areas of
9 the aquifer which is a potential source of
10 drinking water and a valuable natural resource;
11 and finally, by restoring the contaminated
12 aquifer to MCLs protects human health by
13 restoring usable groundwater to a safe level for
14 drinking.
15 The second component of EPA's remedy
16 selection is based on a review of available
17 technologies. Sparton presented several
18 technologies to address the contamination from
19 the facility in the final CMS report. For the
20 source area and soil, these include soil vapor
21 extraction, soil flushing and bioremediation. Of
22 these, the EPA selected soil vapor extraction to
23 meet the objective of the containment and
24 reduction of the source area in the soil.
25 Sparton also recommended this one. For the

1 source area and the aquifer, Sparton presented
2 information on pump and treat, air sparging,
3 bioremediation. Of these, EPA selected pump and
4 treat to meet the objective of the containment
5 and reduction of the source area in the aquifer.
6 For the remainder of the contaminant plume,
7 Sparton presented information on pump and treat,
8 natural attenuation and bioremediation. Of
9 these, EPA selected pump and treat to meet the
10 objections of containment and restoration of the
11 contaminant plume. Sparton recommends natural
12 attenuation as the preferred approach.
13 Sparton's recommendation of natural
14 attenuation is apparently based on two points.
15 The first point is that a contaminant plume
16 consisting of chlorinated solvents such as TCE
17 will naturally degrade over time. Such
18 degradation could possibly occur through
19 biological, chemical or physical processes.
20 However, biological processes have not been shown
21 to degrade the contaminants such as TCE in the
22 groundwater based on the site conditions as we
23 know them today. Sparton's own consultant,
24 Battelle, also concurs with this.
25 As for chemical processes, the only process

1 identified is the breakdown of trichloroethane,
2 also known as TCA, which is another chlorinated
3 solvent in the contaminant plume. The chemical
4 process transforms trichloroethane to
5 dichloroethene, which is a more hazardous
6 chemical, so this process is only making the
7 problem worse.
8 As for physical processes, dilution appears
9 to be Sparton's main solution for this
10 contaminant plume. Therefore, the natural
11 attenuation that Sparton is recommending is
12 really just unrestricted plume migration with the
13 eventual dilution of the contaminant plume to
14 acceptable levels. Before this is accomplished,
15 though, the plume will have continued to
16 migrate --
17 MR. HARRIS: Mr. Malone, in this proceeding
18 Are we unable to object to complete misstatements
19 about my client's position?
20 MR. MALONE: You will be able to rebut
21 whatever EPA says, so when it's your turn to
22 present your case, you can rebut anything that
23 they have said. I mean, what I would suggest is
24 that right now you would jot down notes and just
25 rebut anything that they've said just to make the

1 record complete. You know, in the interest of
2 time, I think we need to let both parties state
3 their case, and then you can rebut whatever you
4 think is just totally inaccurate, and that way
5 you will have a fully developed, complete record.
6 MR. HARRIS: Well, then I hope I'm going to
7 be provided with additional time, because it was
8 my understanding both from your Order and from
9 the regulations that EPA was supposed to be
10 sharing with us in their opening statement their
11 basis. So far they have not provided one
12 scintilla of information to support their
13 selection, but have instead chosen to identify
14 what they disagree with in Sparton's position,
15 and now Mr. Malott is misstating, completely
16 misstating, what Sparton is currently
17 recommending in this proceeding. He is confusing
18 the CMS proceeding, which EPA has terminated and
19 is over and doesn't represent the administrative
20 record for this proceeding, with what is going on
21 in this proceeding. And he knows very well that
22 Sparton has submitted a different proposal in
23 this proceeding than was in the CMS. And if I've
24 got to rebut all that when he's supposed to be
25 providing what EPA's position is, then I'm going

1 to need at least an additional hour of time to
2 properly present our position.
3 MR. MALONE: You may proceed.
4 MR. PEARSON: Well, first of all, as far as
5 the basis, we have to prove the elements of
6 Section 3008(h), which we have done. Secondly,
7 as far as the remedy selection process, Mr.
8 Harris well knows that our record and the Order
9 was based on a Final Decision and Response to
10 Comments document which was made June 24th,
11 1996. The basis of our remedy selection was on
12 their proposal stated in their CMS report. They
13 may have submitted something later. It was not
14 on the basis of the administrative record which
15 we used to present the -- to make the decision.
16 Mr. Malott will explain the remedy
17 selection. The CMS process was part of the
18 remedy selection process. It's true that the
19 Order has been terminated, that is correct, but
20 as part -- and we're trying to explain the
21 technical basis for remedy selection which was
22 set forth in our Final Decision and Response to
23 Comments which was attached to our Order. Mr.
24 Harris is totally misstating the situation here.
25 We will address their one-well containment

1 system, but we did not have it when we made this
2 decision and until this Order was issued. In
3 fact, they did not formally propose their
4 one-well containment system to EPA until we
5 received our February 4th, 1997, brief. All of
6 those negotiations were with the State. We were
7 aware of this proposal, but the proposal was
8 never made formally to EPA. In fact, the
9 proposals to the State came out of over -- in
10 many cases came over the letterhead of their
11 consultant as opposed to Sparton.
12 MR. MALONE: What I think we ought to do, in
13 the March 21, 1997, Order setting the agenda, I
14 instruct -- or I basically informed Sparton that
15 I was particularly interested in how you thought
16 your preferred remedy satisfied the remedy
17 selection criteria, so I think you are going to
18 have the opportunity to discuss your preferred
19 remedy which is something that you have submitted
20 in this proceeding. You submitted it in your
21 initial memorandum supporting the facts -- the
22 initial memorandum on the facts and the law
23 supporting Sparton's position, and you also
24 submitted a similar -- I guess had the same --
25 you covered the same topic when you submitted

1 your additional information.
2 MR. HARRIS: Right.
3 MR. MALONE: So I have seen that. That
4 remedy will be considered in the final decision.
5 Those documents have been included in this
6 proceeding. So I think you're going to have the
7 opportunity to address the preferred remedy of
8 Sparton as of today. I mean, if you need
9 additional time, we can deal with that later, but
10 I think we still need to keep on moving.
11 Otherwise, we can have continual objections and
12 we won't get anywhere.
13 MR. HARRIS: I understand, but the
14 difficulty is -- the fundamental difficulty is
15 that this proceeding allows EPA to
16 mischaracterize the facts on a record that I
17 don't have an ability to deal with on a
18 case-by-case basis. When Mr. Malott makes an
19 incorrect statement, I cannot challenge that at
20 the time it's being made. I apparently have to
21 jot it down and hope I remember it to correct it
22 at some later point in time, because I don't want
23 this proceeding to suggest that when he says
24 something and I don't challenge it, that I agree
25 with what is going on. And what I'm concerned

1 about what right now is the statements that he is
2 making do not accurately reflect what is going
3 on. And it gets back to my point that this whole
4 proceeding involves a tremendous number of
5 adjudicative facts, and that the only way to get
6 to those particular facts is to allow us to be
7 able to cross-examine and have direct examination
8 and to look at documents. Otherwise, this
9 proceeding is going to generate a record that
10 misstates what the actual facts are.
11 For instance, Mr. Pearson has misstated
12 EPA's involvement in the process that has been
13 going on since July with respect to Sparton's
14 proposals. EPA has been intimately involved in
15 that. We sent a letter to Mr. Malott on December
16 9th conveying our latest proposals to him. He
17 has been working with the State, and yet this
18 proceeding allows him in a one-sided way to
19 mischaracterize what has been going on for the
20 last six months, does not give us an opportunity
21 through discovery or cross-examination to get to
22 the heart of the matter, and it is totally
23 inappropriate for the creation of a record. And
24 I need to know what the ground rules are, both in
25 terms of being able to object, as well as the

1 time I'm going to have and be able to review the
2 transcript to be able to address those
3 misstatements.
4 MR. MALONE: See, that -- I think what we
5 ought to do is just, as I set the procedures from
6 the -- on the onset, is to let both parties
7 present their case, and that way you can address
8 whatever you please. You will have the
9 opportunity to rebut whatever EPA says, and I
10 don't think we're going to get anywhere if we
11 continually object one after another. You know,
12 you object and then EPA objects. That's not
13 going to get us anywhere. So what I would
14 recommend is to stick to the agenda that I
15 provided to you guys on March 21, 1997, and that
16 agenda basically stated that EPA would present
17 its case, then the Respondent would be able to
18 rebut anything that EPA says and offer any
19 statements, facts and documents in support of its
20 case. So that's the procedure that I want to
21 follow. I mean, we're not getting anywhere with
22 these continual objections, so --
23 MR. HARRIS: Mr. Malone, if you will tell me
24 then that my objections will be summarily
25 overruled and that I'm not in a position to

1 object when Mr. Malott makes statements that I
2 believe are incorrect and not based on any part
3 of the record, then I will be happy to let him
4 proceed.
5 MR. MALONE: You can rebut anything Mr.
6 Malott says, but it has to be within the confines
7 as set out in 40 C.F.R., Part 24. 40 C.F.R.,
8 Part 24, sets out the procedures for this hearing
9 and we have to stick to it, and you can rebut
10 anything Mr. Malott or Mr. Pearson says.
11 MR. HARRIS: Well, I'm suggesting to you
12 that these procedures don't provide me with an
13 appropriate time --
14 MR. MALONE: Let's move on.
15 MS. PEARSON: I would object --
16 MR. MALONE: Let's move on.
17 MR. PEARSON: I would object that it's
18 already been ruled these procedures are valid.
19 If Mr. Harris has any complaints with these
20 procedures, he can take them up with the Federal
21 Court. These procedures are valid and we have to
22 follow them, and if he has any problems with
23 them, the Federal Court can deal with those.
24 MR. HARRIS: I just want to make sure I
25 know, Mr. Malone, what the ground rules are, and

1 if you're telling me that I am not supposed to
2 during their statements be objecting to
3 misstatements they make, that's fine, as long as
4 I know that's the ground rule.
5 MR. MALONE: The ground rule is for you to
6 be able to rebut anything that EPA says whenever
7 it's your turn to present your case in a rebuttal
8 to the EPA's initial presentation.
9 MR. HARRIS: But not to object while they're
10 making their presentation; is that right?
11 MR. MALONE: Right.
12 MR. MALOTT: Okay. A third component of
13 EPA's selection process is the evaluation of the
14 technologies against the remedy selection
15 criteria described in the 1990 proposed Subpart S
16 rule, the 1991 OSWER directive on the RCRA
17 corrective action decision documents and the 1996
18 Advanced Notice of Proposed Rulemaking to
19 Subpart S.
20 The fourth threshold criteria reflects both
21 the general mandate from the RCRA statute, which
22 is protection of human health and environment,
23 and the three major technical components of
24 remedies, these four here. The major technical
25 components of the remedies include cleanup of the

1 release, source control and management of waste
2 derived -- generated by the cleanup. The five
3 balancing criteria listed here include a
4 combination of technical measures and management
5 controls for addressing releases. For protection
6 of human health and the environment, EPA's remedy
7 will isolate the source and will remove the
8 contaminants to the extent possible, control
9 further spread of the contaminant plume to
10 prevent further degradation of the aquifer, and
11 restore the aquifer to its beneficial use to
12 protect human health.
13 As I already pointed out, Sparton's remedy
14 would allow further loss of a natural resource
15 and is not protective of the environment.
16 Sparton also attempted to show that the
17 unrestricted migration of the contaminant plume
18 would not impact human health through a simulated
19 model of the plume movement. However, EPA has
20 reviewed the model and the supplemental
21 information provided by Sparton and has reached
22 the conclusion that the model results are
23 inconclusive and do not even represent current
24 conditions. Specifically, Sparton's model
25 apparently predicted that concentrations are less

1 than 200 parts per billion only a couple of
2 hundred feet from the source area, yet we know
3 concentrations were over 3,000 parts per billion
4 only 1,600 feet from the source area and 1,900
5 parts per billion closer to the leading edge of
6 the plume. In addition, Sparton claims that the
7 model has accurately predicted the values of the
8 plume, yet we know that Well MW-65, which was
9 installed just last summer, is already
10 contaminated. Sparton's model apparently did not
11 predict this contamination either.
12 Therefore, Sparton's recommended remedy does
13 not even meet the general mandate from the RCRA
14 statute, which is protection of the human health
15 and environment. For media cleanup standards
16 under RCRA, this criteria is consistent with
17 CERCLA, and for contaminated groundwater, the
18 standards are set at the MCLs or State
19 standards. This is consistent with the aquifer's
20 use as a potential source of drinking water and a
21 valuable natural resource. EPA's remedy will
22 achieve this goal by containing the plume and
23 restoring the off-site aquifer in as short as
24 possible time while isolating and reducing the
25 source area of concentrations. Sparton's remedy

1 calls for reaching this goal through dilution and
2 expansion of the plume.
3 The second major technical component of the
4 remedy is to control the source of the release.
5 EPA's selection of pump and treat and soil vapor
6 extraction at the facility will control the
7 source of the release. However, Sparton's
8 proposed implementation of the pumped and treated
9 facility will not control the groundwater
10 contamination beneath the facility. EPA has
11 previously demonstrated in its technical review
12 of the effectiveness of the interim measures pump
13 and treat system that a system pumping at less
14 than one gallon per minute will not contain the
15 plume. This document is in the administrative
16 record. Furthermore, their conversion of one
17 monitoring well to pump at 20 gallons per minute
18 has never been demonstrated to contain the plume
19 beneath the facility. Therefore, Sparton's
20 remedy does not meet this threshold criteria.
21 EPA's remedy calls for the installation of
22 groundwater extraction wells to effectively
23 contain the plume beneath the facility and remove
24 to the extent possible the contaminant
25 concentrations.

1 The last major technical component is the
2 management of waste generated by the cleanup
3 activities. All the technologies will have to
4 comply with the appropriate federal, state and
5 local regulations governing waste discharge from
6 the treatment process. The primary issue appears
7 to be what to do with recovered and treated
8 groundwater. The three options identified
9 included injection, discharge to the surface or
10 some form of beneficial use. While EPA has not
11 rejected any of the three options, EPA prefers
12 injection since it is most likely to conserve the
13 natural resources that we are trying to protect
14 with this RCRA corrective action by returning the
15 treated water back to the aquifer. The South
16 Valley Superfund site is successfully using just
17 such a system to return treated groundwater back
18 to the aquifer. In addition, the potential
19 effectiveness of using injection wells has been
20 explained in the affidavits and reports attached
21 to EPA's brief filed on February 25th. Any
22 injection well will require a permit from the
23 State of Mexico prior to injection.
24 In the final CMS report, Sparton had
25 recommended disposal to the Rio Grande. This

1 option will require an NPDES permit from EPA. At
2 the time Sparton submitted the CMS report on May
3 13th, 1996, Sparton had not submitted such an
4 application. Sparton currently discharges the
5 less-than-one-gallon-per-minute treated
6 groundwater to the City sewer system. This is
7 from the system that is currently operating the
8 facility.
9 Under the five balancing criteria, the first
10 two criteria of long-term reliability and
11 reduction in toxicity, mobility and volume of
12 waste are directly related and apply to source
13 control technologies. EPA's remedy would
14 effectively control the source of the release and
15 permanently reduce the amount of source material
16 remaining. Sparton's remedy would neither
17 control the source of release or reduce the
18 source material in equivalent amount.
19 For short-term effectiveness, all
20 construction activities would have to be
21 conducted to prevent exposure to workers and the
22 residents in nearby neighborhood. Such measures
23 were implemented at the South Valley Superfund
24 site and involved construction of below-ground
25 vaults to prevent accidental exposure at the

1 surface. There is no reason why such a system
2 could not be implemented here at the Sparton site
3 and off-site areas. For implementation, all the
4 technologies are readily available and can be
5 implemented at the site. Permits will have to be
6 issued for disposal of treated groundwater and
7 recovered contaminant vapors from the soil vapor
8 extraction system.
9 The issue of cost is of use to influence the
10 selection of remedies which meet the same
11 threshold criteria and achieve the cleanup
12 range. In this case the only differentiation was
13 between the source control technologies for the
14 soil. In this case EPA recommended the use of
15 soil vapor extraction. In addition, EPA
16 considered two modifying criteria in the remedy
17 selection process in the form of state acceptance
18 and community acceptance. EPA received extensive
19 written and oral comments from the public comment
20 period and public hearing. The public hearing
21 was attended by 106 people. The comments
22 received by EPA were in favor of a remedy which
23 would address the source of the release and
24 contain and restore the contaminant plume.
25 In summary, EPA's selected remedy meets the

1 four threshold criteria, especially protection of
2 human health and environment, cleanup of the
3 release and source control. Sparton's
4 recommended remedy would not meet these same
5 criteria.
6 The same remedy selection is also achieved
7 by using the criteria listed in Task IX of the
8 corrective measures section of the Administrative
9 Order on Consent. At a minimum, these criteria
10 include technical, human health and the
11 environment. Under the technical criteria, we
12 have performance, reliability, implementation and
13 safety issues. Implementation of the
14 technologies under -- I'm sorry. Under the
15 technical criteria, the reliability of each of
16 these technologies has been proven at waste sites
17 elsewhere, particularly at the South Valley
18 Superfund site. Implementation of the
19 technologies will also achieve the corrective
20 action objectives in the shortest period of
21 time.
22 As previously discussed, safety measures
23 have been successful at the South Valley
24 Superfund site to prevent accidental exposure at
25 the surface. The human health criteria listed

1 here in B includes the use of EPA criteria,
2 standards or guidelines in the evaluation
3 process. This includes the 1990 proposed Subpart
4 S rule, the 1991 OSWER Directive on Remedy
5 Selection and the 1996 Advanced Notice of
6 Proposed Rulemaking for Subpart S. Utilizing
7 these guidelines, an aquifer as a potential
8 source of drinking water should be restored to
9 its beneficial use. The EPA's remedy will
10 achieve this objective and the environmental
11 objective through source area containment and
12 reduction, preventing further migration of the
13 plume and restoration of the aquifer. Sparton's
14 remedy would not achieve the same objectives and
15 thus is not protective of human health and the
16 environment.
17 The final component of the remedy selection
18 is the implementation process. EPA has proposed
19 a phased implementation process for the remedy.
20 The benefits of a phased approach is that data
21 generated during the initial steps can be used to
22 adjust the remedy design in response to site
23 conditions and enhance remedy performance.
24 Following additional characterization, the first
25 phase will consist of installing one or more

1 groundwater extraction wells to contain the
2 source area and installation of a soil vapor
3 extraction system. Concurrently, groundwater
4 extraction wells will be installed to prevent
5 further migration of the leading edge of the
6 contaminant plume.
7 Following a review of the performance data,
8 the second phase will be the installation of
9 groundwater extraction wells to begin removing
10 the high-concentration areas within the plume for
11 purposes of restoring the aquifer. This is
12 primarily in the off-site areas. Data from the
13 initial extraction wells will be utilized to
14 assist in the location and design parameters for
15 the new wells. The main area of emphasis is the
16 contaminated aquifer throughout the off-site area
17 which has the greatest exposure. There are three
18 factors that will determine whether restoration
19 is feasible: The physical characteristics of the
20 aquifer, the physical characteristics of the
21 contaminants and the adequacy of the groundwater
22 extraction system design.
23 In the off-site area of the contaminant
24 plume, the aquifer consists predominantly of
25 sands and gravels, which provides a favorable

1 environment for groundwater extraction. The
2 contaminant characteristics are also favorable
3 because the primary contaminant, trichloroethene,
4 has a relatively low absorption potential in
5 aquifer material, which also favors groundwater
6 extraction. These two factors alone favor the
7 use of pump and treat or groundwater extraction
8 throughout the off-site plume to contain and
9 maximize the removal of contaminant mass.
10 The third factor has to do with the adequacy
11 of the design of the groundwater extraction
12 system. This can be accomplished with further
13 characterization of the aquifer and contaminant
14 plume to be determined in appropriate parameters
15 for the design of the system. Finally, the use
16 of a phased approach will ensure that the data is
17 used to refine the system of design.
18 In summary, EPA's remedy is protective of
19 human health and environment by containing and
20 reducing the source area through soil vapor
21 extraction and pump and treat at the facility and
22 the prevention of further migration of the plume
23 and restoration of the aquifer using pump and
24 treat. Sparton's recommended remedy is not
25 protective of human health and environment and is

1 relying solely on soil vapor extraction, the
2 existing pump and treat system which pumps less
3 than one gallon per minute, and the conversion of
4 one monitoring well to pump 20 gallons per
5 minute. This concludes the technical basis for
6 EPA's remedy selection.
7 MR. PEARSON: Your Honor, I just have a few
8 brief comments here to finish up our
9 presentation. As Mr. Malott has stated and as
10 also I previously stated, the basis for our
11 Initial Administrative Order is the Final
12 Decision and Response to Comments document which
13 is based on the CMS report and Sparton's proposal
14 in the CMS report. Now, just to briefly address
15 Sparton's one-well containment system -- or now I
16 guess it's one or more wells -- Sparton's
17 proposal will still not adequately protect human
18 health and the environment. Contamination above
19 the MCLs will remain in the groundwater,
20 presenting a threat to human health and the
21 environment and preventing utilization of a
22 valuable natural resource. It is also contingent
23 on obtaining authorization to discharge in the
24 Calabacillas Arroyo. If this does not occur,
25 then Sparton has stated that they won't implement

1 the remedy.

2 Now, I just want to -- when I mentioned

3 about this authorization of the Calabacillas, I

4 want to emphasize that Sparton has submitted an

5 NPDES permit application, and no decision has

6 been made one way or the other. The decision to

7 issue that permit will be made by the Water

8 Division as opposed to the Enforcement Division.

9 And one last matter in regard to legal basis

10 for issuing the Order, Sparton has claimed that

11 the Order does not provide reasonable specificity

12 as to what is required. The corrective action

13 plan, which is attached to the Order, is probably

14 at least 50 pages long and has detailed work

15 plans as far as what is required to be submitted

16 by Sparton. It's also attached to the Final

17 Decision and Response to Comments document that

18 sets out the implementation of the remedy, and

19 Sparton has not cited any authority which states

20 that you have to set forth the exact number of

21 wells. And at this point that concludes EPA's

22 initial presentation.

23 MR. MALONE: Thank you.

24 Counsel for Respondent, you may proceed.

25 MR. HARRIS: Mr. Malone, we believe there

1 are two fundamental issues that are presented in
2 this proceeding, and the first is, what is the
3 nature of the threat, if any, that's presented by
4 the impacted groundwater associated with
5 Sparton's manufacturing facility, and, secondly,
6 what response is necessary. The starting point,
7 of course, for that analysis is the statutory
8 provision of RCRA under which we're operating,
9 which is 3008(h), which only gives the agency the
10 authority to order those corrective actions that
11 are necessary to protect human health and the
12 environment.
13 We've got several slides -- or several
14 exhibits that we would like to introduce and go
15 through from a demonstrative standpoint in
16 explanation of what our position is. Let me hand
17 to you a set that you can take a look at.
18 MR. PEARSON: I would just like to clarify,
19 Mr. Harris, are all of these exhibits in the
20 administrative record?
21 MR. HARRIS: Well, it didn't -- I believe --
22 no, 1 is -- I believe 1 is not, 2 are not, 3 are
23 not, 4 are not, 5 are not. Several of them are
24 not, but they're all based upon information that
25 is in the administrative record.

1 MR. MALONE: So are these maps consistent
2 with my request for you to explain how your
3 remedy is consistent with -- or how your
4 preferred remedy satisfies RCRA Section 3008(h)
5 and EPA's --
6 MR. HARRIS: I believe they are, Mr. Malone.
7 MR. PEARSON: I would just like to have a --
8 if that's the case, I -- I don't have any chance
9 to take a look at these and I would like to have
10 a standing objection to those exhibits which are
11 not part of the -- part, as we know of, of the
12 administrative record. I have not seen these
13 before, so I would like to have an objection at
14 this time.
15 MR. MALONE: Okay. What I will do, I will
16 allow these documents to come in and be a part of
17 this proceeding, but you guys or the EPA will be
18 able to respond to these documents. You will be
19 able to submit a brief or a written response
20 after this hearing disputing or agreeing or
21 presenting any arguments that you may have with
22 respect to the maps. Now, I'm not going to set a
23 schedule right now, but before we convene today,
24 I will set a schedule for you guys or the EPA to
25 get a response.

1 MR. PEARSON: And assuming there is --
2 MR. HARRIS: May I respond to that first
3 before he asks about it, I mean, because all the
4 information that's contained on these exhibits is
5 already present in the administrative record and
6 our previous submission. They've already had an
7 opportunity to respond to everything that's going
8 to be presented to you, so essentially you're
9 providing them a second bite of the apple. If
10 they get a second bit of the apple, I would like
11 to have a second bite of the apple on behalf of
12 my client.
13 MR. MALONE: The way I understood you
14 earlier is, you said some of these documents were
15 not included in the administrative record. Is
16 that correct?
17 MR. HARRIS: Yes, but all of the information
18 contained on those documents is in the
19 administrative record.
20 MR. MALONE: Well, to the extent that these
21 documents aren't in the administrative record and
22 if they're going to become part of this
23 proceeding, EPA should have the opportunity to
24 review these documents and comment on them.
25 MR. HARRIS: They've already had an

1 opportunity to do that through the previous
2 submissions we've provided.
3 MR. MALONE: Well, I am ordering that EPA
4 have the opportunity to respond to the documents
5 that aren't in the record.
6 MR. HARRIS: And then we request an
7 opportunity to respond to whatever they submit to
8 you because they may misstate what we have in
9 there or make other statements that we should
10 have an opportunity to deal with.
11 MR. MALONE: Okay. Well, I'm going to table
12 that issue, but before the day is over I will
13 decide on that.
14 MR. PEARSON: If I could just before we get
15 started, EPA may or may not want to file a
16 post-hearing brief depending upon the information
17 submitted, but if Mr. Harris because of the
18 Court's ruling on this, if he could specifically
19 identify which of these are taken directly from
20 the administrative record and which are not, we
21 would appreciate that.
22 MR. HARRIS: Sure.
23 MR. MALONE: Okay.
24 MR. PEARSON: Okay.
25 MR. HARRIS: In identifying what threat

1 exists, there are two issues that EPA is supposed
2 to take a look at: What is the toxicity and what
3 are the exposure pathways? The toxicity that
4 supposedly exists at this site is solvents that
5 are found in the groundwater near the Sparton
6 facility. Now, what I've put in front of you and
7 we'll mark as Respondent's Exhibit 1 --
8 (Respondent's Exhibit 1 was marked.)
9 MR. HARRIS: -- is taken from the
10 remedial -- the RFI, which is part of the
11 administrative record in this proceeding. It is
12 simply presented in slightly different form
13 here. What we have done is to take some
14 cross-sections from various wells to show not
15 only the horizontal extent of the plume, but also
16 vertically how deep the solvents are found in the
17 groundwater. I'll try and simplify this a little
18 bit, Mr. Malone. It's very similar to the
19 exhibit that Mr. Pearson had. The Sparton
20 facility is down sort of on the lower right-hand
21 side of Exhibit Number 1, and it's marked as
22 "Sparton," and then you will see a line that sort
23 of encircles that facility, and that represents
24 the limits of the plume, at least the limits
25 based on less than five micrograms per liter,

1 which is consistent with the Metcalf & Eddy
2 document that Mr. Pearson was providing.
3 Now, the wells that have squiggly lines
4 around them indicate nondetects. Those are wells
5 that have been completed in the groundwater, and
6 water samples were taken and analyzed, and there
7 haven't been any solvents shown in those wells,
8 so they are clean for purposes of this. And as
9 you can see, what we have are a series of clean
10 wells surrounding an area that has been impacted
11 by solvents. The same information is shown on
12 the cross-sections.
13 These are simply -- you will see lines --
14 you will see letters A, B, C, D, and then
15 A-prime, D-prime and C-prime. Basically that
16 line, if you follow from A to A-prime, represents
17 what you would see if you followed -- if you were
18 able to essentially cut the earth away and go
19 down to the depth of the groundwater and look at
20 it from the side. And that cross-section is
21 shown -- it's a little tough to make out, but
22 down here at the bottom is Cross-Section A-A, so
23 you're looking through depth. And what that
24 shows, again, are wells with squiggly lines
25 around them that represent nondetects, and the

1 other wells show various concentrations of
2 solvents. Again, the purpose of this is just to
3 give you a sense of where the solvents are
4 located both horizontally and vertically at this
5 particular site.
6 I would note that this characterization of
7 the plume was submitted in the RFI and that
8 document was approved by EPA, and so EPA said
9 sometime in June of 1991 that we had properly
10 delineated and described the plume based upon
11 this work that we had done in the field. So at
12 that point in time, that snapshot in time, that's
13 what the plume looked like.
14 MR. MALONE: So this is the 6/1 document?
15 MR. HARRIS: Yes, it is. The second exhibit
16 we have is an update to 1.
17 (Respondent's Exhibit 2 was marked.)
18 MR. HARRIS: I'll try and put these next to
19 each other so you will have a sense of what we're
20 talking about here. This document represents
21 work that was done -- wells that were installed
22 in, I think, June and July of 1996 in order to
23 determine how the plume had changed in
24 configuration between '91 and 1966, and we used
25 the same format again. You have side views, and

1 then you have wells that are located both within
2 and without the plume, and we've indicated with
3 squiggly lines around those wells that are
4 nondetect.
5 And, again, we have described a plume that
6 has moved what appears approximately 400 or 500
7 feet from 1991. You will note down here the
8 leading edge is approximately, oh, 400 to 500
9 feet sort of southeast of where the line is on
10 Exhibit 2. And, again, the squiggly lines
11 represent those wells that surround this plume
12 and indicate where we have clean zones. So you
13 have an impacted area that's surrounded by a
14 bunch of clean wells, and you can see the same
15 thing with the cross-section.
16 The reason for these exhibits in part is
17 both to give you a sense as to where the solvents
18 are located, their horizontal extent, but also
19 one of the requirements that EPA has suggested in
20 its Order is a need to put in up to 20 more
21 monitor wells at this location in order to better
22 define the plume. We find that request somewhat
23 confusing given the fact that in June of '91 EPA
24 believed that we had properly delineated the
25 plume with the number of wells we had there. We

1 now have more wells. We had the same, if not
2 more, clean wells surrounding the plume, and yet
3 EPA is suggesting that there is a need to put in
4 20 more wells to adequately define the plume. I
5 think from this exhibit you can see that we have
6 ample number of wells defining where the clean
7 areas are and more than sufficient information in
8 order to address what an appropriate remedy is at
9 this site.
10 Apart from the horizontal extent of this
11 plume in the immediate vicinity, we also have an
12 exhibit that gives you a broader sense of how
13 this plume fits in with surrounding usages, and
14 this will be Exhibit 3.
15 (Respondent's Exhibit 3 was marked.)
16 MR. HARRIS: This is not in the
17 administrative record, but it is all based on
18 information from the administrative record. This
19 is a street map that was taken, I guess with
20 permission of Rand McNally, of the surrounding
21 area. The area in green represents the extent of
22 the plume as of July of 1996, and that's
23 obviously taken from Exhibit 2. The rest of the
24 information on here represents domestic wells and
25 municipal industrial wells that State records

1 show are currently in existence. This
2 information is all taken from the RFI, so all we
3 have done is transpose information from the CMS
4 and from the RFI onto what is Exhibit 3, and the
5 purpose for this is to get into the issue of
6 exposure pathways.
7 The question is, if we have impacted this
8 part of the aquifer, who is going to be impacted
9 by that and how can they come in contact with
10 that particular groundwater? You will note that
11 at the current time there are no wells completed
12 directly within the impacted area, nor are there
13 any wells upgradient.
14 And by the way, Mr. Malone, just to have a
15 sense here, the contaminants are moving generally
16 in a northwesterly direction. In other words, if
17 you start at the Sparton facility, which is down
18 in the southeast corner of the green amoeba-like
19 figure that's on Exhibit 3 and you move in sort
20 of a north and west direction, that's the
21 direction that the water is moving; it's moving
22 away from the Rio Grande. And so all of the
23 domestic wells that are in place are what is
24 referred to as downgradient. In other words,
25 they are in the opposite direction to which

1 groundwater is flowing and the way in which the
2 solvents are moving. The only well that is
3 upgradient at this point in time to the impacted
4 area is this red dot up in the upper left-hand
5 corner of Exhibit 3.
6 MR. CHANDLER: You forgot to color one in.
7 There's a circle that --
8 MR. HARRIS: Where is that?
9 MR. CHANDLER: On the New Mexico Utilities
10 Well #2, which is right there. We need to color
11 that in.
12 MR. HARRIS: Okay.
13 MR. CHANDLER: Somehow it didn't get colored
14 in. I apologize for that. The circle is there,
15 it's just not colored in.
16 MR. HARRIS: On Exhibit 3 we have indicated
17 New Mexico Utilities Well #2, which, again, is in
18 a northwesterly direction from the area that has
19 been impacted and would be the closest municipal
20 well. It's approximately two-and-a-half miles or
21 so from the facility or from the leading edge of
22 the plume. There's some confusion; I'm not sure
23 exactly what the distance is, but it's in the two
24 to two-and-a-half mile range. And that is the
25 closest producing well downgradient or in the

1 direction that the solvents are moving.
2 There are -- New Mexico Utilities has a
3 permit for a well -- the New Mexico Utilities --
4 I'll mark on Exhibit 3 here. As a permitted
5 well, it would be -- I'll mark this in green. It
6 would appear to be -- and this is going to be
7 approximate, Mr. Malone, but along Irving
8 Boulevard west of Golf Course. And New Mexico
9 Utilities has also recently filed an application
10 with the State Engineer's Office in New Mexico to
11 add, I don't know, 60 or 70 additional wells.
12 That application does not include any proposed
13 locations within the vicinity between where I've
14 put the green dot and where the impacted area is,
15 nor anywhere in the immediate vicinity around
16 that area.
17 MR. MALONE: So that's approximately one
18 mile from the plume, the leading edge of the
19 plume?
20 MR. HARRIS: Probably. That's a permitted
21 location. But there is a letter from the General
22 Manager of New Mexico Utilities indicating that
23 they have no plans to develop that well in the
24 near future or the near term.
25 MR. PEARSON: Excuse me, Your Honor. Now,

1 previously I had referenced something -- a
2 document that wasn't part of the record, and I
3 don't want to enter -- I know we previously had
4 an objection, but if he has reference to
5 documents concerning permits filed with the New
6 Mexico Utilities -- or the New Mexico Utilities
7 has filed with the State Engineer's office
8 recently, I'm not aware if that's part of the
9 administrative record. So I now would like to
10 object to that because I'm not aware of those
11 permit applications or any indications they're a
12 part of the administrative record, unless Mr.
13 Harris can cite me something to that effect.
14 MR. HARRIS: My understanding of the
15 regulations is that I'm entitled in my response
16 to provide any facts, explanations or summaries,
17 and that's part of what I'm doing here.
18 MR. PEARSON: Well, he also referenced
19 about -- I mean, where both parties -- the Order
20 said both are limited as of March 14th.
21 MR. MALONE: Right.
22 MR. PEARSON: And if I'm limited, he's
23 limited. If he wants to open it up, that's fine.
24 MR. MALONE: Right. I understand your
25 position. To the extent that you're using

1 information that I have not accepted into the
2 administrative record, that information is not
3 usable. I've allowed you to use this information
4 for purposes of this proceeding and it's made
5 part of the total record, but if you're referring
6 to permits that are not part of the record,
7 permits that the EPA has not had a chance to look
8 at, that information will not be accepted into
9 this record and made part of this hearing.
10 MR. HARRIS: Well, that's not what the
11 regulations require. The regulations say I can
12 submit any facts. I'll just quote to you the
13 language, and it's very clear. In 2415(b), the
14 second sentence says, the Respondent may respond
15 to the administrative record the EPA has offered
16 already and offer any facts -- any facts --
17 statements, explanations or documents which bear
18 on any issue for which the hearing has been
19 requested. It goes on to say, any such
20 presentation by Respondent may include new
21 documents only to the extent the Respondent can
22 demonstrate through no fault of its own such
23 documents could not have been submitted.
24 MR. MALONE: So you're not requesting to
25 submit any document, you're just -- you want to

1 reply?

2 MR. PEARSON: Well, if that's the case, then

3 I should be able to -- if I'm not referring to

4 any documents, then I should be able to make a

5 statement outside the administrative record

6 itself as that item that was mentioned before.

7 MR. MALONE: That is correct.

8 MR. PEARSON: So as long as I can make it

9 clear here, I can refer to things that are not in

10 the administrative record as long as it's not a

11 document. Is that correct?

12 MR. MALONE: That's correct, that's correct.

13 MR. HARRIS: Only in response to whatever I

14 bring up.

15 MR. MALONE: Well, in the EPA's presen --

16 which the EPA has already presented its case. I

17 mean, at this point the EPA will be in the mode

18 of rebutting. Now, in that earlier ruling, if

19 there is something that you want to say about a

20 document that you submitted as additional

21 information which I did not accept, if you want

22 to say something about that document, you will be

23 allowed to address that document, but that will

24 be the only document that I will let you address

25 from this point on.

1 MR. PEARSON: Okay. So just so I
2 understand, because when I've made my
3 presentation, I've limited my presentation based
4 on documents -- I could have said stuff that was
5 not in -- I could have said what was in the
6 document without saying what the document was,
7 and according to the way Mr. Harris has
8 mentioned, that that's okay?
9 MR. MALONE: In your rebuttal to the
10 Respondent's presentation, you will be allowed to
11 discuss any facts that are pertinent to rebutting
12 whatever the Respondent has presented, so it can
13 be matters that are outside of the administrative
14 record.
15 MR. PEARSON: But I just want it made a
16 point here that I was basically -- I understood
17 the Court's ruling that -- I limited my
18 presentation on that behalf because of any
19 reference because I thought the facts -- because
20 I couldn't use anything in that document, so I
21 want to make sure that I can talk about things
22 that were in that document without mentioning it
23 on my case in rebuttal.
24 MR. MALONE: Yes, you can.
25 MR. HARRIS: If it rebuts what I have

1 raised.
2 MR. PEARSON: No, that's not --
3 MR. HARRIS: Yes.
4 MR. PEARSON: -- what he said there. In
5 that case, I would like to be able to amend my
6 presentation then, because he's changing the
7 rules in midstream here.
8 MR. HARRIS: I'm going by the same rules.
9 It's Mr. Pearson that's changing them.
10 MR. MALONE: I'm going to address the issue.
11 Whenever you want to present your rebuttal
12 issues, present them as you wish, and I will
13 decide on any objection that the Respondent may
14 have at that time.
15 MR. HARRIS: Thank you.
16 MR. MALONE: Please proceed.
17 MR. HARRIS: My point is that New Mexico
18 Utilities -- and by the way, the area that's in
19 white on Exhibit 3, except for an area up here
20 and it's sort of the northeast side, but
21 basically everything to the west of Coors Road on
22 Exhibit 3, and that's in white, is the New Mexico
23 Utilities Service area. In other words,
24 everybody that lives in that area is provided
25 water by New Mexico Utilities. They are not

1 provided water by the City of Albuquerque. And
2 it's my understanding that the City of
3 Albuquerque, in fact, is prohibited by the public
4 utility laws in the State of New Mexico from
5 servicing people in this particular area. I
6 found it interesting that nobody from New Mexico
7 Utilities has indicated any problem with what
8 Sparton has suggested, and they are the ones most
9 directly impacted, and they are the ones that
10 have already said that this well in green is not
11 a well that in the near term they intend to use.
12 To show you also some sense of the vertical
13 separation with respect to the Sparton site and
14 the New Mexico Utilities well, we've got another
15 exhibit that is taken directly from our
16 submissions in this proceeding, Mr. Malone, and
17 we'll mark this as Exhibit 4.
18 (Respondent's Exhibit 4 was marked.)
19 MR. HARRIS: And this was attached to Mr.
20 Peter Balleau's declaration that was part of our
21 initial submission in this case. What it
22 represents is, again, a cross-section, but a
23 broader cross-section, showing various geological
24 features. The area that is up in the left, and
25 it's marked NMU-RG-4462 -- and I'll try and get

1 these two exhibits next to each other -- that
2 delineation on Exhibit 4 represents what is
3 marked on Exhibit 3, and I'll go ahead and mark
4 it as Well #2. And the point of this document is
5 to demonstrate that not only is there a
6 significant horizontal distance between the area
7 that's been impacted in New Mexico Well #2, but
8 additionally --
9 MR. MALONE: I can't see the exhibit. Can
10 you --
11 MR. HARRIS: Oh, okay, sure. Sorry.
12 Pierce, could you hold that for a second?
13 MR. CHANDLER: Sure.
14 MR. HARRIS: It's sort of in stereo here,
15 Your Honor. We've got NM-2 as the red dot on the
16 west side, and we're showing the horizontal
17 distance --
18 MR. PEARSON: Jim, could you maybe move back
19 just a little bit so we can see?
20 MR. HARRIS: Oh, sure. That's the
21 horizontal distance that we talked about of two
22 to two-and-a-half miles. Now, on Exhibit 4, if
23 you see the little Sparton indication, what we
24 see is an area very near the surface where the
25 impacts are located. As Mr. Pearson indicated in

1 his opening remarks, the groundwater that has
2 been impacted is 60 to 150 feet below the water
3 table. What we have at NMU-RG-4462 is the public
4 supply well, and it's completed at a depth, I
5 believe, of about 1,000 feet. So you can see
6 that not only is there a fairly significant
7 horizontal separation, but there's also a
8 significant vertical separation. And the reason
9 that this well is completed so deeply is that the
10 area that's cross-hatched on Exhibit 4 represents
11 good quality water. The area that Sparton has
12 impacted is poor quality groundwater. In fact,
13 Mr. Balleau's declaration is that even in the
14 absence of the impacts from Sparton, this water
15 would not be prime water for drinking water
16 purposes. And, in fact, you can see that there's
17 a significant separation between the two.
18 Now, the one well that I mentioned on
19 Exhibit 3 that we marked in green, that well
20 would be about halfway between NMU-RG-4462 and
21 the Sparton site. It is to be completed at a
22 depth of 1,500 feet, so it would be -- based upon
23 the surface elevation being approximately 5,500
24 feet, that well would actually be completed
25 somewhere down at the 4,000-foot range so that

1 there would also be significant vertical
2 separation. And Mr. Balleau's declaration makes
3 clear that there shouldn't be -- because of the
4 significant resistance to vertical flow at this
5 site, there should not be -- and Mr. Chandler's
6 declaration also made clear, that the well in
7 question should not be impacted by the solvents
8 from the Sparton operation.
9 To make that point, we submitted as part of
10 our submission the results of some modeling --
11 and this will be Exhibit 5 -- to show how the
12 solvents and groundwater would move over time if
13 we did nothing at that particular site.
14 (Respondent's Exhibit 5 was marked.)
15 MR. HARRIS: Now, the first exhibit, which
16 is Exhibit 5 -- and this is taken directly from
17 our submission and is part of the administrative
18 record -- basically demonstrates, shows what
19 happens if we have no source control and we don't
20 have any containment at the leading edge, how the
21 solvents in the groundwater will move over time.
22 And it's based upon -- the first one is 50 years,
23 Mr. Malone, then 100 years, 150 years, 200 years.
24 In other words, what this model was designed to
25 predict is how the solvents in the groundwater

1 will move over those periods of time. And we've
2 marked on Exhibit 5 where NMU Well #2 is located.
3 And you can see that it's not until approximately
4 150 years that any of the solvents associated
5 with the Sparton site reach NMU Well #2.
6 Now, this modeling was done very
7 conservatively. We attempted to throw out any
8 factors that would cause retardation of this flow
9 and simplify matters to show how -- that it would
10 move as quickly as possible. Contrary to Mr.
11 Malott's statements, the model does predict that
12 Well #65 is going to be impacted within the time
13 frame we're seeing those impacts to Well #65, and
14 secondly, the model was not designed to predict
15 interior concentrations, it was simply designed
16 to predict concentrations on sort of the leading
17 edge. So the fact that the model might show a
18 concentration in the interior different than what
19 is actually there is of no moment to what this is
20 trying to show, which is what the concentration
21 is at the leading edge, and it has done that very
22 effectively in terms of correlating with what is
23 being found in Well #65.
24 But the point to remember is that not only
25 does it take a long time to move horizontally,

1 but as the previous Exhibit Number 4 suggested,
2 what we would be seeing, Mr. Malone, is this type
3 of solvent after 150 years is up at the level of,
4 say, 60 to -- well, it's going to be less than
5 150, but I don't know what the number is, but
6 it's not going to be anywhere near the level that
7 is being shown on this map where the completion
8 of the New Mexico Utilities well is.
9 Finally, let me address for just a second,
10 going back to Exhibit 3, claims by the City of
11 Albuquerque that somehow their water resources
12 are going to be impacted by the plume that is
13 shown on Exhibit 3, and there are several points
14 to keep in mind in that regard. First we've
15 already mentioned that the City -- this is not
16 the City service area, and our previous
17 submission showed that if the City attempted to
18 complete any well in NMU's service area, that it
19 would be protested by several parties and that
20 there was little likelihood that such a permit
21 would, in fact, be granted.
22 Now, the City suggests that a 1982 master
23 plan that they had shows that they're going to be
24 using this area. The difficulty, of course, is
25 that 1982 master plan, as we pointed out,

1 suggested that in 1996 there were going to be 239
2 producing wells in the City of Albuquerque.
3 There are, in fact, at this point in 1996 fewer
4 wells than in 1992, the point being that that
5 master plan is no longer a document that the City
6 is following in any way, shape or form with
7 respect to where it is going to be locating wells
8 as pointed out by the fact that it hasn't put in
9 the wells that it said it was going to put in.
10 We would also point out that there is no
11 infrastructure within three-quarters of a mile of
12 this area. There's no way for the City to get
13 the water if it did produce it without putting in
14 that infrastructure. The City has no permits to
15 produce wells in this area. The City has not
16 applied for any permits to produce wells in this
17 area.
18 There are other documents that the City has
19 generated, a 1985 management study that
20 completely disregards this area. It identifies
21 nine trunk lines in the City, and the one line
22 that it leaves off that was identified in the
23 1982 report was a trunk for this area where the
24 plume is located. There is no budget, there's no
25 money that's been budgeted for any well

1 completion in this area.
2 The City has been unable to show that
3 there's any demand in this area for its users,
4 especially given the fact that it has no users in
5 this area; New Mexico Utilities has all the users
6 in this area. The City would have to increase
7 its propriety of rights, which is a major
8 undertaking, to complete wells in this area, and
9 the City's completion of wells in this area would
10 be at odds with its latest statements that it's
11 attempting to move away from use of groundwater
12 and to use that only to make up supplies to avoid
13 depleting that particular resource. The City has
14 also indicated that this area is near a critical
15 management area and has stated that if the
16 recommendations of the State Engineer's office
17 about critical management areas become effective,
18 it would effectively halt all new drilling on the
19 west side of the river.
20 We make these points to simply underscore
21 the fact that the City's position is entirely
22 speculative. For whatever political reasons,
23 they believe a need to come in and be involved in
24 these proceedings and to suggest they're going to
25 be using water that they are not going to be

1 using. Their role in this proceeding would be
2 similar if they said that we have -- in 1982 we
3 plan to produce wells 100 miles away out in the
4 middle of the desert, and if there are any
5 impacts out there, we think you need to take care
6 of them because we think at some point in the
7 future we may do this. We don't think that that
8 amounts to the type of exposure threat that
9 3008(h) is designed to address.
10 And to go back for just a second on the
11 domestic wells, you will note that most of these
12 are close to the river. The reason for that is
13 that the depth to groundwater at those locations
14 is much shallower than as you move away from the
15 river. And, in fact, as you get into the area
16 immediately adjacent to where the solvents are
17 found from the Sparton operation, the depth to
18 groundwater there is, Pierce, what --
19 MR. CHANDLER: Two hundred feet.
20 MR. HARRIS: -- 200 feet, and the cost of
21 putting in a domestic well -- to complete that
22 well and to put a pump on there is, what, $50,000
23 to $100,000? So there is no realistic chance
24 that an individual homeowner would be interested
25 in completing a well 200 feet to groundwater to

1 serve its individual needs and spending that kind
2 of capital investment of $50,000 to $100,000 when
3 there is abundant water available from New Mexico
4 Utilities.
5 The point of all of this, Mr. Malone, is
6 simply to say, yes, we do have some toxicity
7 associated with the impacts to groundwater, but
8 we don't have any exposure pathways, realistic
9 exposure pathways, to the groundwater. How is
10 somebody going to get in and start making use of
11 the groundwater? Well, New Mexico Utilities
12 isn't, the City isn't, domestic users aren't. So
13 if there is no exposure pathway, then there's no
14 threat because threat consists of two elements,
15 as EPA has identified, toxicity and exposure. If
16 you don't have toxicity, you don't have a threat,
17 and if you have toxicity and no exposure, you
18 don't have a threat. Here, we've demonstrated
19 that there is, in our view, no exposure pathway.
20 We've made the same conclusion in the CMS. That
21 CMS was approved by EPA. So they approved our
22 finding of no exposure pathway and have never
23 submitted any information to you to the contrary
24 and, in fact, can't do so after having approved
25 our CMS.

1 Same thing with their objectives, and I'll
2 just make this point. Mr. Malott suggested that
3 there are certain objectives at this site. The
4 fact of the matter is those objectives are not
5 part of the CMS. The CMS rejected those
6 objectives, stated other objectives, EPA approved
7 the CMS and, in doing so, approved those
8 particular objectives, and everything we are
9 doing here is consistent with the objectives that
10 have been approved in the CMS.
11 One last issue, apart from the groundwater,
12 there has also been some concern identified about
13 the -- one other exhibit real quickly on the
14 impact of New Mexico Utilities --
15 We'll make this Exhibit 5.
16 MR. MALONE: I think we already have a 5.
17 MR. HARRIS: Or 6, I'm sorry. Thank you,
18 Mr. Malone.
19 (Respondent's Exhibit 6 was marked.)
20 MR. HARRIS: -- that uses the same very
21 conservative and very generalized modeling to
22 show what would happen if we cut off the source
23 of the solvents in the groundwater both by a
24 combination of soil vapor extraction and
25 enhancing on-site recovery, and what we see is

1 there is a slug of material that moves away from
2 the facility. Again, the facility on
3 Exhibit 6 -- and this is part of the
4 administrative record by the way -- is on the
5 left side, the New Mexico Utilities well is on
6 the right side, and the groundwater is flowing
7 away from the Rio Grande towards the New Mexico
8 Utilities Well #2.
9 What you see is that after 150 years the
10 slug of material reaches the New Mexico Utility
11 Well #2, but it levels well below the drinking
12 water limit and then at 200 years has passed by
13 that, and, again, we have the same vertical
14 separation as in the previous discussion. And
15 again, our point for both of these exhibits is to
16 simply demonstrate that there are no realistic
17 exposure pathways that would require any type of
18 corrective action, quite frankly.
19 The other issue that has been raised is the
20 possibility of residences at the surface coming
21 in contact with soil vapors. What we've
22 identified as Exhibit 7 --
23 (Respondent's Exhibit 7 was marked.)
24 MR. HARRIS: -- is information -- this is
25 all information that's taken from the approved

1 RFI. This is all information that EPA agreed was
2 good and accurately represented conditions at the
3 site. That Exhibit 7 has plotted soil vapor
4 concentrations. Soil vapor is simply, you drill
5 a hole in the ground and there are actually gases
6 that can be in the soil, and what you do is
7 essentially vacuum out, for lack of a better
8 term, some of that air and then measure the
9 concentration of solvents as vapor in that air,
10 and then you can report those. The New Mexico
11 Environment Department has said that as long as
12 the concentration is at ten parts per million V
13 or below, that there is no threat to human
14 health. What we show here are various
15 concentrations, the highest of which is on our
16 site at 2.24 PPMV, which is well below the ten
17 PPMV that the State of New Mexico has said is the
18 number that should be achieved at this site. And
19 the point of Exhibit 7 is to demonstrate that
20 there are no threats at all. There's no toxicity
21 at the surface, so there is no threat.
22 This information, which is Exhibit 7, has
23 recently been confirmed by work that NMED did and
24 the result of some unfortunate statements that
25 the mayor of Albuquerque made at a news

1 conference. He held that the State of New Mexico
2 has had to go out and reassure residents that
3 there are no problems with respect to the surface
4 site, and they have gone out with photo ion
5 detectors, I think, and some other devices and
6 have measured the concentration of vapors of
7 various solvents at various points in the
8 vicinity of the Sparton site and have found
9 absolutely no information to suggest that anybody
10 in that vicinity is any way threatened by the
11 activities at the Sparton site.
12 So what we are left with, Mr. Malone, is a
13 situation where there are impacts to the
14 groundwater, and those impacts are above MCLs,
15 but there is no realistic exposure pathway. And
16 a conclusion that can be reached is that if there
17 is no exposure pathway, there's no need to
18 address the toxicity. But if you want to remove
19 any chance of exposure, there are obviously two
20 things you can do: You can go in and remove all
21 of the toxicity, that is, all of the solvents
22 that are in the groundwater near the Sparton
23 facility, or you can control withdrawals from the
24 impacted area.
25 Now, Mr. Malott has suggested that what EPA

1 is interested in doing is attempting to remove
2 all of the toxicity. The fact of the matter is
3 that cannot be done at this site, and the reason
4 for that is that the material -- if I could go
5 back to Exhibit 1, which is the plume -- we refer
6 sometimes to what is on-site and off-site. The
7 on-site area, Mr. Malone, is basically the area
8 immediately around the Sparton facility, which is
9 the dark area, and the boundaries, I think, are
10 actually depicted on that with some lines that
11 indicate sort of a square area immediately
12 surrounding the building. Everything outside of
13 that square we refer to as off-site.
14 Now, the material off-site contains both
15 dissolved solvents -- and the easiest way to
16 explain this is if you have an aquarium and you
17 pour salt into that aquarium, some of the salt is
18 going to dissolve and just disappear into the
19 water. Other parts of that salt will actually
20 fall out and you can see them floating around and
21 they'll sink to the bottom. You have the same
22 thing with the solvents we're talking about here,
23 and that is, the solvents that are off-site, some
24 of those are dissolved in the groundwater, but
25 there are numerous silts and clays in the

1 subsurface geology in the off-site area that
2 cause the dissolved material to actually come out
3 of solution and glom onto the silts and the
4 clays, and we refer to that as residual DNAPLs.
5 Other people have different terms for it. One of
6 the problems in this area is that people use
7 different terms to describe the same thing or use
8 the same term to describe different things. But
9 what we're talking about here are situations
10 where solvents that are off-site get attached to
11 silts and clays, and once they get attached to
12 silts and clays, your ability to try and remove
13 them is very difficult.
14 And Mr. Malott in his declaration suggested
15 that this area is -- the area off-site is
16 composed, at least as we read it, almost
17 exclusively, if not entirely, of silts and clays,
18 and that simply is not the fact. And we have a
19 couple of exhibits taken from information
20 contained in the RFI that demonstrate that pretty
21 conclusively.
22 MR. MALONE: For clarification of the
23 record, is that Exhibit 1 or 2 that you have up
24 there?
25 MR. HARRIS: Exhibit 2. I'm sorry. Did I

1 say 1? I meant 2. And this will Exhibit, I
2 believe, 8.
3 (Respondent's Exhibit 8 was marked.)
4 MR. HARRIS: Now, Exhibit 8 represents
5 information that's already contained in the
6 approved RFI. All we've done is plot it on this
7 map. These are numbers that EPA has agreed with.
8 And what this demonstrates is there are soil
9 borings -- when you go out and drill a well, at
10 the time you drill it you take a core sample and
11 the engineer has a chance to -- or geologist has
12 a chance to look at that core and decide what the
13 material is made up of. And what we have
14 attempted to do is, for each of those locations,
15 the bottom number represents the amount of core,
16 the amount of actual soil that was taken out
17 below the water table, and then the number above
18 it represents the percent of that core that is
19 silts and clays.
20 This diagram is interesting for a couple of
21 reasons. One, it's inconsistent with Mr.
22 Malott's suggestion that there are virtually no
23 silts and clays in this area. We have readings
24 of 74%, 70%, 75%, 61%, 52%, 59%. The document
25 speaks for itself, but I'm just trying to give

1 you a sense. We have other areas where we've got
2 zero. What we find then is that this area from a
3 geology standpoint is what is referred to as
4 heterogenous. In other words, it's not all the
5 same. We're not seeing the same percentage
6 throughout the area; we're seeing different
7 percentages that show that the geology changes
8 rather dramatically even over short areas. And
9 so what we have, in our view, in this area is a
10 subsurface geology that is heterogenous. In
11 other words, you move short distances and there's
12 a different configuration.
13 And, Pierce, is the term anisotropic or
14 isotropic?
15 MR. CHANDLER: It's anisotropic.
16 MR. HARRIS: Which means that there's a
17 significant change with position. It also
18 changes direction. Energy-negative changes with
19 position, anisotropic changes with direction.
20 And so contrary to EPA's belief, there are
21 significant amounts of silts and clays. And we
22 can show this rather graphically a little bit
23 better, Mr. Malone, with what I'll mark as
24 Exhibit 9, which, again, is all based on
25 information taken from -- I guess it would be

1 nice if I put it right side up -- all taken from
2 the RFI.
3 Pierce, was this particular document in the
4 CMS or the RFI?
5 MR. CHANDLER: It's in the RFI's records,
6 Figures 20 and 24.
7 MR. HARRIS: So it already exists.
8 MR. CHANDLER: With exception of the
9 shading. We've added the shading between --
10 we've just cross-hatched in the strata.
11 MR. HARRIS: And this will be Exhibit 9.
12 (Respondent's Exhibit 9 was marked.)
13 MR. HARRIS: And what this exhibit is
14 designed to show is -- the cross-hatched area
15 represents silts and clays. And, again, what we
16 have here are cross-sections similar to the
17 cross-sections that were on Exhibit 1 and 2, Mr.
18 Malone, and if you will take a look up here on 9,
19 we've got two cross-sections, a D-D prime and H-H
20 prime. D-D prime is looking sort of towards the
21 north if you cut away the earth, and the
22 cross-hatched areas indicate silts and clays.
23 Profile H-H is looking back towards the Rio
24 Grande beyond the facility if you broke away the
25 earth. So on Profile D-D, groundwater is flowing

1 from the right side of the exhibit to the left
2 side of the exhibit. On Profile H-H, groundwater
3 is flowing into the exhibit.
4 And the point of this exhibit is simply to
5 demonstrate the existence of the significance of
6 silts and clays in those cross-hatched areas, in
7 the areas we're talking about, Mr. Malone, where
8 the dissolved phase of the solvents can come to
9 glom onto that. And once they glom on, it's very
10 difficult to pull them off in any reasonable way
11 and significantly slow down the ability to try
12 and restore any particular aquifer.
13 Now, EPA has, over the course of its
14 experience with both Superfund as well as RCRA,
15 come to recognize that there are numerous
16 situations in which it is just not technically
17 practicable to restore groundwater to MCLs. And
18 we have a chart, again taken from our
19 submissions, that identifies each one of the
20 characteristics the EPA -- and I'll mark this as
21 Exhibit 10.
22 (Respondent's Exhibit 10 was marked.)
23 MR. HARRIS: These are factors that EPA says
24 make it technically impracticable to restore
25 groundwater. And what -- we have added -- this

1 document is taken from the CMS, I believe.
2 MR. CHANDLER: I believe it's Figure 25 of
3 the CMS.
4 MR. HARRIS: Of the CMS? We have added one
5 column which is to go back and identify for your
6 convenience where in the RFI and the CMS
7 documents already approved by EPA supports each
8 one of the conclusions we have reached. Now, the
9 discussion I've just led you through about the
10 silts and clays is down in the Comments,
11 Stratigraphy, Texture of Deposits, Degree of
12 Heterogeneity and Hydraulic Conductivity, and you
13 will note that all of those are indicated to
14 have -- well, three of them, Stratiography,
15 Texture of Deposits and Degree of Heterogeneity
16 are either moderate to high remediation
17 difficulty because of what I refer to in very
18 nontechnical terms as the glomming-on effect, our
19 point being that there does not appear to be a
20 way to restore this groundwater within a
21 reasonable period of time to drinking water
22 limits, and that to do so would simply not only
23 represent a waste of money, but if you attempt to
24 aggressively pump the site given its geology and
25 these other factors, you are actually going to be

1 counter-productive. And, again, that information
2 was set forth in Mr. Chandler's submission either
3 initially or on the additional information that
4 we provided.
5 In our view then, the approach -- and this
6 is what we had recommended in this proceeding --
7 would be to contain the plume and to create a
8 buffer zone around which wells would not be
9 completed. And in doing so, we would then
10 eliminate all exposure pathways, and by
11 eliminating the exposure pathways, we would get
12 rid of the threat because, as I indicated
13 earlier, threat consists of two factors, toxicity
14 and exposure, and if we contain it and create a
15 buffer zone, then we've gotten rid of the
16 exposure pathway.
17 The use of the containment well would be, in
18 our view, a 200-gallon-per-minute containment
19 well. We asked one of our experts, Mr. Peter
20 Balleau, to undertake some modeling to confirm
21 that those particular -- a 200-gallon-per-minute
22 well when put in at the location of the leading
23 edge would, in fact, affect containment. He
24 undertook to describe those flow systems using
25 the Theis equation and two-dimensional

1 superposition by means of a FORTRAN program
2 called WEL-FOR that was written by a Dr. Nabil
3 Shafike of his office.
4 They put in input consisting of well
5 locations that are described in the
6 administrative record, pumping rates,
7 transmissivity and storage factors and a
8 hydraulic gradient of 0.025 feet per day, per
9 day, and then they generated streamlines of
10 potential contours using a piece of commercial
11 software called Teeplot. The transmissivity
12 values they used that they believe were
13 appropriate to this site were taken from -- for
14 the first five layers of this area, which is
15 about 130 feet, were taken from the U.S.
16 Geological Survey's Albuquerque Basin model to be
17 1,950 square feet per day. And based upon that
18 work, Mr. Balleau concluded that a
19 200-gallon-per-minute containment well would
20 effectively contain all of the impacted area even
21 when you had a 200-acre-foot per year recharge
22 and recovery operation one mile west, and even
23 when you had a recharge and recovery operation
24 with an isolated capture cell one mile west of
25 the well at the leading plume, and even when you

had a 200-acre-feet-per-year recovery operation without -- or recharge operation without recovery one mile west.

And so the information that we have establishes that if a containment well is placed -- a 200-gallon-per-minute containment well is placed at the leading edge of the plume, that it would be possible in that situation, not only possible, but what, in fact, would occur is that you would contain the current impacts to their current area and you would not interfere in any way with other water resource use so long as that water resource use was not within the first 500 feet of the groundwater and was not within a quarter-mile of the location.

And if you will remember back to Exhibit 3, there are no current plans to put any wells within the area or within the buffer zone that we have identified, and from an institutional standpoint in the State of New Mexico, it would be a relatively easy matter for the State Engineer's office to ensure that wells were not completed in that area which would allow in that situation the exposure pathway to be completely cut off, thereby eliminating the threat.

1 (Respondent's Exhibit 11 was marked.)
2 MR. HARRIS: What I've marked on Exhibit 11
3 is where we had proposed that a containment well
4 of 200 gallons per minute be located which
5 corresponds to the current leading edge of the
6 plume. I would also note that there's very
7 little likelihood that anyone would want to
8 complete a well within the first 500 feet
9 because, as Mr. Balleau points out, it's poor
10 quality groundwater at that location. The issue,
11 however, if we put in this containment well, is,
12 where do we end up discharging recovered water?
13 We are proposing that the recovered water be
14 discharged to the Calabacillas Arroyo. Sparton
15 has never said in this proceeding at any rate
16 that it would not undertake any remedy in the
17 absence of being able to discharge to the
18 Calabacillas Arroyo. What it has said is that
19 discharge to the Calabacillas Arroyo makes the
20 most sense for a variety of reasons we're about
21 to go through, and in this statement to suggest
22 that we would do otherwise, we don't know what
23 we're going to do until we have determined how
24 the water is going to be gotten rid of. What we
25 have submitted is that going any other route

1 doesn't make a lot of sense either technically or
2 from a cost standpoint.
3 In order to determine what would happen to
4 the water we discharge to the Calabacillas
5 Arroyo, Mr. Gary Richardson, who has submitted a
6 declaration to you, ran a 24-hour test of a
7 slightly over 200-gallon-per-minute discharge at
8 the storm sewer outlet discharge point reflected
9 on Exhibit 11. The water then moved down the
10 Calabacillas Arroyo. The blue 1 hour, 3 hours, 7
11 hours, 15 hours, 24 hours, represents what I
12 think I can refer to as the wetting front. All
13 that means in nontechnical terms is that's where
14 the soil was moist from the water that was
15 released, and what we found is that the -- after
16 24 hours the area actually contracted. The 24
17 hours was at this point, but slightly beyond
18 that -- and I think I'm getting myself boggled up
19 on the facts.
20 MR. CHANDLER: And the area, too.
21 MR. HARRIS: And the area became smaller
22 overall, so that after 24 hours there was not
23 further discharge beyond the 24-hour point, and
24 it's another half-mile down to the Rio Grande.
25 The results of Mr. Richardson's study are

1 consistent with what he would have thought would
2 have occurred, which is that water that was
3 discharged in the Calabacillas Arroyo at that
4 rate soaks into the soil and will actually work
5 its way back down through the nonsaturateds --
6 and that is the part of the soil that doesn't
7 have water in it -- and reach the area that we
8 would withdraw water out from the containment
9 well, so we would have a circulating system.
10 The other beauty of this operation is that the
11 technical people tell me that as the Calabacillas
12 becomes moist, it actually improves the ability
13 of the Calabacillas to allow water to drift back
14 down through the soil and to recharge the area it
15 was taken out of.
16 And so we have hard data to support our
17 position that putting in a containment well at
18 that location and discharging into the
19 Calabacillas would essentially set up a recycling
20 system. Now, EPA has suggested, although,
21 apparently from their remarks that they have not
22 settled upon reinjection, and we have real
23 difficulties with that particular approach. And
24 those were set forth in Mr. Richardson's
25 declaration, but we have also put together

1 something that is not in the administrative
2 record, but is a depiction of the treatment
3 systems that are described in the administrative
4 record as to what would be needed in order to
5 accomplish viable reinjection at this site.
6 (Respondent's Exhibit 12 was marked.)
7 MR. HARRIS: Mr. Richardson's declaration
8 and the technical people that I have visited with
9 have confirmed that reinjection is a very
10 difficult process simply because what you are
11 doing is taking water out and reinjecting it back
12 in the same or similar formation. And that
13 sounds fairly simple, but water chemistry is
14 very, very complex, and removing it from one
15 location and transferring it to another can
16 result in a wholescale number of changes which
17 cause it to be slightly different when you
18 reinject it than when you take it out, and that
19 difference means that it's going to create all
20 sorts of problems in the reinjection process, and
21 Mr. Richardson's declaration describes some of
22 those.
23 The one site that EPA suggests as
24 particularly appropriate to our location, the
25 South Valley, we think it's instructive that at

1 that site General Electric installed, what was
2 it, 78 wells, Pierce, that were supposed to be
3 200 gallons per minute? And they've been running
4 those wells at about 80 gallons per minute, our
5 point being that you don't run a
6 200-gallon-per-minute well at 80 gallons per
7 minute unless you're having some difficulty with
8 what you're doing.
9 Additionally, in order to make reinjection
10 work, there's a significant amount of treatment
11 that you have to go through. We have identified
12 that as filtration, pH adjustment, air removal
13 and chlorination. All of those are unnecessary
14 when you're discharging to the Calabacillas
15 Arroyo. EPA in its latest submissions got rid of
16 pH adjustment, got rid of air removal, got rid of
17 chlorination, and lo and behold, when they got
18 rid of those things, the cost of dealing with
19 reinjection dropped rather dramatically. The
20 fact of the matter is without these other
21 treatment requirements, you're going to have a
22 reinjection system that fails on you very
23 rapidly, and we are talking about very expensive
24 wells, something in the neighborhood of $80,000
25 to $100,000 for each one of these injection

1 wells, and there's a significant cost to
2 reworking them to fix them, the point being that
3 there are also wastes that are generated and
4 additional hazards associated with each one of
5 these activities. Obviously chlorination, we've
6 got to have chlorine gas there. pH adjustment
7 means introducing chemicals, and filtration means
8 that we're going to have wastes that are going to
9 be generated from that operation. None of
10 that -- I'll just point out that none of this is
11 necessary for discharge to the Calabacillas. All
12 of that goes away.
13 The other interesting part is that from a
14 water conservation standpoint, the Calabacillas
15 approach makes more sense. If you go through
16 what we have on Exhibit 12, you will see a water
17 loss as you go through that treatment train of 5%
18 to 10%. In other words, 5% to 10% of the water
19 that you extract is going to be lost and cannot
20 be reinjected. If you discharge to the
21 Calabacillas Arroyo based upon Mr. Richardson's
22 calculations, you are in a situation where you're
23 only losing 1% to 3% of water. So if, in fact,
24 the State and EPA are concerned about conserving
25 water, then they should be interested in

1 discharging to the Calabacillas and not going to
2 reinjection, which not only is more
3 energy-intensive, more chemical-intensive,
4 generates waste, is more expensive, but also
5 creates further water loss.
6 I would also note that EPA has come up with
7 some fairly creative numbers when it comes to
8 cost comparisons. They originally said in the
9 decision document that their remedy would cost 15
10 to 26 million dollars, and in their last
11 submission to you suggested that that number has
12 now been reduced to 4 to 6 million dollars.
13 (Respondent's Exhibit 13 was marked.)
14 MR. HARRIS: And Exhibit 13 is taken from a
15 submission that we've already provided and
16 compares those costs. What we have is a
17 comparison of capital costs and annual O&M. The
18 first two columns represent EPA's cost estimate
19 in the Final Decision Document, and then we went
20 back and verified whether those numbers were
21 accurate, and by and large we were able to reach
22 essentially the same numbers as EPA. EPA in its
23 position statement, the last document it filed in
24 Exhibit 18, that was put together by a guy named
25 Raimonde came up with new numbers, and what they

1 did is, lo and behold, they found in Exhibit 18
2 that instead of costing 2.275 million to do
3 reinjection, it's only going to cost us 1.4
4 million dollars. Well, we're not -- first off,
5 we went back and double-checked Mr. Raimonde's
6 numbers to see if they were internally consistent
7 and discovered they were not -- that's what this
8 last column represents -- that he actually
9 understated costs by 1. -- or about a half a
10 million dollars.
11 But apart from that, the most glaring
12 difference here, if you will take at the row
13 styled Injection Well Disposal, EPA in its
14 original decision, and as we verify, initially
15 estimated that the cost of injection well
16 disposal which included both wells and treatment
17 was 1.237 -- 1.3 million dollars or 1.2 million
18 dollars. Now, in Exhibit 18 the EPA says, no,
19 guess what, the number we gave you in the Final
20 Decision document which they say was based upon
21 our numbers wasn't correct, it really should be
22 $169,000.
23 But the fact of the matter is EPA doesn't
24 include any of the treatment trains that we
25 identified in Exhibit 11. They just have taken

1 those away to get down to the $169,000 number,
2 and they also have gone with low-carbon steel
3 casing instead of stainless steel casing, and
4 they've also assumed -- interestingly, Mr.
5 Raimonde assumed that you could use one
6 200-gallon-per-minute well to reinject 600
7 gallons per minute, but, in fact, you're going to
8 need at least three wells and, based on the GE
9 experience, probably more likely eight wells to
10 be able to do that. We have assumed just for
11 these purposes that it's only going to be three
12 wells, and you can see that his numbers in that
13 respect are off. But the point is that we
14 believe the 1.2 figure more accurately represents
15 what it would cost to do injection well disposal.
16 On Annual O&M, you will note that Mr.
17 Raimonde also changed the numbers rather
18 dramatically from what EPA initially had. We
19 went back and looked at that and discovered that
20 in his O&M the reason his number was so low is he
21 didn't include any maintenance, appreciation,
22 well rehabilitation, cost of expendables or waste
23 residue management. When you don't include those
24 things in your O&M, you can get it done pretty
25 quickly, but in the real world you generally have

1 to do those things. And when you factor those
2 matters in, the cost of O&M, even under Mr.
3 Raimonde's scenario, is in the neighborhood of
4 $800,000, which is right in line with what EPA
5 estimated initially in its Final Decision
6 document and not the $303,000 that Mr. Raimonde
7 suggested would be the case.
8 Finally, we have put together a chart that
9 compares the various alternatives, and then I'll
10 conclude, Mr. Malone, with a review of the
11 factors that EPA believes need to be taken into
12 consideration.
13 (Respondent's Exhibit 14 was marked.)
14 MR. HARRIS: Exhibit 14 represents a
15 comparison of the objectives and the costs for
16 what EPA has proposed, and these -- we still
17 don't quite understand what it is EPA is
18 proposing. I have yet to hear anything other
19 than we're going to study the situation and put
20 in maybe one to three wells, and maybe do some
21 extraction wells, and maybe put in some more
22 on-site wells, and maybe do soil vapor extraction
23 after we study it for a couple of years. But we
24 have assumed under EPA's recommended alternatives
25 that we've got -- one is VOC removal, the

1 multiple treatment is to get rid of metals, and
2 then Sparton's recommended alternative. If you
3 will note, Sparton's recommended alternative
4 contains the plume, it removes VOCs from the
5 groundwater, it removes VOCs from the soil and
6 soil gas, it recharges the shallow aquifer, and
7 it has the same remediation time frame as EPA's.
8 Our groundwater extraction rate is less, our
9 water loss is less, we have no significant
10 production of hazardous waste, our capital costs
11 are less, our present value costs are less. And
12 I think even if I run this by my twelve-year-old,
13 if he takes a look at the comparison side by side
14 and our alternative is accomplishing everything
15 EPA's is accomplishing and is going to cost
16 anywhere from 12 to 23 million dollars less, then
17 it would seem to be somewhat rational to go with
18 the alternative that costs 12 to 23 million
19 dollars less.
20 I would note that if Mr. Malott's belief as
21 to groundwater condition and subsurface geology
22 is correct, then there's no reason not to expect
23 that our single-well containment wouldn't restore
24 the groundwater within 30 years, because if he is
25 saying that the subsurface geology consists

1 almost entirely, if not entirely, of sands and
2 gravels, then a drop of solvent right at our
3 off-site point will move essentially unimpeded to
4 our containment well, and at the rate of 100 feet
5 per year, the linear distance between our
6 containment well and off-site corresponds to
7 about a 30-year time period to move where it
8 would be removed, at least as I understand EPA's
9 position in the subsurface geology. So if
10 remediation through restoration is possible here,
11 then Sparton's remedy will accomplish it in the
12 same time as EPA's. We have already submitted
13 that restoration is not technically practicable
14 here, and what we have proposed is something that
15 at a lower cost will still achieve -- avoid
16 exposure pathways.
17 Let me touch real briefly on the factors
18 that EPA has identified. The first is -- and
19 they use this in their own terms on protection of
20 human health and the environment -- that we have
21 to prevent exposure by reducing or controlling
22 contamination. That's their words both from the
23 Statement of Basis as well as the document that
24 supported the final record and decision.
25 I'll submit to you that a single containment

1 well, coupled with enhanced on-site recovery to
2 prevent the movement of materials off-site,
3 coupled with soil vapor extraction -- and I would
4 provide an update that with respect to oil vapor
5 extraction, that program is ongoing; the testing
6 has been completed and we are now moving into a
7 design phase and intend to undertake that action
8 as soon as possible and consistent with what NMED
9 has suggested is an appropriate time frame --
10 that the combination of those three factors will
11 prevent exposure by controlling the
12 contamination, and at the same time that
13 containment well will also be reducing the
14 contamination by removing volatile organic
15 compounds that are pulled out with the
16 groundwater and run through an air-stripping
17 operation before they are released to the
18 Calabacillas Arroyo.
19 The second requirement is that we have to
20 obtain media cleanup standards. Now, there is a
21 fair amount of confusion about what standards
22 are. They are not the same as limits, and EPA,
23 at least Region 6, has consistently confused the
24 requirement of this criteria as mandating that
25 you have to meet the MCLs. Well, the fact of the

1 matter is that you don't.
2 EPA in the most recent proposal regarding
3 corrective measures makes it very clear that one
4 of the questions that the agency is supposed to
5 ask itself is to what extent are the assumptions
6 in the development of MCLs consistent with
7 specific site conditions. And I'll just quote
8 from Page 19449 of the Federal Register of May
9 1st, 1996: When available media cleanup
10 standards are used, EGMCLs, state cleanup
11 standards, the assumptions used to develop the
12 standardized cleanup values should be consistent
13 with the site-specific conditions at the facility
14 in question.
15 Now, what assumptions were used in the
16 development of the MCLs? The MCLs assumes that
17 somebody will drink two liters of water a day
18 every day of their life for 70 years. There's
19 absolutely no information in this record that
20 suggests that assumption is true with respect to
21 this site, and, in fact, the information we've
22 shared with you today and previously demonstrates
23 conclusively that that assumption is not true
24 with respect to waters at this site currently and
25 certainly won't be true when the containment

1 system, both on- and off-site, and soil vapor
2 extraction is in place. So if those assumptions
3 are not applicable at this site, then there is no
4 need to meet the MCLs within the impacted area.
5 Besides that, we've also demonstrated that any
6 water that would be used in this area would
7 involve deeper wells, would involve some
8 blending, and there's absolutely no information
9 before you to identify who would be drinking two
10 liters of water per day for 70 years from this
11 particular location, and EPA just can't assume
12 that to be the fact. That's the teaching of the
13 Leather Industries case, is that it is irrational
14 for the agency to base a decision on assumption
15 which has not been shown to be the case at the
16 specific site in question. And, again, there's
17 another need in this hearing to be able to
18 undertake cross-examination and direct
19 examination to be able to properly develop
20 adjudicative facts.
21 The other point that EPA overlooks is even
22 with its remedy, even with its remedy, there is a
23 period of time when there will be material in the
24 groundwater above MCLs, and they have never
25 addressed why for that 30-year period of time it

1 is entirely appropriate not to have any control
2 over exposure. I mean, under their assumption,
3 we'll be out there for 30 years. Under our
4 assumption, we'll be out there for a long, long
5 time trying to remove the material in here, and
6 yet nobody has suggested what happens if, while
7 that remediation is ongoing, somebody tries to
8 stick a well in this location. That's not
9 addressed by EPA. Our point is that it needs to
10 be addressed. We've suggested that it can be
11 addressed with the State Engineer's office and
12 would work well with the containment strategy
13 here, and so, really, the containment at the
14 media levels at the conclusion of the
15 remediation, and EPA has not shown how media
16 levels are going to be achieved during the
17 remediation itself.
18 Both our remedy and EPA's remedy will
19 control at the source. As I've said, we're
20 undertaking pursuant to State authorization
21 testing and development of a design to deal with
22 the solvents that are in the soil at the site.
23 We have also suggested enhancing on-site
24 containment so that solvents above MCLs don't
25 move off-site. The only thing that is preventing

1 us from moving forward is that the City of
2 Albuquerque will not allow us to discharge that
3 recovered water to its City sewer system. We
4 have asked for permission to discharge it to the
5 Calabacillas Arroyo. If that permit were issued,
6 then there's nothing that would prevent us from
7 immediately starting to do that. And we believe
8 what we have proposed can be demonstrated to
9 work, and if it doesn't, we have never said that
10 we are limited to 20 gallons per minute here.
11 What we have said is we believe that the
12 20-gallon-per-minute rate will be more than
13 sufficient to control the on-site contamination,
14 but obviously the proof will be in the pudding
15 after this system is run.
16 Both what we have recommended in this
17 proceeding and what EPA recommends would comply
18 with waste management standards, and that simply
19 means that we'll have the necessary air permits
20 and water permits and wastewater discharge
21 permits. And in that regard, Mr. Malone, I think
22 it's important to understand we have already
23 applied for on an emergency basis permits to
24 remove 200 gallons per minute from the aquifer in
25 order to treat it. Interestingly, the State

1 Trustee's office has protested our being able to
2 remove that sort of material somewhat
3 counter-productive to us moving forward.
4 Secondly, we have filed for an NPDES permit.
5 We have checked with the City of Albuquerque
6 regarding our ability to put in the
7 infrastructure we need. We have talked with them
8 about using, and have gotten from them a draft of
9 an agreement to use, the storm sewer on the
10 exhibit that we had that showed the storm sewer
11 discharge point. We would go from the
12 containment well to the Calabacillas Arroyo
13 through City of Albuquerque storm sewers. They
14 have already submitted to us a draft agreement to
15 do that.
16 I'm trying to think. There's something --
17 we've applied to the State of New Mexico for a
18 discharge plan permit, and we are -- have been in
19 negotiations for several months with AMAFCA,
20 which is a quasi- -- or a governmental agency
21 that has authority for the Calabacillas Arroyo,
22 and have a draft agreement from them for purposes
23 of using the Calabacillas Arroyo for discharge
24 purposes.
25 At this point -- so we -- from compliance

1 with waste management standards, we can achieve
2 compliance with all those, and our remedy doesn't
3 present any greater institutional barriers than
4 EPA's does. With reinjection, we still have got
5 to get appropriate permits from various agencies
6 to do that, and we still have to get air permits,
7 and with reinjection, we would also have to deal
8 with potentially hazardous waste or other waste
9 that would have to be disposed of properly.
10 Long-term reliability, I've never really
11 heard EPA with a coherent explanation of what
12 that entails. I believe it's supposed to mean
13 after the remediation is complete, will the
14 remedy be permanent, will it continue to work?
15 And we are -- on that score, it's difficult to
16 say with either of the remedies because we don't
17 know when they're going to achieve completion,
18 which would be restoration, if they ever can.
19 Our point is as long as we have a containment
20 well out there, we'll be monitoring the situation
21 and we will be able on a long-term basis to make
22 sure it is working appropriately. Both remedies
23 reduce toxicity in the sense that both will
24 remove solvents from the groundwater.
25 Short-term effectiveness, both remedies --

1 well, actually our remedy is better from a
2 short-term standpoint. As I understand
3 short-term effectiveness, it means what
4 protections are being provided while the remedy
5 is in place. And to that score, we will be
6 providing the same protection as EPA will be, so
7 there's no difference there. We believe ours
8 from a short term will be more effective because
9 we think that the containment well, even though
10 it appears to be slower, will actually achieve
11 restoration removal more quickly than a more
12 aggressive approach that EPA has suggested that's
13 going to be counter-productive.
14 From an implementability standpoint, both
15 remedies present essentially the same issues.
16 The only difference on ours is that we have to
17 get an NPDES permit, whereas with the
18 reinjection, we probably have to get some sort of
19 discharge plan approval or other approval from
20 the State and potential UIC approval with
21 reinjecting that, so I think that's a tradeoff at
22 that point.
23 So finally we get to cost. Our cost is on
24 order of magnitude lower than EPA's. It meets
25 all of the other criteria, it's lower in cost,

1 and in that situation we believe that the result
2 is obvious, and that is that the lower cost
3 approach that achieves all of the objectives
4 should be selected.
5 From a State acceptance standpoint, I would
6 point out that we have been in discussions with
7 the State of New Mexico since July of 1996 trying
8 to implement what we have been describing to you,
9 which is off-site containment well, on-site soil
10 vapor extraction, on-site containment. As of
11 January 3rd, we have received permission from the
12 State to do the on-site soil vapor testing, to
13 begin the on-site further containment increasing
14 to 20 gallons per minute and to begin testing
15 off-site for the containment well. The State has
16 yet to agree that one containment well is going
17 to be appropriate but has said that we could go
18 forward to test it to see whether our assumptions
19 are correct or not.
20 Where things have hit a snag, so to speak,
21 is, what do we do with the water that we recover?
22 We want to be able to run that well after test
23 purposes on a full-time basis because our view is
24 that at least one well operating full-time is
25 better than shutting it down, and at this point

1 we don't have a cost-effective way of getting rid
2 of the water. There is a disagreement obviously
3 about going to the Calabacillas Arroyo, at least
4 with EPA. The State's position, I think, is that
5 we just need to get the necessary permits to do
6 that, and we have not yet gotten those permits,
7 although we did file on January 31st. And the
8 quality of the water, by the way, that would be
9 discharged to the Calabacillas, it would be no
10 different than what is reinjected, and what we
11 have proposed is to meet both drinking water
12 limits and State water quality -- or State
13 groundwater quality standards in terms of the
14 discharge we have to the Calabacillas Arroyo.
15 That's part of our permit application. And so
16 from a State acceptance standpoint, I can't stand
17 here and tell you the State has accepted it, but
18 what the State has said is that they would like
19 us to go forward on each one of these elements
20 and see whether what we're proposing is going to
21 work the way that we have suggested it is going
22 to work than have it stand in the way of us doing
23 that.
24 In short, the Enforcement Division of
25 Region 6 has not demonstrated by a preponderance

1 of the evidence what is a threat. We have no
2 evidence other than what we put on that there is
3 any threat. The evidence we put on is there is
4 no threat, nor have they established by a
5 preponderance of the evidence that what they have
6 proposed -- and I'm still kind of waiting to hear
7 the details on it -- is necessary in the sense
8 that it's required to protect human health or the
9 environment; in other words, what is the
10 toxicity, what is the exposure, why is this
11 necessary to get rid of the toxicity or the
12 exposure to get rid of the threat?
13 On the other hand, Sparton has put forward
14 what I think is a very reasonable, very
15 cost-effective proposal and one that satisfies
16 all of EPA's criteria. I'm not meaning to
17 suggest that we agree that EPA's criteria have to
18 be followed here. It is only guidance, and it's
19 the agency's interpretation of a statute. We
20 don't necessarily agree that interpretation is
21 correct and the agency's interpretation where it
22 is simply interpreted as opposed to a rule or a
23 rulemaking is not entitled to any deference by a
24 court. The real issue statutorily is, is it
25 necessary to protect the health and the

1 environment? What EPA has proposed is not. What
2 we've proposed -- we're not sure what we've
3 proposed is necessary, but what we've proposed
4 will at least contain the plume and deal with
5 exposure pathways appropriately and at a much
6 lower cost than what EPA is proposing. And I
7 believe that that covers the points that you had
8 addressed in your Order.
9 Let me go back for just a second. There
10 were a couple of statements that were made in
11 EPA's opening that I wanted to make sure that I
12 had touched upon, and I think I already have. I
13 would note that the references to the South
14 Valley site, I'm not sure that any of that has
15 been put in the form presented here into the
16 record, so we haven't had a chance to comment on
17 that. And, again, I would point out that the
18 real difficulty in this proceeding is that
19 somebody will claim something is being done at a
20 particular site and that it's working and
21 somebody else will claim that it's not. The fact
22 is that we can't get to the facts. This whole
23 proceeding prevents us from engaging in the sort
24 of discovery that allows us to determine exactly
25 what is going on and why if somebody makes some

1 general conclusion, what the assumptions are, and
2 if you had a chance to get to those assumptions,
3 you can generally show that the conclusion may
4 not be what is really intended to be conveyed.
5 But the whole way that this process is set up
6 with respect to --
7 MR. PEARSON: Excuse me. I would like to
8 object to this. We've already ruled upon this
9 issue about cross-examination, what the
10 procedures are. We don't need to hear a
11 recitation of his arguments again. That's an
12 issue that's appropriately addressed in Federal
13 Court if it ever gets there.
14 MR. MALONE: I'm going to overrule the
15 objection and allow the Respondent to proceed. I
16 do believe from my review of the administrative
17 record that there is information on the remedy at
18 the site you mentioned, but, you know, I'll let
19 you go on and just hear you out. I would tend to
20 try and develop a full record and hear what both
21 parties have to say. That's why in -- in the
22 afternoon session, whenever you get -- whenever
23 EPA has the opportunity to address the
24 Respondent's presentation, I will allow the EPA
25 to address documents that aren't in the record.

1 MR. PEARSON: Well, what I also was going to
2 say, he's going into this cross-examination
3 argument. We've already heard that before, and
4 that's what I was objecting to. And the South
5 Valley, there is information in the
6 administrative record concerning that.
7 MR. MALONE: Okay.
8 MR. HARRIS: But that's my point. There is
9 some information, but we have no idea whether the
10 information is accurate or not and no way to test
11 it. In a lot of cases, EPA will talk to somebody
12 that won't talk to us or is not available to us,
13 and we have no way of determining whether the
14 information in the record is accurate or not.
15 The same thing is true with respect to statements
16 that the City makes about their use of the water.
17 We get these generalizations and don't have the
18 ability to effectively rebut that because we
19 can't talk to the people or they won't talk to us
20 in the fashion that we need to in order to test
21 the determinations in the statements that they
22 made, and it puts us at a significant
23 disadvantage in this particular proceeding.
24 MR. PEARSON: And, again, I would like to
25 object and I would ask the Court to instruct Mr.

1 Harris not to bring up arguments about the nature
2 of this proceeding, what is required. I mean,
3 cross-examination, discovery is not allowed
4 except as provided for. Mr. Harris did submit
5 discovery, the Court overruled because it is
6 overburdensome and does not meet the
7 requirements. I object to any further argument
8 by Mr. Harris about the requirements of this
9 proceeding. No direct or cross-examination is
10 allowed, and he can take that up in Federal
11 Court.
12 MR. MALONE: Well, your point is well taken,
13 and I think it may be better, sir, for you to
14 address those points in your rebuttal, but the
15 record is already clear on that, as you have
16 already suggested; I've ruled on those matters
17 already, and if -- although it's repetitive, I am
18 giving both parties latitude here today to get
19 their presentations presented in full, so let's
20 proceed.
21 Counsel for Respondent, please proceed.
22 MR. HARRIS: Mr. Malone, I think that
23 concludes our initial presentation that -- and,
24 again, just to emphasize, we -- Sparton has stood
25 ready, willing and able to begin the remedy that

1 it has proposed. The only impediment to us
2 moving forward on that is finding a way that we
3 can cost-effectively get rid of the water. And
4 if EPA would act on our NPDES permit today, we
5 could start work out there based upon what we
6 propose tomorrow. So I don't want to leave this
7 proceeding with the suggestion that we are not in
8 a position to implement. We are in a position to
9 implement immediately what we have called for.
10 We're simply waiting on action with respect to
11 our permit. And what we have asked to implement
12 would not require, as EPA's remedy would, another
13 two to five years of study before anything could
14 be done at the site with respect to addressing
15 the presence of solvents in the groundwater.
16 MR. PEARSON: One last thing, just for the
17 record, I think we would like to mark the
18 exhibits that we have used in this case for the
19 record, if I could borrow some exhibit stickers.
20 MR. MALONE: Okay.
21 MR. PEARSON: The site map I'm marking as
22 Government Exhibit Number 1, the board concerning
23 the threshold and balance criteria would be
24 Exhibit 2, and the Task IX board we'll mark as
25 Exhibit 3.

1 (Government Exhibits 1-3 were marked.)
2 MR. HARRIS: Mr. Malone, I think I noticed
3 that you were putting exhibit stickers on those,
4 and I appreciate you doing that because I thought
5 that would be a little easier for the record.
6 MR. MALONE: Right. I'm going to have to
7 modify -- my stickers say "Government Exhibit,"
8 so I will just have to put "Respondent's
9 Exhibit," but I do have them numbered properly.
10 MR. HARRIS: Thank you.
11 MR. MALONE: Okay. I think right now would
12 be a good time to take a recess. Let's all --
13 let's say we all meet back in this room at 1:00.
14 Is that enough time for everyone?
15 MR. PEARSON: Your Honor, considering the
16 fact that they have brought in -- they've raised
17 arguments and they've referenced modeling that
18 was done on like one of their exhibits for the
19 Calabacillas conducted in March, we have not seen
20 the basis for those arguments, the calculations,
21 and I would just like a little more time, maybe
22 1:15 or 1:30. That's the only -- I guess I would
23 just ask a little more time to prepare for our
24 rebuttal.
25 MR. HARRIS: I don't have a problem with a

1 little additional time. However, I do want the
2 record to reflect that everything we have they
3 have in their possession. The information from
4 Mr. Richardson was in our last submission, so
5 they have that information.
6 MR. PEARSON: There's a reference in there
7 to a March 1997 that is also -- that is not in
8 there.
9 MR. HARRIS: It is, but the record speaks
10 for itself.
11 MR. MALONE: The additional time will be
12 granted. Let's take a recess till 1:15.
13 (A recess was taken.)
14 MR. MALONE: Okay. Let's go back on the
15 record. The first thing that I would like to
16 have the parties address would be the EPA's
17 rebuttal.
18 MR. PEARSON: Thank you, Your Honor. In
19 rebuttal, our rebuttal will be split up between
20 myself and Mr. Malott, just to address first
21 Sparton's initial argument concerning risks in
22 which they base it on toxicity and exposure, and
23 Mr. Malott is going to address this issue more
24 closely concerning the modeling and the other
25 effects from the modeling.

1 Your Honor, we believe that the Respondent,
2 when it talks about these exposure problems,
3 takes statements out of the Federal Register out
4 of context. For example, if you look at the
5 situation here, there's no question we have a
6 potential source of drinking water. The water
7 resources that have been contaminated are a
8 valuable natural resource. It's been planned for
9 use for a water supply since 1982. In fact, the
10 City of Albuquerque has begun proceedings -- is
11 currently negotiating with New Mexico Utilities
12 to acquire all of New Mexico Utilities' access
13 area which includes infrastructure, water rights
14 and well permits. Therefore, Sparton's arguments
15 concerning the City's right to use the water are
16 basically going to disappear.
17 In fact, there is a well currently permitted
18 in the area that's located very close to the
19 Sparton site which New Mexico Utilities currently
20 has permitted, and when the City acquires -- as
21 soon as the City acquires the service area, then
22 they will be able to acquire that permit. And
23 just to kind of show the general area on the map
24 here -- this is Page 3791 of the administrative
25 record which shows the location of the proposed

1 well, and it would be somewhere -- I think
2 somewhere around this area right here, but that's
3 Page 3791 of the administrative record.
4 Furthermore, Sparton's contentions
5 concerning growth are wrong. There is a major
6 demand for this water that is evidenced by New
7 Mexico Utilities' application to the State
8 Engineer for 69 additional wells in their service
9 area. The growth projection for this area is
10 booming, and they've been revised to show the
11 higher growth. The City has also had success in
12 permitting wells nearby to serve new customers.
13 Concerning Sparton's application to the
14 State Engineer that Sparton claims the City
15 protested, the reason for the protesting was that
16 they had failed -- they wanted them to modify
17 their application to remove chromium. So if that
18 is done, then it's my understanding that the City
19 will withdraw their objections. Under the Water
20 Management Plan, the use of groundwater by the
21 City will continue to be a major supply source
22 and the only source of drinking water available
23 during a drought.
24 Furthermore, concerning the quality of the
25 drinking water in this area, Sparton has said

1 that the water quality is poor. I would refer
2 you to Mr. Norman Gaume's affidavit that is
3 attached as Exhibit 7 to EPA's February 27th --
4 excuse me, 25th, 1995, brief in this matter. I
5 would also like to read a few sections of the
6 proposed Subpart S that talks about groundwater
7 and potential risks to human health and the
8 environment. It states on Page 30804 that
9 potentially drinkable groundwater should be
10 cleaned up to levels safe for drinking throughout
11 the contaminant plume regardless of whether the
12 water is, in fact, being used -- being consumed.
13 By this statement, it assumes a potential source
14 of drinking water. That's the same situation
15 that we have here. You wouldn't clean up
16 drinking water to drinking water standards unless
17 there is a risk to human health. You have got to
18 remember, there is a potential risk to human
19 health. It doesn't have to be actual like Mr.
20 Harris states.
21 Furthermore, Sparton's arguments never
22 addressed risk to the environment. We have a
23 valuable natural resource, and as such it is
24 protected under New Mexico law. It's also
25 considered a natural resource under CERCLA. So

1 therefore we do have a risk to human health and
2 the environment here.
3 Secondly, we have some problems -- part of
4 the problems in this case is -- when EPA proposed
5 its remedy, it based it on the Final Decision and
6 Response to Comments Document. Sparton did not
7 propose to contain the plume. That was the basis
8 of that -- their proposal came out after the
9 Final Decision document was made. Also, our
10 Initial Administrative Order was based on the
11 Final Decision and Response to Comments Document
12 as stated, and after that, then Sparton presented
13 a containment proposal. So Sparton has presented
14 EPA with a moving target here as far as remedy
15 selection.
16 Furthermore, I think part of the problems
17 that we have had with this is some of these
18 contradictions Sparton has made in regard to some
19 of the issues concerning containment and
20 characterization. I would just like to read a
21 few of these. In regard to the issue of
22 containment -- and I would also like to first
23 mention on Page 9 of Pierce Chandler's report,
24 which is Attachment A to Sparton's initial brief
25 of February 4th, he stated the following: The

1 ability to predict results and advanced
2 installation demonstrates a comprehensive
3 understanding of the plume. And in this
4 particular case he was referring to installation
5 of five monitoring wells.
6 Let's just look at Sparton's demonstration
7 of their understanding of the plume. In a
8 November 6, 1995, letter to EPA, on Page 13 of
9 this letter, which in the administrative record
10 is 4631, Sparton stated, pump and treat will not
11 work; it will have little impact upon migration.
12 They also stated on the next page that, aquifer
13 parameters would indicate that you need two to
14 three wells to contain the plume, assuming you
15 try to contain it. They also stated that they
16 would have to pump at a rate of 864,000 gallons a
17 day or an equivalent of 600 gallons per minute.
18 Now, their proposal here only called for one well
19 pumping at 200 gallons per minute. Six months
20 later in their CMS report, on Page 5622 of the
21 administrative record, they state that
22 containment could be provided, but only one well
23 pumping at 50 to 100 gallons a minute. Now it's
24 up to 200 gallons, representing a moving target
25 here, and I think this shows that Sparton doesn't

1 have a good comprehensive understanding of the
2 plume.
3 Furthermore, in regard to characterization,
4 Mr. Chandler's report stated that in the summer
5 of 1996 all five new wells detected (sic)
6 nondetect -- excuse me, all five wells tested
7 nondetect, and this report was dated February
8 24th, 1997. However, he failed to mention that
9 Monitoring Well #65, which was in October of '96,
10 showed 9.3 parts per billion TCE. So apparently
11 the plume is still moving, and their model, as
12 Mr. Malott mentioned, had not predicted that.
13 Turning to the issue of how to dispose of
14 the treated groundwater, EPA in its Order did not
15 state a preference on a -- in our Final Decision
16 document, we preferred reinjection, however on
17 the Order left that open, and there are many
18 reasons for that. We believe that that's
19 something that's best left to the technical
20 expertise of the EPA. We will consider
21 discharging in the Calabacillas or any other
22 option that preserves groundwater, but I don't
23 think at this point it's something that the Court
24 should determine what the discharge options be.
25 For example, the permitting process involves

1 public review and comment. If the Court decides
2 that discharge to the arroyo is preferred or
3 orders that, that, in essence, means -- that ties
4 EPA into issuing an NPDES permit, and if a permit
5 is not received, then no cleanup will take
6 place. And so I believe the best approach to
7 take is not to make any decision on the discharge
8 into the arroyo or reinjection; it should be left
9 up to be determined later.
10 Also in regard to the discharge into the
11 Calabacillas, as we pointed out in our brief, EPA
12 had asked Sparton to consider this option. They
13 said it was speculative at best, and therefore
14 later on after we selected the remedy, they
15 decided to do the testing, and then they come up
16 and then they decide, oh, it's okay now. And
17 that's part of the problem. They had their
18 opportunity in the CMS report to submit this
19 information, and now we're, in essence, facing a
20 moving target.
21 Finally, I would just like to make a couple
22 of comments concerning the reliance on the CMS
23 report. EPA submitted extensive comments to the
24 CMS report. It was approved with concerns. I
25 think the way Mr. Harris has presented the CMS

1 report is now we have three testaments. We have
2 the Old Testament, the New Testament and the CMS
3 report, so it's apparently just like infallible,
4 and that's not the case. We do not -- we
5 provided extensive comments on it that just
6 because they take some situation out of context
7 and say, oh, we have agreed with that, that's
8 gospel, we've got to accept it, and that is
9 simply not the case.
10 And at this point I would like to have Mr.
11 Malott address some of the remaining issues, and
12 I may have a few other comments after Mr. Malott
13 is done. Thank you.
14 MR. MALOTT: Regarding the model, there was
15 a couple of other statements made about that.
16 First I want to go ahead and use the Respondent's
17 Exhibit 4. I would start off with a little
18 additional background. This is, I believe,
19 supposed to be a representation of the New Mexico
20 Utilities Well #2. And as you can see, this is,
21 I believe, meant to represent the water table
22 which extends across and is also beneath the
23 Sparton facility itself. I believe what Mr.
24 Harris has stated earlier -- and there might have
25 been some confusion about this -- he indicated

1 that this was upgradient. I want to make sure
2 that this is clear that the New Mexico well
3 apparently is downgradient from the Sparton
4 facility.
5 Mr. Harris also indicated that the well was
6 thousands of feet -- the well intake was
7 thousands of feet below where the plume is
8 located. If you look at where the water table
9 extends underneath the Sparton facility -- and it
10 extends all the way across -- you can see that
11 the plume goes right across here to the well
12 intake. I'm assuming that -- I believe this is
13 from Mr. Balleau's report -- that the well
14 intake, I believe, characterizes hundreds or
15 thousands of feet, and if that was the case,
16 well, then the plume is definitely going to
17 intersect the well intake according to this
18 cross-section here. So I want to make sure
19 that's clear.
20 In addition, the modeling itself -- let me
21 see. I believe there's still one up here. The
22 modeling itself did not accurately predict what
23 the source area -- or the concentrations are
24 inside the plume itself. The diagrams they have
25 here all represent three -- a little over three

1 parts per billion and one part per billion. What
2 they've not demonstrated here is what the
3 interior concentrations are. And I believe Mr.
4 Harris used the analogy of an aquarium, of
5 dropping salt into an aquarium. Well, in this
6 case, if you do not -- if you have not correctly
7 modeled what the interior concentrations are
8 going to be, you do not have a mass that will
9 migrate downgradient so that you could get
10 appropriate concentrations from your modeling
11 effort.
12 According to the files that we had looked at
13 that were supplied on March 14th, these
14 concentrations never even approach what they
15 currently are off-site. So thus, it's like
16 taking a teaspoon of salt and dropping it into an
17 aquarium as opposed to maybe dropping in a
18 shovelful. If you don't have enough mass, how
19 can you predict how far it will migrate down?
20 This may not be an issue anymore. According to
21 Mr. Harris, they've now agreed to contain the
22 plume no matter how many wells it actually takes,
23 in which case the modeling effort may not be as
24 critical an issue. However, it does go to the
25 issue of impacts to human health in this case.

1 We still do not know what kind of future impacts
2 there may be to the New Mexico Utilities Well #2,
3 so in this case we still do not have any kind of
4 assessment that EPA or any other regulatory
5 agency can rely on. Based on the work we've seen
6 so far, it's almost pure speculation according to
7 this model.
8 MR. MALONE: Which exhibit is this?
9 MR. MALOTT: This is Exhibit Number 5. I
10 believe we may have some other exhibits also.
11 Exhibit 6 also displays some of the contaminant
12 concentrations as well.
13 MR. MALONE: Has the Respondent shared this
14 information with the EPA, or is this your first
15 time seeing these particular charts?
16 MR. MALOTT: They've presented -- well, I
17 believe these were the diagrams, and I would have
18 to go back and verify it with the CMS report.
19 These diagrams are actually in the CMS report
20 themselves. They presented the modeling work in
21 this format. We did not have the input or output
22 files. The code that was used in the model also
23 has apparently been modified from the original
24 model. We do not have that code, nor do we
25 understand what the modifications are.

1 Apparently HLA, which is another consulting firm,
2 has modified this. This was indicated in the
3 brief that was submitted on March 14th that
4 indicated this was modified. So there's a lot of
5 concern regarding how the source material is
6 represented in the model. Apparently it was
7 portrayed as 10,000 parts per billion of TCE. We
8 know that some of the original concentrations
9 were closer to 90,000 parts per billion back in
10 1983. So there are questions regarding the
11 source term, how it was configured. I believe
12 it's configured as a very small area on the
13 facility. We know that as it migrated down, it
14 spread out laterally across the facility,
15 representing a much wider area. The modeling
16 terms that were used also apparently do not match
17 what you would normally anticipate in groundwater
18 flow. Some of these issues were pointed out in
19 our brief of February 25th. So EPA does not have
20 any confidence in the results of this modeling
21 and what kind of predictability for impacts to
22 existing wells. In addition, exactly how far
23 this plume would migrate without any control
24 measures is also another major concern.
25 The issue of regarding restoration, I

1 believe, was portrayed in the issue of toxicity
2 and risk. Mr. Harris explained that the toxicity
3 cannot be removed because of residual DNAPL,
4 which is an issue that we addressed in our
5 February 25th brief. That terminology, I think,
6 is misleading. We do have residual DNAPL that is
7 likely present beneath the Sparton facility. The
8 same occurrence is not anticipated off-site. I
9 believe it's referred to as absorbed material
10 onto silts and clays, which Mr. Harris --
11 according to one of the exhibits, he portrayed
12 various percentages, which we had not seen before
13 in that same characterization regarding
14 percentages of the borings and the saturated
15 interval, so we would have to take a closer look
16 to verify that those percentages are actually
17 correct. Again, while the basic material might
18 have been presented in the RFI, it was not
19 presented as percentages.
20 I looked at some of the wells within the
21 plume itself and went back and looked at the
22 descriptions from the boring logs. Take, for
23 example, Wells #61 and #60. According to the
24 descriptions, they consist of fine-to-medium
25 sands, gravels and fine sands. Well #57 consists

1 of fine-to-medium sand; #58 consists of sandy
2 gravel; #54 consists of sandy gravel; #64
3 consists of clay, gravel and fine-to-medium sand;
4 #53 is fine-to-medium sand; #52 is silty,
5 fine-to-median sand, fine-to-course sand. There
6 is one well cluster, #48, #56 and #55 monitoring
7 wells, that varies between gravel, we have
8 fine-to-course sand, and then we have one well
9 that penetrated about 18 feet of sandy clay, but
10 that was the only one. Wells #46 and #47 contain
11 gravel, gravely sand, fine-to-course sand. Where
12 I'm going with this is that based on the
13 descriptions of the boring logs, we do not see
14 that much clay and sand. This is based on the
15 descriptions from the boring logs. So the
16 question of restoration, when we review the
17 material, it appears that it is a feasible option
18 at this site. We recognize that we cannot always
19 accurately predict the exact response of the
20 groundwater extraction system, but based on the
21 information that we have at hand, it does
22 indicate that the geology and the characteristics
23 of the aquifer are suitable for groundwater
24 extraction in removing this material.
25 Also, there is a question on the cost for

1 reinjection and the whole feasibility of
2 reinjection, and as Mr. Pearson has previously
3 indicated, we looked at the options out there,
4 but Sparton has attempted to completely dismiss
5 the idea of reinjection even though we know it is
6 successful in operation at the South Valley
7 Superfund site. We also looked at a site in
8 Region 9 at a facility there, the Air Force
9 Plant 44, I believe was the name of it -- that
10 was also in our brief that we filed on the
11 25th -- where we had successful operation.
12 Basically some of the issues they raised
13 regarding pH adjustment, we had addressed that in
14 our cost estimates. It's the acid feed in the
15 treatment train. They also said that we did not
16 address filtration, and that's actually Filter #1
17 and #2 of the treatment train. They also
18 indicated that we not considered de-airing as far
19 as the water before it's injected. That was also
20 in the Equalization Tank #2. We did not include
21 chlorination in the system on our cost estimates.
22 That's from anticipated low biological oxygen
23 demand of the water. The South Valley problem
24 (sic) had a descalant problem, but it was not a
25 biological problem, so that's why we did not

1 think that chlorination was going to be an issue
2 as far as cost. The bottom line is that we did
3 consider a lot of these issues in our preparation
4 of the schematics and the costs regarding
5 reinjection.
6 Also, there was an issue raised regarding
7 time frames. Mr. Harris indicated that operation
8 of their system at 220 gallons per minute for 30
9 years is shorter than EPA's aggressive approach,
10 and I'm not sure how he came up with that. If
11 you consider the system of extraction with
12 additional wells that are removing additional
13 mass at a rate greater than 200 gallons per
14 minute, it appears to be logical that you would,
15 in fact, remove more mass. Now, any system that
16 would be operating in such a manner would have to
17 be designed so that you do not -- or that you
18 avoid well interferences, that you actually
19 maximize removal and that you're not pulling in
20 tremendous quantities of clean water. Also, the
21 net water loss regarding their discharge to the
22 Calabacillas, the 1% to 3% versus 5% or 6%, I
23 guess their estimates are based on precipitation
24 and the wet sludge itself in the calcium
25 carbonate, but I'm not clear on that.

1 At this point we do not anticipate any
2 production of hazardous waste, especially the
3 quantities that Sparton has estimated from their
4 treatment train, and that was in our original
5 Final Decision document.
6 Also, there was an issue raised regarding
7 characterization. I believe it was portrayed
8 that EPA was going to require 20 wells. EPA
9 included the cost for 20 wells in our Final
10 Decision document because there are areas of the
11 plume itself that are currently undefined. Part
12 of it is due to continued plume migration since
13 the RFI was approved. When you look at this
14 cross-section, it is somewhat misleading. Their
15 cross-section extended along the south boundary
16 of the facility, and they attempted to show that
17 they have control below the plume on these wells,
18 when, in fact, we know that we have the plume in
19 this area as undefined as far as the vertical
20 extent. We also do not know the vertical extent
21 of the plume at this depth in this area here or
22 over here.
23 We know that this well here is now
24 contaminated, so there is some question as far as
25 the vertical depth and the lateral extent.

1 Though it appears to be at low concentrations, it
2 may be near the edge. And this general area up
3 here, based on the potentiometric map that we
4 submitted in our brief, it appears that flow
5 gradient is back in this direction here for the
6 upper flow zone or the top part of the aquifer
7 itself.
8 Now, they do have a well here that extends
9 below the base of the plume at some distance,
10 and, in fact, this is really the only control
11 point that we have off-site that is below the
12 plume. Now, they do have other nondetect wells,
13 these two up here and these two here, but as I
14 mentioned before, they have already lost one of
15 the wells here and it's contaminated. So
16 additional characterization is going to be needed
17 to determine exactly what is the base of the
18 plume. And we want to get a good handle on what
19 the vertical extent of the plume is, so in order
20 that when we design the extraction system, we'll
21 know what the plume size is and how efficient or
22 what kind of design parameters for the extraction
23 system should be incorporated.
24 We've also recommended conducting an aquifer
25 test off-site to verify the aquifer parameters,

1 and this will influence how efficient the wells
2 are and how many wells will be required. Sparton
3 has focused on the design and implementation of
4 one well pumping at 200 gallons per minute, and
5 based on the boring logs that we have from
6 off-site, it indicates the formation is much more
7 transmissive than what we have seen on-site
8 beneath the Sparton facility. And I'll remind
9 you that the distance is approximately a
10 half-mile. And in order to design any kind of
11 efficient system, we should have an aquifer test
12 out there performed to proceed with the design
13 characteristics of the system itself.
14 The technical and practicability issue, they
15 did bring it up in their CMS report. They talked
16 about some of the issues on TI. We addressed
17 those issues. A lot of it goes to the
18 restoration aspect, and based on the previous
19 discussion here, EPA has addressed those issues
20 to show that restoration is a feasible option,
21 and we've rejected the TI -- they've not made a
22 formal TI proposal to EPA, and typically TI
23 proposals are based on extensive
24 characterization, probably much more than what we
25 have here, and, really, the TI guidance says that

1 the TI decision can be made at any point in the
2 decision process; during characterization, during
3 the remedy selection process or even during the
4 remedy implementation phase itself. One of the
5 things they do recommend, though, before you can
6 make a TI decision is to actually see how the
7 system performs. Does it meet the anticipated
8 performance? And in this case all we have is
9 eight wells pumping from roughly the upper ten
10 feet of the aquifer beneath the facility, you
11 know, at a rate of less than a gallon a minute,
12 and we really have no other site characteristics
13 or performance of a system that indicates that it
14 will not meet our expectations. If we look at
15 the South Valley site, which has slightly
16 different geology, so far it has been successful,
17 though it has not been in operation in a great
18 deal of time, so it's premature to conclude that
19 the TI decision at this time is warranted.
20 MR. PEARSON: And now I just have a few
21 brief comments before I conclude our rebuttal. I
22 would like to follow up on what Vince said in
23 regard to the TI. It is provided in the Order
24 that the Respondent can submit a TI demonstration
25 to EPA at any time. And like he mentioned, we

1 have not yet received a real extensive TI
2 demonstration, and we pointed this out in our
3 brief, and we would also like to refer the Court
4 to our comments on their TI proposal in our CMS
5 comments.
6 A couple of other issues I would like to
7 address -- the issue of cost, cost only comes
8 into effect when you basically have like
9 equivalent remedies or assuming both remedies are
10 protective of human health and the environment.
11 And I think as we've shown here that Sparton's
12 proposed remedy, whether it's in the CMS report
13 or their one-well containment system, is not
14 protective of human health and the environment.
15 The City is going to require the assets of that
16 area. They've identified it as a potential well
17 site. The guidance documents in the Subpart S
18 mention you should restore groundwater, a
19 potential source of drinking water, to drinking
20 water status, and therefore that assumes there is
21 a potential risk to human health, and their
22 argument also is that there has to be an actual
23 threat to the environment. You do not have to
24 have an actual threat as Sparton seems to
25 indicate in order to implement corrective

1 action.

2 And finally, I would just like to refer --

3 because of the time constraints here, I would

4 like to refer (sic) the Court that all of these

5 issues should have been addressed in detail in

6 our briefs and in the accompanying affidavit

7 concerning reinjection cost, some of the

8 arguments that they have made concerning

9 reinjection, some of the other cost issues. All

10 of these issues have been addressed in our brief,

11 and I would refer the Court to those documents.

12 That concludes our presentation. Thank you.

13 MR. MALONE: Okay. Before allowing the

14 Respondent to proceed, I have a couple of

15 questions. You said the vertical extent of

16 contamination has not been defined. What about

17 the horizontal extent of the contamination?

18 MR. MALOTT: Well, there are areas in the

19 horizontal, as I mentioned. Well #65, which is

20 on the -- if you look at the plume itself, it's

21 on the western edge. That one is currently

22 contaminated. Also, according to the

23 potentiometric map which shows a water level in

24 the aquifer for the top part, it appears that the

25 flow direction is back in this direction here,

1 and all we have is these two wells which are
2 really across the gradient and not directly in
3 the flow path of the plume itself. We have two
4 wells here, but it's not clear that those wells
5 will actually catch the plume. At some point
6 they will, of course, if the plume continues to
7 migrate in this direction. The preferential flow
8 path may be in this direction here.
9 The other issue is the separation between
10 this well cluster and this one, and Sparton is
11 proposing the installation of a containment well,
12 which is also what we would require under our
13 remedy as well. The design of the system is
14 going to -- the information you're going to need
15 to have is exactly -- or within a fairly good
16 limit of what is the leading edge of the plume
17 right in here so that you can design the system
18 so that it is efficient and you don't pull in a
19 lot of clean water. This distance, I believe,
20 is, you know, 1,200 feet or so, which is a pretty
21 good separation. Also, there's -- this area
22 here, according to the potentiometric map, shows
23 that the flow is back in this direction here. We
24 know that these two wells here, the
25 concentrations have been going up, and the plume

1 would also continue to migrate in this area here.
2 So there are concerns that the plume has not
3 been adequately defined to proceed with the
4 design of an efficient groundwater extraction
5 system. And that's what we're looking for from
6 the data is the appropriate design so we can be
7 sure that it's efficient and effective, and also
8 the requirements of performance monitoring for
9 the system so that we can show that the plume is
10 actually being captured and that we're moving the
11 mass appropriately.
12 MR. MALONE: How successful is the current
13 pump and treat system? We understand that they
14 actually have -- the Respondent has a pump and
15 treat system in place right now.
16 MR. MALOTT: That is correct.
17 MR. MALONE: How successful has that been?
18 I mean, have we had lots of problems with, I
19 guess, the technical and practicability issue, or
20 how is that working?
21 MR. MALOTT: That issue has not been
22 raised. The pump and treat system was designed
23 at the start of the Administrative Order on
24 Consent back in 1988. They designated certain
25 wells for either the conversion to pump and

1 treat, and they really didn't have a good handle
2 on the site characteristics themselves. The
3 wells are sited in kind of a silt and a sand.
4 They pump at a very low rate, you know, less than
5 a gallon a minute. We looked at the
6 characteristics of those wells and how they
7 perform, and based on the characteristics, those
8 wells do not capture the plume which is in the
9 upper ten feet of the aquifer underneath the
10 facility so that we know that we have material
11 migrating off-site that's not captured by those
12 wells, and that document is also in the
13 administrative record. I believe it's dated June
14 20th, 1996, regarding the effectiveness of the
15 recovery system.
16 MR. PEARSON: That document should be in the
17 same area with our CMS comments. I believe it
18 was -- it's an enclosure to our CMS comments.
19 MR. MALOTT: No, it's separate.
20 MR. PEARSON: Oh, it's separate?
21 MR. MALOTT: Separate.
22 MR. PEARSON: Excuse me, it's separate.
23 MR. MALOTT: So in this case you could not
24 use -- or at least I don't see how you could use
25 the characteristics of a system that's pumping

1 at, you know, less than a gallon per minute to
2 make a technical and practicability decision for
3 the remainder of the plume.
4 MR. MALONE: Thank you.
5 You may respond to EPA's rebuttal.
6 MR. HARRIS: Mr. Malone, our target may be
7 moving, but at least we have a target, and the
8 target that they claim is moving has actually
9 represented changes taken by Sparton in response
10 to additional information, and every change we
11 have suggested has been for more involvement at
12 the site rather than less, and based upon our
13 presentation today, we think that we probably are
14 doing more than is actually required by the
15 statute, but we've now had a chance to have EPA
16 file its brief and listen to them this afternoon,
17 and we still don't know what it is EPA is
18 proposing.
19 EPA has said we need to do further study of
20 the plume, and then we need to run an off-site
21 pump test and study those results, and then we
22 need to do some more study in an effort to
23 determine how many containment wells we need, and
24 then maybe we'll run a containment well for a
25 while and decide whether there's any technical

1 impracticability, and then we'll decide whether
2 we want to put in any extraction wells, and then
3 we'll do some more studies and decide whether we
4 have to put in some more wells on-site, and I
5 have --
6 MR. PEARSON: Excuse me. I would like to
7 object. I think this is supposed to be limited
8 to a rebuttal, and I don't think we raised any of
9 those issues concerning what our remedy is in the
10 rebuttal. We talked about technical issues, not
11 about number of wells, so I don't think his
12 comments are appropriate.
13 MR. HARRIS: I thought he was the one that
14 raised the issue about the moving target in
15 comparing that to their own.
16 MR. PEARSON: Okay. I apologize then. I'm
17 sorry.
18 MR. MALONE: Proceed. And I just want the
19 parties to know I'm going to tend to allow
20 information in today. I would more or less
21 prefer to have a fully developed record that
22 clarifies all the issues today, so please
23 proceed.
24 MR. HARRIS: My point is we don't know what
25 EPA is proposing, and that raises one of the

1 concerns that we have addressed in our briefs and
2 they brought out through their statements, and
3 that is that 3008(h) requires that any Order
4 include with reasonable specificity the nature of
5 the required corrective action or other response
6 measure and shall specify a time for compliance.
7 The difficulty is, what we're hearing from EPA
8 is, we don't know exactly what our target is, go
9 out and keep studying it and we'll let you know
10 when you have closed in on our target, but you're
11 not going to have the review procedures that are
12 available to you under 3008(h), we're going to
13 make the decision under the terms of this Order,
14 and if you don't like it, that's just too bad,
15 the procedures for challenging that will be in
16 the Order and they're not going to be the same as
17 we're entitled to under Part 24, and you're just
18 going to have to live with what we say. Well,
19 our point is we've got a very specific proposal,
20 and we want to implement that. If it doesn't
21 work the way that we have suggested it will work,
22 then the agency is free to specify some other
23 procedure and give us an opportunity under Part
24 24 to challenge that. But what they're
25 suggesting is let's not go out and do anything

1 specific right now, let's just go study it for
2 another two to five years, then we'll make a
3 decision under the Order what we think is
4 required and tell you that, at which point we
5 don't think you have any rights under Part 24 to
6 challenge our determinations. And in our view,
7 that violates the requirements of the statute,
8 and we have real difficulties without having a
9 target. And let me try then after that general
10 statement to respond more specifically point by
11 point.
12 With respect to their claim that this water
13 is a potential source, everything you heard from
14 them today is just gross generalizations, and it
15 is part of my frustration with this procedure
16 that I've indicated to you before that they
17 say -- it's sort of like them saying the earth is
18 flat and providing no basis for that, and then I
19 guess I'm supposed to come back and say, no, the
20 earth is round, and we don't ever join issue on
21 that point.
22 With respect to the water being a potential
23 source, they haven't given any particular facts
24 for that. We've shown you that there are no
25 wells there, that there's no likelihood any wells

1 are going to be located there with facts. They
2 haven't rebutted that with any facts. Similar
3 vein, they say the City -- first they started off
4 with saying the City plans to acquire NMU, then
5 they've said, well, the City is going to acquire
6 it, and by the end of the presentation I think
7 the City already owned NMU. The fact of the
8 matter is that is entirely speculative. All we
9 know is that they have said that the City intends
10 to acquire it. Whether they legally can do that
11 has never been demonstrated by any facts. How
12 long it's going to take or what the City is going
13 to have to pay or what the ability of NMU to
14 resist that is, whether there's any likelihood of
15 it happening has never been presented by EPA and
16 for good reason, because our understanding from
17 discussing with local counsel in New Mexico on
18 water law issues is that the likelihood of the
19 City acquiring through condemnation NMU is
20 relatively remote, but the problem is we don't
21 have any way -- I'll tell you that and you have
22 to listen to me and you have to listen to them.
23 Who are you going to believe, them or me? We
24 don't have any facts and we haven't had the
25 opportunity in this proceeding to flesh those

1 out, and I think making a decision where you're
2 asking my client, which is a very small company,
3 to spend 15 to 26 million dollars on the basis of
4 somebody from EPA saying that the City plans to
5 acquire through condemnation New Mexico Utilities
6 is beyond the pale, so to speak. And we'll just
7 submit that we don't think, frankly, from what we
8 understand of the politics of the situation that
9 the NMU condemnation is ever going to go
10 anywhere, but we haven't had a chance to develop
11 those facts in this proceeding.
12 But it's certainly not -- what we can say as
13 of today is that NMU is a separate entity with a
14 separate service area and hasn't been acquired by
15 the City of Albuquerque, and I think your
16 decision has got to be based on the facts that
17 are actually in existence today, not what is
18 going to happen five, ten, fifteen years, if
19 ever. If that were the case, we would never be
20 able to reach any decisions in this particular
21 matter. And, again, they then say, well, there's
22 this well currently permitted, and I guess
23 they're referring to the one well we put on with
24 the green dot that's between the producing well
25 and our facility. Again, NMU says they don't

1 have any near-term interest in developing that
2 well. The information that we have presented to
3 you from Pete Balleau, the hydrologist in
4 Albuquerque, that suggested even if that well
5 were permitted or were produced in conjunction
6 with recharge, that if you had containment here,
7 they could go ahead and do that, was never
8 addressed by EPA.
9 Mr. Malott is correct that I get my
10 upgradient and downgradient confused; that well
11 is downgradient. But, again, it's a depth, and
12 the point that I want to make -- and I think it
13 got a little confused by Mr. Malott -- there's a
14 significant vertical separation between the area
15 that's been impacted and where these wells are
16 producing of probably at least 500 to 1,000
17 feet. Apart from everything else you have heard,
18 there is a vertical separation -- I'm not sure of
19 the exact distance. We can supply that if that's
20 of interest to you. But that vertical separation
21 at this site where the material is moving
22 horizontally 30 times faster than it is
23 vertically suggests that there's little or no
24 likelihood that that material is going to impact
25 on any well that's currently pumping within a

1 couple or few miles of the area that's been
2 impacted.
3 I'm not sure where they were going with
4 their growth estimates being wrong again. We
5 don't have any facts on that. We did supply
6 facts in our submission from various services
7 that have looked at what the growth is going to
8 be, and frankly those show that through the year
9 2010, I believe, that the City of Albuquerque --
10 setting aside New Mexico Utilities, but the City
11 of Albuquerque on the west side through its
12 current wells has enough capacity to provide
13 service for its existing and future population
14 through at least the year 2010. Basically it's
15 my understanding that NMU has sought permission
16 for additional wells to protect itself from
17 incursions from the City of Albuquerque.
18 Obviously it's now interested in trying to
19 contain or acquire in some form. Whether that
20 happens remains to be seen and really has nothing
21 to do with the growth rate out there. But even
22 with those wells, none of them as we've pointed
23 out, except for the one that was already
24 permitted, are in the area that is downgradient
25 of where the impacts are.

1 I wasn't aware that the City had protested
2 Sparton's application to remove 200 gallons per
3 minute from that area. We haven't seen a copy of
4 that. We know that the natural resources trustee
5 has. But, again, it brings back the point that
6 we're trying to get something done out there, and
7 all we hear from EPA is you've got to study it
8 more, and when we try and get something done,
9 people will protest our ability to try and move
10 forward with the very specific target that we
11 have in place of what we're willing to do.
12 Again, I don't know what to say about
13 whether the water quality is poor or not. Mr.
14 Balleau says that it's poor and shouldn't be
15 used. Mr. Gaume seems to suggest it might be
16 used anyway. We don't have the ability to talk
17 to either of those people to find out the basis
18 for their conclusions, although I will say Mr.
19 Balleau pointed out specific parameters that
20 indicated bad quality water. I mean, at least he
21 provided some facts. He pointed out some
22 hardness and some nitrates and some other numbers
23 that are at or above secondary water standards.
24 Mr. Gaume tends -- at least as I understand it,
25 the affidavit suggests, well, apparently we've

1 got to be concerned about the solvent in the
2 groundwater above standards, but we shouldn't be
3 so concerned about the nitrates and the
4 conductants and hardness being above these other
5 standards, so some standards are important but
6 other standards aren't. Mr. Balleau is simply
7 making the point that the quality of the water
8 that's been impacted is not as good as the
9 quality of the groundwater in other areas that is
10 being produced and would make this the least
11 likely source to be used for drinking water
12 purposes, and nobody from EPA or the City has
13 refuted that fact in this particular proceeding.
14 You know, the guidance on corrective action that
15 Mr. Pearson read from, again, both of them are
16 proposed regulations. The 1990 regulations were
17 proposed, never adopted. The 1996 regulations
18 were an advanced notice of rulemaking. I'm not
19 entirely sure what -- to what extent they are
20 controlling on the agency in any way, shape or
21 form. They do give some indication that the
22 agency is thinking on certain points, and I would
23 submit that the '96 advanced notice of proposed
24 rulemaking is very much consistent with what we
25 have proposed. It's much more consistent with

1 what we have proposed than with what Region 6 has
2 proposed.
3 The impact to the environment argument is
4 interesting. EPA has recently proposed some
5 ecological risk rules that make it very clear
6 that the agency internally considers the term
7 environment in 3008(h) not to be some natural
8 resource. The act doesn't say protection of
9 human health and natural resources, it says
10 protection of human health and the environment,
11 and the way the agency is interpreting the
12 environment is to be an ecological receptor.
13 It's basically some nonhuman, animate object that
14 is going to be impacted by the material in the
15 groundwater, and the fact of the matter is there
16 are no facts in this proceeding to suggest that
17 any nonhuman, animate object is impacted in any
18 way, shape or form by the solvents that are in
19 the groundwater at the Sparton facility. This
20 water is not flowing towards a river. It doesn't
21 come out and hit any anything else at the
22 surface. The only way you can come in contact
23 with this water is to drill, what, 200 feet --
24 either drill or dig down 200 feet before you get
25 there, and there's nothing in the record to

1 suggest that anybody is currently being impacted,
2 nor are there any facts, frankly, in the record
3 to suggest that there is even a potential. I've
4 been waiting all day to hear the facts rather
5 than a conclusion about potential impacts, and I
6 haven't heard any.
7 We agree, and have agreed now based on more
8 recent data, although initially Sparton was of
9 the view about a year-and-a-half or so ago that
10 the plume was not moving, but on the basis of
11 additional analysis, we're now of the view that
12 the plume is moving at about 100 feet per year,
13 and we're not surprised that the one well that
14 Mr. Malott pointed out is showing some hits at
15 this point. That's consistent with what we think
16 the plume is now doing. If this proceeding
17 continues at its current pace, other wells are
18 also going to be impacted. That's why we want to
19 go out and do something now as opposed to
20 studying the situation. Under EPA's scenario,
21 we're not talking about 30 years, we're talking
22 about two to five years to study it when the
23 plume is going to be continuing to move. If
24 fact, if we follow EPA's approach, we'll never
25 get done. After two years it will move,

1 apparently we have to study it again, if it's
2 moved another bit in those two years, we've got
3 to go back and study it again, and we're going to
4 be studying this thing for 30 years because it's
5 going to keep moving, and every time it moves,
6 apparently Mr. Malott's view is we've got to go
7 back out and recharacterize where the plume is
8 before we can do anything. You know, my reaction
9 to that without being too glib is I'm just glad
10 Mr. Malott wasn't designing the additions to my
11 house because we would still be waiting for the
12 plans to be completed before we could even begin
13 building.
14 Our point is that we have appropriate
15 characterization. We have as much
16 characterization today as we did in 1991 when EPA
17 approved the plume description, and we have more
18 than enough description now in order to move
19 forward with some off-site testing. And I would
20 also point out that we had a meeting in Santa Fe
21 back in September when we discussed this issue,
22 and at that time EPA was of the position, along
23 with the State and the City, that if we put in
24 one additional monitor well, that would be
25 sufficient as far as they were concerned to

1 characterize the plume. And at this point it's
2 gone into hibernation at this time. We think --
3 and Mr. Chandler's declarations and those of
4 other people here have suggested that we have
5 more than enough information to move forward and
6 at least install the well, run the pump test, and
7 from that confirm the aquifer characteristics,
8 confirm the capture zone and move forward. The
9 only thing that's holding us up is being able to
10 discharge that water in a cost-effective fashion,
11 and for that we are simply waiting on EPA to
12 issue us an NPDES permit.
13 I'm going to let Mr. Chandler speak for just
14 a minute to the modeling. I would note, however,
15 that at least we've done some modeling. EPA,
16 again, has no facts in the record that show there
17 are going to be any impacts to that well. The
18 fact that Mr. Malott thinks it's going to be so
19 doesn't make it so, and his generalization that
20 this is going to happen doesn't help us if we
21 don't know the basis and he has some fundamental
22 facts to support that conclusion, and he doesn't
23 have any. They don't have a model that they have
24 projected to show that what we've done is wrong.
25 All they can do is snipe at the model that we

1 have provided.

2 Ard, Mr. Chandler, if you could talk for

3 just a few minutes about what the model was

4 designed to do and address Mr. Malott's concerns

5 about its accuracy.

6 MR. MALONE: I have a couple of questions I

7 would like to pose first.

8 MR. HARRIS: Sure.

9 MR. MALONE: So if I understand you

10 correctly, the vertical and the horizontal extent

11 of the contamination is somewhat defined, but not

12 completely defined?

13 MR. HARRIS: We believe it's -- if I could,

14 Mr. Malone, let me refer back to -- if I can find

15 it here -- the '96 data. What is interesting --

16 what we're saying here is that these wells with

17 the squiggly lines around them represent

18 situations where we have found the concentration

19 to be below the drinking water limit. And so we

20 think from a horizontal standpoint -- I mean,

21 what Mr. Malott is suggesting is that somehow the

22 plume will act strangely and will shoot out this

23 way between MW-57 and MW-60 or will shoot out

24 strangely between MW-68 and MW-65, and therefore

25 the plumes all the way down here have snuck by

1 these monitor wells. Well, under his scenario, I
2 guess we'll never get there because we keep
3 putting wells in. We'll put a well between these
4 two. Well, how do we know it doesn't shoot out
5 between those two? Well, we'll put another well.
6 How do we know it doesn't shoot out between
7 those? Pretty soon we've got 15 wells in there,
8 and, you know, the point is, well, Mr. Malott,
9 we've now got two feet of separation between the
10 wells. Is that too much? Do we need to put
11 another well in? When is enough enough? And
12 what Mr. Chandler has said in his declaration is
13 he's been doing this work
14 for -- what --
15 MR. CHANDLER: Twenty years.
16 MR. HARRIS: -- 20 years, teaches courses in
17 it and is saying, you don't see in this sort
18 of -- and we also have well-defined subsurface
19 geology -- the plume just ain't going to sneak
20 out that way. And most people in the field would
21 recognize that, that at some point you have got
22 to call it quits. And what we're saying is that
23 there is adequate description here based upon the
24 subsurface geology in these wells to know that
25 we've got a horizontal description. We think

1 it's there.

2 From a vertical standpoint, take a look

3 here. For instance, if you take a look at this

4 cross-section down at the bottom, which is A-A,

5 which runs down sort of through the center of the

6 plume, we have wells down here at the facility

7 and wells on the front end. This is what was

8 referred to as the keel. Again, what Mr. Malott

9 is suggesting is that somehow the plume does

10 something funny in between Well #40 here and Well

11 #48, that instead of just following this line, it

12 somehow drops down to the center of the earth and

13 comes back up. It just doesn't happen that way

14 once you know what the subsurface geology is.

15 You have got to exercise some judgment here.

16 Otherwise, we would be putting in a well every

17 five feet.

18 There was one area where we agreed that it

19 might be worthwhile to confirm what we thought

20 the plume was doing, and that was on

21 Cross-section D-D prime, and that's depicted in

22 here by a dotted line. Mr. Chandler put that

23 dotted line in to indicate that he didn't feel

24 real comfortable that that's where the bottom of

25 the plume was in the vertical direction. We

1 think that's where it is.
2 We would be willing to go forward with our
3 remedy without having to drop another well there,
4 but simply for purposes of confirming and putting
5 the agency at ease, we're were willing to put in
6 one additional well there, and that was the
7 subject of the discussion in September in Santa
8 Fe, and we left that meeting with the
9 understanding that all parties were willing to
10 allow us to go forward to put that well in there
11 and to move forward with some other testing that
12 was required.
13 So except for that one instance, we are
14 satisfied that the current well structure
15 adequately defines the plume both vertically and
16 horizontally, and if EPA would follow the same
17 criteria it used in '91, it would be satisfied,
18 but they've changed apparently the rules of the
19 game on us in '96.
20 MR. MALONE: I have one more question for
21 you. It seems like Sparton and the EPA agrees on
22 certain aspects of a remedy. If you could just
23 put it in a nutshell, what do you think EPA and
24 Sparton agree on?
25 MR. HARRIS: EPA and Sparton agree that soil

1 vapor extraction needs to be done on-site. EPA
2 and Sparton agree that on-site groundwater
3 containment needs to be enhanced. They disagree
4 at this point on how much enhancement is
5 required. Sparton's position is, let us do some
6 enhancement, reevaluate. EPA's position, at
7 least as I understand it, is, no, study it
8 further, then put in some more wells and then see
9 where we are. EPA and Sparton agree that
10 off-site containment is appropriate.
11 MR. MALONE: What about the extent of
12 off-site containment?
13 MR. HARRIS: There are two aspects to that,
14 Mr. Malone. When I say off-site containment, I'm
15 talking about putting a well at the leading edge
16 of the plume to prevent that from moving
17 forward. Where we dis -- I'm not even sure we
18 disagree on the extent. EPA believes that it may
19 be one to three wells. We think, based on all
20 the analysis we've done, that one well will do
21 it, but we have not foreclosed the possibility
22 that we could be wrong. And what we have said in
23 our submissions is, we want to put in the one
24 well, if it works, it works, if it doesn't, allow
25 us to continue with the one well while we

1 determine what else needs to be done. If I
2 understand EPA's position, they want us to study,
3 come to a conclusion whether it's one well or
4 three wells before we actually implement the
5 containment.
6 Where we disagree significantly is on
7 whether anything more than off-site containment
8 is necessary. EPA wants to undertake a series of
9 wells -- or wants us to install a series of wells
10 in the interior of the plume in an effort to
11 restore the aquifer, in their view, more quickly
12 than if we put in a one-well containment or
13 two-well containment system, whatever it is. Our
14 opposition to that is based on our belief that
15 the conditions of that aquifer and the nature of
16 the material there will prevent any effective
17 restoration in a reasonable period of time and
18 that, in fact, more aggressive pumping has a
19 bunch of detriments associated with it. First,
20 it pulls out a tremendous amount of water from
21 the system. Secondly -- and Mr. Chandler speaks
22 to this in his declaration -- if you don't run it
23 very precisely, you can overstress the system,
24 and that could actually cause you to remove less
25 material than if you ran it more slowly, and in

1 our view, it's going to be throwing good money
2 after bad.
3 The last area that I guess we agree on is
4 that we've got to do something with the water
5 that we recover. And I'm not sure we disagree on
6 where it should go, because if I understand EPA's
7 position, they haven't made a final decision on
8 what to do with that water, if I understand Mr.
9 Pearson's statements, that they have not ruled
10 out discharge to the arroyo, nor have we ruled
11 out other options. It's just at this point
12 discharge to the arroyo is to us the most
13 cost-effective and most environmentally friendly
14 and best from a water conservation standpoint and
15 therefore is also one that my client can afford
16 and doesn't have to tinker with, as I think -- as
17 we went through. And so that's why we've
18 indicated some frustration with -- at least we've
19 got a target, and we're still waiting for EPA's
20 target because it seems to be based more on
21 studying the situation.
22 But I think that fairly -- I mean, one way
23 to look at it is we're not very far apart, but to
24 say that, one has to assume that it's not very --
25 that this issue of interior wells and where you

1 go with the water -- how important those
2 particular issues are. They're obviously
3 important to my client from a cost standpoint,
4 and their point in this proceeding has -- what
5 we've attempted to convey to you is we think that
6 what we have proposed does everything that EPA's
7 remedy would do at a much lower cost and that one
8 could afford, one that is necessary as that term
9 is defined in the statute, and one that meets all
10 of the criteria. And if you have two -- my
11 understanding of EPA's policy is if you have two
12 remedies, both of which meet all of the criteria
13 and one is cheaper than the other, then you
14 should go with the cheaper one, especially in
15 this case where we view ourselves from an
16 implementability standpoint and long-term
17 effectiveness being more effective than what EPA
18 has proposed, because ultimately discharge to the
19 arroyo is easier to deal with and handle than
20 reinjection is. The other point is that the
21 fewer wells you have, the less intrusion you have
22 in the community and the less likelihood you have
23 of somebody bumping into one. It just becomes
24 much simpler and you just have less risk down the
25 road, and we think it accomplishes exactly the

1 same result.

2 MR. MALONE: Thank you.

3 MR. HARRIS: And I think we were talking a

4 little bit about modeling, so Mr. Chandler is

5 going to talk about that for a second.

6 MR. CHANDLER: Sure. Thanks. First off,

7 Mr. Malott questioned the use of the model code.

8 The model code that we used was a PC-executable

9 version of what was originally a FORTRAN model to

10 be run on a mainframe computer that the

11 Department of Energy had developed at Oakridge

12 National Laboratory. It's called Analytical

13 Transit 123-D, or we call it AT-123-D. There are

14 a variety of PC versions of AT-123-D around. We

15 had used one that Harding Lawson had developed

16 years ago. A gentleman named Eric Laplim

17 (spelled phonetically) had provided this.

18 It's -- the only difference between it and the

19 mainframe version is -- like I said, it is

20 compatible with a PC. It was configured to run

21 on a personal computer, not on the mainframe.

22 The input and output form is almost identical to

23 the mainframe version.

24 With respect to the actual model, the

25 purpose of the model, as stated both in the CMS

1 where it was first included and in subsequent
2 responses to it, as we indicated, it was an
3 attempt to be a simulation to try and show
4 general plume movement characteristics. We
5 recognize that because of the complex subsurface
6 conditions, that to try to come up with an exact
7 model is somewhat problematical.
8 Secondly, there's some misinformation
9 regarding the length of time that a release
10 occurred, what the quantity of release was. What
11 we tried to do is make a best judgment case of
12 what a realistic time frame for a release was,
13 what an average concentration was for that
14 release. In two cases -- we looked first at a
15 continual release where the release is ongoing
16 for an extended period of years. That's the
17 continual sources model that you saw in the
18 exhibit. We also looked at a source that was
19 interrupted after 20 years which we thought might
20 represent the -- a closure of the facilities on
21 the site that occurred in the mid-1980s. There
22 was approximately a 20-year window that releases
23 could have occurred. The attempt was to show the
24 movement of the leading edge of the plume more or
25 less to give some indication of how rapidly or in

1 what time frame contamination might reach the New
2 Mexico Utilities Well #1 on a very simplistic
3 basis.
4 There are two things that are very obvious.
5 If you look at the exhibits, even on a continual
6 release which was modeled, the plume achieves --
7 at some distance achieves a more or less
8 equilibrium-type configuration with respect to
9 higher concentrations. Again, though, we were
10 interested in looking more at the leading edge of
11 the plume as it extends out. In the interrupted
12 source model, we were also looking at the idea of
13 a slug detaching and moving away from the source
14 area and moving out toward the New Mexico
15 Utilities well, which the model showed. There is
16 analytical data that we've obtained from our
17 continuing sampling to date -- we indicate that
18 that's exactly what is occurring. Again, I think
19 we're in agreement in that Mr. Malott has pointed
20 out that the model is very simplistic. I think
21 we would agree. I think we pointed that out.
22 (Mr. Chandler and Mr. Harris confer.)
23 MR. CHANDLER: Yeah, there was a question
24 made that we didn't simulate enough mass with the
25 release. That could be a valid observation. It

1 would be -- if you doubled the amount of mass
2 that was released, then you would expect to see a
3 corresponding increase in the concentrations, but
4 you wouldn't expect to see it change in the time
5 that it took to reach out. Again, we're making a
6 lot of assumptions here, too, that the New Mexico
7 Utilities well will be there for 100 years or 200
8 years, and that's probably not a realistic
9 assumption either. A model is no more realistic
10 than you can make it, and there's a lot of
11 constraints; time and money is one. Sparton
12 spent a lot of money previously back in the
13 mid-eighties modeling -- this site has been
14 modeled twice, to my knowledge. I believe EPA
15 modeled it once before, and Sparton modeled it
16 once before with disparate results in both
17 occasions. What we believed is that we had a
18 history from like the mid-1980s to, oh, 1991 --
19 we had a history of how the plume had moved, and
20 what we tried to do was come up with a model that
21 more or less matched the plume footprint, if you
22 will, and then we used that matching the plume
23 footprint to try to use a model that was
24 calibrated only to that footprint to try to
25 predict the future movement of that plume,

1 nothing more, nothing less.
2 MR. HARRIS: Apart from the model, the other
3 issue that was raised was the distance residual
4 DNAPL by Mr. Malott. He says that it's not
5 anticipated. He doesn't provide any factual
6 basis, nor is there anything in the record to
7 suggest how EPA Region 6 has reached that
8 conclusion. What we have submitted is the fact
9 that at sites across the country -- and we give
10 examples of it -- where there are silts and clays
11 present that the solvents in the dissolve phase
12 will, as I use my very nontechnical term, glom
13 onto these silts and clays and make remediation
14 more difficult. Again, we've got facts, and the
15 facts are site studies from the National Research
16 Counsel and EPA's own documents that show this
17 phenomenon occurring, and there are no facts,
18 again, that Region 6 has put in the record to
19 suggest that condition does not exist at this
20 site. If it does exist, then it is going to
21 impede and prevent quite probably restoration as
22 EPA has defined it.
23 I'm also somewhat amazed that EPA says that
24 they have never looked at the composition of
25 silts and clays, that this is the first time they

1 have ever thought about this particular problem
2 and don't know whether what we've put up is
3 accurate or not. It seems to me that if one is
4 attempting to analyze what is an appropriate
5 response, that you would want to have taken a
6 look at the composition of silts and clays to
7 begin with, and we have provided data that's
8 going to be taken from the logs, so it's very
9 easy to take a look at those and compare what
10 we've said to what is actually in the logs.
11 Apparently EPA hasn't done that yet.
12 With respect to -- and I guess they
13 apparently agree that if our percentages are
14 right on there, that there are significant
15 problems associated with the removal of this
16 material. There are no facts in the record and
17 they haven't said anything today to suggest that
18 if our percentages are correct, that what we have
19 said is accurate, and that is that there's going
20 to be a real difficulty in trying to restore this
21 plume to levels below MCLs.
22 With respect to the cost of reinjection, we
23 haven't sought to dismiss that possibility out of
24 hand, but we've taken it on from a factual
25 standpoint and attempted to identify all of the

1 problems that are associated with it and all of
2 the costs that are associated with it. I find it
3 interesting that they've given us two sites, one
4 in South Valley and another in Arizona where
5 reinjection has been successful. We point out
6 why we don't think it's been that successful and
7 why the geology is different certainly between
8 those two sites. But I would point -- I would
9 remind you that we had asked for discovery on
10 this particular point for this very reason. We
11 think that there are literally tens, if not
12 hundreds, of sites out there in Region 6 where
13 there have been difficulties with reinjection of
14 the type we've pointed out, that there's a track
15 record that shows that technically it's very
16 difficult and it's very expensive, and we've got
17 an option here that avoids those technical
18 difficulties and avoids those costs and achieves
19 all of the objectives that EPA would otherwise
20 wasn't.
21 I'm personally familiar with one site in
22 Texas where the agency decided on its own to do
23 reinjection. The site worked for, I think, maybe
24 two months, and then had to be shut down for over
25 two years because the reinjection wells got

1 immediately clogged. And that's just one
2 example. I think there are others. And that's
3 why we wanted to get into that discovery, was to
4 be able to establish for you that when we make
5 these conclusions, it's based upon the experience
6 that the agency has said for them not to share
7 that and take that into account of their
8 institutional expertise here, which I think is
9 inappropriate.
10 We disagree -- again, we disagree with the
11 way they've characterized what their numbers were
12 and the way they've characterized the South
13 Valley site, but, again -- and I know I'm beating
14 a dead horse here, but I want to make sure the
15 record is clear -- this is, again, an example of
16 a situation where if we had an opportunity to
17 undertake some discovery, if we had an
18 opportunity to do depositions or direct or
19 cross-examination, we could much more easily get
20 to the bottom of those disputes. This format
21 just doesn't allow us to do that.
22 EPA apparently has not looked at the net
23 water loss problem that we have raised. There's
24 nothing in the administrative record here that
25 suggests they ever considered the fact that

1 through reinjection you're going to lose more
2 water than if you go to the Calabacillas Arroyo.
3 Mr. Malott was not disagreeing with our numbers,
4 and there's nothing I'm aware of in the
5 administrative record that suggests that our
6 percentage reduction is any way disputed by the
7 agency. Apparently the agency hasn't looked at
8 production of hazardous waste and how that
9 compares between the two alternatives.
10 If I understood their comments on technical
11 impracticality, they've suggested that they need
12 more information but have never told us what that
13 additional information is and have never said
14 that if we have insufficient information, why it
15 is insufficient. We've pointed out where we
16 satisfy all the factors, and Mr. Chandler's
17 declaration, I think, clearly establishes the
18 conditions that show, in our view, to be
19 technically impracticable. And our point, Mr.
20 Malone, is that if we put in the containment
21 well, we'll be able to run that and, in our view,
22 demonstrate all of those concerns in the field.
23 If they don't demonstrate it, then EPA can say,
24 fine, you haven't demonstrated that, now we can
25 ask for more. EPA, if I understand it, they want

1 us to study it, then based on that study put in a
2 bunch of wells, and then if the wells don't work
3 after we've spent significant capital costs, then
4 we can apparently shut them down after we've kind
5 of covered the area in wells and pipes and
6 everything else. We think, again, perhaps we're
7 doing it a little bit backwards there.
8 With respect to the current pump and treat
9 system, I'm not sure Mr. Malott really answered
10 your question. I thought it went to how has it
11 removed material from the site. It has removed
12 some material, but it hasn't come close to
13 achieving MCLs and, I think for all the reasons
14 that we believe exist at this site, make it
15 technically impracticable.
16 Mr. Malott complained about the size of the
17 system or its rate, but it is, in our view,
18 effectively capturing. One of our consultants,
19 Battelle Institute in Ohio, took a look at our
20 on-site system, and the information was shared
21 with EPA and NMED and concluded the on-site
22 system is effectively capturing the contaminants
23 on-site. It is a relatively slow system, but for
24 that type of geology, we think it is appropriate.
25 It is removing the VOCs, but it's been in

1 operation for eight years, and consistent with
2 what Mr. Chandler has concluded, I don't think we
3 are ever going to get to MCLs in anybody in this
4 room's lifetime at any rate, nor would we be able
5 to do so even if we increased it. The
6 enhancement we were talking about was simply to
7 have wells with a greater degree of coverage for
8 the purpose of confirming that what we're doing
9 out there is actually taking place. It was
10 something that we could do to address a concern
11 EPA had even though we didn't have that
12 particular concern, but one we were willing to
13 do.
14 I believe that covers all of the points that
15 I had wanted to address. And, again, we believe
16 that we have shown that under 3008(h), which
17 requires that you identify the threat and explain
18 why it's necessary, that we have addressed what
19 we perceive to be a threat which is really lack
20 of a threat, but notwithstanding that, that what
21 we have proposed would be more than necessary to
22 address any current or potential -- potential
23 being in the future -- threat that might exist at
24 that location. We disagree obviously with EPA's
25 view that anytime the evidence exceeds the MCLs,

1 there's a potential threat. The case they cite
2 doesn't stand for that proposition. There's a
3 footnote with one line of dicta that doesn't
4 stand for the proposition that they suggest.
5 Under their view, I guess, apparently if we had
6 some contamination out in the middle of the
7 desert and nobody lived within 1,000 miles of it,
8 we would still be obligated to go in and clean
9 that up. Perhaps there are reasons for doing
10 that, but it's difficult to say in that situation
11 that it's necessary to do that cleanup in order
12 to protect human health or the environment, and,
13 again, environment defined in terms of what
14 environmental receptors out there are impacted by
15 the presence of that material in the groundwater.
16 But we would ask -- I think we've asked for
17 a couple of things. I would ask, one, that the
18 Order be dismissed, but in the absence of the
19 Order being dismissed, that it be modified to
20 specify the type of remediation that we have
21 specifically proposed, recognizing that such a
22 specification does not in any way limit EPA from
23 taking action in the future if what is specified
24 in the Order turns out to be not sufficient to
25 protect human health and the environment, and we

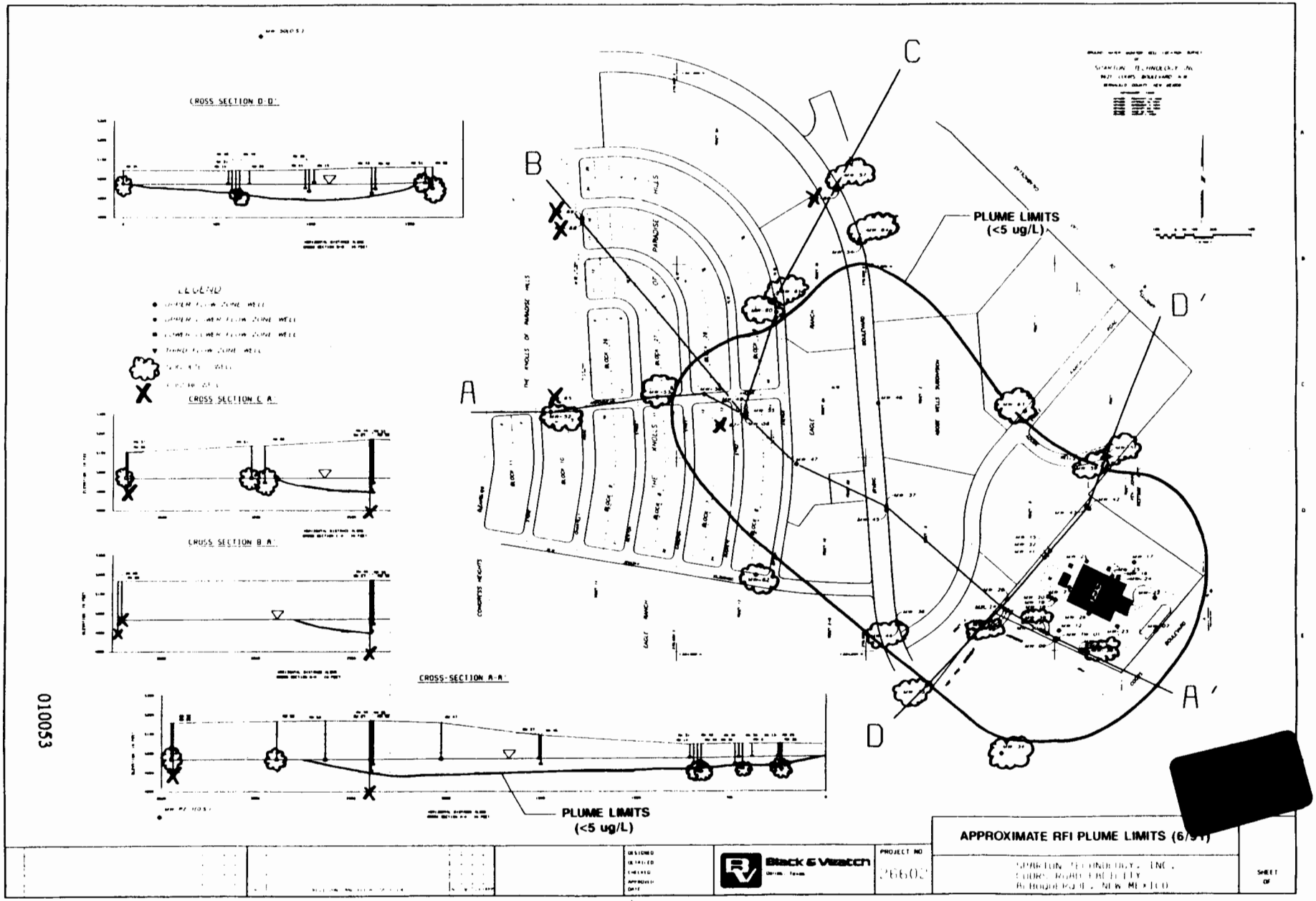
1 think what we have proposed is consistent with
2 what Congress intended under Section 3008(h) and
3 would ask you to so adopt.
4 MR. MALONE: Thank you for your comments.
5 Before concluding this hearing, I just want to
6 inform everyone as to what happens after today.
7 After receiving a transcript, which, you know,
8 there may be some comments on it. I know -- I've
9 talked to the court reporter, and she said, you
10 know, I'm going to be talking to you about this,
11 and I just told her to fax me a list of the
12 questions that she has. So I will respond to her
13 comments and her questions, and we can get that
14 finalized. And if there's something that I need
15 clarification on, what I will do is give both of
16 the parties a call and say, look, guys, I need
17 some help on this.
18 But after the transcript is complete, I will
19 review the transcript and I will review all the
20 information that has been made part of this 40
21 C.F.R. Part 24 proceeding and write a recommended
22 decision. After writing that recommended
23 decision, it will be issued to both parties. It
24 will also be issued to the Regional
25 Administrator. Upon receipt by both parties, you

1 have a 21-day window to draft comments. After
2 you have drafted your comments and the Regional
3 Administrator has reviewed my decision, she will
4 make a final decision once again after reviewing
5 your comments.
6 I want to thank both parties for their
7 participation today. I thought the presentations
8 were certainly enlightening, and I look forward
9 to getting a final transcript back. And unless
10 there are any further questions or things that
11 you want to clarify, we can conclude the
12 proceeding, but it seems like Mr. Pearson has a
13 question, so --
14 MR. PEARSON: Just a couple of minor things.
15 In regard to service of the recommended decision,
16 since it's 21 days for date of service and I
17 usually get mine before Jim's and, in essence,
18 mine will probably be filed before his is filed,
19 I would just like the Court not to allow any
20 advantages, to somehow ensure that we get service
21 at the same time, whether that means I have to
22 wait a few days, you know, so -- or hand-deliver
23 it to both of us or however it works, but I would
24 like you to take that into consideration. I
25 don't want to get any advantage, but I don't want

1 to have the possibility of my brief sitting
2 there, them coming over and looking at it and
3 then making modifications. That's the only
4 thing.
5 And one last item. You have mentioned
6 before about whether we would want to respond to
7 some of the exhibits. I would just ask that --
8 we are not sure at this time whether there's any
9 need to, and we would like to get back to you in
10 a few days on whether there's any need to, and at
11 that time then the Court can make any decision as
12 to whether he allows Mr. Harris to respond to
13 what we submit, briefing times, that sort of
14 thing. We just need a few days to look at the
15 exhibits, and I would want something like maybe
16 possibly a week from Friday.
17 MR. MALONE: So you would like April 4th to
18 be --
19 MR. PEARSON: Yes. And that would just be
20 to let the Court know whether we have -- we would
21 like to respond to any of the exhibits.
22 MR. MALONE: Okay.
23 MR. PEARSON: We may or may not. We just --
24 MR. MALONE: If there are no objections from
25 the Respondent, April 4th seems like that would

1 be a reasonable date to allow the EPA to perform
2 the tribune of whether or not it would like to
3 address the exhibits submitted by the
4 Respondents.
5 MR. HARRIS: I don't want -- we may object
6 to their ability to file anything else, but I
7 don't have any objection giving them until April
8 4th to make that decision. Obviously if they
9 don't want to do anything, it moots my need to
10 make any further comment to the Presiding
11 Officer.
12 MR. MALONE: With respect to service of the
13 recommended decision, Mr. Harris, if you would
14 like to have someone, a courier come over to the
15 agency the day that it's issued --
16 MR. HARRIS: Yeah, if somebody lets me know,
17 I would be happy to do that.
18 MR. MALONE: Okay. Well, that's what I will
19 do. I will make that commitment. The day that
20 the recommended decision is filed, I will make
21 sure to give your office a call and you can have
22 someone to come over and pick it up.
23 MR. HARRIS: Okay.
24 MR. MALONE: Well, thank you, gentlemen.
(End of Proceedings.)
25

1 STATE OF TEXAS *
2 COUNTY OF DALLAS *
3 I, Susan Boudin, Certified Shorthand Reporter in and
4 for the State of Texas, do hereby certify that the above
5 contains a true and correct transcription of all
6 proceedings which occurred at the EPA Hearing and were
7 reported by me.
8 I further certify that the transcription of the
9 proceedings truly and correctly reflects the exhibits, if
10 any, offered by the respective parties.
11 I further certify that I am neither attorney for nor
12 counsel for nor related to nor employed by any of the
13 parties to which this Hearing is taken and further that I
14 am not a relative or employee of any attorney or counsel
15 employed by the parties hereto or financially interested in
16 the action.
17 GIVEN UNDER MY HAND AND SEAL OF OFFICE on this the
18 15th day of April, 1997.
19 Susan Boudin
20 SUSAN E. BOUDIN, CSR #4185
Certified Shorthand Reporter
In and for the State of Texas
21 QUICK TRANSCRIPTS OF DALLAS
(972) 442-4161
22 310 Woodhollow
Wylie, Texas 75098
23 My Commission expires: 12/31/97
24
25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OF

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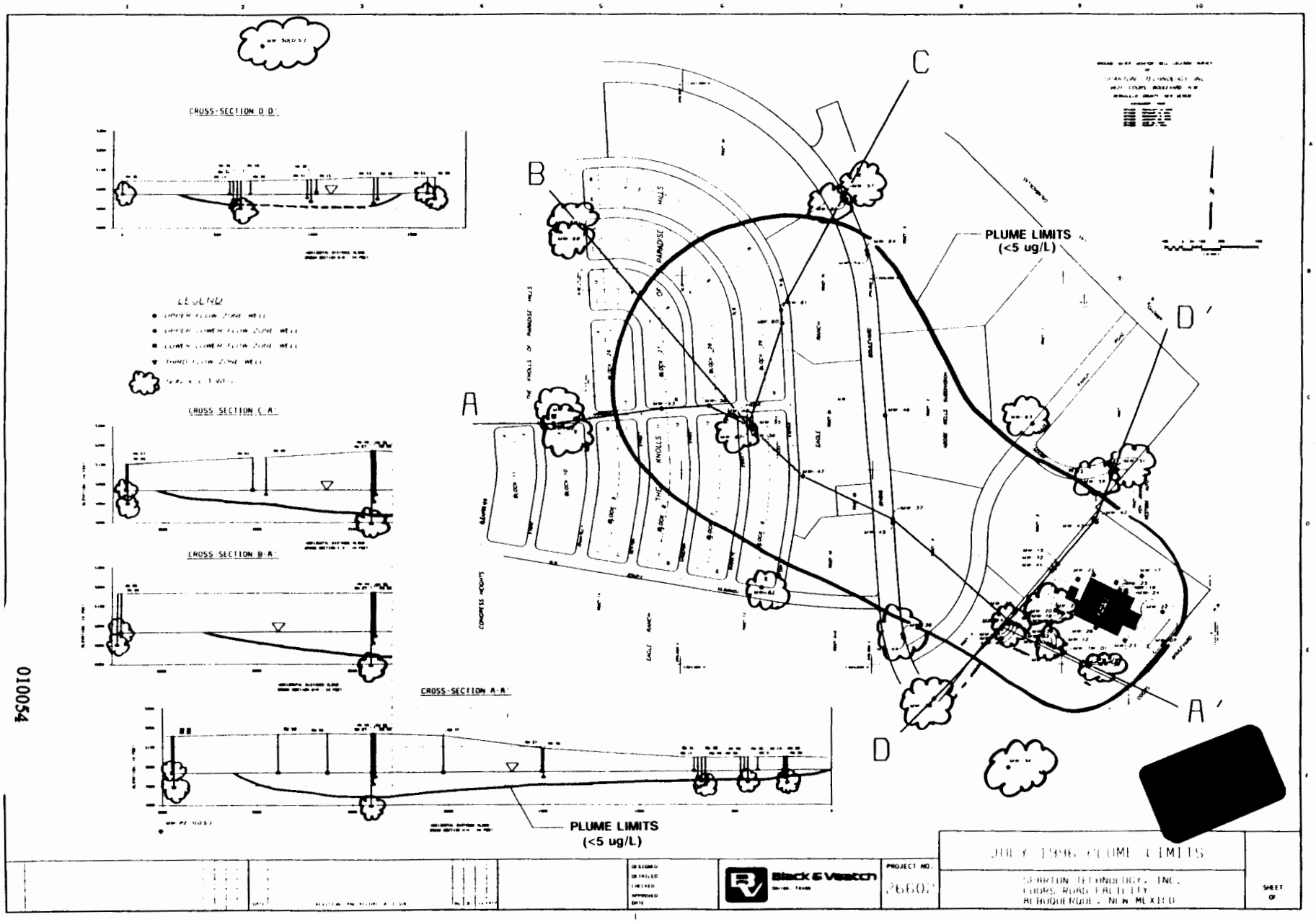
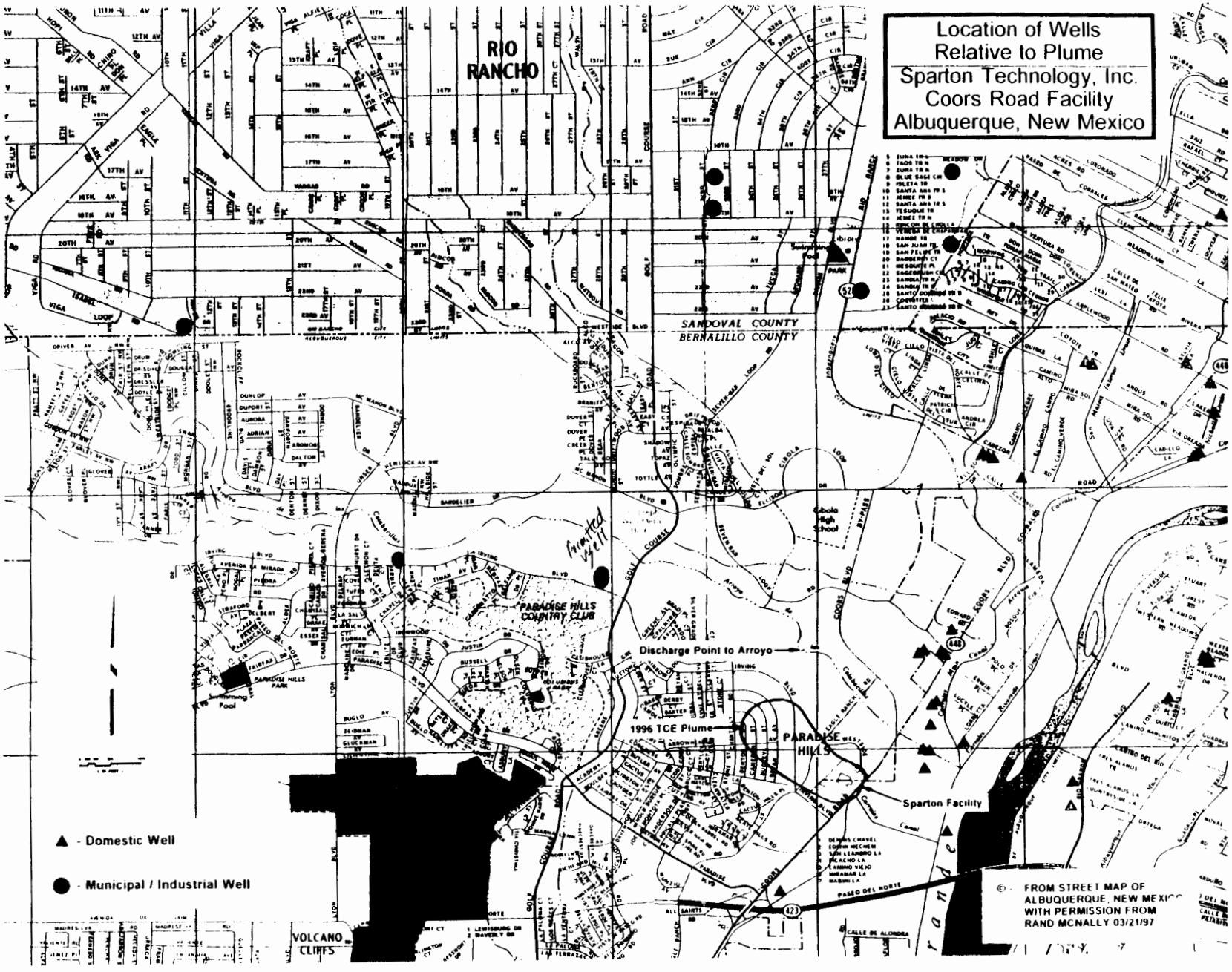
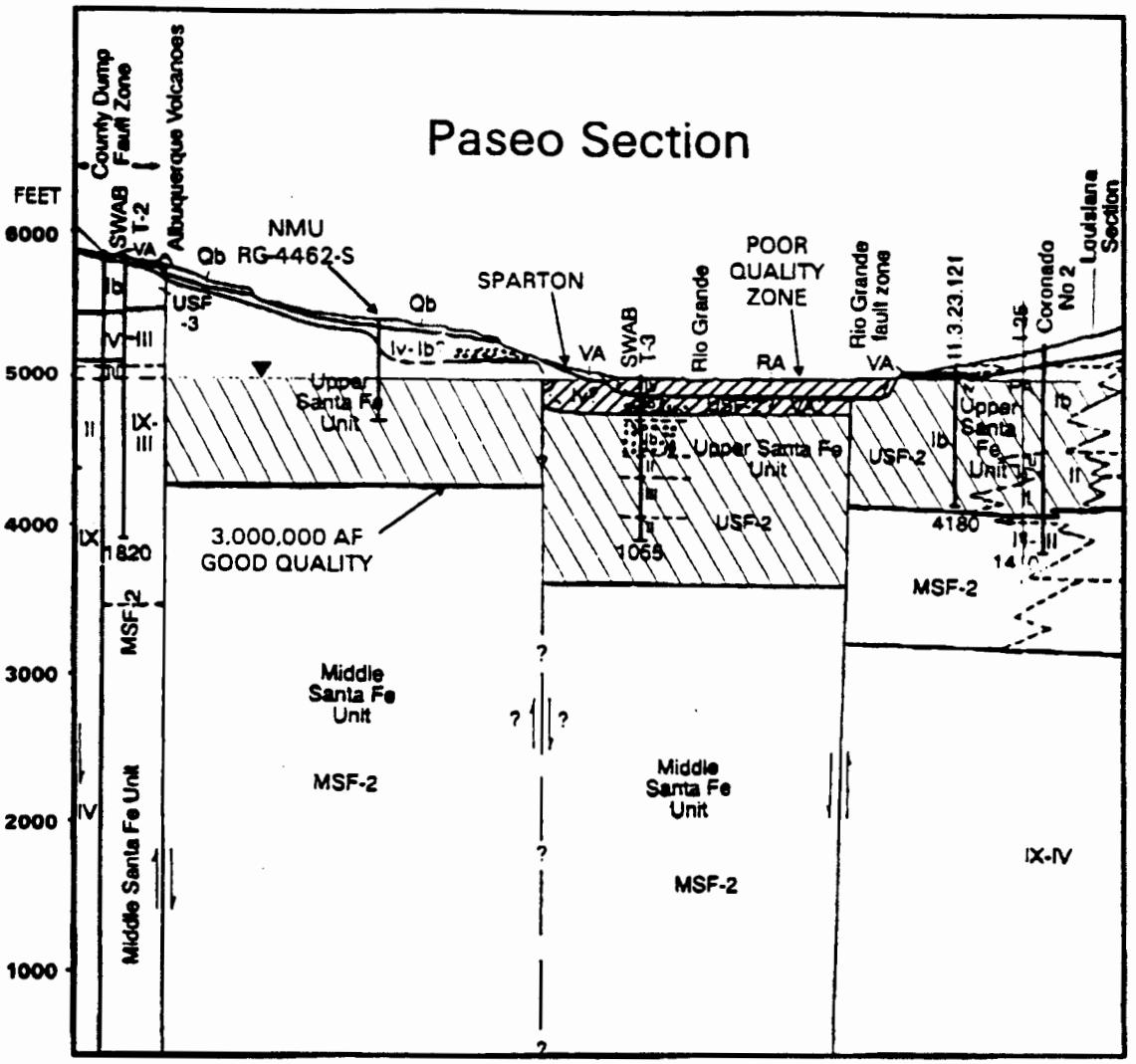

CROSS-SECTION D-D'
LEGEND
CROSS SECTION C-A'
CROSS SECTION B-A'
CROSS-SECTION A-A'
PLUME LIMITS
(<5 ug/L)
A
A'
B
C
D
D'
Black & Veatch
PROJECT NO.
26602
JULY 1996 PLUME LIMITS
SCIENCE TECHNOLOGY, INC.
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO
SHEET
OF

010054


Location of Wells
Relative to Plume
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico
RIO RANCHO
SANDOVAL COUNTY
BERNALILLO COUNTY
PARADISE HILLS COUNTRY CLUB
Discharge Point to Arroyo
1996 TCE Plume
PARADISE HILLS
Sparton Facility
Cibola High School
VOLCANO CLIFFS
▲ - Domestic Well
● - Municipal / Industrial Well
© - FROM STREET MAP OF ALBUQUERQUE, NEW MEXICO WITH PERMISSION FROM RAND MCNALLY 03/21/97

010055



Paseo del Norte Hydrogeologic Section

MODIFIED FROM HAWLEY AND HAASE, 1992

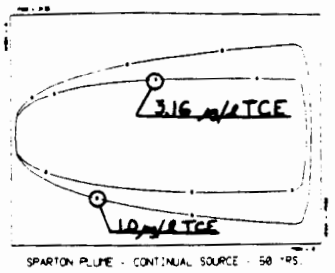
SHEEHAN, SHEEHAN & STELZNER, P.A. / SPARTON

SPARTON REGIONAL GEOLOGIC UNITS AND WATER QUALITY ZONES

FIGURE 1

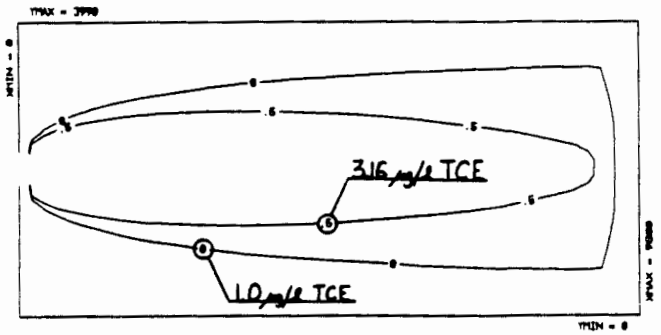
BALLEAU GROUNDWATER, INC.

010056

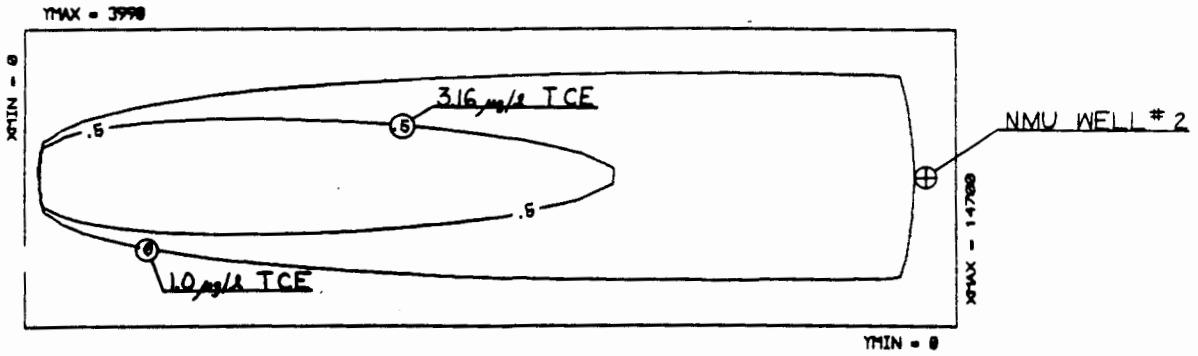


NMU WELL # 2

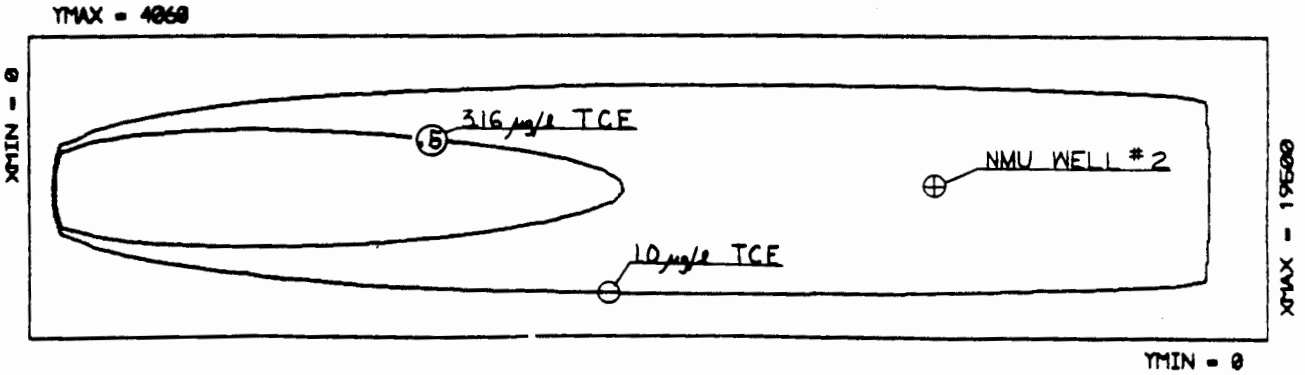
TCE Plume
Continual Source
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico



SPARTON PLUME - CONTINUAL SOURCE - 100 YRS.

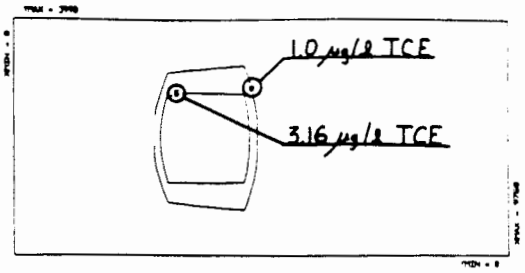


SPARTON PLUME - CONTINUAL SOURCE - 150 YRS.

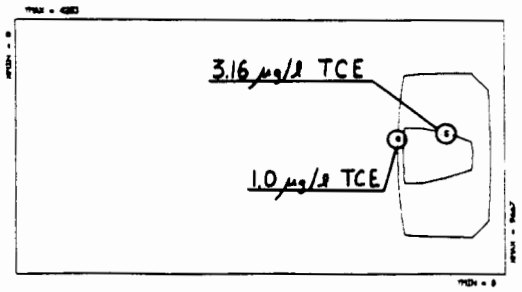


SPARTON PLUME - CONTINUAL SOURCE - 200 YRS.

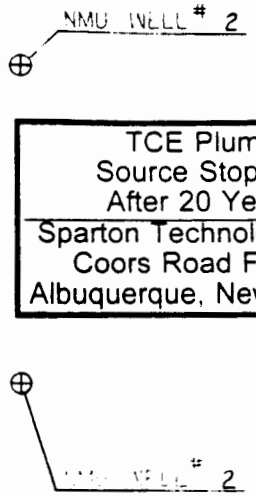
[redacted]



SPARTON PLUME - SOURCE STOPPED - 50 YRS.

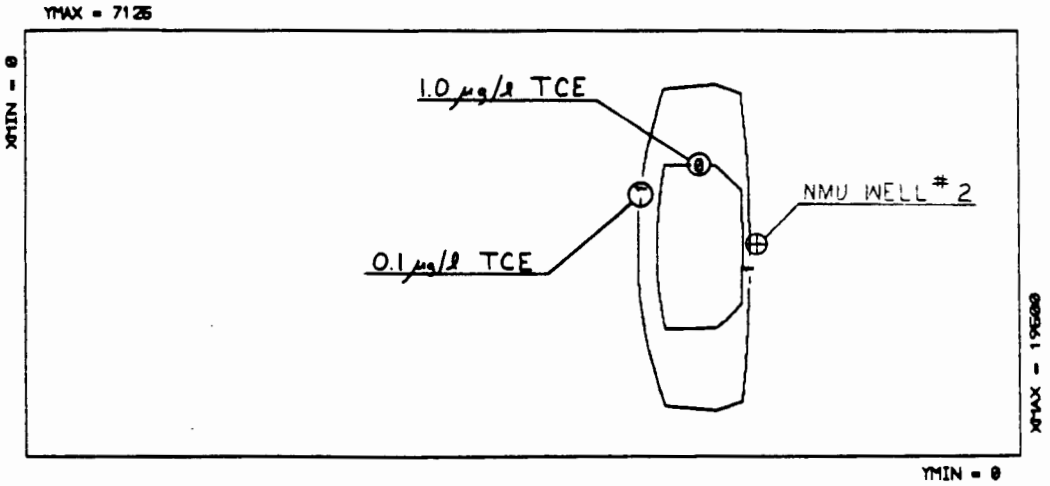


SPARTON PLUME - SOURCE STOPPED - 100 YRS.

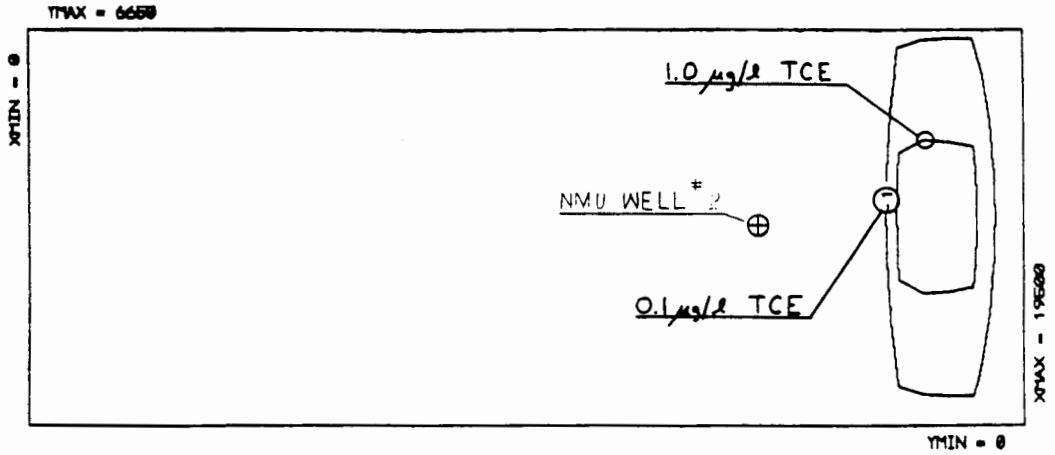


TCE Plume
Source Stopped
After 20 Years

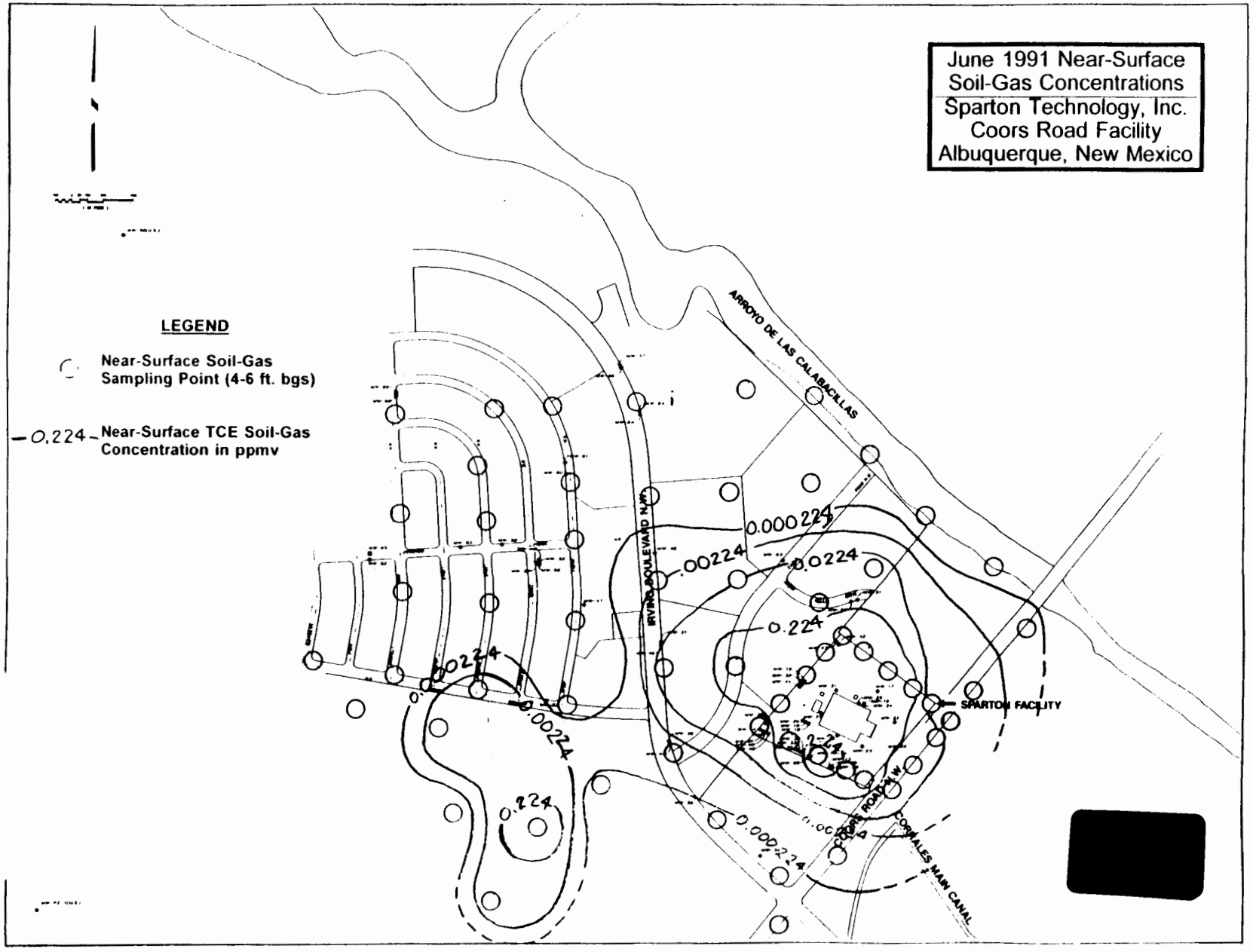
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico



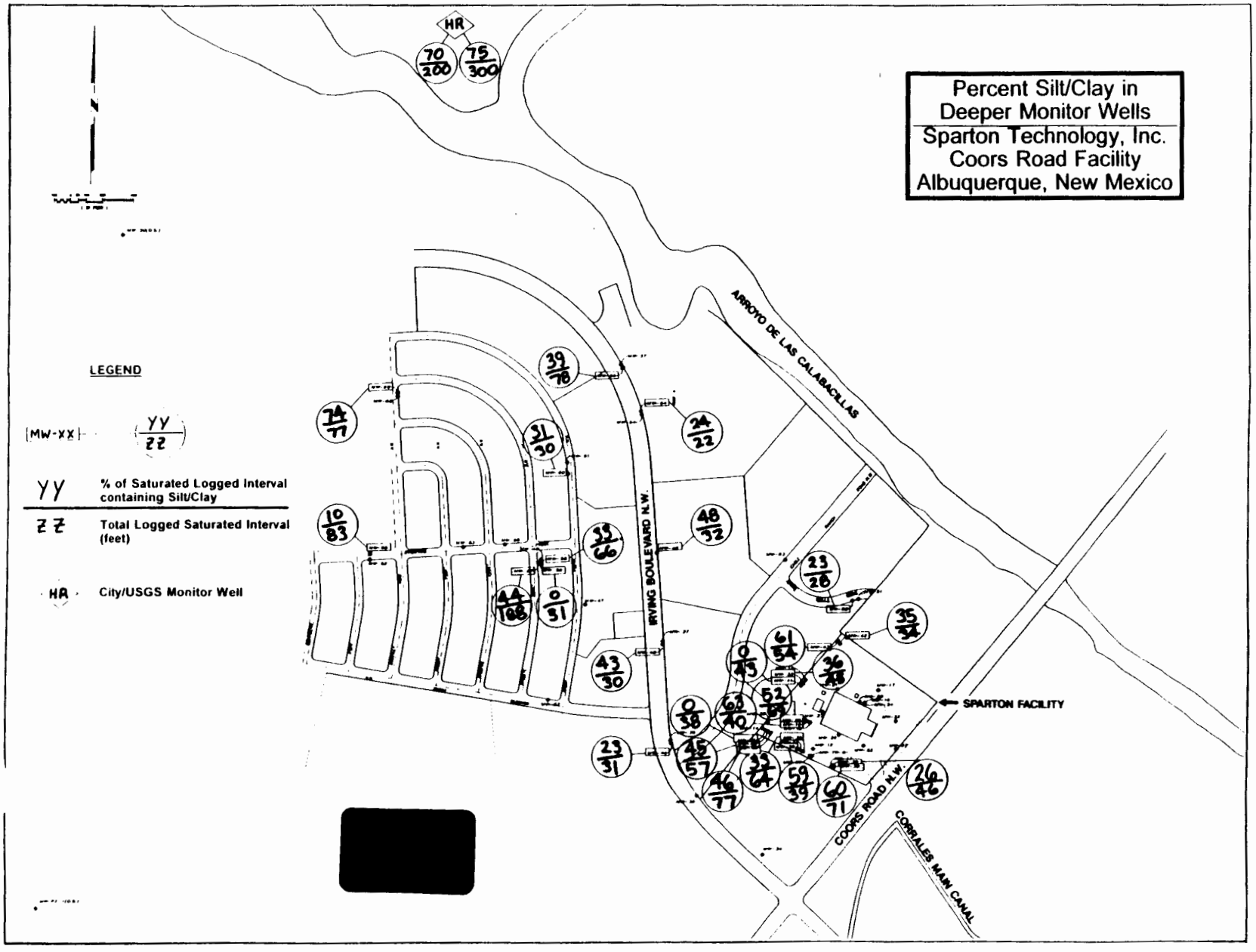
SPARTON PLUME - SOURCE STOPPED - 150 YRS.



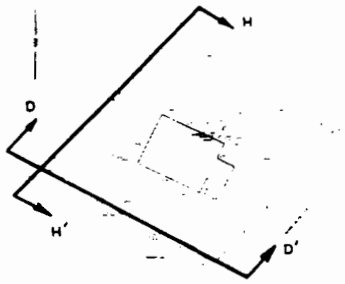
SPARTON PLUME - SOURCE STOPPPED - 200 YRS.


June 1991 Near-Surface Soil-Gas Concentrations
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico
LEGEND
Near-Surface Soil-Gas Sampling Point (4-6 ft. bgs)
0.224 Near-Surface TCE Soil-Gas Concentration in ppmv
ARROYO DE LAS CALABACILLAS
IRVING BOULEVARD N.W.
COORS ROAD N.W.
CORRALES MAIN CANAL
SPARTON FACILITY
0.000224
0.00224
0.0224
0.224

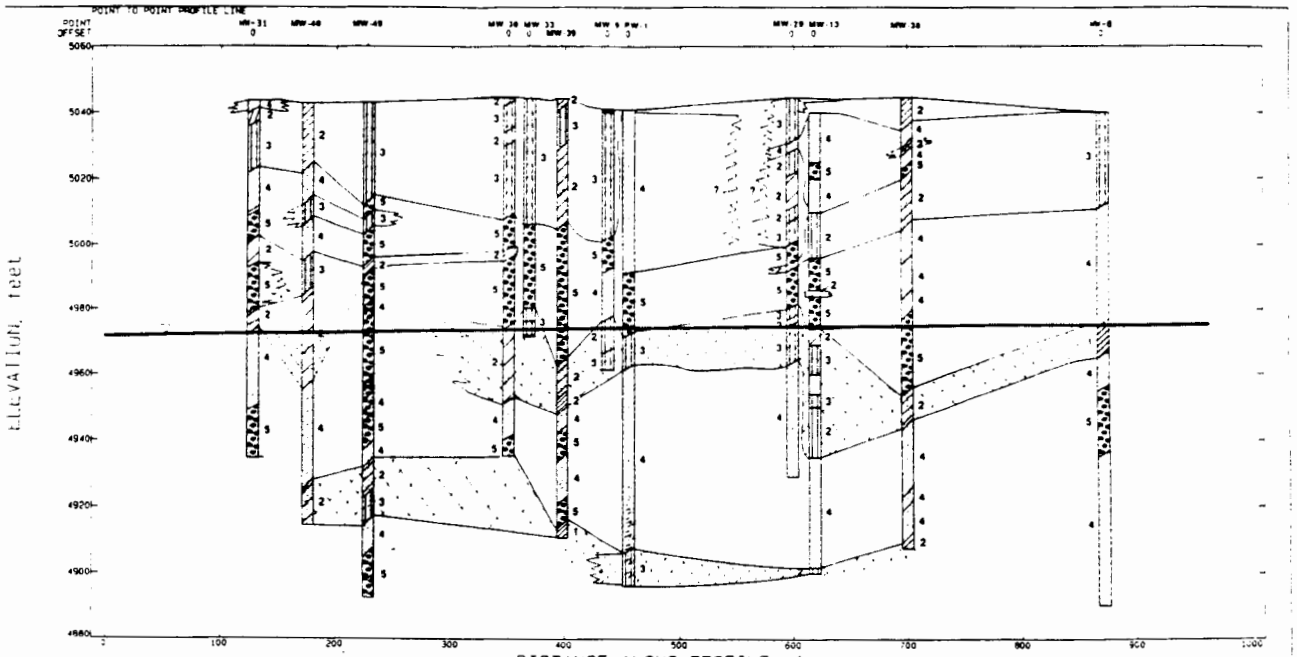
010059


Percent Silt/Clay in Deeper Monitor Wells
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico
LEGEND
MW-XX
YY / ZZ
YY % of Saturated Logged Interval containing Silt/Clay
ZZ Total Logged Saturated Interval (feet)
HR City/USGS Monitor Well
HR
70/200
75/300
39/78
24/22
74/77
31/30
10/83
35/66
48/32
44/108
0/31
43/30
23/28
35/34
61/54
0/45
36/48
52/55
0/38
69/40
23/31
45/57
33/64
59/39
60/71
26/46
46/77
ARROYO DE LAS CALABACILLAS
IRVING BOULEVARD N.W.
COORS ROAD N.W.
CORRALES MAIN CANAL
SPARTON FACILITY

010060

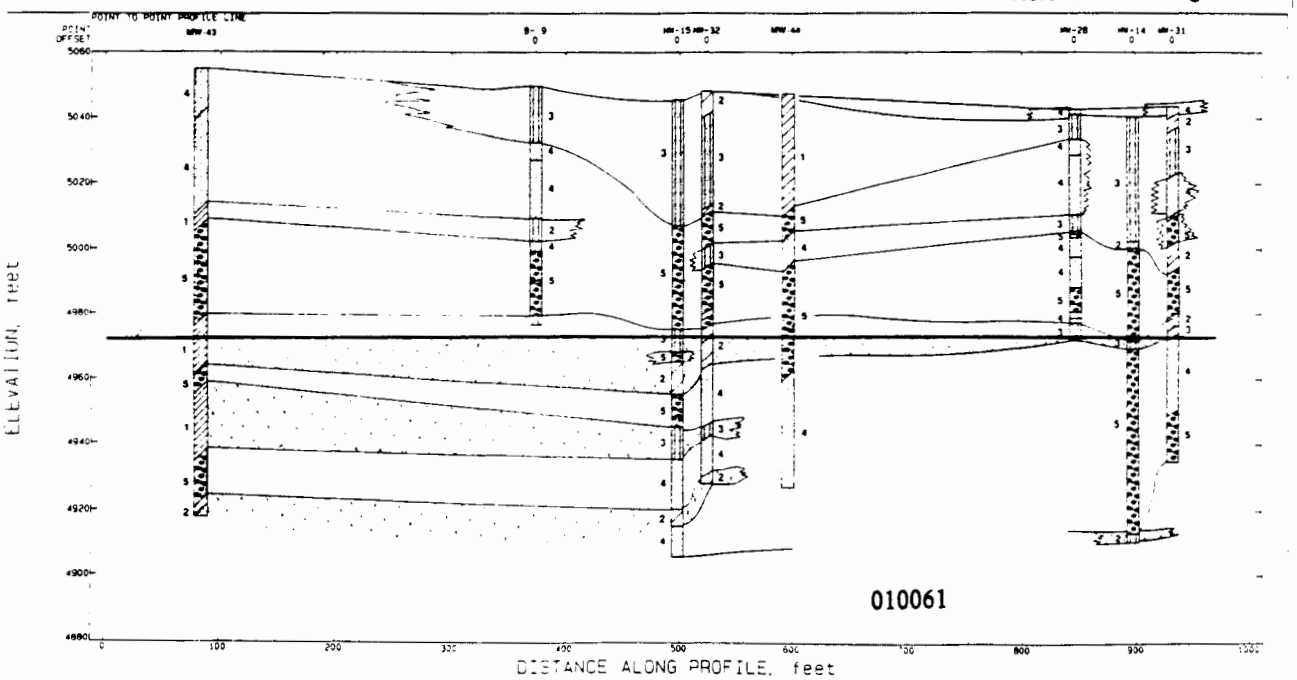


Silt/Clay Presence in Saturated Zone
Sparton Technology, Inc.
Coors Road Facility
Albuquerque, New Mexico



SUBSURFACE PROFILE D-D'

Reference RFI Figure 20



010061

SUBSURFACE PROFILE H-H'

Reference RFI Figure 24

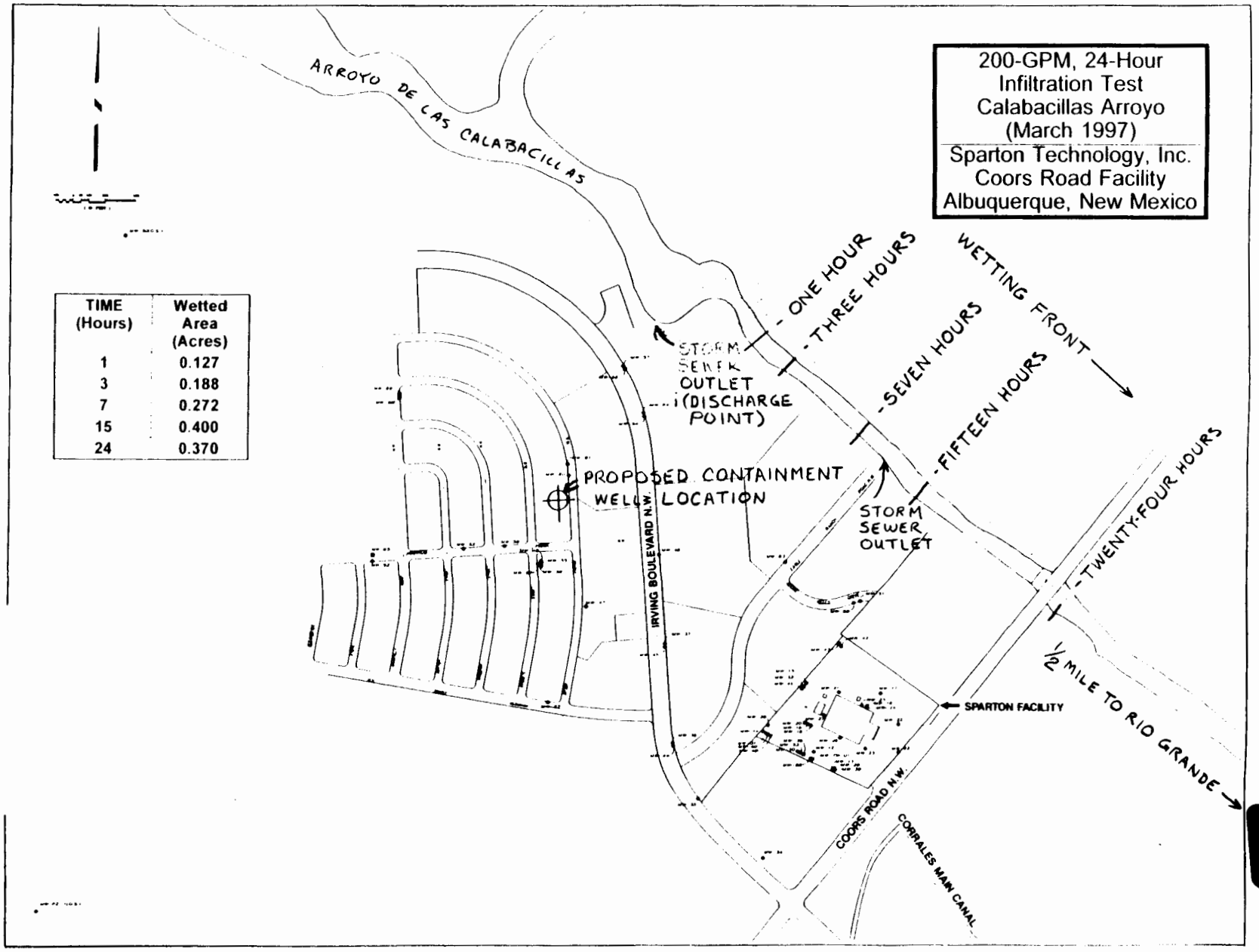
SITE-SPECIFIC FACTORS AFFECTING GROUNDWATER REMEDIATION*

SPARTON TECHNOLOGY, INC., COORS ROAD FACILITY

Contaminant/ Hydrogeologic Factors*	Basis/Description	Remediation Difficulty*	
Nature of release	Long duration	High	BACKGROUND from CMS (pII-1) RFI (p2)
Biotic/abiotic decay potential	Moderate to low potential	Moderate to High	RFI (p15, p127) New Mexico Water Resources Research Institute (NMWRRI)
Volatility	Moderate	Moderate	RFI (p128)
Retardation (sorption potential	High (Residual DNAPL)	High	RFI (p15, p127)
Contaminant phase	Aqeous, gaseous, sorbed (Residual DNAPL)	Moderate to High	RFI (p82), CMS (pIII-25) Characterization
Volume of contaminated media	Relatively large	High	RFI (p82), CMS (pIII-25) Characterization 90 Acres ±
Contamination depth	Relatively deep	High	RFI, CMS Characterization - Over 300 ft bgs
Stratigraphy	Complex geology, interbedded and discontinuous	High	RFI (p19), CMS (pIII-1), USGS, USBR, City of Albuquerque, NMWRRI (Hawley), Lambert, Kelley
Texture of deposits	Ranges from gravelly sand to silts and clays	Moderate to High	RFI (p19), CMS (pIII-1), USGS, USBR, City of Albuquerque, NMWRRI (Hawley), Lambert, Kelley
Degree of Heterogeneity	Heterogeneous, anisotropic, inter-bedded and discontinuous	High	RFI (p19), CMS (pIII-1), USGS, USBR, City of Albuquerque, NMWRRI (Hawley), Lambert, Kelley
Hydraulic conductivity	Range from high (=10^{2} cm/sec) in gravelly sand to low (<10^{4} cm/sec) in clays/silts	Low to High	RFI, CMS, USGS, Hawley
Temporal variation	Slight change in water elevation/ gradient	Low to Moderate	RFI, CMS
Vertical flow	Little to none	Low	RFI, CMS, USGS, NMWRRI, Intel, City of Albuquerque

*Reference: Figure 1, Guidance for Evaluating the Technical Impracticability of Ground Water Restoration, OSWER Directive 9234.2-25, U.S. EPA, 1993
Figure 25,CMS

010062



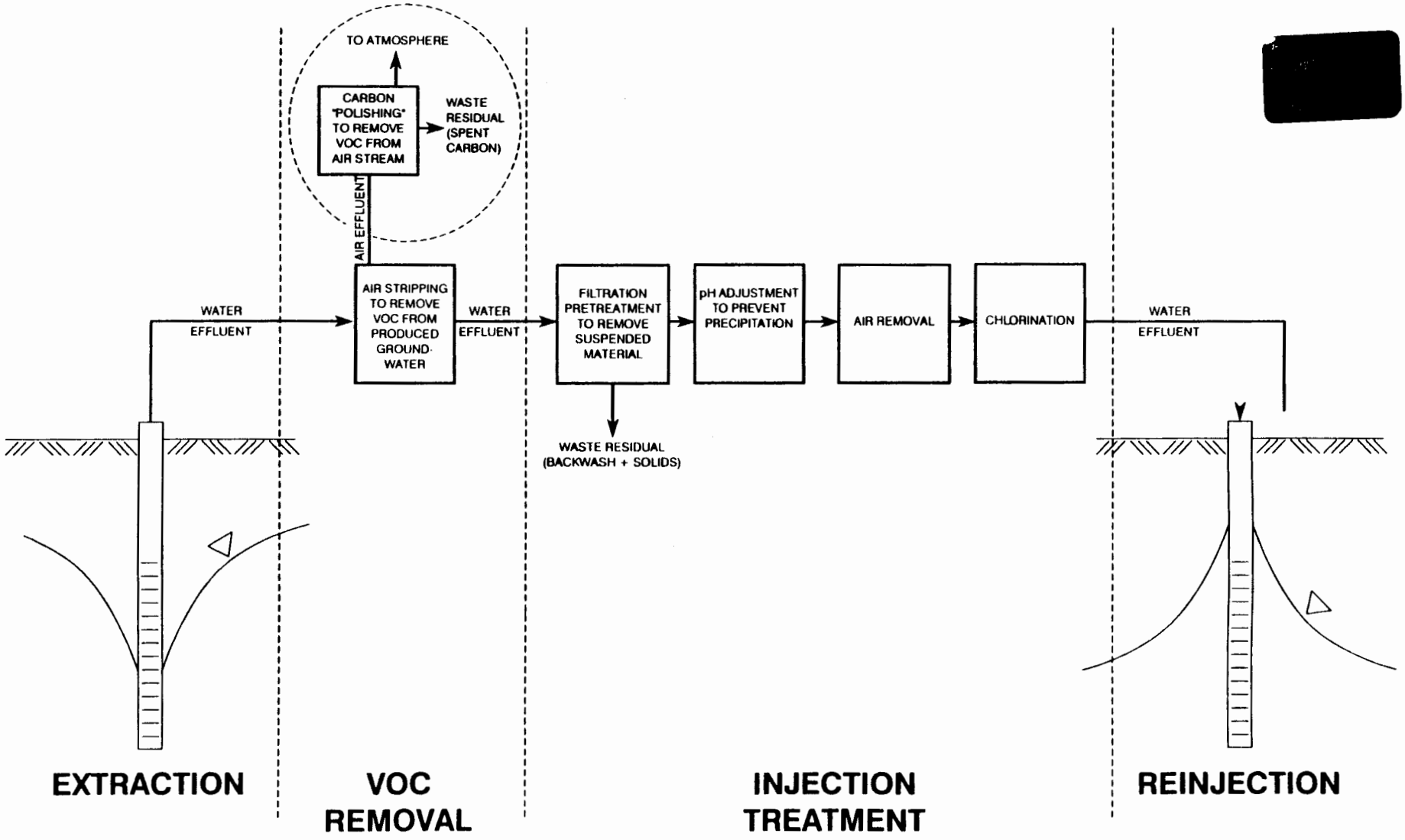
TIME (Hours)	Wetted Area (Acres)
1	0.127
3	0.188
7	0.272
15	0.400
24	0.370

010063

EPA PROPOSED REMEDIAL ALTERNATIVE WITH VOC REMOVAL ONLY

GROUNDWATER EXTRACTION/TREATMENT TRAIN/ REINJECTION

SPARTON TECHNOLOGY, INC., COORS ROAD FACILITY



010064

COST COMPARISONS
600 GPM EPA FDRTC ALTERNATIVE 4
SPARTON TECHNOLOGY, INC., COORS ROAD FACILITY

	CAPITAL COSTS				ANNUAL O&M			
ITEM (CMS REFERENCE)	EPA FDRTC ESTIMATE	VERIFICATION OF FDRTC USING CMS COSTS	EPA POSITION STATEMENT AND EXHIBIT 18	VERIFICATION OF POSITION STATEMENT USING CMS COSTS	EPA FDRTC ESTIMATE	VERIFICATION OF FDRTC USING CMS COSTS	EPA POSITION STATEMENT AND EXHIBIT 18	VERIFICATION OF POSITION STATEMENT USING CMS COSTS
GROUNDWATER MONITORING (REF CMS P.VII-6)	$400,000 (20 WELLS- IMPLIED OUTSIDE PLUME)	$600,000 (20 WELLS-10 OUTSIDE PLUME;10 INSIDE PLUME)	$400,000 (20 WELLS - IMPLIED OUTSIDE PLUME)	$600,000 (TO INCLUDE WELLS IN PLUME)	$160,000 (40 wells)	$160,000 (40 wells)	$160,000 (40 wells)	$160,000 (40 wells)
SOIL VAPOR EXTRACTION (REF CMS P.VII-56)	$150,000 (ON SITE SVE)	$150,000 (ON-SITE SVE)	EXCLUDED (POSITION STATEMENT P62)	—	$28,000	$28,000	EXCLUDED (POSITION STATEMENT P62)	—
IM EXPANSION (REF CMS P.VII-17)	NOT INCLUDED	NOT INCLUDED	EXCLUDED (POSITION STATEMENT P62)	—	$25,000 (OPERATION OF CURRENT IM)	$25,000 (OPERATION OF CURRENT IM)	EXCLUDED (POSITION STATEMENT P62)	—
EXPANDED GROUNDWATER EXTRACTION (REF CMS P.VII-23)	$306,250 (3 STAINLESS STEEL WELLS & ELECTRIC SERVICE/PIPING TO FACILITY)	$306,250 (3 STAINLESS STEEL WELLS & ELECTRIC SERVICE/PIPING TO FACILITY)	$346,250 (3 WELLS, LOW CARBON STEEL CASING, NO ELECTRIC SERVICE, NO PIPING TO FACILITY)	$346,250 (LOW CARBON STEEL CASING) + $100,000 (ELECTRIC SERVICE AND PIPING TO FACILITY)	$54,410 (3 WELLS)	$54,410 (3 WELLS)	$143,308 (DOES NOT INCLUDE: MAINTENANCE, DEPRECIATION, WELL REHABILITATION, COST OF EXPENDABLES, WASTE RESIDUE MANAGEMENT)	$54,410 (3 WELLS)
WATER TREATMENT-VOC (REF CMS P.VII-38,39)	$181,250	$181,250	$509,238	$509,238	$76,490 (TREATMENT & CARBON REPLACEMENT)	$76,490 (TREATMENT & CARBON REPLACEMENT)		$76,490 (TREATMENT & CARBON REPLACEMENT)
WATER TREATMENT-METALS (REF CMS P.VII-49)	$587,500	$587,500	$247,050	$247,050	$700,000 (NO WASTE RESIDUE MANAGEMENT)	$710,000 (O&M) $2,000,000 (WASTE RESIDUE MANAGEMENT, TCLP TOXIC)		$710,000 (O&M) $2,000,000 (WASTE RESIDUE MANAGEMENT, TCLP TOXIC)
INJECTION WELL DISPOSAL (REF CMS P.VII-30)	$1,237,500 (3 STAINLESS STEEL WELLS & ADDITIONAL INJECTION TREATMENT)	$1,237,500 (3 STAINLESS STEEL WELLS & ADDITIONAL INJECTION TREATMENT)	$169,756 (SINGLE WELL, LOW CARBON STEEL CASING AND FILTRATION TREATMENT ONLY)	$331,875 (LOW CARBON STEEL CASING FOR 3 WELLS) + $32,256 (FILTRATION ONLY)	$510,000	$180,000 (ADDITIONAL TREATMENT) $90,000 (REDEVELOPMENT) $240,000 (REPLACEMENT & MAINTENANCE)		$180,000 (ADDITIONAL TREATMENT) $90,000 (REDEVELOPMENT) $240,000 (REPLACEMENT & MAINTENANCE)
TOTAL COST W/O METAL TREATMENT	$2,275,000	$2,475,000	$1,425,244 ($1,575,244 w/ SVE)	$1,919,619 ($2,069,619 WITH SVE)	$853,900	$853,900	$303,308 ($356,308 w/ SVE & IM)	$800,900 ($853,900 w/ SVE & IM)
TOTAL COST WITH METAL TREATMENT	$2,862,500	$3,062,500	$1,672,294 ($1,822,294 w/ SVE)	$2,166,669 ($2,316,669 WITH SVE)	$1,553,900	$3,563,900	$303,308 ($356,308 w/ SVE & IM)	$3,510,900 ($3,563,900 w/ SVE & IM)

010065

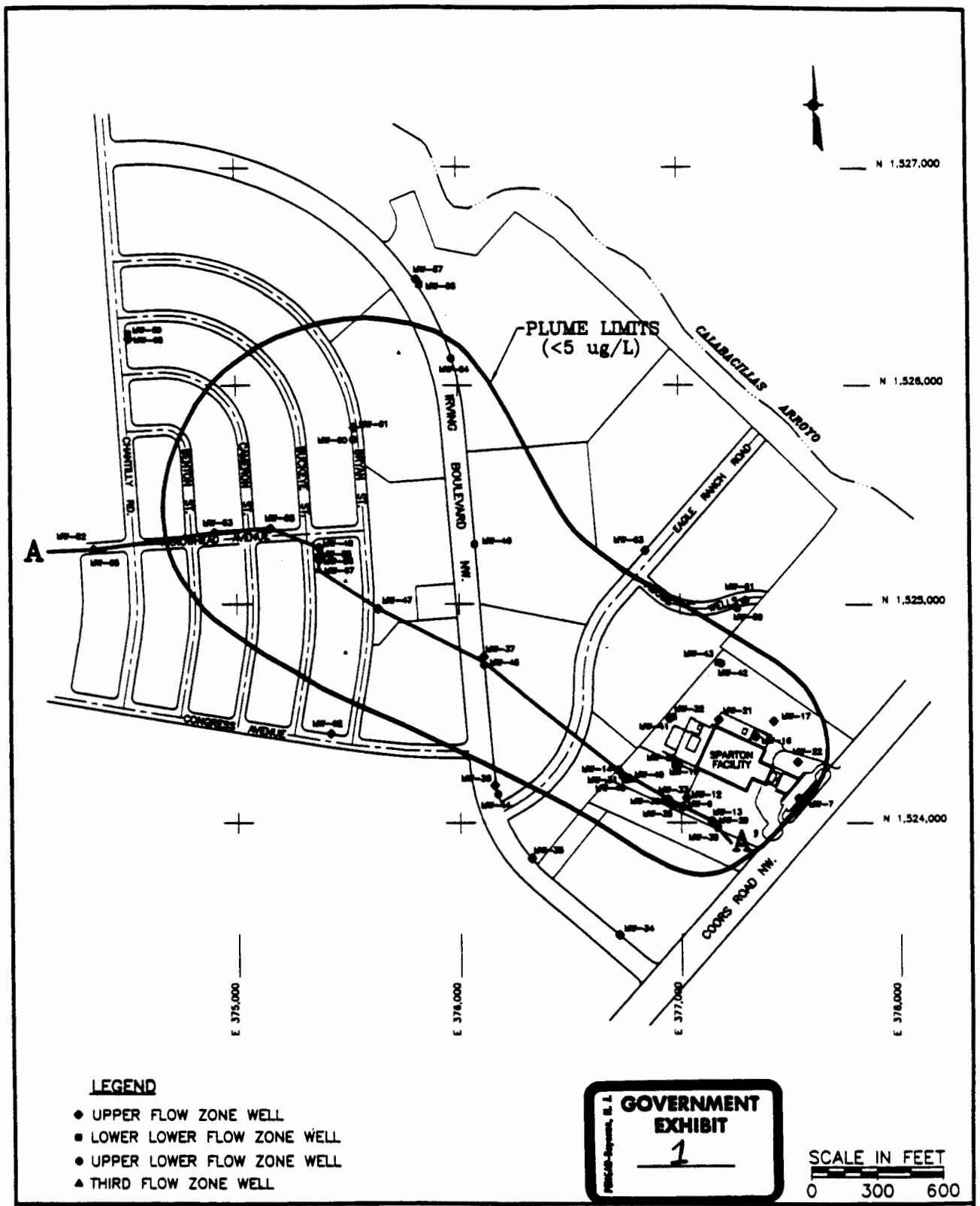
REMEDY COMPARISON

SPARTON TECHNOLOGY, INC., COORS ROAD FACILITY

COMPARISON ELEMENT	EPA RECOMMENDED ALTERNATIVE		SPARTON RECOMMENDED ALTERNATIVE
	VOC REMOVAL	MULTIPLE TREATMENT	
GROUNDWATER PLUME CONTAINMENT	YES	YES	YES
VOC REMOVAL FROM GROUNDWATER	YES	YES	YES
VOC REMOVAL FROM SOIL AND SOIL GAS	YES	YES	YES
RECHARGE TO SHALLOW AQUIFER	YES	YES	YES
REMEDIATION TIMEFRAME	30 YEARS	30 YEARS	30 YEARS
GROUNDWATER EXTRACTION RATE	>600 GPM	>600 GPM	<220 GPM
NET WATER LOSS	3 TO 8%	5 TO 10%	1 TO 3%
SIGNIFICANT PRODUCTION OF POTENTIALLY HAZARDOUS WASTE	NO	YES	NO
CAPITAL COST	$2,475,000+	$3,062,500+	$500,000
ANNUAL O&M (YEARS 1-3)	$853,900+ $825,900+	$1,553,900+* $1,525,900+*	$200,000 $172,000
PRESENT VALUE	$15,247,358+	$26,749,298+*	$3,574,490

NOTES: * DOES NOT INCLUDE MANAGEMENT OF WASTE RESIDUE FROM METALS/REINJECTION TREATMENT
+ BASED ON 3 REINJECTION WELLS AT 200-GPM EACH, HOWEVER, MORE WELLS MAY BE REQUIRED. RECENT GE-SOUTH VALLEY EXPERIENCE INDICATE PERFORMANCE IS <30% OF DESIGN.

010066



LEGEND

- ◆ UPPER FLOW ZONE WELL
- ■ LOWER LOWER FLOW ZONE WELL
- ● UPPER LOWER FLOW ZONE WELL
- ▲ THIRD FLOW ZONE WELL

GOVERNMENT EXHIBIT 1

SCALE IN FEET
0 300 600

M&E Metcalf & Eddy	SPARTON TECHNOLOGY, INC. PLUME MAP ALBUQUERQUE, NEW MEXICO	Project Number 166022 File Name SP-COL22 / Figure 1

010067

FOUR THRESHOLD CRITERIA

- Overall Protection of human health and the environment
- Attain media cleanup standards
- Control the sources of releases
- Comply with standards for management of wastes

FIVE BALANCING CRITERIA

- Long-term reliability and effectiveness
- Reduction of toxicity, mobility, or volume of wastes
- Short-term effectiveness
- Implementability
- Cost

TWO MODIFYING CRITERIA

- State acceptance
- Community acceptance

010068

GOVERNMENT EXHIBIT
2

Task IX: Justification And Recommendation Of The Corrective Measure Or Measures

... The U.S. EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks III and IX. At a minimum, the following criteria will be used to justify the final corrective measure or measures

A. TECHNICAL

1. Performance

2. Reliability

3. Implementability

4. Safety

B. HUMAN HEALTH

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health

C. ENVIRONMENTAL

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored

GOVERNMENT EXHIBIT 3

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REFERENCE

SPARTON TECHNOLOGY, INC.
EPA ID NO. NMD083212332

ADMINISTRATIVE RECORD
FOR
THE FINAL
ADMINISTRATIVE ORDER

Volume 22

010070 through 010473

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010071

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:

SPARTON TECHNOLOGY, INC.
9621 COORS ROAD NW
ALBUQUERQUE, NM 87114
EPA I.D. NO. NMD083212332,
RESPONDENT

U.S. EPA DOCKET NO.
RCRA-VI-001(h)-96-H

PROCEEDINGS OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY taken in the above-numbered cause on the 27th day of March, 1997, at 9:40 a.m., before Susan Boudin, a Certified Shorthand Reporter in and for the State of Texas, at the offices of United States Environmental Protection Agency, Region 6, located at 1445 Ross Avenue, in the City of Dallas, County of Dallas, State of Texas, 75202-2733; whereupon the following proceedings were had:

A P P E A R A N C E S:

Honorable George Malone
United States Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

ADMINISTRATIVE JUDGE
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Mr. Evan Pearson
Senior Enforcement Counsel (GEN-LH)
United States Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

APPEARING FOR THE
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY

Mr. James B. Harris, Esq.
Law Offices of Thompson & Knight
1700 Pacific Avenue, Suite 3300
Dallas, Texas 75201

APPEARING FOR THE RESPONDENT

ALSO PRESENT:
Mr. Vincent Malott
Mr. Pierce Chandler

I N D E X

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Response to Mr. Pearson's Rebuttal by Mr. Harris	148
Court Reporter's Certificate	186

EXHIBIT INDEX

EXHIBIT NO.	DESCRIPTION	PAGE OFFERED/ MARKED	PAGE ADMITTED
Respondent's 1:	Approximate RFI Plume Limits (6/91)	56	N/A
Respondent's 2:	July 1996 Plume Limits	58	N/A
Respondent's 3:	Location of Wells Relative to Plume	60	N/A
Respondent's 4:	Paseo del Norte Hydrogeologic Section	69	N/A
Respondent's 5:	TCE Plume Continual Source	72	N/A
Respondent's 6:	TCE Plume Source Stopped After 20 Years	79	N/A
Respondent's 7:	June 1991 Near-Surface Soil-Gas Concentrations	80	N/A
Respondent's 8:	Percent Silt/Clay in Deeper Monitor Wells	85	N/A
Respondent's 9:	Silt/Clay Presence in Saturated Zone	87	N/A
Respondent's 10:	Site-Specific Factors Affecting Groundwater Remediation	89	N/A
Respondent's 11:	200-GPM, 24-Hour Infiltration Test of Calabacillas Arroyo (March 1997)	93	N/A
Respondent's 12:	EPA Proposed Remedial Alternative with VOC Removal Only	96	N/A
Respondent's 13:	Cost Comparisons	99	N/A

EXHIBIT INDEX CONTINUED

EXHIBIT NO.	DESCRIPTION	PAGE OFFERED/ MARKED	PAGE ADMITTED
Government's 1:	Sparton Technology, Inc. Plume Map	121	N/A
Government's 2	Four Threshold Criteria, Five Balance Criteria, and Two Modifying Criteria	121	N/A
Government's 3:	Task IX: Justification and Recommendation of the Corrective Measure or Measures	121	N/A

(Exhibits attached at the end of the original and certified copies of the transcript.)

P R O C E E D I N G S

MR. MALONE: Okay. Let's go on the record. It is now about 9:40 on March 27th, 1997, and I hereby formally open this hearing. Good morning, everyone. My name is George Malone, and I have been appointed by the Regional Administrator to serve as the Presiding Officer in this action today.

This action involves the Resource Conservation & Recovery Act, otherwise known as RCRA, Section 3008(h) Initial Administrative Orderr issued by EPA Region 6 to the Respondent, Sparton Technology, Incorporated. The Initial Administrative Order requiring corrective action was issued on September 16th, 1996, while on October 18th, 1996, the Respondent, Sparton Technology, requested a public hearing under Subpart C of the governing federal regulations. Pursuant to a December 16th, 1996, Scheduling Order, this hearing was scheduled for today. Prior to today's hearing, the parties have been allowed the opportunity to submit information supporting their respective positions on the facts and the law governing this action. The

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1 federal regulations governing this particular
2 action are found at 40 C.F.R., Part 24,
3 Subpart C.
4 At this point I want to provide the parties
5 with the procedures to be utilized at the hearing
6 today. The procedures are consistent with the
7 March 21, 1997, Order setting the hearing
8 agenda. The first thing to occur entails the EPA
9 representative introducing the administrative
10 record and the Initial Order into the hearing
11 record. Next the EPA representative will
12 summarize the basis for issuance of the Initial
13 Administrative Order. As mentioned in the Order
14 setting the agenda, I am particularly interested
15 in the EPA's position regarding the legal and
16 technical basis for issuance of the Order and the
17 benefits of using a phased corrective action
18 approach.
19 After such presentation by EPA, the
20 Respondent may respond to the administrative
21 record and offer facts, statements and documents
22 explaining any issue for which the hearing was
23 requested. I am particularly interested in the
24 Respondent's preferred remedy selection and how
25 it complies with RCRA and EPA's policy for remedy

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1 selection. I'm also interested in the
2 Respondent's position regarding groundwater
3 treatment and reuse into the Calabacillas
4 Arroyo.
5 I want it to be clear that although I'm
6 particularly interested in certain items for both
7 parties, it does not limit the parties' scope of
8 their presentations today. The EPA may present
9 matters solely in rebuttal to issues previously
10 presented by the Respondent. In my discretion as
11 Presiding Officer, I may allow the Respondent to
12 respond to EPA's rebuttal. Today's agenda
13 includes time for such a rebuttal. Please be
14 advised that apart from questions by me, there
15 will be no direct- or cross-examination today.
16 The Respondent and EPA will only be allowed to
17 provide presentations as mentioned earlier. It
18 is my duty to conduct this hearing in a fair and
19 impartial manner, to take action to avoid undue
20 delays and to maintain order. In my discretion,
21 I may exclude repetitive or irrelevant matters.
22 As you-all can see, this hearing is being
23 transcribed by a court reporter, so I would ask
24 that whenever you speak, please speak clearly,
25 and we can only have one person speaking at any

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1 given time. So at this point are there any
2 questions by either of the parties?
3 MR. HARRIS: Mr. Malone, my name is Jim
4 Harris. I'm an attorney with Thompson & Knight
5 here on behalf of Sparton Technology, Inc. We
6 have one preliminary matter we wanted to raise
7 with you, and that has to do with the request
8 that you recuse yourself. While we believe you
9 will attempt to be fair and impartial, my client
10 is concerned that institutional pressures will
11 impact your decision. In particular, you
12 obviously are an employee of EPA, you work for
13 Region 6, you answer to the regional counsel in
14 this region. You have worked with or for those
15 who are pressing a particular position in this
16 proceeding, and you probably have both a personal
17 and professional relationship with any number of
18 people that are involved in this particular
19 proceeding, and we think that puts you in a very
20 difficult position.
21 I might provide by way of an example a
22 situation that I run into in State Court where
23 there is a State Court Judge whose son is an
24 associate at my law firm. Because of that, he
25 routinely tells of what cases in which Thompson &

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1 Knight is involved and provides them with an
2 opportunity to ask for a different judge because
3 he recognizes that that personal relationship,
4 that situation, would cause him or could cause
5 somebody to question whether he will be fair and
6 impartial in a situation. And I think the
7 regulations and the Regional Administrator by
8 selecting you to hear this particular proceeding
9 has put you in a very awkward and difficult, if
10 not impossible, position. We think that this
11 type of case requires that an administrative law
12 judge who operates independently of the agency be
13 allowed to hear the proceedings in this matter
14 and to hear any statements that are made in this
15 proceeding and to make a totally independent
16 determination of the factors that the statute
17 requires.
18 We would therefore request and we believe
19 that under the requirements of Part 24 the
20 appointment of an administrative law judge would
21 be entirely appropriate and consistent with those
22 requirements and would respectfully request that
23 you recuse yourself and that the regional
24 administrative or appointed administrative law
25 judge hear this matter.

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1 MR. MALONE: Thank you for your concerns.
2 Does Counsel for EPA have a response?
3 MR. PEARSON: Yes, Your Honor. 40 C.F.R.,
4 Part 24, of the procedures have been upheld by
5 the Court of Appeals for the District of
6 Columbia, so they are valid on their face.
7 According to Mr. Harris's reasoning, if someone
8 was appointed -- for example, as typical, like an
9 assisting -- or a U.S. attorney is appointed as a
10 judge, by his type of theory, he could never hear
11 any cases brought by the United States Attorney's
12 office. I believe since the regulations are
13 upheld, they're valid and you have met the
14 requirements, that you have no prior connection
15 in the case and this motion should be denied.
16 MR. HARRIS: May I respond very briefly?
17 MR. MALONE: Okay.
18 MR. HARRIS: We don't know whether you have
19 any prior connection with the case. As you're
20 well aware, we had requested discovery on this
21 issue through our written questions, and in your
22 discretion you denied our ability to get into
23 that, so we don't know at this point exactly what
24 the relationship is, what involvement you have
25 had. We haven't had a chance to test any of

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1 those statements by EPA. And while we have no
2 reason at this point to believe that from a
3 personal standpoint you would have bias towards
4 us, what we're saying is institutionally we have
5 very legitimate and significant concerns, and
6 secondly, we have had no opportunity to really
7 get into the issue of what your particular
8 relationship has been with any of the people
9 here, what previous positions you have had in the
10 agency.
11 I know you have just recently been appointed
12 the Regional Judicial Officer, and I think what
13 we have raised are very legitimate concerns that
14 aren't addressed by the decision that Mr. Pearson
15 makes reference to. I would point out that that
16 decision simply said, hey, look, on the face of
17 it, it appears this may work, but the Court
18 specifically reserved the question of whether, as
19 applied to any particular situation, those
20 regulations would, in fact, be constitutional,
21 and I think the bias or lack thereof of the
22 Presiding Officer is a very legitimate concern
23 under due process and one that we are concerned
24 about and wanted to raise obviously before the
25 hearing began.

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1 MR. MALONE: Okay. I'm going to rule on
2 this. I'm going to deny your request, and just
3 to give you a response as to my involvement in
4 this particular action, the way that the region
5 is set up, I work within the office of regional
6 counsel. I have been appointed by the Regional
7 Administrator to preside over this proceeding. I
8 have no direct relationship with the division
9 director over this enforcement program who issued
10 the Section 3008(h) Order to you, so I have had
11 no prior involvement in that, have no involvement
12 in it other than my capacity as presiding over
13 these proceedings, so therefore I'm going to deny
14 your request.
15 Moving on, before we get started, I would
16 just like for all the parties that are going to
17 actively participate in this hearing today to
18 introduce themselves and state your capacity for
19 the record. We can start with Sparton. You have
20 already introduced yourself. If you have someone
21 else that's going to actively participate --
22 MR. CHANDLER: Sure. I'm Pierce Chandler.
23 I'm an engineer here with Black & Veatch here in
24 Dallas representing Sparton.
25 MR. MALONE: Thank you.

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1 MR. PEARSON: For the record, my name is
2 Evan Pearson, and I'm an attorney with EPA.
3 MR. MALOTT: I'm Vincent Malott. I'm an
4 enforcement officer with the Compliance
5 Assurance & Enforcement Division.
6 MR. MALONE: EPA may proceed.
7 MR. PEARSON: May it please the Court,
8 Counsel. As I previously stated, my name is Evan
9 Pearson and I'm a Senior Enforcement Counsel with
10 EPA here in Dallas and, along with Vincent
11 Malott, who is an environmental scientist with
12 the technical section, will be making
13 presentations on behalf of the EPA for this first
14 portion of the hearing. I will first address the
15 legal basis for issuing the Order, Mr. Malott
16 will address the technical basis, along with some
17 of the other issues that you identified in your
18 Order, and then I'll make some concluding
19 remarks.
20 As this Court knows, on September 16th,
21 1996, EPA issued an Initial Administrative Order
22 against Sparton Technology, Inc., seeking to
23 implement the remedy that it had selected in its
24 June 24th, 1996, Final Decision and Response to
25 Comments. Concurrent with this filing, EPA filed

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1 with the regional hearing clerk an administrative
2 record which consists of 19 volumes of almost
3 9,000 pages. These documents are the ones that
4 the agency considered in issuing the Order, and
5 at this time I would like to formally introduce
6 into this hearing the administrative record and
7 the Initial Administrative Order.
8 MR. HARRIS: On behalf of Sparton, we
9 object. We have already made the point that the
10 administrative record that EPA has put together
11 is a cobbled-together set of documents that do
12 not represent the basis on which the agency
13 actually made the decision. We had requested,
14 again, discovery on this particular point to
15 establish that the decision in this case was made
16 well before any administrative record was
17 developed, well in advance of the corrective
18 measure study being completed. We were denied
19 all discovery on this particular issue.
20 We have reviewed the administrative record.
21 It does not in any way, shape or form include all
22 of the correspondence, all of the communications
23 and all of the material that was shared between
24 EPA and other parties to which we were excluded
25 and which explain the true basis for the agency's

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1 decision in this case, and therefore we object to
2 the acceptance of this administrative record
3 because it is not complete and does not
4 accurately reflect the reasons why the agency
5 made the decision it did make.
6 MR. MALONE: The objection is overruled. I
7 have reviewed the administrative record a number
8 of times, and I found the administrative record
9 to be adequate.
10 Counsel, you may proceed.
11 MR. PEARSON: Okay. Thank you, Your Honor.
12 Now I would like to address the legal basis for
13 issuing the Order. In order to prove our case,
14 EPA must show by a preponderance of the evidence
15 for a RCRA 3008(h) action that there has been a
16 release into the environment of hazardous waste
17 from an interim-status facility and that
18 corrective action or other response measures are
19 necessary to protect human health and the
20 environment.
21 And now I would just like to briefly
22 summarize the first portion of this requirement,
23 the release of hazardous waste into the
24 environment from an interim-status facility. And
25 it is more fully explained in my brief, and I

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1 don't think I need to go into it in any detail at
2 this time, but I would like to put the situation
3 of the facility in perspective.
4 May I have the chart, please?
5 Okay. Here is a chart of the facility in
6 question here on the site. Located down here is
7 Sparton Technology, and Sparton filed a
8 notification of hazardous waste activity prior to
9 August 19, 1980, and also filed a Part A permit
10 application prior to November 19th, 1980.
11 Sparton stored hazardous waste in surface
12 impoundments after November 19th, 1980, therefore
13 meeting all the requirements for interim status,
14 and this is more fully set forth in our brief.
15 The release in question primarily occurred,
16 according to Sparton, from a solvent storage cell
17 located at the facility. The primary contaminant
18 is trichloroethylene, which is a hazardous
19 waste. What we have here -- this is the
20 approximate boundary of the trichloroethylene
21 plume, and this is indicated by a five parts per
22 billion of trichloroethylene. As far as the
23 contamination on site, as of January 19, 1996, on
24 site the concentrations were approximately 7,600
25 parts per billion TCE, the middle of the plume

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1 was approximately 3,200 parts per billion, and
2 explains this indicates a five-parts-per-billion
3 limit there. The reason the five parts per
4 billion was chosen, that is the MCL or maximum
5 contaminant level for TCE. The maximum
6 contaminant level is defined as the maximum
7 allowable concentration of specific contaminants
8 in water supplied by public water systems. And
9 the MCLs are health-based standards that EPA has
10 determined that's protective of human health.
11 The plume itself extends approximately
12 one-half mile off the facility. It's
13 approximately 3,300 feet long by 1,650 feet wide.
14 It covers approximately 90 acres, and it's
15 approximately anywhere from 50 to 125 feet below
16 the water table. To get a little better
17 perspective as far as the site itself, on either
18 side of the facility is commercial development.
19 There is a day care center located approximately
20 here. We have residential properties in this
21 area here, and this is also known up here as the
22 Paradise Hill subdivision.
23 Turning to the next matter where corrective
24 actions or other response measures are necessary
25 to protect human health and the environment, EPA

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1 must show either a present or a potential
2 threat. In this particular case we have a
3 potential threat to human health and a present or
4 actual threat to the environment. And as the
5 Court will see, there is going to be some
6 overlap.
7 In regard to the potential threat to human
8 health, I would like to set the scene here. The
9 aquifer that has been contaminated by Sparton is
10 part of the Santa Fe Group Aquifer System, which
11 the City of Albuquerque relies on as its sole
12 source of drinking water. More than 500,000
13 persons in the City of Albuquerque are dependent
14 solely upon groundwater for their water usage,
15 and the City of Albuquerque as the governing body
16 has a compelling interest in protecting the
17 health, safety and welfare of the citizens, and
18 this necessarily includes the vigorous protection
19 of the City's limited groundwater resources. And
20 as part of its responsibility, in 1982, the City
21 designated this area as a future well site and
22 thus a critical resource for the City.
23 Furthermore, as part of its responsibility,
24 it drafted in 1994 a Groundwater Protection
25 Policy and Action Plan which also designates the

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1 area contaminated by Sparton as a critical area
2 for groundwater quality protection. The purpose
3 of this plan was to ensure the quality of the
4 City's groundwater resources so that public
5 health and the quality of life and economic
6 status will not be diminished.
7 Unless corrective action is taken, this
8 plume will continue to migrate into other areas
9 of the Santa Fe Group Aquifer System and thus
10 prevent utilization of this valuable natural
11 resource. As I previously stated, the
12 trichloroethylene contamination off-site is
13 approximately 3,200 parts per billion in the
14 middle of the plume, which is approximately a
15 half-mile off-site. The maximum contaminant
16 level, as I previously stated, is five parts per
17 billion, so we have concentrations of over 600
18 times the maximum contaminant level.
19 Now that I've set the scene here, I would
20 like to look at the situation in terms of risk
21 analysis. The pathway for the contamination is
22 the aquifer, and the receptors are the potential
23 users. And because this is a potential source of
24 drinking water and you have contamination above
25 the MCLs, we have a potential threat to human

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1 health. And I refer the Court to a case I cited
2 in my brief, the State of New York vs. Shore
3 Realty Company, where the Court found that
4 released groundwater poses a threat to human
5 health even if drinking water supplies are not
6 threatened. And this analysis I outlined fits in
7 with the proposed Subpart S regulation, 40
8 C.F.R., Section 264.525(d)(1) which I cite in my
9 brief, which, contrary to the response assertion,
10 has not been superseded. This proposed
11 regulation provides that in determining the
12 cleanup levels that are protective of human
13 health for a potential source of drinking water,
14 EPA must consider MCLs in establishing cleanup
15 levels. Therefore, if there wasn't a potential
16 threat to human health due to contamination of
17 potential source of drinking water, one wouldn't
18 establish cleanup levels for the aquifer. Now,
19 Sparton has claimed that its contamination will
20 not cause any loss of any reasonable foreseeable
21 use of the aquifer.
22 MR. HARRIS: Mr. Malone, I'm a bit puzzled
23 here. I thought the opening by EPA was designed
24 to give the basis of the Order from the
25 administrative record as opposed to arguing

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1 Sparton's position. Maybe I misunderstood the
2 regulations or your Order, but I thought it was
3 pretty clear that they were going to introduce
4 the record and identify from the record what
5 support they have, and it seems to me that this
6 particular line of argument is clearly outside
7 the scope of the regulations in your Order and I
8 would object to it.
9 MR. MALONE: Well, the objection is
10 overruled. And on March 21, 1997, when you read
11 that Order, I specifically stated that I was
12 interested in the legal and technical basis for
13 issuance of the Order, so I want EPA to proceed
14 with that. I mean, either I get it now or I get
15 it later, so your objection is overruled.
16 MR. HARRIS: Well, I'm just -- I'm still
17 trying to understand what their legal basis is,
18 and they have yet to supply that to me; I think,
19 in writing or now, that's not being provided, its
20 argument with respect to Sparton's position,
21 which to me is rebuttal, but I understand your
22 ruling.
23 MR. PEARSON: Well, I would like to say
24 we've clearly set forth the legal requirements in
25 our brief. We set six elements there, and I

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1 think we will be addressing all the legal basis.
2 Part of the legal basis includes whether there's
3 a threat to human health and the environment, and
4 I've explained the basis for that threat.
5 Okay. Like I said, Sparton has previously
6 stated that this contamination will not cause any
7 loss of any reasonable foreseeable use of the
8 aquifer. However, the City back in 1982
9 identified this area as a potential well site,
10 and it can't be used because of the contamination
11 that Sparton caused. The City also -- Sparton
12 has also raised the issue that -- because the
13 contaminated portion of the aquifer is located
14 within the New Mexico Utilities service area. In
15 our CMS comments, we stated that the goal for
16 addressing restoring groundwater to unrestricted
17 use is so that any user can have access to the
18 resource regardless of the boundaries of the
19 service area, and the reason we put this in here
20 is because we recognize we could not predict the
21 future. No one can predict the rapid development
22 in the area surrounding the facility, and
23 economic and legal and technical factors could
24 change the situation drastically. And I would
25 like to reference just briefly our filing of

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1 March 20th, 1996, in regard to that matter.
2 MR. HARRIS: I'm sorry. The March 20th
3 filing, are you referring to the letter from the
4 City?
5 MR. PEARSON: Yes.
6 MR. HARRIS: Are you accepting that?
7 MR. MALONE: I did not accept that into the
8 record, so --
9 MR. HARRIS: Well, it's being mentioned in
10 the record, so is it now part of the record?
11 MR. MALONE: It's not part of the record.
12 The letter is not part of the record. I mean, he
13 mentioned the letter, but that letter has not
14 been admitted into these proceedings, so your
15 objection is well taken.
16 MR. PEARSON: Moving on here, where the City
17 and the State Government in this particular
18 case -- or excuse me, where the City has
19 determined how the groundwater is going to be
20 used, I believe EPA must accept its
21 determination. This is a matter of drinking
22 water. As far as what aquifer is going to be
23 used is a question for the state and local
24 authorities. So in this situation we have a case
25 where the City says there's a potential source of

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1 drinking water and the City says that it will use
2 it. And this also fits into EPA's stated policy
3 that it expects to return usable groundwater to
4 its maximum beneficial use.
5 Now, Sparton has made the statement in their
6 brief that Region 6 is required to prove that the
7 groundwater will be drunk and at levels that
8 justify the MCLs, citing the case of Leather
9 Industries of America vs. EPA. I would like to
10 point out there's no requirement under Section
11 3008(h) for this requirement. The Leather
12 Industries case involves challenges to proposed
13 use or disposal of sewage sludge regulation under
14 the Clean Water Act. In this particular case,
15 EPA was required to identify and set numerical
16 limits for toxic plumes which may be present in
17 sewage sludge or in concentrations which might
18 adversely affect the public health environment.
19 EPA has already done this for drinking water when
20 it established the MCLs.
21 Now, turning to the issue of whether the
22 contaminated groundwater presents a threat to the
23 environment, when you read Sparton's brief, they
24 seem to lump human health and the environment
25 together. Groundwater as defined by CERCLA --

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1 excuse me, natural resource as defined by CERCLA
2 includes groundwater. Groundwater is also
3 protected as a natural resource under the New
4 Mexico Water Regulations, and therefore you do
5 not have to have, like the Respondent contends, a
6 threat to an ecosystem in order to have a threat
7 to the environment.
8 Further, I would like to point out that the
9 New Mexico definition of water pollution -- and
10 when they define water, they include
11 groundwater -- as defined as the introduction
12 into water of contaminants in such quantity and
13 duration so as to unreasonably interfere with the
14 public welfare. Also, the State of New Mexico
15 defines adverse environmental impact as an act or
16 omission that amounts to $10,000 or more in
17 damage or litigation costs to groundwater. Even
18 if you accept Sparton's proposed remedy, which in
19 the Final Decision documents is roughly three
20 million dollars, you could see that exceeds the
21 $10,000 limit.
22 And therefore, now that EPA has shown that
23 there is a threat to human health and the
24 environment, the last requirement of the statute,
25 the question then becomes how best to protect

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1 human health and the environment. Mr. Malott
2 will discuss remedy selection criteria, along
3 with other issues identified by the Presiding
4 Officer. With Mr. Malott's remedy selection, he
5 will be discussing the remedy as proposed by
6 Sparton in its CMS report. We did not have a
7 containment proposal from Sparton when we made
8 our Final Decision and Response to Comments
9 document. I will then address Sparton's
10 containment proposal in my closing remarks as
11 part of this presentation. Thank you.
12 MR. MALOTT: The technical basis for this
13 remedy is based on several components, the first
14 of which is the establishment of the objectives
15 for the RCRA corrective action. These objectives
16 are based in part on criteria established under
17 Task VII of the corrective measures study and the
18 1988 Administrative Order of Consent. These
19 criteria include public health and environmental
20 criteria, the RFI, EPA guidance, state and
21 federal statutes and the regulations under 40
22 C.F.R., Part 264.
23 As previously discussed by Mr. Pearson, the
24 contaminated aquifer is potentially usable as a
25 source of drinking water. In the preamble to the

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1 1990 Subpart S proposed rule and the 1996
2 Advanced Notice for Proposed Rulemaking for
3 Subpart S for aquifers that are currently being
4 used or potentially usable as a source of
5 drinking water, the EPA expects to return the
6 groundwater to its maximum beneficial uses. In
7 addition, the State of New Mexico Water Quality
8 Control Commission of Regulations provide for the
9 protection of groundwater. Therefore, the
10 corrective action objectives for this site are
11 the following: One, containment of the source
12 area and reduction to the extent possible, and
13 the source area includes the contamination that
14 remains in the soil beneath the facility as well
15 as the high contaminant concentrations in the
16 aquifer beneath the facility; two, containment of
17 the contaminant plume to prevent further
18 migration and degradation of the aquifer; and
19 three, restoration of the contaminated aquifer to
20 its beneficial use.
21 EPA provided these objectives to Sparton and
22 the comments on the CMS report by letter dated
23 October 3rd, 1995, and March 1, 1996. These
24 letters are included in the administrative
25 record. These objectives were also outlined in

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1 the Statement of Basis that EPA made available
2 for public comment from December 8, 1995, to
3 February 8, 1996. These objectives are
4 protective of human health and environment by
5 reducing the source material available for
6 further contamination; secondly, by preventing
7 further migration of the contaminant plume which
8 prevents contamination of the unaffected areas of
9 the aquifer which is a potential source of
10 drinking water and a valuable natural resource;
11 and finally, by restoring the contaminated
12 aquifer to MCLs protects human health by
13 restoring usable groundwater to a safe level for
14 drinking.
15 The second component of EPA's remedy
16 selection is based on a review of available
17 technologies. Sparton presented several
18 technologies to address the contamination from
19 the facility in the final CMS report. For the
20 source area and soil, these include soil vapor
21 extraction, soil flushing and bioremediation. Of
22 these, the EPA selected soil vapor extraction to
23 meet the objective of the containment and
24 reduction of the source area in the soil.
25 Sparton also recommended this one. For the

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1 source area and the aquifer, Sparton presented
2 information on pump and treat, air sparging,
3 bioremediation. Of these, EPA selected pump and
4 treat to meet the objective of the containment
5 and reduction of the source area in the aquifer.
6 For the remainder of the contaminant plume,
7 Sparton presented information on pump and treat,
8 natural attenuation and bioremediation. Of
9 these, EPA selected pump and treat to meet the
10 objections of containment and restoration of the
11 contaminant plume. Sparton recommends natural
12 attenuation as the preferred approach.
13 Sparton's recommendation of natural
14 attenuation is apparently based on two points.
15 The first point is that a contaminant plume
16 consisting of chlorinated solvents such as TCE
17 will naturally degrade over time. Such
18 degradation could possibly occur through
19 biological, chemical or physical processes.
20 However, biological processes have not been shown
21 to degrade the contaminants such as TCE in the
22 groundwater based on the site conditions as we
23 know them today. Sparton's own consultant,
24 Battelle, also concurs with this.
25 As for chemical processes, the only process

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1 identified is the breakdown of trichloroethane,
2 also known as TCA, which is another chlorinated
3 solvent in the contaminant plume. The chemical
4 process transforms trichloroethane to
5 dichloroethene, which is a more hazardous
6 chemical, so this process is only making the
7 problem worse.
8 As for physical processes, dilution appears
9 to be Sparton's main solution for this
10 contaminant plume. Therefore, the natural
11 attenuation that Sparton is recommending is
12 really just unrestricted plume migration with the
13 eventual dilution of the contaminant plume to
14 acceptable levels. Before this is accomplished,
15 though, the plume will have continued to
16 migrate --
17 MR. HARRIS: Mr. Malone, in this proceeding
18 are we unable to object to complete misstatements
19 about my client's position?
20 MR. MALONE: You will be able to rebut
21 whatever EPA says, so when it's your turn to
22 present your case, you can rebut anything that
23 they have said. I mean, what I would suggest is
24 that right now you would jot down notes and just
25 rebut anything that they've said just to make the

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1 record complete. You know, in the interest of
2 time, I think we need to let both parties state
3 their case, and then you can rebut whatever you
4 think is just totally inaccurate, and that way
5 you will have a fully developed, complete record.
6 MR. HARRIS: Well, then I hope I'm going to
7 be provided with additional time, because it was
8 my understanding both from your Order and from
9 the regulations that EPA was supposed to be
10 sharing with us in their opening statement their
11 basis. So far they have not provided one
12 scintilla of information to support their
13 selection, but have instead chosen to identify
14 what they disagree with in Sparton's position,
15 and now Mr. Malott is misstating, completely
16 misstating, what Sparton is currently
17 recommending in this proceeding. He is confusing
18 the CMS proceeding, which EPA has terminated and
19 is over and doesn't represent the administrative
20 record for this proceeding, with what is going on
21 in this proceeding. And he knows very well that
22 Sparton has submitted a different proposal in
23 this proceeding than was in the CMS. And if I've
24 got to rebut all that when he's supposed to be
25 providing what EPA's position is, then I'm going

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1 to need at least an additional hour of time to
2 properly present our position.
3 MR. MALONE: You may proceed.
4 MR. PEARSON: Well, first of all, as far as
5 the basis, we have to prove the elements of
6 Section 3008(h), which we have done. Secondly,
7 as far as the remedy selection process, Mr.
8 Harris well knows that our record and the Order
9 was based on a Final Decision and Response to
10 Comments document which was made June 24th,
11 1996. The basis of our remedy selection was on
12 their proposal stated in their CMS report. They
13 may have submitted something later. It was not
14 on the basis of the administrative record which
15 we used to present the -- to make the decision.
16 Mr. Malott will explain the remedy
17 selection. The CMS process was part of the
18 remedy selection process. It's true that the
19 Order has been terminated, that is correct, but
20 as part -- and we're trying to explain the
21 technical basis for remedy selection which was
22 set forth in our Final Decision and Response to
23 Comments which was attached to our Order. Mr.
24 Harris is totally misstating the situation here.
25 We will address their one-well containment

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1 system, but we did not have it when we made this
2 decision and until this Order was issued. In
3 fact, they did not formally propose their
4 one-well containment system to EPA until we
5 received our February 4th, 1997, brief. All of
6 those negotiations were with the State. We were
7 aware of this proposal, but the proposal was
8 never made formally to EPA. In fact, the
9 proposals to the State came out of over -- in
10 many cases came over the letterhead of their
11 consultant as opposed to Sparton.
12 MR. MALONE: What I think we ought to do, in
13 the March 21, 1997, Order setting the agenda, I
14 instruct -- or I basically informed Sparton that
15 I was particularly interested in how you thought
16 your preferred remedy satisfied the remedy
17 selection criteria, so I think you are going to
18 have the opportunity to discuss your preferred
19 remedy which is something that you have submitted
20 in this proceeding. You submitted it in your
21 initial memorandum supporting the facts -- the
22 initial memorandum on the facts and the law
23 supporting Sparton's position, and you also
24 submitted a similar -- I guess had the same --
25 you covered the same topic when you submitted

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1 your additional information.
2 MR. HARRIS: Right.
3 MR. MALONE: So I have seen that. That
4 remedy will be considered in the final decision.
5 Those documents have been included in this
6 proceeding. So I think you're going to have the
7 opportunity to address the preferred remedy of
8 Sparton as of today. I mean, if you need
9 additional time, we can deal with that later, but
10 I think we still need to keep on moving.
11 Otherwise, we can have continual objections and
12 we won't get anywhere.
13 MR. HARRIS: I understand, but the
14 difficulty is -- the fundamental difficulty is
15 that this proceeding allows EPA to
16 mischaracterize the facts on a record that I
17 don't have an ability to deal with on a
18 case-by-case basis. When Mr. Malott makes an
19 incorrect statement, I cannot challenge that at
20 the time it's being made. I apparently have to
21 jot it down and hope I remember it to correct it
22 at some later point in time, because I don't want
23 this proceeding to suggest that when he says
24 something and I don't challenge it, that I agree
25 with what is going on. And what I'm concerned

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1 about what right now is the statements that he is
2 making do not accurately reflect what is going
3 on. And it gets back to my point that this whole
4 proceeding involves a tremendous number of
5 adjudicative facts, and that the only way to get
6 to those particular facts is to allow us to be
7 able to cross-examine and have direct examination
8 and to look at documents. Otherwise, this
9 proceeding is going to generate a record that
10 misstates what the actual facts are.
11 For instance, Mr. Pearson has misstated
12 EPA's involvement in the process that has been
13 going on since July with respect to Sparton's
14 proposals. EPA has been intimately involved in
15 that. We sent a letter to Mr. Malott on December
16 9th conveying our latest proposals to him. He
17 has been working with the State, and yet this
18 proceeding allows him in a one-sided way to
19 mischaracterize what has been going on for the
20 last six months, does not give us an opportunity
21 through discovery or cross-examination to get to
22 the heart of the matter, and it is totally
23 inappropriate for the creation of a record. And
24 I need to know what the ground rules are, both in
25 terms of being able to object, as well as the

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1 time I'm going to have and be able to review the
2 transcript to be able to address those
3 misstatements.
4 MR. MALONE: See, that -- I think what we
5 ought to do is just, as I set the procedures from
6 the -- on the onset, is to let both parties
7 present their case, and that way you can address
8 whatever you please. You will have the
9 opportunity to rebut whatever EPA says, and I
10 don't think we're going to get anywhere if we
11 continually object one after another. You know,
12 you object and then EPA objects. That's not
13 going to get us anywhere. So what I would
14 recommend is to stick to the agenda that I
15 provided to you guys on March 21, 1997, and that
16 agenda basically stated that EPA would present
17 its case, then the Respondent would be able to
18 rebut anything that EPA says and offer any
19 statements, facts and documents in support of its
20 case. So that's the procedure that I want to
21 follow. I mean, we're not getting anywhere with
22 these continual objections, so --
23 MR. HARRIS: Mr. Malone, if you will tell me
24 then that my objections will be summarily
25 overruled and that I'm not in a position to

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1 object when Mr. Malott makes statements that I
2 believe are incorrect and not based on any part
3 of the record, then I will be happy to let him
4 proceed.
5 MR. MALONE: You can rebut anything Mr.
6 Malott says, but it has to be within the confines
7 as set out in 40 C.F.R., Part 24. 40 C.F.R.,
8 Part 24, sets out the procedures for this hearing
9 and we have to stick to it, and you can rebut
10 anything Mr. Malott or Mr. Pearson says.
11 MR. HARRIS: Well, I'm suggesting to you
12 that these procedures don't provide me with an
13 appropriate time --
14 MR. MALONE: Let's move on.
15 MS. PEARSON: I would object --
16 MR. MALONE: Let's move on.
17 MR. PEARSON: I would object that it's
18 already been ruled these procedures are valid.
19 If Mr. Harris has any complaints with these
20 procedures, he can take them up with the Federal
21 Court. These procedures are valid and we have to
22 follow them, and if he has any problems with
23 them, the Federal Court can deal with those.
24 MR. HARRIS: I just want to make sure I
25 know, Mr. Malone, what the ground rules are, and

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1 if you're telling me that I am not supposed to
2 during their statements be objecting to
3 misstatements they make, that's fine, as long as
4 I know that's the ground rule.
5 MR. MALONE: The ground rule is for you to
6 be able to rebut anything that EPA says whenever
7 it's your turn to present your case in a rebuttal
8 to the EPA's initial presentation.
9 MR. HARRIS: But not to object while they're
10 making their presentation; is that right?
11 MR. MALONE: Right.
12 MR. MALOTT: Okay. A third component of
13 EPA's selection process is the evaluation of the
14 technologies against the remedy selection
15 criteria described in the 1990 proposed Subpart S
16 rule, the 1991 OSWER directive on the RCRA
17 corrective action decision documents and the 1996
18 Advanced Notice of Proposed Rulemaking to
19 Subpart S.
20 The fourth threshold criteria reflects both
21 the general mandate from the RCRA statute, which
22 is protection of human health and environment,
23 and the three major technical components of
24 remedies, these four here. The major technical
25 components of the remedies include cleanup of the

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1 release, source control and management of waste
2 derived -- generated by the cleanup. The five
3 balancing criteria listed here include a
4 combination of technical measures and management
5 controls for addressing releases. For protection
6 of human health and the environment, EPA's remedy
7 will isolate the source and will remove the
8 contaminants to the extent possible, control
9 further spread of the contaminant plume to
10 prevent further degradation of the aquifer, and
11 restore the aquifer to its beneficial use to
12 protect human health.
13 As I already pointed out, Sparton's remedy
14 would allow further loss of a natural resource
15 and is not protective of the environment.
16 Sparton also attempted to show that the
17 unrestricted migration of the contaminant plume
18 would not impact human health through a simulated
19 model of the plume movement. However, EPA has
20 reviewed the model and the supplemental
21 information provided by Sparton and has reached
22 the conclusion that the model results are
23 inconclusive and do not even represent current
24 conditions. Specifically, Sparton's model
25 apparently predicted that concentrations are less

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1 than 200 parts per billion only a couple of
2 hundred feet from the source area, yet we know
3 concentrations were over 3,000 parts per billion
4 only 1,600 feet from the source area and 1,900
5 parts per billion closer to the leading edge of
6 the plume. In addition, Sparton claims that the
7 model has accurately predicted the values of the
8 plume, yet we know that Well MW-65, which was
9 installed just last summer, is already
10 contaminated. Sparton's model apparently did not
11 predict this contamination either.
12 Therefore, Sparton's recommended remedy does
13 not even meet the general mandate from the RCRA
14 statute, which is protection of the human health
15 and environment. For media cleanup standards
16 under RCRA, this criteria is consistent with
17 CERCLA, and for contaminated groundwater, the
18 standards are set at the MCLs or State
19 standards. This is consistent with the aquifer's
20 use as a potential source of drinking water and a
21 valuable natural resource. EPA's remedy will
22 achieve this goal by containing the plume and
23 restoring the off-site aquifer in as short as
24 possible time while isolating and reducing the
25 source area of concentrations. Sparton's remedy

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1 calls for reaching this goal through dilution and
2 expansion of the plume.
3 The second major technical component of the
4 remedy is to control the source of the release.
5 EPA's selection of pump and treat and soil vapor
6 extraction at the facility will control the
7 source of the release. However, Sparton's
8 proposed implementation of the pumped and treated
9 facility will not control the groundwater
10 contamination beneath the facility. EPA has
11 previously demonstrated in its technical review
12 of the effectiveness of the interim measures pump
13 and treat system that a system pumping at less
14 than one gallon per minute will not contain the
15 plume. This document is in the administrative
16 record. Furthermore, their conversion of one
17 monitoring well to pump at 20 gallons per minute
18 has never been demonstrated to contain the plume
19 beneath the facility. Therefore, Sparton's
20 remedy does not meet this threshold criteria.
21 EPA's remedy calls for the installation of
22 groundwater extraction wells to effectively
23 contain the plume beneath the facility and remove
24 to the extent possible the contaminant
25 concentrations.

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The last major technical component is the management of waste generated by the cleanup activities. All the technologies will have to comply with the appropriate federal, state and local regulations governing waste discharge from the treatment process. The primary issue appears to be what to do with recovered and treated groundwater. The three options identified included injection, discharge to the surface or some form of beneficial use. While EPA has not rejected any of the three options, EPA prefers injection since it is most likely to conserve the natural resources that we are trying to protect with this RCRA corrective action by returning the treated water back to the aquifer. The South Valley Superfund site is successfully using just such a system to return treated groundwater back to the aquifer. In addition, the potential effectiveness of using injection wells has been explained in the affidavits and reports attached to EPA's brief filed on February 25th. Any injection well will require a permit from the State of Mexico prior to injection.

In the final CMS report, Sparton had recommended disposal to the Rio Grande. This

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option will require an NPDES permit from EPA. At the time Sparton submitted the CMS report on May 13th, 1996, Sparton had not submitted such an application. Sparton currently discharges the less-than-one-gallon-per-minute treated groundwater to the City sewer system. This is from the system that is currently operating the facility.

Under the five balancing criteria, the first two criteria of long-term reliability and reduction in toxicity, mobility and volume of waste are directly related and apply to source control technologies. EPA's remedy would effectively control the source of the release and permanently reduce the amount of source material remaining. Sparton's remedy would neither control the source of release or reduce the source material in equivalent amount.

For short-term effectiveness, all construction activities would have to be conducted to prevent exposure to workers and the residents in nearby neighborhood. Such measures were implemented at the South Valley Superfund site and involved construction of below-ground vaults to prevent accidental exposure at the

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surface. There is no reason why such a system could not be implemented here at the Sparton site and off-site areas. For implementation, all the technologies are readily available and can be implemented at the site. Permits will have to be issued for disposal of treated groundwater and recovered contaminant vapors from the soil vapor extraction system.

The issue of cost is of use to influence the selection of remedies which meet the same threshold criteria and achieve the cleanup range. In this case the only differentiation was between the source control technologies for the soil. In this case EPA recommended the use of soil vapor extraction. In addition, EPA considered two modifying criteria in the remedy selection process in the form of state acceptance and community acceptance. EPA received extensive written and oral comments from the public comment period and public hearing. The public hearing was attended by 106 people. The comments received by EPA were in favor of a remedy which would address the source of the release and contain and restore the contaminant plume.

In summary, EPA's selected remedy meets the

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four threshold criteria, especially protection of human health and environment, cleanup of the release and source control. Sparton's recommended remedy would not meet these same criteria.

The same remedy selection is also achieved by using the criteria listed in Task IX of the corrective measures section of the Administrative Order on Consent. At a minimum, these criteria include technical, human health and the environment. Under the technical criteria, we have performance, reliability, implementation and safety issues. Implementation of the technologies under -- I'm sorry. Under the technical criteria, the reliability of each of these technologies has been proven at waste sites elsewhere, particularly at the South Valley Superfund site. Implementation of the technologies will also achieve the corrective action objectives in the shortest period of time.

As previously discussed, safety measures have been successful at the South Valley Superfund site to prevent accidental exposure at the surface. The human health criteria listed

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here in B includes the use of EPA criteria, standards or guidelines in the evaluation process. This includes the 1990 proposed Subpart S rule, the 1991 OSWER Directive on Remedy Selection and the 1996 Advanced Notice of Proposed Rulemaking for Subpart S. Utilizing these guidelines, an aquifer as a potential source of drinking water should be restored to its beneficial use. The EPA's remedy will achieve this objective and the environmental objective through source area containment and reduction, preventing further migration of the plume and restoration of the aquifer. Sparton's remedy would not achieve the same objectives and thus is not protective of human health and the environment.

The final component of the remedy selection is the implementation process. EPA has proposed a phased implementation process for the remedy. The benefits of a phased approach is that data generated during the initial steps can be used to adjust the remedy design in response to site conditions and enhance remedy performance. Following additional characterization, the first phase will consist of installing one or more

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groundwater extraction wells to contain the source area and installation of a soil vapor extraction system. Concurrently, groundwater extraction wells will be installed to prevent further migration of the leading edge of the contaminant plume.

Following a review of the performance data, the second phase will be the installation of groundwater extraction wells to begin removing the high-concentration areas within the plume for purposes of restoring the aquifer. This is primarily in the off-site areas. Data from the initial extraction wells will be utilized to assist in the location and design parameters for the new wells. The main area of emphasis is the contaminated aquifer throughout the off-site area which has the greatest exposure. There are three factors that will determine whether restoration is feasible: The physical characteristics of the aquifer, the physical characteristics of the contaminants and the adequacy of the groundwater extraction system design.

In the off-site area of the contaminant plume, the aquifer consists predominantly of sands and gravels, which provides a favorable

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1 environment for groundwater extraction. The
2 contaminant characteristics are also favorable
3 because the primary contaminant, trichloroethene,
4 has a relatively low absorption potential in
5 aquifer material, which also favors groundwater
6 extraction. These two factors alone favor the
7 use of pump and treat or groundwater extraction
8 throughout the off-site plume to contain and
9 maximize the removal of contaminant mass.
10 The third factor has to do with the adequacy
11 of the design of the groundwater extraction
12 system. This can be accomplished with further
13 characterization of the aquifer and contaminant
14 plume to be determined in appropriate parameters
15 for the design of the system. Finally, the use
16 of a phased approach will ensure that the data is
17 used to refine the system of design.
18 In summary, EPA's remedy is protective of
19 human health and environment by containing and
20 reducing the source area through soil vapor
21 extraction and pump and treat at the facility and
22 the prevention of further migration of the plume
23 and restoration of the aquifer using pump and
24 treat. Sparton's recommended remedy is not
25 protective of human health and environment and is

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1 relying solely on soil vapor extraction, the
2 existing pump and treat system which pumps less
3 than one gallon per minute, and the conversion of
4 one monitoring well to pump 20 gallons per
5 minute. This concludes the technical basis for
6 EPA's remedy selection.
7 MR. PEARSON: Your Honor, I just have a few
8 brief comments here to finish up our
9 presentation. As Mr. Malott has stated and as
10 also I previously stated, the basis for our
11 Initial Administrative Order is the Final
12 Decision and Response to Comments document which
13 is based on the CMS report and Sparton's proposal
14 in the CMS report. Now, just to briefly address
15 Sparton's one-well containment system -- or now I
16 guess it's one or more wells -- Sparton's
17 proposal will still not adequately protect human
18 health and the environment. Contamination above
19 the MCLs will remain in the groundwater,
20 presenting a threat to human health and the
21 environment and preventing utilization of a
22 valuable natural resource. It is also contingent
23 on obtaining authorization to discharge in the
24 Calabacillas Arroyo. If this does not occur,
25 then Sparton has stated that they won't implement

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1 the remedy.
2 Now, I just want to -- when I mentioned
3 about this authorization of the Calabacillas, I
4 want to emphasize that Sparton has submitted an
5 NPDES permit application, and no decision has
6 been made one way or the other. The decision to
7 issue that permit will be made by the Water
8 Division as opposed to the Enforcement Division.
9 And one last matter in regard to legal basis
10 for issuing the Order, Sparton has claimed that
11 the Order does not provide reasonable specificity
12 as to what is required. The corrective action
13 plan, which is attached to the Order, is probably
14 at least 50 pages long and has detailed work
15 plans as far as what is required to be submitted
16 by Sparton. It's also attached to the Final
17 Decision and Response to Comments document that
18 sets out the implementation of the remedy, and
19 Sparton has not cited any authority which states
20 that you have to set forth the exact number of
21 wells. And at this point that concludes EPA's
22 initial presentation.
23 MR. MALONE: Thank you.
24 Counsel for Respondent, you may proceed.
25 MR. HARRIS: Mr. Malone, we believe there

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1 are two fundamental issues that are presented in
2 this proceeding, and the first is, what is the
3 nature of the threat, if any, that's presented by
4 the impacted groundwater associated with
5 Sparton's manufacturing facility, and, secondly,
6 what response is necessary. The starting point,
7 of course, for that analysis is the statutory
8 provision of RCRA under which we're operating,
9 which is 3008(h), which only gives the agency the
10 authority to order those corrective actions that
11 are necessary to protect human health and the
12 environment.
13 We've got several slides -- or several
14 exhibits that we would like to introduce and go
15 through from a demonstrative standpoint in
16 explanation of what our position is. Let me hand
17 to you a set that you can take a look at.
18 MR. PEARSON: I would just like to clarify,
19 Mr. Harris, are all of these exhibits in the
20 administrative record?
21 MR. HARRIS: Well, it didn't -- I believe --
22 no, 1 is -- I believe 1 is not, 2 are not, 3 are
23 not, 4 are not, 5 are not. Several of them are
24 not, but they're all based upon information that
25 is in the administrative record.

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1 MR. MALONE: So are these maps consistent
2 with my request for you to explain how your
3 remedy is consistent with -- or how your
4 preferred remedy satisfies RCRA Section 3008(h)
5 and EPA's --
6 MR. HARRIS: I believe they are, Mr. Malone.
7 MR. PEARSON: I would just like to have a --
8 if that's the case, I -- I don't have any chance
9 to take a look at these and I would like to have
10 a standing objection to those exhibits which are
11 not part of the -- part, as we know of, of the
12 administrative record. I have not seen these
13 before, so I would like to have an objection at
14 this time.
15 MR. MALONE: Okay. What I will do, I will
16 allow these documents to come in and be a part of
17 this proceeding, but you guys or the EPA will be
18 able to respond to these documents. You will be
19 able to submit a brief or a written response
20 after this hearing disputing or agreeing or
21 presenting any arguments that you may have with
22 respect to the maps. Now, I'm not going to set a
23 schedule right now, but before we convene today,
24 I will set a schedule for you guys or the EPA to
25 get a response.

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1 MR. PEARSON: And assuming there is --
2 MR. HARRIS: May I respond to that first
3 before he asks about it, I mean, because all the
4 information that's contained on these exhibits is
5 already present in the administrative record and
6 our previous submission. They've already had an
7 opportunity to respond to everything that's going
8 to be presented to you, so essentially you're
9 providing them a second bite of the apple. If
10 they get a second bit of the apple, I would like
11 to have a second bite of the apple on behalf of
12 my client.
13 MR. MALONE: The way I understood you
14 earlier is, you said some of these documents were
15 not included in the administrative record. Is
16 that correct?
17 MR. HARRIS: Yes, but all of the information
18 contained on those documents is in the
19 administrative record.
20 MR. MALONE: Well, to the extent that these
21 documents aren't in the administrative record and
22 if they're going to become part of this
23 proceeding, EPA should have the opportunity to
24 review these documents and comment on them.
25 MR. HARRIS: They've already had an

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1 opportunity to do that through the previous
2 submissions we've provided.
3 MR. MALONE: Well, I am ordering that EPA
4 have the opportunity to respond to the documents
5 that aren't in the record.
6 MR. HARRIS: And then we request an
7 opportunity to respond to whatever they submit to
8 you because they may misstate what we have in
9 there or make other statements that we should
10 have an opportunity to deal with.
11 MR. MALONE: Okay. Well, I'm going to table
12 that issue, but before the day is over I will
13 decide on that.
14 MR. PEARSON: If I could just before we get
15 started, EPA may or may not want to file a
16 post-hearing brief depending upon the information
17 submitted, but if Mr. Harris because of the
18 Court's ruling on this, if he could specifically
19 identify which of these are taken directly from
20 the administrative record and which are not, we
21 would appreciate that.
22 MR. HARRIS: Sure.
23 MR. MALONE: Okay.
24 MR. PEARSON: Okay.
25 MR. HARRIS: In identifying what threat

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1 exists, there are two issues that EPA is supposed
2 to take a look at: What is the toxicity and what
3 are the exposure pathways? The toxicity that
4 supposedly exists at this site is solvents that
5 are found in the groundwater near the Sparton
6 facility. Now, what I've put in front of you and
7 we'll mark as Respondent's Exhibit 1 --
8 (Respondent's Exhibit 1 was marked.)
9 MR. HARRIS: -- is taken from the
10 remedial -- the RFI, which is part of the
11 administrative record in this proceeding. It is
12 simply presented in slightly different form
13 here. What we have done is to take some
14 cross-sections from various wells to show not
15 only the horizontal extent of the plume, but also
16 vertically how deep the solvents are found in the
17 groundwater. I'll try and simplify this a little
18 bit, Mr. Malone. It's very similar to the
19 exhibit that Mr. Pearson had. The Sparton
20 facility is down sort of on the lower right-hand
21 side of Exhibit Number 1, and it's marked as
22 "Sparton," and then you will see a line that sort
23 of encircles that facility, and that represents
24 the limits of the plume, at least the limits
25 based on less than five micrograms per liter,

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1 which is consistent with the Metcalf & Eddy
2 document that Mr. Pearson was providing.
3 Now, the wells that have squiggly lines
4 around them indicate nondetects. Those are wells
5 that have been completed in the groundwater, and
6 water samples were taken and analyzed, and there
7 haven't been any solvents shown in those wells,
8 so they are clean for purposes of this. And as
9 you can see, what we have are a series of clean
10 wells surrounding an area that has been impacted
11 by solvents. The same information is shown on
12 the cross-sections.
13 These are simply -- you will see lines --
14 you will see letters A, B, C, D, and then
15 A-prime, D-prime and C-prime. Basically that
16 line, if you follow from A to A-prime, represents
17 what you would see if you followed -- if you were
18 able to essentially cut the earth away and go
19 down to the depth of the groundwater and look at
20 it from the side. And that cross-section is
21 shown -- it's a little tough to make out, but
22 down here at the bottom is Cross-Section A-A, so
23 you're looking through depth. And what that
24 shows, again, are wells with squiggly lines
25 around them that represent nondetects, and the

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1 other wells show various concentrations of
2 solvents. Again, the purpose of this is just to
3 give you a sense of where the solvents are
4 located both horizontally and vertically at this
5 particular site.
6 I would note that this characterization of
7 the plume was submitted in the RFI and that
8 document was approved by EPA, and so EPA said
9 sometime in June of 1991 that we had properly
10 delineated and described the plume based upon
11 this work that we had done in the field. So at
12 that point in time, that snapshot in time, that's
13 what the plume looked like.
14 MR. MALONE: So this is the 6/1 document?
15 MR. HARRIS: Yes, it is. The second exhibit
16 we have is an update to 1.
17 (Respondent's Exhibit 2 was marked.)
18 MR. HARRIS: I'll try and put these next to
19 each other so you will have a sense of what we're
20 talking about here. This document represents
21 work that was done -- wells that were installed
22 in, I think, June and July of 1996 in order to
23 determine how the plume had changed in
24 configuration between '91 and 1966, and we used
25 the same format again. You have side views, and

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1 then you have wells that are located both within
2 and without the plume, and we've indicated with
3 squiggly lines around those wells that are
4 nondetect.
5 And, again, we have described a plume that
6 has moved what appears approximately 400 or 500
7 feet from 1991. You will note down here the
8 leading edge is approximately, oh, 400 to 500
9 feet sort of southeast of where the line is on
10 Exhibit 2. And, again, the squiggly lines
11 represent those wells that surround this plume
12 and indicate where we have clean zones. So you
13 have an impacted area that's surrounded by a
14 bunch of clean wells, and you can see the same
15 thing with the cross-section.
16 The reason for these exhibits in part is
17 both to give you a sense as to where the solvents
18 are located, their horizontal extent, but also
19 one of the requirements that EPA has suggested in
20 its Order is a need to put in up to 20 more
21 monitor wells at this location in order to better
22 define the plume. We find that request somewhat
23 confusing given the fact that in June of '91 EPA
24 believed that we had properly delineated the
25 plume with the number of wells we had there. We

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1 now have more wells. We had the same, if not
2 more, clean wells surrounding the plume, and yet
3 EPA is suggesting that there is a need to put in
4 20 more wells to adequately define the plume. I
5 think from this exhibit you can see that we have
6 ample number of wells defining where the clean
7 areas are and more than sufficient information in
8 order to address what an appropriate remedy is at
9 this site.
10 Apart from the horizontal extent of this
11 plume in the immediate vicinity, we also have an
12 exhibit that gives you a broader sense of how
13 this plume fits in with surrounding usages, and
14 this will be Exhibit 3.
15 (Respondent's Exhibit 3 was marked.)
16 MR. HARRIS: This is not in the
17 administrative record, but it is all based on
18 information from the administrative record. This
19 is a street map that was taken, I guess with
20 permission of Rand McNally, of the surrounding
21 area. The area in green represents the extent of
22 the plume as of July of 1996, and that's
23 obviously taken from Exhibit 2. The rest of the
24 information on here represents domestic wells and
25 municipal industrial wells that State records

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1 show are currently in existence. This
2 information is all taken from the RFI, so all we
3 have done is transpose information from the CMS
4 and from the RFI onto what is Exhibit 3, and the
5 purpose for this is to get into the issue of
6 exposure pathways.
7 The question is, if we have impacted this
8 part of the aquifer, who is going to be impacted
9 by that and how can they come in contact with
10 that particular groundwater? You will note that
11 at the current time there are no wells completed
12 directly within the impacted area, nor are there
13 any wells upgradient.
14 And by the way, Mr. Malone, just to have a
15 sense here, the contaminants are moving generally
16 in a northwesterly direction. In other words, if
17 you start at the Sparton facility, which is down
18 in the southeast corner of the green amoeba-like
19 figure that's on Exhibit 3 and you move in sort
20 of a north and west direction, that's the
21 direction that the water is moving; it's moving
22 away from the Rio Grande. And so all of the
23 domestic wells that are in place are what is
24 referred to as downgradient. In other words,
25 they are in the opposite direction to which

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1 groundwater is flowing and the way in which the
2 solvents are moving. The only well that is
3 upgradient at this point in time to the impacted
4 area is this red dot up in the upper left-hand
5 corner of Exhibit 3.
6 MR. CHANDLER: You forgot to color one in.
7 There's a circle that --
8 MR. HARRIS: Where is that?
9 MR. CHANDLER: On the New Mexico Utilities
10 Well #2, which is right there. We need to color
11 that in.
12 MR. HARRIS: Okay.
13 MR. CHANDLER: Somehow it didn't get colored
14 in. I apologize for that. The circle is there,
15 it's just not colored in.
16 MR. HARRIS: On Exhibit 3 we have indicated
17 New Mexico Utilities Well #2, which, again, is in
18 a northwesterly direction from the area that has
19 been impacted and would be the closest municipal
20 well. It's approximately two-and-a-half miles or
21 so from the facility or from the leading edge of
22 the plume. There's some confusion; I'm not sure
23 exactly what the distance is, but it's in the two
24 to two-and-a-half mile range. And that is the
25 closest producing well downgradient or in the

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1 direction that the solvents are moving.
2 There are -- New Mexico Utilities has a
3 permit for a well -- the New Mexico Utilities --
4 I'll mark on Exhibit 3 here. As a permitted
5 well, it would be -- I'll mark this in green. It
6 would appear to be -- and this is going to be
7 approximate, Mr. Malone, but along Irving
8 Boulevard west of Golf Course. And New Mexico
9 Utilities has also recently filed an application
10 with the State Engineer's Office in New Mexico to
11 add, I don't know, 60 or 70 additional wells.
12 That application does not include any proposed
13 locations within the vicinity between where I've
14 put the green dot and where the impacted area is,
15 nor anywhere in the immediate vicinity around
16 that area.
17 MR. MALONE: So that's approximately one
18 mile from the plume, the leading edge of the
19 plume?
20 MR. HARRIS: Probably. That's a permitted
21 location. But there is a letter from the General
22 Manager of New Mexico Utilities indicating that
23 they have no plans to develop that well in the
24 near future or the near term.
25 MR. PEARSON: Excuse me, Your Honor. Now,

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1 previously I had referenced something -- a
2 document that wasn't part of the record, and I
3 don't want to enter -- I know we previously had
4 an objection, but if he has reference to
5 documents concerning permits filed with the New
6 Mexico Utilities -- or the New Mexico Utilities
7 has filed with the State Engineer's office
8 recently, I'm not aware if that's part of the
9 administrative record. So I now would like to
10 object to that because I'm not aware of those
11 permit applications or any indications they're a
12 part of the administrative record, unless Mr.
13 Harris can cite me something to that effect.
14 MR. HARRIS: My understanding of the
15 regulations is that I'm entitled in my response
16 to provide any facts, explanations or summaries,
17 and that's part of what I'm doing here.
18 MR. PEARSON: Well, he also referenced
19 about -- I mean, where both parties -- the Order
20 said both are limited as of March 14th.
21 MR. MALONE: Right.
22 MR. PEARSON: And if I'm limited, he's
23 limited. If he wants to open it up, that's fine.
24 MR. MALONE: Right. I understand your
25 position. To the extent that you're using

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1 information that I have not accepted into the
2 administrative record, that information is not
3 usable. I've allowed you to use this information
4 for purposes of this proceeding and it's made
5 part of the total record, but if you're referring
6 to permits that are not part of the record,
7 permits that the EPA has not had a chance to look
8 at, that information will not be accepted into
9 this record and made part of this hearing.
10 MR. HARRIS: Well, that's not what the
11 regulations require. The regulations say I can
12 submit any facts. I'll just quote to you the
13 language, and it's very clear. In 2415(b), the
14 second sentence says, the Respondent may respond
15 to the administrative record the EPA has offered
16 already and offer any facts -- any facts --
17 statements, explanations or documents which bear
18 on any issue for which the hearing has been
19 requested. It goes on to say, any such
20 presentation by Respondent may include new
21 documents only to the extent the Respondent can
22 demonstrate through no fault of its own such
23 documents could not have been submitted.
24 MR. MALONE: So you're not requesting to
25 submit any document, you're just -- you want to

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1 reply?
2 MR. PEARSON: Well, if that's the case, then
3 I should be able to -- if I'm not referring to
4 any documents, then I should be able to make a
5 statement outside the administrative record
6 itself as that item that was mentioned before.
7 MR. MALONE: That is correct.
8 MR. PEARSON: So as long as I can make it
9 clear here, I can refer to things that are not in
10 the administrative record as long as it's not a
11 document. Is that correct?
12 MR. MALONE: That's correct, that's correct.
13 MR. HARRIS: Only in response to whatever I
14 bring up.
15 MR. MALONE: Well, in the EPA's presen --
16 which the EPA has already presented its case. I
17 mean, at this point the EPA will be in the mode
18 of rebutting. Now, in that earlier ruling, if
19 there is something that you want to say about a
20 document that you submitted as additional
21 information which I did not accept, if you want
22 to say something about that document, you will be
23 allowed to address that document, but that will
24 be the only document that I will let you address
25 from this point on.

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1 MR. PEARSON: Okay. So just so I
2 understand, because when I've made my
3 presentation, I've limited my presentation based
4 on documents -- I could have said stuff that was
5 not in -- I could have said what was in the
6 document without saying what the document was,
7 and according to the way Mr. Harris has
8 mentioned, that that's okay?
9 MR. MALONE: In your rebuttal to the
10 Respondent's presentation, you will be allowed to
11 discuss any facts that are pertinent to rebutting
12 whatever the Respondent has presented, so it can
13 be matters that are outside of the administrative
14 record.
15 MR. PEARSON: But I just want it made a
16 point here that I was basically -- I understood
17 the Court's ruling that -- I limited my
18 presentation on that behalf because of any
19 reference because I thought the facts -- because
20 I couldn't use anything in that document, so I
21 want to make sure that I can talk about things
22 that were in that document without mentioning it
23 on my case in rebuttal.
24 MR. MALONE: Yes, you can.
25 MR. HARRIS: If it rebuts what I have

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1 raised.
2 MR. PEARSON: No, that's not --
3 MR. HARRIS: Yes.
4 MR. PEARSON: -- what he said there. In
5 that case, I would like to be able to amend my
6 presentation then, because he's changing the
7 rules in midstream here.
8 MR. HARRIS: I'm going by the same rules.
9 It's Mr. Pearson that's changing them.
10 MR. MALONE: I'm going to address the issue.
11 Whenever you want to present your rebuttal
12 issues, present them as you wish, and I will
13 decide on any objection that the Respondent may
14 have at that time.
15 MR. HARRIS: Thank you.
16 MR. MALONE: Please proceed.
17 MR. HARRIS: My point is that New Mexico
18 Utilities -- and by the way, the area that's in
19 white on Exhibit 3, except for an area up here
20 and it's sort of the northeast side, but
21 basically everything to the west of Coors Road on
22 Exhibit 3, and that's in white, is the New Mexico
23 Utilities Service area. In other words,
24 everybody that lives in that area is provided
25 water by New Mexico Utilities. They are not

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1 provided water by the City of Albuquerque. And
2 it's my understanding that the City of
3 Albuquerque, in fact, is prohibited by the public
4 utility laws in the State of New Mexico from
5 servicing people in this particular area. I
6 found it interesting that nobody from New Mexico
7 Utilities has indicated any problem with what
8 Sparton has suggested, and they are the ones most
9 directly impacted, and they are the ones that
10 have already said that this well in green is not
11 a well that in the near term they intend to use.
12 To show you also some sense of the vertical
13 separation with respect to the Sparton site and
14 the New Mexico Utilities well, we've got another
15 exhibit that is taken directly from our
16 submissions in this proceeding, Mr. Malone, and
17 we'll mark this as Exhibit 4.
18 (Respondent's Exhibit 4 was marked.)
19 MR. HARRIS: And this was attached to Mr.
20 Peter Balleau's declaration that was part of our
21 initial submission in this case. What it
22 represents is, again, a cross-section, but a
23 broader cross-section, showing various geological
24 features. The area that is up in the left, and
25 it's marked NMU-RG-4462 -- and I'll try and get

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1 these two exhibits next to each other -- that
2 delineation on Exhibit 4 represents what is
3 marked on Exhibit 3, and I'll go ahead and mark
4 it as Well #2. And the point of this document is
5 to demonstrate that not only is there a
6 significant horizontal distance between the area
7 that's been impacted in New Mexico Well #2, but
8 additionally --
9 MR. MALONE: I can't see the exhibit. Can
10 you --
11 MR. HARRIS: Oh, okay, sure. Sorry.
12 Pierce, could you hold that for a second?
13 MR. CHANDLER: Sure.
14 MR. HARRIS: It's sort of in stereo here,
15 Your Honor. We've got NM-2 as the red dot on the
16 west side, and we're showing the horizontal
17 distance --
18 MR. PEARSON: Jim, could you maybe move back
19 just a little bit so we can see?
20 MR. HARRIS: Oh, sure. That's the
21 horizontal distance that we talked about of two
22 to two-and-a-half miles. Now, on Exhibit 4, if
23 you see the little Sparton indication, what we
24 see is an area very near the surface where the
25 impacts are located. As Mr. Pearson indicated in

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1 his opening remarks, the groundwater that has
2 been impacted is 60 to 150 feet below the water
3 table. What we have at NMU-RG-4462 is the public
4 supply well, and it's completed at a depth, I
5 believe, of about 1,000 feet. So you can see
6 that not only is there a fairly significant
7 horizontal separation, but there's also a
8 significant vertical separation. And the reason
9 that this well is completed so deeply is that the
10 area that's cross-hatched on Exhibit 4 represents
11 good quality water. The area that Sparton has
12 impacted is poor quality groundwater. In fact,
13 Mr. Balleau's declaration is that even in the
14 absence of the impacts from Sparton, this water
15 would not be prime water for drinking water
16 purposes. And, in fact, you can see that there's
17 a significant separation between the two.
18 Now, the one well that I mentioned on
19 Exhibit 3 that we marked in green, that well
20 would be about halfway between NMU-RG-4462 and
21 the Sparton site. It is to be completed at a
22 depth of 1,500 feet, so it would be -- based upon
23 the surface elevation being approximately 5,500
24 feet, that well would actually be completed
25 somewhere down at the 4,000-foot range so that

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1 there would also be significant vertical
2 separation. And Mr. Balleau's declaration makes
3 clear that there shouldn't be -- because of the
4 significant resistance to vertical flow at this
5 site, there should not be -- and Mr. Chandler's
6 declaration also made clear, that the well in
7 question should not be impacted by the solvents
8 from the Sparton operation.
9 To make that point, we submitted as part of
10 our submission the results of some modeling --
11 and this will be Exhibit 5 -- to show how the
12 solvents and groundwater would move over time if
13 we did nothing at that particular site.
14 (Respondent's Exhibit 5 was marked.)
15 MR. HARRIS: Now, the first exhibit, which
16 is Exhibit 5 -- and this is taken directly from
17 our submission and is part of the administrative
18 record -- basically demonstrates, shows what
19 happens if we have no source control and we don't
20 have any containment at the leading edge, how the
21 solvents in the groundwater will move over time.
22 And it's based upon -- the first one is 50 years,
23 Mr Malone, then 100 years, 150 years, 200 years.
24 In other words, what this model was designed to
25 predict is how the solvents in the groundwater

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1 will move over those periods of time. And we've
2 marked on Exhibit 5 where NMU Well #2 is located.
3 And you can see that it's not until approximately
4 150 years that any of the solvents associated
5 with the Sparton site reach NMU Well #2.
6 Now, this modeling was done very
7 conservatively. We attempted to throw out any
8 factors that would cause retardation of this flow
9 and simplify matters to show how -- that it would
10 move as quickly as possible. Contrary to Mr.
11 Malott's statements, the model does predict that
12 Well #65 is going to be impacted within the time
13 frame we're seeing those impacts to Well #65, and
14 secondly, the model was not designed to predict
15 interior concentrations, it was simply designed
16 to predict concentrations on sort of the leading
17 edge. So the fact that the model might show a
18 concentration in the interior different than what
19 is actually there is of no moment to what this is
20 trying to show, which is what the concentration
21 is at the leading edge, and it has done that very
22 effectively in terms of correlating with what is
23 being found in Well #65.
24 But the point to remember is that not only
25 does it take a long time to move horizontally,

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1 but as the previous Exhibit Number 4 suggested,
2 what we would be seeing, Mr. Malone, is this type
3 of solvent after 150 years is up at the level of,
4 say, 60 to -- well, it's going to be less than
5 150, but I don't know what the number is, but
6 it's not going to be anywhere near the level that
7 is being shown on this map where the completion
8 of the New Mexico Utilities well is.
9 Finally, let me address for just a second,
10 going back to Exhibit 3, claims by the City of
11 Albuquerque that somehow their water resources
12 are going to be impacted by the plume that is
13 shown on Exhibit 3, and there are several points
14 to keep in mind in that regard. First we've
15 already mentioned that the City -- this is not
16 the City service area, and our previous
17 submission showed that if the City attempted to
18 complete any well in NMU's service area, that it
19 would be protested by several parties and that
20 there was little likelihood that such a permit
21 would, in fact, be granted.
22 Now, the City suggests that a 1982 master
23 plan that they had shows that they're going to be
24 using this area. The difficulty, of course, is
25 that 1982 master plan, as we pointed out,

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1 suggested that in 1996 there were going to be 239
2 producing wells in the City of Albuquerque.
3 There are, in fact, at this point in 1996 fewer
4 wells than in 1992, the point being that that
5 master plan is no longer a document that the City
6 is following in any way, shape or form with
7 respect to where it is going to be locating wells
8 as pointed out by the fact that it hasn't put in
9 the wells that it said it was going to put in.
10 We would also point out that there is no
11 infrastructure within three-quarters of a mile of
12 this area. There's no way for the City to get
13 the water if it did produce it without putting in
14 that infrastructure. The City has no permits to
15 produce wells in this area. The City has not
16 applied for any permits to produce wells in this
17 area.
18 There are other documents that the City has
19 generated, a 1985 management study that
20 completely disregards this area. It identifies
21 nine trunk lines in the City, and the one line
22 that it leaves off that was identified in the
23 1982 report was a trunk for this area where the
24 plume is located. There is no budget, there's no
25 money that's been budgeted for any well

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1 completion in this area.
2 The City has been unable to show that
3 there's any demand in this area for its users,
4 especially given the fact that it has no users in
5 this area; New Mexico Utilities has all the users
6 in this area. The City would have to increase
7 its propriety of rights, which is a major
8 undertaking, to complete wells in this area, and
9 the City's completion of wells in this area would
10 be at odds with its latest statements that it's
11 attempting to move away from use of groundwater
12 and to use that only to make up supplies to avoid
13 depleting that particular resource. The City has
14 also indicated that this area is near a critical
15 management area and has stated that if the
16 recommendations of the State Engineer's office
17 about critical management areas become effective,
18 it would effectively halt all new drilling on the
19 west side of the river.
20 We make these points to simply underscore
21 the fact that the City's position is entirely
22 speculative. For whatever political reasons,
23 they believe a need to come in and be involved in
24 these proceedings and to suggest they're going to
25 be using water that they are not going to be

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1 using. Their role in this proceeding would be
2 similar if they said that we have -- in 1982 we
3 plan to produce wells 100 miles away out in the
4 middle of the desert, and if there are any
5 impacts out there, we think you need to take care
6 of them because we think at some point in the
7 future we may do this. We don't think that that
8 amounts to the type of exposure threat that
9 3008(h) is designed to address.
10 And to go back for just a second on the
11 domestic wells, you will note that most of these
12 are close to the river. The reason for that is
13 that the depth to groundwater at those locations
14 is much shallower than as you move away from the
15 river. And, in fact, as you get into the area
16 immediately adjacent to where the solvents are
17 found from the Sparton operation, the depth to
18 groundwater there is, Pierce, what --
19 MR. CHANDLER: Two hundred feet.
20 MR. HARRIS: -- 200 feet, and the cost of
21 putting in a domestic well -- to complete that
22 well and to put a pump on there is, what, $50,000
23 to $100,000? So there is no realistic chance
24 that an individual homeowner would be interested
25 in completing a well 200 feet to groundwater to

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1 serve its individual needs and spending that kind
2 of capital investment of $50,000 to $100,000 when
3 there is abundant water available from New Mexico
4 Utilities.
5 The point of all of this, Mr. Malone, is
6 simply to say, yes, we do have some toxicity
7 associated with the impacts to groundwater, but
8 we don't have any exposure pathways, realistic
9 exposure pathways, to the groundwater. How is
10 somebody going to get in and start making use of
11 the groundwater? Well, New Mexico Utilities
12 isn't, the City isn't, domestic users aren't. So
13 if there is no exposure pathway, then there's no
14 threat because threat consists of two elements,
15 as EPA has identified, toxicity and exposure. If
16 you don't have toxicity, you don't have a threat,
17 and if you have toxicity and no exposure, you
18 don't have a threat. Here, we've demonstrated
19 that there is, in our view, no exposure pathway.
20 We've made the same conclusion in the CMS. That
21 CMS was approved by EPA. So they approved our
22 finding of no exposure pathway and have never
23 submitted any information to you to the contrary
24 and, in fact, can't do so after having approved
25 our CMS.

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1 Same thing with their objectives, and I'll
2 just make this point. Mr. Malott suggested that
3 there are certain objectives at this site. The
4 fact of the matter is those objectives are not
5 part of the CMS. The CMS rejected those
6 objectives, stated other objectives, EPA approved
7 the CMS and, in doing so, approved those
8 particular objectives, and everything we are
9 doing here is consistent with the objectives that
10 have been approved in the CMS.
11 One last issue, apart from the groundwater,
12 there has also been some concern identified about
13 the -- one other exhibit real quickly on the
14 impact of New Mexico Utilities --
15 We'll make this Exhibit 5.
16 MR. MALONE: I think we already have a 5.
17 MR. HARRIS: Or 6, I'm sorry. Thank you,
18 Mr. Malone.
19 (Respondent's Exhibit 6 was marked.)
20 MR. HARRIS: -- that uses the same very
21 conservative and very generalized modeling to
22 show what would happen if we cut off the source
23 of the solvents in the groundwater both by a
24 combination of soil vapor extraction and
25 enhancing on-site recovery, and what we see is

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1 there is a slug of material that moves away from
2 the facility. Again, the facility on
3 Exhibit 6 -- and this is part of the
4 administrative record by the way -- is on the
5 left side, the New Mexico Utilities well is on
6 the right side, and the groundwater is flowing
7 away from the Rio Grande towards the New Mexico
8 Utilities Well #2.
9 What you see is that after 150 years the
10 slug of material reaches the New Mexico Utility
11 Well #2, but it levels well below the drinking
12 water limit and then at 200 years has passed by
13 that, and, again, we have the same vertical
14 separation as in the previous discussion. And
15 again, our point for both of these exhibits is to
16 simply demonstrate that there are no realistic
17 exposure pathways that would require any type of
18 corrective action, quite frankly.
19 The other issue that has been raised is the
20 possibility of residences at the surface coming
21 in contact with soil vapors. What we've
22 identified as Exhibit 7 --
23 (Respondent's Exhibit 7 was marked.)
24 MR. HARRIS: -- is information -- this is
25 all information that's taken from the approved

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1 RFI. This is all information that EPA agreed was
2 good and accurately represented conditions at the
3 site. That Exhibit 7 has plotted soil vapor
4 concentrations. Soil vapor is simply, you drill
5 a hole in the ground and there are actually gases
6 that can be in the soil, and what you do is
7 essentially vacuum out, for lack of a better
8 term, some of that air and then measure the
9 concentration of solvents as vapor in that air,
10 and then you can report those. The New Mexico
11 Environment Department has said that as long as
12 the concentration is at ten parts per million V
13 or below, that there is no threat to human
14 health. What we show here are various
15 concentrations, the highest of which is on our
16 site at 2.24 PPMV, which is well below the ten
17 PPMV that the State of New Mexico has said is the
18 number that should be achieved at this site. And
19 the point of Exhibit 7 is to demonstrate that
20 there are no threats at all. There's no toxicity
21 at the surface, so there is no threat.
22 This information, which is Exhibit 7, has
23 recently been confirmed by work that NMED did and
24 the result of some unfortunate statements that
25 the mayor of Albuquerque made at a news

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1 conference. He held that the State of New Mexico
2 has had to go out and reassure residents that
3 there are no problems with respect to the surface
4 site, and they have gone out with photo ion
5 detectors, I think, and some other devices and
6 have measured the concentration of vapors of
7 various solvents at various points in the
8 vicinity of the Sparton site and have found
9 absolutely no information to suggest that anybody
10 in that vicinity is any way threatened by the
11 activities at the Sparton site.
12 So what we are left with, Mr. Malone, is a
13 situation where there are impacts to the
14 groundwater, and those impacts are above MCLs,
15 but there is no realistic exposure pathway. And
16 a conclusion that can be reached is that if there
17 is no exposure pathway, there's no need to
18 address the toxicity. But if you want to remove
19 any chance of exposure, there are obviously two
20 things you can do: You can go in and remove all
21 of the toxicity, that is, all of the solvents
22 that are in the groundwater near the Sparton
23 facility, or you can control withdrawals from the
24 impacted area.
25 Now, Mr. Malott has suggested that what EPA

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1 is interested in doing is attempting to remove
2 all of the toxicity. The fact of the matter is
3 that cannot be done at this site, and the reason
4 for that is that the material -- if I could go
5 back to Exhibit 1, which is the plume -- we refer
6 sometimes to what is on-site and off-site. The
7 on-site area, Mr. Malone, is basically the area
8 immediately around the Sparton facility, which is
9 the dark area, and the boundaries, I think, are
10 actually depicted on that with some lines that
11 indicate sort of a square area immediately
12 surrounding the building. Everything outside of
13 that square we refer to as off-site.
14 Now, the material off-site contains both
15 dissolved solvents -- and the easiest way to
16 explain this is if you have an aquarium and you
17 pour salt into that aquarium, some of the salt is
18 going to dissolve and just disappear into the
19 water. Other parts of that salt will actually
20 fall out and you can see them floating around and
21 they'll sink to the bottom. You have the same
22 thing with the solvents we're talking about here,
23 and that is, the solvents that are off-site, some
24 of those are dissolved in the groundwater, but
25 there are numerous silts and clays in the

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1 subsurface geology in the off-site area that
2 cause the dissolved material to actually come out
3 of solution and glom onto the silts and the
4 clays, and we refer to that as residual DNAPLs.
5 Other people have different terms for it. One of
6 the problems in this area is that people use
7 different terms to describe the same thing or use
8 the same term to describe different things. But
9 what we're talking about here are situations
10 where solvents that are off-site get attached to
11 silts and clays, and once they get attached to
12 silts and clays, your ability to try and remove
13 them is very difficult.
14 And Mr. Malott in his declaration suggested
15 that this area is -- the area off-site is
16 composed, at least as we read it, almost
17 exclusively, if not entirely, of silts and clays,
18 and that simply is not the fact. And we have a
19 couple of exhibits taken from information
20 contained in the RFI that demonstrate that pretty
21 conclusively.
22 MR. MALONE: For clarification of the
23 record, is that Exhibit 1 or 2 that you have up
24 there?
25 MR. HARRIS: Exhibit 2. I'm sorry. Did I

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1 say 1? I meant 2. And this will Exhibit, I
2 believe, 8.
3 (Respondent's Exhibit 8 was marked.)
4 MR. HARRIS: Now, Exhibit 8 represents
5 information that's already contained in the
6 approved RFI. All we've done is plot it on this
7 map. These are numbers that EPA has agreed with.
8 And what this demonstrates is there are soil
9 borings -- when you go out and drill a well, at
10 the time you drill it you take a core sample and
11 the engineer has a chance to -- or geologist has
12 a chance to look at that core and decide what the
13 material is made up of. And what we have
14 attempted to do is, for each of those locations,
15 the bottom number represents the amount of core,
16 the amount of actual soil that was taken out
17 below the water table, and then the number above
18 it represents the percent of that core that is
19 silts and clays.
20 This diagram is interesting for a couple of
21 reasons. One, it's inconsistent with Mr.
22 Malott's suggestion that there are virtually no
23 silts and clays in this area. We have readings
24 of 74%, 70%, 75%, 61%, 52%, 59%. The document
25 speaks for itself, but I'm just trying to give

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1 you a sense. We have other areas where we've got
2 zero. What we find then is that this area from a
3 geology standpoint is what is referred to as
4 heterogenous. In other words, it's not all the
5 same. We're not seeing the same percentage
6 throughout the area; we're seeing different
7 percentages that show that the geology changes
8 rather dramatically even over short areas. And
9 so what we have, in our view, in this area is a
10 subsurface geology that is heterogenous. In
11 other words, you move short distances and there's
12 a different configuration.
13 And, Pierce, is the term anisotropic or
14 isotropic?
15 MR. CHANDLER: It's anisotropic.
16 MR. HARRIS: Which means that there's a
17 significant change with position. It also
18 changes direction. Energy-negative changes with
19 position, anisotropic changes with direction.
20 And so contrary to EPA's belief, there are
21 significant amounts of silts and clays. And we
22 can show this rather graphically a little bit
23 better, Mr. Malone, with what I'll mark as
24 Exhibit 9, which, again, is all based on
25 information taken from -- I guess it would be

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1 nice if I put it right side up -- all taken from
2 the RFI.
3 Pierce, was this particular document in the
4 CMS or the RFI?
5 MR. CHANDLER: It's in the RFI's records,
6 Figures 20 and 24.
7 MR. HARRIS: So it already exists.
8 MR. CHANDLER: With the exception of the
9 shading. We've added the shading between --
10 we've just cross-hatched in the strata.
11 MR. HARRIS: And this will be Exhibit 9.
12 (Respondent's Exhibit 9 was marked.)
13 MR. HARRIS: And what this exhibit is
14 designed to show is -- the cross-hatched area
15 represents silts and clays. And, again, what we
16 have here are cross-sections similar to the
17 cross-sections that were on Exhibit 1 and 2, Mr.
18 Malone, and if you will take a look up here on 9,
19 we've got two cross-sections, a D-D prime and H-H
20 prime. D-D prime is looking sort of towards the
21 north if you cut away the earth, and the
22 cross-hatched areas indicate silts and clays.
23 Profile H-H is looking back towards the Rio
24 Grande beyond the facility if you broke away the
25 earth. So on Profile D-D, groundwater is flowing

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1 from the right side of the exhibit to the left
2 side of the exhibit. On Profile H-H, groundwater
3 is flowing into the exhibit.
4 And the point of this exhibit is simply to
5 demonstrate the existence of the significance of
6 silts and clays in those cross-hatched areas, in
7 the areas we're talking about, Mr. Malone, where
8 the dissolved phase of the solvents can come to
9 glom onto that. And once they glom on, it's very
10 difficult to pull them off in any reasonable way
11 and significantly slow down the ability to try
12 and restore any particular aquifer.
13 Now, EPA has, over the course of its
14 experience with both Superfund as well as RCRA,
15 come to recognize that there are numerous
16 situations in which it is just not technically
17 practicable to restore groundwater to MCLs. And
18 we have a chart, again taken from our
19 submissions, that identifies each one of the
20 characteristics the EPA -- and I'll mark this as
21 Exhibit 10.
22 (Respondent's Exhibit 10 was marked.)
23 MR. HARRIS: These are factors that EPA says
24 make it technically impracticable to restore
25 groundwater. And what -- we have added -- this

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1 document is taken from the CMS, I believe.
2 MR. CHANDLER: I believe it's Figure 25 of
3 the CMS.
4 MR. HARRIS: Of the CMS? We have added one
5 column which is to go back and identify for your
6 convenience where in the RFI and the CMS
7 documents already approved by EPA supports each
8 one of the conclusions we have reached. Now, the
9 discussion I've just led you through about the
10 silts and clays is down in the Comments,
11 Stratigraphy, Texture of Deposits, Degree of
12 Heterogeneity and Hydraulic Conductivity, and you
13 will note that all of those are indicated to
14 have -- well, three of them, Stratiography,
15 Texture of Deposits and Degree of Heterogeneity
16 are either moderate to high remediation
17 difficulty because of what I refer to in very
18 nontechnical terms as the glomming-on effect, our
19 point being that there does not appear to be a
20 way to restore this groundwater within a
21 reasonable period of time to drinking water
22 limits, and that to do so would simply not only
23 represent a waste of money, but if you attempt to
24 aggressively pump the site given its geology and
25 these other factors, you are actually going to be

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1 counter-productive. And, again, that information
2 was set forth in Mr. Chandler's submission either
3 initially or on the additional information that
4 we provided.
5 In our view then, the approach -- and this
6 is what we had recommended in this proceeding --
7 would be to contain the plume and to create a
8 buffer zone around which wells would not be
9 completed. And in doing so, we would then
10 eliminate all exposure pathways, and by
11 eliminating the exposure pathways, we would get
12 rid of the threat because, as I indicated
13 earlier, threat consists of two factors, toxicity
14 and exposure, and if we contain it and create a
15 buffer zone, then we've gotten rid of the
16 exposure pathway.
17 The use of the containment well would be, in
18 our view, a 200-gallon-per-minute containment
19 well. We asked one of our experts, Mr. Peter
20 Balleau, to undertake some modeling to confirm
21 that those particular -- a 200-gallon-per-minute
22 well when put in at the location of the leading
23 edge would, in fact, affect containment. He
24 undertook to describe those flow systems using
25 the Theis equation and two-dimensional

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1 superposition by means of a FORTRAN program
2 called WEL-FOR that was written by a Dr. Nabil
3 Shafike of his office.
4 They put in input consisting of well
5 locations that are described in the
6 administrative record, pumping rates,
7 transmissivity and storage factors and a
8 hydraulic gradient of 0.025 feet per day, per
9 day, and then they generated streamlines of
10 potential contours using a piece of commercial
11 software called Teeplot. The transmissivity
12 values they used that they believe were
13 appropriate to this site were taken from -- for
14 the first five layers of this area, which is
15 about 130 feet, were taken from the U.S.
16 Geological Survey's Albuquerque Basin model to be
17 1,950 square feet per day. And based upon that
18 work, Mr. Balleau concluded that a
19 200-gallon-per-minute containment well would
20 effectively contain all of the impacted area even
21 when you had a 200-acre-foot per year recharge
22 and recovery operation one mile west, and even
23 when you had a recharge and recovery operation
24 with an isolated capture cell one mile west of
25 the well at the leading plume, and even when you

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1 had a 200-acre-feet-per-year recovery operation
2 without -- or recharge operation without recovery
3 one mile west.
4 And so the information that we have
5 establishes that if a containment well is
6 placed -- a 200-gallon-per-minute containment
7 well is placed at the leading edge of the plume,
8 that it would be possible in that situation, not
9 only possible, but what, in fact, would occur is
10 that you would contain the current impacts to
11 their current area and you would not interfere in
12 any way with other water resource use so long as
13 that water resource use was not within the first
14 500 feet of the groundwater and was not within a
15 quarter-mile of the location.
16 And if you will remember back to Exhibit 3,
17 there are no current plans to put any wells
18 within the area or within the buffer zone that we
19 have identified, and from an institutional
20 standpoint in the State of New Mexico, it would
21 be a relatively easy matter for the State
22 Engineer's office to ensure that wells were not
23 completed in that area which would allow in that
24 situation the exposure pathway to be completely
25 cut off, thereby eliminating the threat.

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1 (Respondent's Exhibit 11 was marked.)
2 MR. HARRIS: What I've marked on Exhibit 11
3 is where we had proposed that a containment well
4 of 200 gallons per minute be located which
5 corresponds to the current leading edge of the
6 plume. I would also note that there's very
7 little likelihood that anyone would want to
8 complete a well within the first 500 feet
9 because, as Mr. Balleau points out, it's poor
10 quality groundwater at that location. The issue,
11 however, if we put in this containment well, is,
12 where do we end up discharging recovered water?
13 We are proposing that the recovered water be
14 discharged to the Calabacillas Arroyo. Sparton
15 has never said in this proceeding at any rate
16 that it would not undertake any remedy in the
17 absence of being able to discharge to the
18 Calabacillas Arroyo. What it has said is that
19 discharge to the Calabacillas Arroyo makes the
20 most sense for a variety of reasons we're about
21 to go through, and in this statement to suggest
22 that we would do otherwise, we don't know what
23 we're going to do until we have determined how
24 the water is going to be gotten rid of. What we
25 have submitted is that going any other route

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1 doesn't make a lot of sense either technically or
2 from a cost standpoint.
3 In order to determine what would happen to
4 the water we discharge to the Calabacillas
5 Arroyo, Mr. Gary Richardson, who has submitted a
6 declaration to you, ran a 24-hour test of a
7 slightly over 200-gallon-per-minute discharge at
8 the storm sewer outlet discharge point reflected
9 on Exhibit 11. The water then moved down the
10 Calabacillas Arroyo. The blue 1 hour, 3 hours, 7
11 hours, 15 hours, 24 hours, represents what I
12 think I can refer to as the wetting front. All
13 that means in nontechnical terms is that's where
14 the soil was moist from the water that was
15 released, and what we found is that the -- after
16 24 hours the area actually contracted. The 24
17 hours was at this point, but slightly beyond
18 that -- and I think I'm getting myself boggled up
19 on the facts.
20 MR. CHANDLER: And the area, too.
21 MR. HARRIS: And the area became smaller
22 overall, so that after 24 hours there was not
23 further discharge beyond the 24-hour point, and
24 it's another half-mile down to the Rio Grande.
25 The results of Mr. Richardson's study are

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1 consistent with what he would have thought would
2 have occurred, which is that water that was
3 discharged in the Calabacillas Arroyo at that
4 rate soaks into the soil and will actually work
5 its way back down through the nonsaturateds --
6 and that is the part of the soil that doesn't
7 have water in it -- and reach the area that we
8 would withdraw water out from the containment
9 well, so we would have a circulating system.
10 The other beauty of this operation is that the
11 technical people tell me that as the Calabacillas
12 becomes moist, it actually improves the ability
13 of the Calabacillas to allow water to drift back
14 down through the soil and to recharge the area it
15 was taken out of.
16 And so we have hard data to support our
17 position that putting in a containment well at
18 that location and discharging into the
19 Calabacillas would essentially set up a recycling
20 system. Now, EPA has suggested, although,
21 apparently from their remarks that they have not
22 settled upon reinjection, and we have real
23 difficulties with that particular approach. And
24 those were set forth in Mr. Richardson's
25 declaration, but we have also put together

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1 something that is not in the administrative
2 record, but is a depiction of the treatment
3 systems that are described in the administrative
4 record as to what would be needed in order to
5 accomplish viable reinjection at this site.
6 (Respondent's Exhibit 12 was marked.)
7 MR. HARRIS: Mr. Richardson's declaration
8 and the technical people that I have visited with
9 have confirmed that reinjection is a very
10 difficult process simply because what you are
11 doing is taking water out and reinjecting it back
12 in the same or similar formation. And that
13 sounds fairly simple, but water chemistry is
14 very, very complex, and removing it from one
15 location and transferring it to another can
16 result in a wholescale number of changes which
17 cause it to be slightly different when you
18 reinject it than when you take it out, and that
19 difference means that it's going to create all
20 sorts of problems in the reinjection process, and
21 Mr. Richardson's declaration describes some of
22 those.
23 The one site that EPA suggests as
24 particularly appropriate to our location, the
25 South Valley, we think it's instructive that at

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that site General Electric installed, what was it, 78 wells, Pierce, that were supposed to be 200 gallons per minute? And they've been running those wells at about 80 gallons per minute, our point being that you don't run a 200-gallon-per-minute well at 80 gallons per minute unless you're having some difficulty with what you're doing.

Additionally, in order to make reinjection work, there's a significant amount of treatment that you have to go through. We have identified that as filtration, pH adjustment, air removal and chlorination. All of those are unnecessary when you're discharging to the Calabacillas Arroyo. EPA in its latest submissions got rid of pH adjustment, got rid of air removal, got rid of chlorination, and lo and behold, when they got rid of those things, the cost of dealing with reinjection dropped rather dramatically. The fact of the matter is without these other treatment requirements, you're going to have a reinjection system that fails on you very rapidly, and we are talking about very expensive wells, something in the neighborhood of $80,000 to $100,000 for each one of these injection

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wells, and there's a significant cost to reworking them to fix them, the point being that there are also wastes that are generated and additional hazards associated with each one of these activities. Obviously chlorination, we've got to have chlorine gas there. pH adjustment means introducing chemicals, and filtration means that we're going to have wastes that are going to be generated from that operation. None of that -- I'll just point out that none of this is necessary for discharge to the Calabacillas. All of that goes away.

The other interesting part is that from a water conservation standpoint, the Calabacillas approach makes more sense. If you go through what we have on Exhibit 12, you will see a water loss as you go through that treatment train of 5% to 10%. In other words, 5% to 10% of the water that you extract is going to be lost and cannot be reinjected. If you discharge to the Calabacillas Arroyo based upon Mr. Richardson's calculations, you are in a situation where you're only losing 1% to 3% of water. So if, in fact, the State and EPA are concerned about conserving water, then they should be interested in

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discharging to the Calabacillas and not going to reinjection, which not only is more energy-intensive, more chemical-intensive, generates waste, is more expensive, but also creates further water loss.

I would also note that EPA has come up with some fairly creative numbers when it comes to cost comparisons. They originally said in the decision document that their remedy would cost 15 to 26 million dollars, and in their last submission to you suggested that that number has now been reduced to 4 to 6 million dollars.

(Respondent's Exhibit 13 was marked.)

MR. HARRIS: And Exhibit 13 is taken from a submission that we've already provided and compares those costs. What we have is a comparison of capital costs and annual O&M. The first two columns represent EPA's cost estimate in the Final Decision Document, and then we went back and verified whether those numbers were accurate, and by and large we were able to reach essentially the same numbers as EPA. EPA in its position statement, the last document it filed in Exhibit 18, that was put together by a guy named Raimonde came up with new numbers, and what they

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did is, lo and behold, they found in Exhibit 18 that instead of costing 2.275 million to do reinjection, it's only going to cost us 1.4 million dollars. Well, we're not -- first off, we went back and double-checked Mr. Raimonde's numbers to see if they were internally consistent and discovered they were not -- that's what this last column represents -- that he actually understated costs by 1. -- or about a half a million dollars.

But apart from that, the most glaring difference here, if you will take at the row styled Injection Well Disposal, EPA in its original decision, and as we verify, initially estimated that the cost of injection well disposal which included both wells and treatment was 1.237 -- 1.3 million dollars or 1.2 million dollars. Now, in Exhibit 18 the EPA says, no, guess what, the number we gave you in the Final Decision document which they say was based upon our numbers wasn't correct, it really should be $169,000.

But the fact of the matter is EPA doesn't include any of the treatment trains that we identified in Exhibit 11. They just have taken

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those away to get down to the $169,000 number, and they also have gone with low-carbon steel casing instead of stainless steel casing, and they've also assumed -- interestingly, Mr. Raimonde assumed that you could use one 200-gallon-per-minute well to reinject 600 gallons per minute, but, in fact, you're going to need at least three wells and, based on the GE experience, probably more likely eight wells to be able to do that. We have assumed just for these purposes that it's only going to be three wells, and you can see that his numbers in that respect are off. But the point is that we believe the 1.2 figure more accurately represents what it would cost to do injection well disposal.

On Annual O&M, you will note that Mr. Raimonde also changed the numbers rather dramatically from what EPA initially had. We went back and looked at that and discovered that in his O&M the reason his number was so low is he didn't include any maintenance, appreciation, well rehabilitation, cost of expendables or waste residue management. When you don't include those things in your O&M, you can get it done pretty quickly, but in the real world you generally have

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to do those things. And when you factor those matters in, the cost of O&M, even under Mr. Raimonde's scenario, is in the neighborhood of $800,000, which is right in line with what EPA estimated initially in its Final Decision document and not the $303,000 that Mr. Raimonde suggested would be the case.

Finally, we have put together a chart that compares the various alternatives, and then I'll conclude, Mr. Malone, with a review of the factors that EPA believes need to be taken into consideration.

(Respondent's Exhibit 14 was marked.)

MR. HARRIS: Exhibit 14 represents a comparison of the objectives and the costs for what EPA has proposed, and these -- we still don't quite understand what it is EPA is proposing. I have yet to hear anything other than we're going to study the situation and put in maybe one to three wells, and maybe do some extraction wells, and maybe put in some more on-site wells, and maybe do soil vapor extraction after we study it for a couple of years. But we have assumed under EPA's recommended alternatives that we've got -- one is VOC removal, the

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1 multiple treatment is to get rid of metals, and
2 then Sparton's recommended alternative. If you
3 will note, Sparton's recommended alternative
4 contains the plume, it removes VOCs from the
5 groundwater, it removes VOCs from the soil and
6 soil gas, it recharges the shallow aquifer, and
7 it has the same remediation time frame as EPA's.
8 Our groundwater extraction rate is less, our
9 water loss is less, we have no significant
10 production of hazardous waste, our capital costs
11 are less, our present value costs are less. And
12 I think even if I run this by my twelve-year-old,
13 if he takes a look at the comparison side by side
14 and our alternative is accomplishing everything
15 EPA's is accomplishing and is going to cost
16 anywhere from 12 to 23 million dollars less, then
17 it would seem to be somewhat rational to go with
18 the alternative that costs 12 to 23 million
19 dollars less.
20 I would note that if Mr. Malott's belief as
21 to groundwater condition and subsurface geology
22 is correct, then there's no reason not to expect
23 that our single-well containment wouldn't restore
24 the groundwater within 30 years, because if he is
25 saying that the subsurface geology consists

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1 almost entirely, if not entirely, of sands and
2 gravels, then a drop of solvent right at our
3 off-site point will move essentially unimpeded to
4 our containment well, and at the rate of 100 feet
5 per year, the linear distance between our
6 containment well and off-site corresponds to
7 about a 30-year time period to move where it
8 would be removed, at least as I understand EPA's
9 position in the subsurface geology. So if
10 remediation through restoration is possible here,
11 then Sparton's remedy will accomplish it in the
12 same time as EPA's. We have already submitted
13 that restoration is not technically practicable
14 here, and what we have proposed is something that
15 at a lower cost will still achieve -- avoid
16 exposure pathways.
17 Let me touch real briefly on the factors
18 that EPA has identified. The first is -- and
19 they use this in their own terms on protection of
20 human health and the environment -- that we have
21 to prevent exposure by reducing or controlling
22 contamination. That's their words both from the
23 Statement of Basis as well as the document that
24 supported the final record and decision.
25 I'll submit to you that a single containment

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1 well, coupled with enhanced on-site recovery to
2 prevent the movement of materials off-site,
3 coupled with soil vapor extraction -- and I would
4 provide an update that with respect to oil vapor
5 extraction, that program is ongoing; the testing
6 has been completed and we are now moving into a
7 design phase and intend to undertake that action
8 as soon as possible and consistent with what NMED
9 has suggested is an appropriate time frame --
10 that the combination of those three factors will
11 prevent exposure by controlling the
12 contamination, and at the same time that
13 containment well will also be reducing the
14 contamination by removing volatile organic
15 compounds that are pulled out with the
16 groundwater and run through an air-stripping
17 operation before they are released to the
18 Calabacillas Arroyo.
19 The second requirement is that we have to
20 obtain media cleanup standards. Now, there is a
21 fair amount of confusion about what standards
22 are. They are not the same as limits, and EPA,
23 at least Region 6, has consistently confused the
24 requirement of this criteria as mandating that
25 you have to meet the MCLs. Well, the fact of the

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1 matter is that you don't.
2 EPA in the most recent proposal regarding
3 corrective measures makes it very clear that one
4 of the questions that the agency is supposed to
5 ask itself is to what extent are the assumptions
6 in the development of MCLs consistent with
7 specific site conditions. And I'll just quote
8 from Page 19449 of the Federal Register of May
9 1st, 1996: When available media cleanup
10 standards are used, EGMCLs, state cleanup
11 standards, the assumptions used to develop the
12 standardized cleanup values should be consistent
13 with the site-specific conditions at the facility
14 in question.
15 Now, what assumptions were used in the
16 development of the MCLs? The MCLs assumes that
17 somebody will drink two liters of water a day
18 every day of their life for 70 years. There's
19 absolutely no information in this record that
20 suggests that assumption is true with respect to
21 this site, and, in fact, the information we've
22 shared with you today and previously demonstrates
23 conclusively that that assumption is not true
24 with respect to waters at this site currently and
25 certainly won't be true when the containment

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1 system, both on- and off-site, and soil vapor
2 extraction is in place. So if those assumptions
3 are not applicable at this site, then there is no
4 need to meet the MCLs within the impacted area.
5 Besides that, we've also demonstrated that any
6 water that would be used in this area would
7 involve deeper wells, would involve some
8 blending, and there's absolutely no information
9 before you to identify who would be drinking two
10 liters of water per day for 70 years from this
11 particular location, and EPA just can't assume
12 that to be the fact. That's the teaching of the
13 Leather Industries case, is that it is irrational
14 for the agency to base a decision on assumption
15 which has not been shown to be the case at the
16 specific site in question. And, again, there's
17 another need in this hearing to be able to
18 undertake cross-examination and direct
19 examination to be able to properly develop
20 adjudicative facts.
21 The other point that EPA overlooks is even
22 with its remedy, even with its remedy, there is a
23 period of time when there will be material in the
24 groundwater above MCLs, and they have never
25 addressed why for that 30-year period of time it

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1 is entirely appropriate not to have any control
2 over exposure. I mean, under their assumption,
3 we'll be out there for 30 years. Under our
4 assumption, we'll be out there for a long, long
5 time trying to remove the material in here, and
6 yet nobody has suggested what happens if, while
7 that remediation is ongoing, somebody tries to
8 stick a well in this location. That's not
9 addressed by EPA. Our point is that it needs to
10 be addressed. We've suggested that it can be
11 addressed with the State Engineer's office and
12 would work well with the containment strategy
13 here, and so, really, the containment at the
14 media levels at the conclusion of the
15 remediation, and EPA has not shown how media
16 levels are going to be achieved during the
17 remediation itself.
18 Both our remedy and EPA's remedy will
19 control at the source. As I've said, we're
20 undertaking pursuant to State authorization
21 testing and development of a design to deal with
22 the solvents that are in the soil at the site.
23 We have also suggested enhancing on-site
24 containment so that solvents above MCLs don't
25 move off-site. The only thing that is preventing

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1 us from moving forward is that the City of
2 Albuquerque will not allow us to discharge that
3 recovered water to its City sewer system. We
4 have asked for permission to discharge it to the
5 Calabacillas Arroyo. If that permit were issued,
6 then there's nothing that would prevent us from
7 immediately starting to do that. And we believe
8 what we have proposed can be demonstrated to
9 work, and if it doesn't, we have never said that
10 we are limited to 20 gallons per minute here.
11 What we have said is we believe that the
12 20-gallon-per-minute rate will be more than
13 sufficient to control the on-site contamination,
14 but obviously the proof will be in the pudding
15 after this system is run.
16 Both what we have recommended in this
17 proceeding and what EPA recommends would comply
18 with waste management standards, and that simply
19 means that we'll have the necessary air permits
20 and water permits and wastewater discharge
21 permits. And in that regard, Mr. Malone, I think
22 it's important to understand we have already
23 applied for on an emergency basis permits to
24 remove 200 gallons per minute from the aquifer in
25 order to treat it. Interestingly, the State

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1 Trustee's office has protested our being able to
2 remove that sort of material somewhat
3 counter-productive to us moving forward.
4 Secondly, we have filed for an NPDES permit.
5 We have checked with the City of Albuquerque
6 regarding our ability to put in the
7 infrastructure we need. We have talked with them
8 about using, and have gotten from them a draft of
9 an agreement to use, the storm sewer on the
10 exhibit that we had that showed the storm sewer
11 discharge point. We would go from the
12 containment well to the Calabacillas Arroyo
13 through City of Albuquerque storm sewers. They
14 have already submitted to us a draft agreement to
15 do that.
16 I'm trying to think. There's something --
17 we've applied to the State of New Mexico for a
18 discharge plan permit, and we are -- have been in
19 negotiations for several months with AMAFCA,
20 which is a quasi- -- or a governmental agency
21 that has authority for the Calabacillas Arroyo,
22 and have a draft agreement from them for purposes
23 of using the Calabacillas Arroyo for discharge
24 purposes.
25 At this point -- so we -- from compliance

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1 with waste management standards, we can achieve
2 compliance with all those, and our remedy doesn't
3 present any greater institutional barriers than
4 EPA's does. With reinjection, we still have got
5 to get appropriate permits from various agencies
6 to do that, and we still have to get air permits,
7 and with reinjection, we would also have to deal
8 with potentially hazardous waste or other waste
9 that would have to be disposed of properly.
10 Long-term reliability, I've never really
11 heard EPA with a coherent explanation of what
12 that entails. I believe it's supposed to mean
13 after the remediation is complete, will the
14 remedy be permanent, will it continue to work?
15 And we are -- on that score, it's difficult to
16 say with either of the remedies because we don't
17 know when they're going to achieve completion,
18 which would be restoration, if they ever can.
19 Our point is as long as we have a containment
20 well out there, we'll be monitoring the situation
21 and we will be able on a long-term basis to make
22 sure it is working appropriately. Both remedies
23 reduce toxicity in the sense that both will
24 remove solvents from the groundwater.
25 Short-term effectiveness, both remedies --

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1 well, actually our remedy is better from a
2 short-term standpoint. As I understand
3 short-term effectiveness, it means what
4 protections are being provided while the remedy
5 is in place. And to that score, we will be
6 providing the same protection as EPA will be, so
7 there's no difference there. We believe ours
8 from a short term will be more effective because
9 we think that the containment well, even though
10 it appears to be slower, will actually achieve
11 restoration removal more quickly than a more
12 aggressive approach that EPA has suggested that's
13 going to be counter-productive.
14 From an implementability standpoint, both
15 remedies present essentially the same issues.
16 The only difference on ours is that we have to
17 get an NPDES permit, whereas with the
18 reinjection, we probably have to get some sort of
19 discharge plan approval or other approval from
20 the State and potential UIC approval with
21 reinjecting that, so I think that's a tradeoff at
22 that point.
23 So finally we get to cost. Our cost is on
24 order of magnitude lower than EPA's. It meets
25 all of the other criteria, it's lower in cost,

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1 and in that situation we believe that the result
2 is obvious, and that is that the lower cost
3 approach that achieves all of the objectives
4 should be selected.
5 From a State acceptance standpoint, I would
6 point out that we have been in discussions with
7 the State of New Mexico since July of 1996 trying
8 to implement what we have been describing to you,
9 which is off-site containment well, on-site soil
10 vapor extraction, on-site containment. As of
11 January 3rd, we have received permission from the
12 State to do the on-site soil vapor testing, to
13 begin the on-site further containment increasing
14 to 20 gallons per minute and to begin testing
15 off-site for the containment well. The State has
16 yet to agree that one containment well is going
17 to be appropriate but has said that we could go
18 forward to test it to see whether our assumptions
19 are correct or not.
20 Where things have hit a snag, so to speak,
21 is, what do we do with the water that we recover?
22 We want to be able to run that well after test
23 purposes on a full-time basis because our view is
24 that at least one well operating full-time is
25 better than shutting it down, and at this point

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1 we don't have a cost-effective way of getting rid
2 of the water. There is a disagreement obviously
3 about going to the Calabacillas Arroyo, at least
4 with EPA. The State's position, I think, is that
5 we just need to get the necessary permits to do
6 that, and we have not yet gotten those permits,
7 although we did file on January 31st. And the
8 quality of the water, by the way, that would be
9 discharged to the Calabacillas, it would be no
10 different than what is reinjected, and what we
11 have proposed is to meet both drinking water
12 limits and State water quality -- or State
13 groundwater quality standards in terms of the
14 discharge we have to the Calabacillas Arroyo.
15 That's part of our permit application. And so
16 from a State acceptance standpoint, I can't stand
17 here and tell you the State has accepted it, but
18 what th : State has said is that they would like
19 us to go forward on each one of these elements
20 and see whether what we're proposing is going to
21 work the way that we have suggested it is going
22 to work than have it stand in the way of us doing
23 that.
24 In short, the Enforcement Division of
25 Region 6 has not demonstrated by a preponderance

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1 of the evidence what is a threat. We have no
2 evidence other than what we put on that there is
3 any threat. The evidence we put on is there is
4 no threat, nor have they established by a
5 preponderance of the evidence that what they have
6 proposed -- and I'm still kind of waiting to hear
7 the details on it -- is necessary in the sense
8 that it's required to protect human health or the
9 environment; in other words, what is the
10 toxicity, what is the exposure, why is this
11 necessary to get rid of the toxicity or the
12 exposure to get rid of the threat?
13 On the other hand, Sparton has put forward
14 what I think is a very reasonable, very
15 cost-effective proposal and one that satisfies
16 all of EPA's criteria. I'm not meaning to
17 suggest that we agree that EPA's criteria have to
18 be followed here. It is only guidance, and it's
19 the agency's interpretation of a statute. We
20 don't necessarily agree that interpretation is
21 correct and the agency's interpretation where it
22 is simply interpreted as opposed to a rule or a
23 rulemaking is not entitled to any deference by a
24 court. The real issue statutorily is, is it
25 necessary to protect the health and the

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1 environment? What EPA has proposed is not. What
2 we've proposed -- we're not sure what we've
3 proposed is necessary, but what we've proposed
4 will at least contain the plume and deal with
5 exposure pathways appropriately and at a much
6 lower cost than what EPA is proposing. And I
7 believe that that covers the points that you had
8 addressed in your Order.
9 Let me go back for just a second. There
10 were a couple of statements that were made in
11 EPA's opening that I wanted to make sure that I
12 had touched upon, and I think I already have. I
13 would note that the references to the South
14 Valley site, I'm not sure that any of that has
15 been put in the form presented here into the
16 record, so we haven't had a chance to comment on
17 that. And, again, I would point out that the
18 real difficulty in this proceeding is that
19 somebody will claim something is being done at a
20 particular site and that it's working and
21 somebody else will claim that it's not. The fact
22 is that we can't get to the facts. This whole
23 proceeding prevents us from engaging in the sort
24 of discovery that allows us to determine exactly
25 what is going on and why if somebody makes some

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1 general conclusion, what the assumptions are, and
2 if you had a chance to get to those assumptions,
3 you can generally show that the conclusion may
4 not be what is really intended to be conveyed.
5 But the whole way that this process is set up
6 with respect to --
7 MR. PEARSON: Excuse me. I would like to
8 object to this. We've already ruled upon this
9 issue about cross-examination, what the
10 procedures are. We don't need to hear a
11 recitation of his arguments again. That's an
12 issue that's appropriately addressed in Federal
13 Court if it ever gets there.
14 MR. MALONE: I'm going to overrule the
15 objection and allow the Respondent to proceed. I
16 do believe from my review of the administrative
17 record that there is information on the remedy at
18 the site you mentioned, but, you know, I'll let
19 you go on and just hear you out. I would tend to
20 try and develop a full record and hear what both
21 parties have to say. That's why in -- in the
22 afternoon session, whenever you get -- whenever
23 EPA has the opportunity to address the
24 Respondent's presentation, I will allow the EPA
25 to address documents that aren't in the record.

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1 MR. PEARSON: Well, what I also was going to
2 say, he's going into this cross-examination
3 argument. We've already heard that before, and
4 that's what I was objecting to. And the South
5 Valley, there is information in the
6 administrative record concerning that.
7 MR. MALONE: Okay.
8 MR. HARRIS: But that's my point. There is
9 some information, but we have no idea whether the
10 information is accurate or not and no way to test
11 it. In a lot of cases, EPA will talk to somebody
12 that won't talk to us or is not available to us,
13 and we have no way of determining whether the
14 information in the record is accurate or not.
15 The same thing is true with respect to statements
16 that the City makes about their use of the water.
17 We get these generalizations and don't have the
18 ability to effectively rebut that because we
19 can't talk to the people or they won't talk to us
20 in the fashion that we need to in order to test
21 the determinations in the statements that they
22 made, and it puts us at a significant
23 disadvantage in this particular proceeding.
24 MR. PEARSON: And, again, I would like to
25 object and I would ask the Court to instruct Mr.

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1 Harris not to bring up arguments about the nature
2 of this proceeding, what is required. I mean,
3 cross-examination, discovery is not allowed
4 except as provided for. Mr. Harris did submit
5 discovery, the Court overruled because it is
6 overburdensome and does not meet the
7 requirements. I object to any further argument
8 by Mr. Harris about the requirements of this
9 proceeding. No direct or cross-examination is
10 allowed, and he can take that up in Federal
11 Court.
12 MR. MALONE: Well, your point is well taken,
13 and I think it may be better, sir, for you to
14 address those points in your rebuttal, but the
15 record is already clear on that, as you have
16 already suggested; I've ruled on those matters
17 already, and if -- although it's repetitive, I am
18 giving both parties latitude here today to get
19 their presentations presented in full, so let's
20 proceed.
21 Counsel for Respondent, please proceed.
22 MR. HARRIS: Mr. Malone, I think that
23 concludes our initial presentation that -- and,
24 again, just to emphasize, we -- Sparton has stood
25 ready, willing and able to begin the remedy that

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1 it has proposed. The only impediment to us
2 moving forward on that is finding a way that we
3 can cost-effectively get rid of the water. And
4 if EPA would act on our NPDES permit today, we
5 could start work out there based upon what we
6 propose tomorrow. So I don't want to leave this
7 proceeding with the suggestion that we are not in
8 a position to implement. We are in a position to
9 implement immediately what we have called for.
10 We're simply waiting on action with respect to
11 our permit. And what we have asked to implement
12 would not require, as EPA's remedy would, another
13 two to five years of study before anything could
14 be done at the site with respect to addressing
15 the presence of solvents in the groundwater.
16 MR. PEARSON: One last thing, just for the
17 record, I think we would like to mark the
18 exhibits that we have used in this case for the
19 record, if I could borrow some exhibit stickers.
20 MR. MALONE: Okay.
21 MR. PEARSON: The site map I'm marking as
22 Government Exhibit Number 1, the board concerning
23 the threshold and balance criteria would be
24 Exhibit 2, and the Task IX board we'll mark as
25 Exhibit 3.

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1 (Government Exhibits 1-3 were marked.)
2 MR. HARRIS: Mr. Malone, I think I noticed
3 that you were putting exhibit stickers on those,
4 and I appreciate you doing that because I thought
5 that would be a little easier for the record.
6 MR. MALONE: Right. I'm going to have to
7 modify -- my stickers say "Government Exhibit,"
8 so I will just have to put "Respondent's
9 Exhibit," but I do have them numbered properly.
10 MR. HARRIS: Thank you.
11 MR. MALONE: Okay. I think right now would
12 be a good time to take a recess. Let's all --
13 let's say we all meet back in this room at 1:00.
14 Is that enough time for everyone?
15 MR. PEARSON: Your Honor, considering the
16 fact that they have brought in -- they've raised
17 arguments and they've referenced modeling that
18 was done on like one of their exhibits for the
19 Calabacillas conducted in March, we have not seen
20 the basis for those arguments, the calculations,
21 and I would just like a little more time, maybe
22 1:15 or 1:30. That's the only -- I guess I would
23 just ask a little more time to prepare for our
24 rebuttal.
25 MR. HARRIS: I don't have a problem with a

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1 little additional time. However, I do want the
2 record to reflect that everything we have they
3 have in their possession. The information from
4 Mr. Richardson was in our last submission, so
5 they have that information.
6 MR. PEARSON: There's a reference in there
7 to a March 1997 that is also -- that is not in
8 there.
9 MR. HARRIS: It is, but the record speaks
10 for itself.
11 MR. MALONE: The additional time will be
12 granted. Let's take a recess till 1:15.
13 (A recess was taken.)
14 MR. MALONE: Okay. Let's go back on the
15 record. The first thing that I would like to
16 have the parties address would be the EPA's
17 rebuttal.
18 MR. PEARSON: Thank you, Your Honor. In
19 rebuttal, our rebuttal will be split up between
20 myself and Mr. Malott, just to address first
21 Sparton's initial argument concerning risks in
22 which they base it on toxicity and exposure, and
23 Mr. Malott is going to address this issue more
24 closely concerning the modeling and the other
25 effects from the modeling.

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1 Your Honor, we believe that the Respondent,
2 when it talks about these exposure problems,
3 takes statements out of the Federal Register out
4 of context. For example, if you look at the
5 situation here, there's no question we have a
6 potential source of drinking water. The water
7 resources that have been contaminated are a
8 valuable natural resource. It's been planned for
9 use for a water supply since 1982. In fact, the
10 City of Albuquerque has begun proceedings -- is
11 currently negotiating with New Mexico Utilities
12 to acquire all of New Mexico Utilities' access
13 area which includes infrastructure, water rights
14 and well permits. Therefore, Sparton's arguments
15 concerning the City's right to use the water are
16 basically going to disappear.
17 In fact, there is a well currently permitted
18 in the area that's located very close to the
19 Sparton site which New Mexico Utilities currently
20 has permitted, and when the City acquires -- as
21 soon as the City acquires the service area, then
22 they will be able to acquire that permit. And
23 just to kind of show the general area on the map
24 here -- this is Page 3791 of the administrative
25 record which shows the location of the proposed

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1 well, and it would be somewhere -- I think
2 somewhere around this area right here, but that's
3 Page 3791 of the administrative record.
4 Furthermore, Sparton's contentions
5 concerning growth are wrong. There is a major
6 demand for this water that is evidenced by New
7 Mexico Utilities' application to the State
8 Engineer for 69 additional wells in their service
9 area. The growth projection for this area is
10 booming, and they've been revised to show the
11 higher growth. The City has also had success in
12 permitting wells nearby to serve new customers.
13 Concerning Sparton's application to the
14 State Engineer that Sparton claims the City
15 protested, the reason for the protesting was that
16 they had failed -- they wanted them to modify
17 their application to remove chromium. So if that
18 is done, then it's my understanding that the City
19 will withdraw their objections. Under the Water
20 Management Plan, the use of groundwater by the
21 City will continue to be a major supply source
22 and the only source of drinking water available
23 during a drought.
24 Furthermore, concerning the quality of the
25 drinking water in this area, Sparton has said

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1 that the water quality is poor. I would refer
2 you to Mr. Norman Gaume's affidavit that is
3 attached as Exhibit 7 to EPA's February 27th --
4 excuse me, 25th, 1995, brief in this matter. I
5 would also like to read a few sections of the
6 proposed Subpart S that talks about groundwater
7 and potential risks to human health and the
8 environment. It states on Page 30804 that
9 potentially drinkable groundwater should be
10 cleaned up to levels safe for drinking throughout
11 the contaminant plume regardless of whether the
12 water is, in fact, being used -- being consumed.
13 By this statement, it assumes a potential source
14 of drinking water. That's the same situation
15 that we have here. You wouldn't clean up
16 drinking water to drinking water standards unless
17 there is a risk to human health. You have got to
18 remember, there is a potential risk to human
19 health. It doesn't have to be actual like Mr.
20 Harris states.
21 Furthermore, Sparton's arguments never
22 addressed risk to the environment. We have a
23 valuable natural resource, and as such it is
24 protected under New Mexico law. It's also
25 considered a natural resource under CERCLA. So

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1 therefore we do have a risk to human health and
2 the environment here.
3 Secondly, we have some problems -- part of
4 the problems in this case is -- when EPA proposed
5 its remedy, it based it on the Final Decision and
6 Response to Comments Document. Sparton did not
7 propose to contain the plume. That was the basis
8 of that -- their proposal came out after the
9 Final Decision document was made. Also, our
10 Initial Administrative Order was based on the
11 Final Decision and Response to Comments Document
12 as stated, and after that, then Sparton presented
13 a containment proposal. So Sparton has presented
14 EPA with a moving target here as far as remedy
15 selection.
16 Furthermore, I think part of the problems
17 that we have had with this is some of these
18 contradictions Sparton has made in regard to some
19 of the issues concerning containment and
20 characterization. I would just like to read a
21 few of these. In regard to the issue of
22 containment -- and I would also like to first
23 mention on Page 9 of Pierce Chandler's report,
24 which is Attachment A to Sparton's initial brief
25 of February 4th, he stated the following: The

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1 ability to predict results and advanced
2 installation demonstrates a comprehensive
3 understanding of the plume. And in this
4 particular case he was referring to installation
5 of five monitoring wells.
6 Let's just look at Sparton's demonstration
7 of their understanding of the plume. In a
8 November 6, 1995, letter to EPA, on Page 13 of
9 this letter, which in the administrative record
10 is 4631, Sparton stated, pump and treat will not
11 work; it will have little impact upon migration.
12 They also stated on the next page that, aquifer
13 parameters would indicate that you need two to
14 three wells to contain the plume, assuming you
15 try to contain it. They also stated that they
16 would have to pump at a rate of 864,000 gallons a
17 day or an equivalent of 600 gallons per minute.
18 Now, their proposal here only called for one well
19 pumping at 200 gallons per minute. Six months
20 later in their CMS report, on Page 5622 of the
21 administrative record, they state that
22 containment could be provided, but only one well
23 pumping at 50 to 100 gallons a minute. Now it's
24 up to 200 gallons, representing a moving target
25 here, and I think this shows that Sparton doesn't

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1 have a good comprehensive understanding of the
2 plume.
3 Furthermore, in regard to characterization,
4 Mr. Chandler's report stated that in the summer
5 of 1996 all five new wells detected (sic)
6 nondetect -- excuse me, all five wells tested
7 nondetect, and this report was dated February
8 24th, 1997. However, he failed to mention that
9 Monitoring Well #65, which was in October of '96,
10 showed 9.3 parts per billion TCE. So apparently
11 the plume is still moving, and their model, as
12 Mr. Malott mentioned, had not predicted that.
13 Turning to the issue of how to dispose of
14 the treated groundwater, EPA in its Order did not
15 state a preference on a -- in our Final Decision
16 document, we preferred reinjection, however on
17 the Order left that open, and there are many
18 reasons for that. We believe that that's
19 something that's best left to the technical
20 expertise of the EPA. We will consider
21 discharging in the Calabacillas or any other
22 option that preserves groundwater, but I don't
23 think at this point it's something that the Court
24 should determine what the discharge options be.
25 For example, the permitting process involves

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1 public review and comment. If the Court decides
2 that discharge to the arroyo is preferred or
3 orders that, that, in essence, means -- that ties
4 EPA into issuing an NPDES permit, and if a permit
5 is not received, then no cleanup will take
6 place. And so I believe the best approach to
7 take is not to make any decision on the discharge
8 into the arroyo or reinjection; it should be left
9 up to be determined later.
10 Also in regard to the discharge into the
11 Calabacillas, as we pointed out in our brief, EPA
12 had asked Sparton to consider this option. They
13 said it was speculative at best, and therefore
14 later on after we selected the remedy, they
15 decided to do the testing, and then they come up
16 and then they decide, oh, it's okay now. And
17 that's part of the problem. They had their
18 opportunity in the CMS report to submit this
19 information, and now we're, in essence, facing a
20 moving target.
21 Finally, I would just like to make a couple
22 of comments concerning the reliance on the CMS
23 report. EPA submitted extensive comments to the
24 CMS report. It was approved with concerns. I
25 think the way Mr. Harris has presented the CMS

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1 report is now we have three testaments. We have
2 the Old Testament, the New Testament and the CMS
3 report, so it's apparently just like infallible,
4 and that's not the case. We do not -- we
5 provided extensive comments on it that just
6 because they take some situation out of context
7 and say, oh, we have agreed with that, that's
8 gospel, we've got to accept it, and that is
9 simply not the case.
10 And at this point I would like to have Mr.
11 Malott address some of the remaining issues, and
12 I may have a few other comments after Mr. Malott
13 is done. Thank you.
14 MR. MALOTT: Regarding the model, there was
15 a couple of other statements made about that.
16 First I want to go ahead and use the Respondent's
17 Exhibit 4. I would start off with a little
18 additional background. This is, I believe,
19 supposed to be a representation of the New Mexico
20 Utilities Well #2. And as you can see, this is,
21 I believe, meant to represent the water table
22 which extends across and is also beneath the
23 Sparton facility itself. I believe what Mr.
24 Harris has stated earlier -- and there might have
25 been some confusion about this -- he indicated

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1 that this was upgradient. I want to make sure
2 that this is clear that the New Mexico well
3 apparently is downgradient from the Sparton
4 facility.
5 Mr. Harris also indicated that the well was
6 thousands of feet -- the well intake was
7 thousands of feet below where the plume is
8 located. If you look at where the water table
9 extends underneath the Sparton facility -- and it
10 extends all the way across -- you can see that
11 the plume goes right across here to the well
12 intake. I'm assuming that -- I believe this is
13 from Mr. Balleau's report -- that the well
14 intake, I believe, characterizes hundreds or
15 thousands of feet, and if that was the case,
16 well, then the plume is definitely going to
17 intersect the well intake according to this
18 cross-section here. So I want to make sure
19 that's clear.
20 In addition, the modeling itself -- let me
21 see. I believe there's still one up here. The
22 modeling itself did not accurately predict what
23 the source area -- or the concentrations are
24 inside the plume itself. The diagrams they have
25 here all represent three -- a little over three

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1 parts per billion and one part per billion. What
2 they've not demonstrated here is what the
3 interior concentrations are. And I believe Mr.
4 Harris used the analogy of an aquarium, of
5 dropping salt into an aquarium. Well, in this
6 case, if you do not -- if you have not correctly
7 modeled what the interior concentrations are
8 going to be, you do not have a mass that will
9 migrate downgradient so that you could get
10 appropriate concentrations from your modeling
11 effort.
12 According to the files that we had looked at
13 that were supplied on March 14th, these
14 concentrations never even approach what they
15 currently are off-site. So thus, it's like
16 taking a teaspoon of salt and dropping it into an
17 aquarium as opposed to maybe dropping in a
18 shovelful. If you don't have enough mass, how
19 can you predict how far it will migrate down?
20 This may not be an issue anymore. According to
21 Mr. Harris, they've now agreed to contain the
22 plume no matter how many wells it actually takes,
23 in which case the modeling effort may not be as
24 critical an issue. However, it does go to the
25 issue of impacts to human health in this case.

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1 We still do not know what kind of future impacts
2 there may be to the New Mexico Utilities Well #2,
3 so in this case we still do not have any kind of
4 assessment that EPA or any other regulatory
5 agency can rely on. Based on the work we've seen
6 so far, it's almost pure speculation according to
7 this model.
8 MR. MALONE: Which exhibit is this?
9 MR. MALOTT: This is Exhibit Number 5. I
10 believe we may have some other exhibits also.
11 Exhibit 6 also displays some of the contaminant
12 concentrations as well.
13 MR. MALONE: Has the Respondent shared this
14 information with the EPA, or is this your first
15 time seeing these particular charts?
16 MR. MALOTT: They've presented -- well, I
17 believe these were the diagrams, and I would have
18 to go back and verify it with the CMS report.
19 These diagrams are actually in the CMS report
20 themselves. They presented the modeling work in
21 this format. We did not have the input or output
22 files. The code that was used in the model also
23 has apparently been modified from the original
24 model. We do not have that code, nor do we
25 understand what the modifications are.

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1 Apparently HLA, which is another consulting firm,
2 has modified this. This was indicated in the
3 brief that was submitted on March 14th that
4 indicated this was modified. So there's a lot of
5 concern regarding how the source material is
6 represented in the model. Apparently it was
7 portrayed as 10,000 parts per billion of TCE. We
8 know that some of the original concentrations
9 were closer to 90,000 parts per billion back in
10 1983. So there are questions regarding the
11 source term, how it was configured. I believe
12 it's configured as a very small area on the
13 facility. We know that as it migrated down, it
14 spread out laterally across the facility,
15 representing a much wider area. The modeling
16 terms that were used also apparently do not match
17 what you would normally anticipate in groundwater
18 flow. Some of these issues were pointed out in
19 our brief of February 25th. So EPA does not have
20 any confidence in the results of this modeling
21 and what kind of predictability for impacts to
22 existing wells. In addition, exactly how far
23 this plume would migrate without any control
24 measures is also another major concern.
25 The issue of regarding restoration, I

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1 believe, was portrayed in the issue of toxicity
2 and risk. Mr. Harris explained that the toxicity
3 cannot be removed because of residual DNAPL,
4 which is an issue that we addressed in our
5 February 25th brief. That terminology, I think,
6 is misleading. We do have residual DNAPL that is
7 likely present beneath the Sparton facility. The
8 same occurrence is not anticipated off-site. I
9 believe it's referred to as absorbed material
10 onto silts and clays, which Mr. Harris --
11 according to one of the exhibits, he portrayed
12 various percentages, which we had not seen before
13 in that same characterization regarding
14 percentages of the borings and the saturated
15 interval, so we would have to take a closer look
16 to verify that those percentages are actually
17 correct. Again, while the basic material might
18 have been presented in the RFI, it was not
19 presented as percentages.
20 I looked at some of the wells within the
21 plume itself and went back and looked at the
22 descriptions from the boring logs. Take, for
23 example, Wells #61 and #60. According to the
24 descriptions, they consist of fine-to-medium
25 sands, gravels and fine sands. Well #57 consists

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1 of fine-to-medium sand; #58 consists of sandy
2 gravel; #54 consists of sandy gravel; #64
3 consists of clay, gravel and fine-to-medium sand;
4 #53 is fine-to-medium sand; #52 is silty,
5 fine-to-median sand, fine-to-course sand. There
6 is one well cluster, #48, #56 and #55 monitoring
7 wells, that varies between gravel, we have
8 fine-to-course sand, and then we have one well
9 that penetrated about 18 feet of sandy clay, but
10 that was the only one. Wells #46 and #47 contain
11 gravel, gravely sand, fine-to-course sand. Where
12 I'm going with this is that based on the
13 descriptions of the boring logs, we do not see
14 that much clay and sand. This is based on the
15 descriptions from the boring logs. So the
16 question of restoration, when we review the
17 material, it appears that it is a feasible option
18 at this site. We recognize that we cannot always
19 accurately predict the exact response of the
20 groundwater extraction system, but based on the
21 information that we have at hand, it does
22 indicate that the geology and the characteristics
23 of the aquifer are suitable for groundwater
24 extraction in removing this material.
25 Also, there is a question on the cost for

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1 reinjection and the whole feasibility of
2 reinjection, and as Mr. Pearson has previously
3 indicated, we looked at the options out there,
4 but Sparton has attempted to completely dismiss
5 the idea of reinjection even though we know it is
6 successful in operation at the South Valley
7 Superfund site. We also looked at a site in
8 Region 9 at a facility there, the Air Force
9 Plant 44, I believe was the name of it -- that
10 was also in our brief that we filed on the
11 25th -- where we had successful operation.
12 Basically some of the issues they raised
13 regarding pH adjustment, we had addressed that in
14 our cost estimates. It's the acid feed in the
15 treatment train. They also said that we did not
16 address filtration, and that's actually Filter #1
17 and #2 of the treatment train. They also
18 indicated that we not considered de-airing as far
19 as the water before it's injected. That was also
20 in the Equalization Tank #2. We did not include
21 chlorination in the system on our cost estimates.
22 That's from anticipated low biological oxygen
23 demand of the water. The South Valley problem
24 (sic) had a descalant problem, but it was not a
25 biological problem, so that's why we did not

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1 think that chlorination was going to be an issue
2 as far as cost. The bottom line is that we did
3 consider a lot of these issues in our preparation
4 of the schematics and the costs regarding
5 reinjection.
6 Also, there was an issue raised regarding
7 time frames. Mr. Harris indicated that operation
8 of their system at 220 gallons per minute for 30
9 years is shorter than EPA's aggressive approach,
10 and I'm not sure how he came up with that. If
11 you consider the system of extraction with
12 additional wells that are removing additional
13 mass at a rate greater than 200 gallons per
14 minute, it appears to be logical that you would,
15 in fact, remove more mass. Now, any system that
16 would be operating in such a manner would have to
17 be designed so that you do not -- or that you
18 avoid well interferences, that you actually
19 maximize removal and that you're not pulling in
20 tremendous quantities of clean water. Also, the
21 net water loss regarding their discharge to the
22 Calabacillas, the 1% to 3% versus 5% or 6%, I
23 guess their estimates are based on precipitation
24 and the wet sludge itself in the calcium
25 carbonate, but I'm not clear on that.

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1 At this point we do not anticipate any
2 production of hazardous waste, especially the
3 quantities that Sparton has estimated from their
4 treatment train, and that was in our original
5 Final Decision document.
6 Also, there was an issue raised regarding
7 characterization. I believe it was portrayed
8 that EPA was going to require 20 wells. EPA
9 included the cost for 20 wells in our Final
10 Decision document because there are areas of the
11 plume itself that are currently undefined. Part
12 of it is due to continued plume migration since
13 the RFI was approved. When you look at this
14 cross-section, it is somewhat misleading. Their
15 cross-section extended along the south boundary
16 of the facility, and they attempted to show that
17 they have control below the plume on these wells,
18 when, in fact, we know that we have the plume in
19 this area as undefined as far as the vertical
20 extent. We also do not know the vertical extent
21 of the plume at this depth in this area here or
22 over here.
23 We know that this well here is now
24 contaminated, so there is some question as far as
25 the vertical depth and the lateral extent.

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1 Though it appears to be at low concentrations, it
2 may be near the edge. And this general area up
3 here, based on the potentiometric map that we
4 submitted in our brief, it appears that flow
5 gradient is back in this direction here for the
6 upper flow zone or the top part of the aquifer
7 itself.
8 Now, they do have a well here that extends
9 below the base of the plume at some distance,
10 and, in fact, this is really the only control
11 point that we have off-site that is below the
12 plume. Now, they do have other nondetect wells,
13 these two up here and these two here, but as I
14 mentioned before, they have already lost one of
15 the wells here and it's contaminated. So
16 additional characterization is going to be needed
17 to determine exactly what is the base of the
18 plume. And we want to get a good handle on what
19 the vertical extent of the plume is, so in order
20 that when we design the extraction system, we'll
21 know what the plume size is and how efficient or
22 what kind of design parameters for the extraction
23 system should be incorporated.
24 We've also recommended conducting an aquifer
25 test off-site to verify the aquifer parameters,

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1 and this will influence how efficient the wells
2 are and how many wells will be required. Sparton
3 has focused on the design and implementation of
4 one well pumping at 200 gallons per minute, and
5 based on the boring logs that we have from
6 off-site, it indicates the formation is much more
7 transmissive than what we have seen on-site
8 beneath the Sparton facility. And I'll remind
9 you that the distance is approximately a
10 half-mile. And in order to design any kind of
11 efficient system, we should have an aquifer test
12 out there performed to proceed with the design
13 characteristics of the system itself.
14 The technical and practicability issue, they
15 did bring it up in their CMS report. They talked
16 about some of the issues on TI. We addressed
17 those issues. A lot of it goes to the
18 restoration aspect, and based on the previous
19 discussion here, EPA has addressed those issues
20 to show that restoration is a feasible option,
21 and we've rejected the TI -- they've not made a
22 formal TI proposal to EPA, and typically TI
23 proposals are based on extensive
24 characterization, probably much more than what we
25 have here, and, really, the TI guidance says that

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1 the TI decision can be made at any point in the
2 decision process; during characterization, during
3 the remedy selection process or even during the
4 remedy implementation phase itself. One of the
5 things they do recommend, though, before you can
6 make a TI decision is to actually see how the
7 system performs. Does it meet the anticipated
8 performance? And in this case all we have is
9 eight wells pumping from roughly the upper ten
10 feet of the aquifer beneath the facility, you
11 know, at a rate of less than a gallon a minute,
12 and we really have no other site characteristics
13 or performance of a system that indicates that it
14 will not meet our expectations. If we look at
15 the South Valley site, which has slightly
16 different geology, so far it has been successful,
17 though it has not been in operation in a great
18 deal of time, so it's premature to conclude that
19 the TI decision at this time is warranted.
20 MR. PEARSON: And now I just have a few
21 brief comments before I conclude our rebuttal. I
22 would like to follow up on what Vince said in
23 regard to the TI. It is provided in the Order
24 that the Respondent can submit a TI demonstration
25 to EPA at any time. And like he mentioned, we

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1 have not yet received a real extensive TI
2 demonstration, and we pointed this out in our
3 brief, and we would also like to refer the Court
4 to our comments on their TI proposal in our CMS
5 comments.
6 A couple of other issues I would like to
7 address -- the issue of cost, cost only comes
8 into effect when you basically have like
9 equivalent remedies or assuming both remedies are
10 protective of human health and the environment.
11 And I think as we've shown here that Sparton's
12 proposed remedy, whether it's in the CMS report
13 or their one-well containment system, is not
14 protective of human health and the environment.
15 The City is going to require the assets of that
16 area. They've identified it as a potential well
17 site. The guidance documents in the Subpart S
18 mention you should restore groundwater, a
19 potential source of drinking water, to drinking
20 water status, and therefore that assumes there is
21 a potential risk to human health, and their
22 argument also is that there has to be an actual
23 threat to the environment. You do not have to
24 have an actual threat as Sparton seems to
25 indicate in order to implement corrective

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1 action.
2 And finally, I would just like to refer --
3 because of the time constraints here, I would
4 like to refer (sic) the Court that all of these
5 issues should have been addressed in detail in
6 our briefs and in the accompanying affidavit
7 concerning reinjection cost, some of the
8 arguments that they have made concerning
9 reinjection, some of the other cost issues. All
10 of these issues have been addressed in our brief,
11 and I would refer the Court to those documents.
12 That concludes our presentation. Thank you.
13 MR. MALONE: Okay. Before allowing the
14 Respondent to proceed, I have a couple of
15 questions. You said the vertical extent of
16 contamination has not been defined. What about
17 the horizontal extent of the contamination?
18 MR. MALOTT: Well, there are areas in the
19 horizontal, as I mentioned. Well #65, which is
20 on the -- if you look at the plume itself, it's
21 on the western edge. That one is currently
22 contaminated. Also, according to the
23 potentiometric map which shows a water level in
24 the aquifer for the top part, it appears that the
25 flow direction is back in this direction here,

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1 and all we have is these two wells which are
2 really across the gradient and not directly in
3 the flow path of the plume itself. We have two
4 wells here, but it's not clear that those wells
5 will actually catch the plume. At some point
6 they will, of course, if the plume continues to
7 migrate in this direction. The preferential flow
8 path may be in this direction here.
9 The other issue is the separation between
10 this well cluster and this one, and Sparton is
11 proposing the installation of a containment well,
12 which is also what we would require under our
13 remedy as well. The design of the system is
14 going to -- the information you're going to need
15 to have is exactly -- or within a fairly good
16 limit of what is the leading edge of the plume
17 right in here so that you can design the system
18 so that it is efficient and you don't pull in a
19 lot of clean water. This distance, I believe,
20 is, you know, 1,200 feet or so, which is a pretty
21 good separation. Also, there's -- this area
22 here, according to the potentiometric map, shows
23 that the flow is back in this direction here. We
24 know that these two wells here, the
25 concentrations have been going up, and the plume

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1 would also continue to migrate in this area here.
2 So there are concerns that the plume has not
3 been adequately defined to proceed with the
4 design of an efficient groundwater extraction
5 system. And that's what we're looking for from
6 the data is the appropriate design so we can be
7 sure that it's efficient and effective, and also
8 the requirements of performance monitoring for
9 the system so that we can show that the plume is
10 actually being captured and that we're moving the
11 mass appropriately.
12 MR. MALONE: How successful is the current
13 pump and treat system? We understand that they
14 actually have -- the Respondent has a pump and
15 treat system in place right now.
16 MR. MALOTT: That is correct.
17 MR. MALONE: How successful has that been?
18 I mean, have we had lots of problems with, I
19 guess, the technical and practicability issue, or
20 how is that working?
21 MR. MALOTT: That issue has not been
22 raised. The pump and treat system was designed
23 at the start of the Administrative Order on
24 Consent back in 1988. They designated certain
25 wells for either the conversion to pump and

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1 treat, and they really didn't have a good handle
2 on the site characteristics themselves. The
3 wells are sited in kind of a silt and a sand.
4 They pump at a very low rate, you know, less than
5 a gallon a minute. We looked at the
6 characteristics of those wells and how they
7 perform, and based on the characteristics, those
8 wells do not capture the plume which is in the
9 upper ten feet of the aquifer underneath the
10 facility so that we know that we have material
11 migrating off-site that's not captured by those
12 wells, and that document is also in the
13 administrative record. I believe it's dated June
14 20th, 1996, regarding the effectiveness of the
15 recovery system.
16 MR. PEARSON: That document should be in the
17 same area with our CMS comments. I believe it
18 was -- it's an enclosure to our CMS comments.
19 MR. MALOTT: No, it's separate.
20 MR. PEARSON: Oh, it's separate?
21 MR. MALOTT: Separate.
22 MR. PEARSON: Excuse me, it's separate.
23 MR. MALOTT: So in this case you could not
24 use -- or at least I don't see how you could use
25 the characteristics of a system that's pumping

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1 at, you know, less than a gallon per minute to
2 make a technical and practicability decision for
3 the remainder of the plume.
4 MR. MALONE: Thank you.
5 You may respond to EPA's rebuttal.
6 MR. HARRIS: Mr. Malone, our target may be
7 moving, but at least we have a target, and the
8 target that they claim is moving has actually
9 represented changes taken by Sparton in response
10 to additional information, and every change we
11 have suggested has been for more involvement at
12 the site rather than less, and based upon our
13 presentation today, we think that we probably are
14 doing more than is actually required by the
15 statute, but we've now had a chance to have EPA
16 file its brief and listen to them this afternoon,
17 and we still don't know what it is EPA is
18 proposing.
19 EPA has said we need to do further study of
20 the plume, and then we need to run an off-site
21 pump test and study those results, and then we
22 need to do some more study in an effort to
23 determine how many containment wells we need, and
24 then maybe we'll run a containment well for a
25 while and decide whether there's any technical

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1 impracticability, and then we'll decide whether
2 we want to put in any extraction wells, and then
3 we'll do some more studies and decide whether we
4 have to put in some more wells on-site, and I
5 have --
6 MR. PEARSON: Excuse me. I would like to
7 object. I think this is supposed to be limited
8 to a rebuttal, and I don't think we raised any of
9 those issues concerning what our remedy is in the
10 rebuttal. We talked about technical issues, not
11 about number of wells, so I don't think his
12 comments are appropriate.
13 MR. HARRIS: I thought he was the one that
14 raised the issue about the moving target in
15 comparing that to their own.
16 MR. PEARSON: Okay. I apologize then. I'm
17 sorry.
18 MR. MALONE: Proceed. And I just want the
19 parties to know I'm going to tend to allow
20 information in today. I would more or less
21 prefer to have a fully developed record that
22 clarifies all the issues today, so please
23 proceed.
24 MR. HARRIS: My point is we don't know what
25 EPA is proposing, and that raises one of the

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1 concerns that we have addressed in our briefs and
2 they brought out through their statements, and
3 that is that 3008(h) requires that any Order
4 include with reasonable specificity the nature of
5 the required corrective action or other response
6 measure and shall specify a time for compliance.
7 The difficulty is, what we're hearing from EPA
8 is, we don't know exactly what our target is, go
9 out and keep studying it and we'll let you know
10 when you have closed in on our target, but you're
11 not going to have the review procedures that are
12 available to you under 3008(h), we're going to
13 make the decision under the terms of this Order,
14 and if you don't like it, that's just too bad,
15 the procedures for challenging that will be in
16 the Order and they're not going to be the same as
17 we're entitled to under Part 24, and you're just
18 going to have to live with what we say. Well,
19 our point is we've got a very specific proposal,
20 and we want to implement that. If it doesn't
21 work the way that we have suggested it will work,
22 then the agency is free to specify some other
23 procedure and give us an opportunity under Part
24 24 to challenge that. But what they're
25 suggesting is let's not go out and do anything

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1 specific right now, let's just go study it for
2 another two to five years, then we'll make a
3 decision under the Order what we think is
4 required and tell you that, at which point we
5 don't think you have any rights under Part 24 to
6 challenge our determinations. And in our view,
7 that violates the requirements of the statute,
8 and we have real difficulties without having a
9 target. And let me try then after that general
10 statement to respond more specifically point by
11 point.
12 With respect to their claim that this water
13 is a potential source, everything you heard from
14 them today is just gross generalizations, and it
15 is part of my frustration with this procedure
16 that I've indicated to you before that they
17 say -- it's sort of like them saying the earth is
18 flat and providing no basis for that, and then I
19 guess I'm supposed to come back and say, no, the
20 earth is round, and we don't ever join issue on
21 that point.
22 With respect to the water being a potential
23 source, they haven't given any particular facts
24 for that. We've shown you that there are no
25 wells there, that there's no likelihood any wells

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1 are going to be located there with facts. They
2 haven't rebutted that with any facts. Similar
3 vein, they say the City -- first they started off
4 with saying the City plans to acquire NMU, then
5 they've said, well, the City is going to acquire
6 it, and by the end of the presentation I think
7 the City already owned NMU. The fact of the
8 matter is that is entirely speculative. All we
9 know is that they have said that the City intends
10 to acquire it. Whether they legally can do that
11 has never been demonstrated by any facts. How
12 long it's going to take or what the City is going
13 to have to pay or what the ability of NMU to
14 resist that is, whether there's any likelihood of
15 it happening has never been presented by EPA and
16 for good reason, because our understanding from
17 discussing with local counsel in New Mexico on
18 water law issues is that the likelihood of the
19 City acquiring through condemnation NMU is
20 relatively remote, but the problem is we don't
21 have any way -- I'll tell you that and you have
22 to listen to me and you have to listen to them.
23 Who are you going to believe, them or me? We
24 don't have any facts and we haven't had the
25 opportunity in this proceeding to flesh those

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1 out, and I think making a decision where you're
2 asking my client, which is a very small company,
3 to spend 15 to 26 million dollars on the basis of
4 somebody from EPA saying that the City plans to
5 acquire through condemnation New Mexico Utilities
6 is beyond the pale, so to speak. And we'll just
7 submit that we don't think, frankly, from what we
8 understand of the politics of the situation that
9 the NMU condemnation is ever going to go
10 anywhere, but we haven't had a chance to develop
11 those facts in this proceeding.
12 But it's certainly not -- what we can say as
13 of today is that NMU is a separate entity with a
14 separate service area and hasn't been acquired by
15 the City of Albuquerque, and I think your
16 decision has got to be based on the facts that
17 are actually in existence today, not what is
18 going to happen five, ten, fifteen years, if
19 ever. If that were the case, we would never be
20 able to reach any decisions in this particular
21 matter. And, again, they then say, well, there's
22 this well currently permitted, and I guess
23 they're referring to the one well we put on with
24 the green dot that's between the producing well
25 and our facility. Again, NMU says they don't

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1 have any near-term interest in developing that
2 well. The information that we have presented to
3 you from Pete Balleau, the hydrologist in
4 Albuquerque, that suggested even if that well
5 were permitted or were produced in conjunction
6 with recharge, that if you had containment here,
7 they could go ahead and do that, was never
8 addressed by EPA.
9 Mr. Malott is correct that I get my
10 upgradient and downgradient confused; that well
11 is downgradient. But, again, it's a depth, and
12 the point that I want to make -- and I think it
13 got a little confused by Mr. Malott -- there's a
14 significant vertical separation between the area
15 that's been impacted and where these wells are
16 producing of probably at least 500 to 1,000
17 feet. Apart from everything else you have heard,
18 there is a vertical separation -- I'm not sure of
19 the exact distance. We can supply that if that's
20 of interest to you. But that vertical separation
21 at this site where the material is moving
22 horizontally 30 times faster than it is
23 vertically suggests that there's little or no
24 likelihood that that material is going to impact
25 on any well that's currently pumping within a

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1 couple or few miles of the area that's been
2 impacted.
3 I'm not sure where they were going with
4 their growth estimates being wrong again. We
5 don't have any facts on that. We did supply
6 facts in our submission from various services
7 that have looked at what the growth is going to
8 be, and frankly those show that through the year
9 2010, I believe, that the City of Albuquerque --
10 setting aside New Mexico Utilities, but the City
11 of Albuquerque on the west side through its
12 current wells has enough capacity to provide
13 service for its existing and future population
14 through at least the year 2010. Basically it's
15 my understanding that NMU has sought permission
16 for additional wells to protect itself from
17 incursions from the City of Albuquerque.
18 Obviously it's now interested in trying to
19 contain or acquire in some form. Whether that
20 happens remains to be seen and really has nothing
21 to do with the growth rate out there. But even
22 with those wells, none of them as we've pointed
23 out, except for the one that was already
24 permitted, are in the area that is downgradient
25 of where the impacts are.

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1 I wasn't aware that the City had protested
2 Sparton's application to remove 200 gallons per
3 minute from that area. We haven't seen a copy of
4 that. We know that the natural resources trustee
5 has. But, again, it brings back the point that
6 we're trying to get something done out there, and
7 all we hear from EPA is you've got to study it
8 more, and when we try and get something done,
9 people will protest our ability to try and move
10 forward with the very specific target that we
11 have in place of what we're willing to do.
12 Again, I don't know what to say about
13 whether the water quality is poor or not. Mr.
14 Balleau says that it's poor and shouldn't be
15 used. Mr. Gaume seems to suggest it might be
16 used anyway. We don't have the ability to talk
17 to either of those people to find out the basis
18 for their conclusions, although I will say Mr.
19 Balleau pointed out specific parameters that
20 indicated bad quality water. I mean, at least he
21 provided some facts. He pointed out some
22 hardness and some nitrates and some other numbers
23 that are at or above secondary water standards.
24 Mr. Gaume tends -- at least as I understand it,
25 the affidavit suggests, well, apparently we've

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1 got to be concerned about the solvent in the
2 groundwater above standards, but we shouldn't be
3 so concerned about the nitrates and the
4 conductants and hardness being above these other
5 standards, so some standards are important but
6 other standards aren't. Mr. Balleau is simply
7 making the point that the quality of the water
8 that's been impacted is not as good as the
9 quality of the groundwater in other areas that is
10 being produced and would make this the least
11 likely source to be used for drinking water
12 purposes, and nobody from EPA or the City has
13 refuted that fact in this particular proceeding.
14 You know, the guidance on corrective action that
15 Mr. Pearson read from, again, both of them are
16 proposed regulations. The 1990 regulations were
17 proposed, never adopted. The 1996 regulations
18 were an advanced notice of rulemaking. I'm not
19 entirely sure what -- to what extent they are
20 controlling on the agency in any way, shape or
21 form. They do give some indication that the
22 agency is thinking on certain points, and I would
23 submit that the '96 advanced notice of proposed
24 rulemaking is very much consistent with what we
25 have proposed. It's much more consistent with

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1 what we have proposed than with what Region 6 has
2 proposed.
3 The impact to the environment argument is
4 interesting. EPA has recently proposed some
5 ecological risk rules that make it very clear
6 that the agency internally considers the term
7 environment in 3008(h) not to be some natural
8 resource. The act doesn't say protection of
9 human health and natural resources, it says
10 protection of human health and the environment,
11 and the way the agency is interpreting the
12 environment is to be an ecological receptor.
13 It's basically some nonhuman, animate object that
14 is going to be impacted by the material in the
15 groundwater, and the fact of the matter is there
16 are no facts in this proceeding to suggest that
17 any nonhuman, animate object is impacted in any
18 way, shape or form by the solvents that are in
19 the groundwater at the Sparton facility. This
20 water is not flowing towards a river. It doesn't
21 come out and hit any anything else at the
22 surface. The only way you can come in contact
23 with this water is to drill, what, 200 feet --
24 either drill or dig down 200 feet before you get
25 there, and there's nothing in the record to

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1 suggest that anybody is currently being impacted,
2 nor are there any facts, frankly, in the record
3 to suggest that there is even a potential. I've
4 been waiting all day to hear the facts rather
5 than a conclusion about potential impacts, and I
6 haven't heard any.
7 We agree, and have agreed now based on more
8 recent data, although initially Sparton was of
9 the view about a year-and-a-half or so ago that
10 the plume was not moving, but on the basis of
11 additional analysis, we're now of the view that
12 the plume is moving at about 100 feet per year,
13 and we're not surprised that the one well that
14 Mr. Malott pointed out is showing some hits at
15 this point. That's consistent with what we think
16 the plume is now doing. If this proceeding
17 continues at its current pace, other wells are
18 also going to be impacted. That's why we want to
19 go out and do something now as opposed to
20 studying the situation. Under EPA's scenario,
21 we're not talking about 30 years, we're talking
22 about two to five years to study it when the
23 plume is going to be continuing to move. If
24 fact, if we follow EPA's approach, we'll never
25 get done. After two years it will move,

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1 apparently we have to study it again, if it's
2 moved another bit in those two years, we've got
3 to go back and study it again, and we're going to
4 be studying this thing for 30 years because it's
5 going to keep moving, and every time it moves,
6 apparently Mr. Malott's view is we've got to go
7 back out and recharacterize where the plume is
8 before we can do anything. You know, my reaction
9 to that without being too glib is I'm just glad
10 Mr. Malott wasn't designing the additions to my
11 house because we would still be waiting for the
12 plans to be completed before we could even begin
13 building.
14 Our point is that we have appropriate
15 characterization. We have as much
16 characterization today as we did in 1991 when EPA
17 approved the plume description, and we have more
18 than enough description now in order to move
19 forward with some off-site testing. And I would
20 also point out that we had a meeting in Santa Fe
21 back in September when we discussed this issue,
22 and at that time EPA was of the position, along
23 with the State and the City, that if we put in
24 one additional monitor well, that would be
25 sufficient as far as they were concerned to

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1 characterize the plume. And at this point it's
2 gone into hibernation at this time. We think --
3 and Mr. Chandler's declarations and those of
4 other people here have suggested that we have
5 more than enough information to move forward and
6 at least install the well, run the pump test, and
7 from that confirm the aquifer characteristics,
8 confirm the capture zone and move forward. The
9 only thing that's holding us up is being able to
10 discharge that water in a cost-effective fashion,
11 and for that we are simply waiting on EPA to
12 issue us an NPDES permit.
13 I'm going to let Mr. Chandler speak for just
14 a minute to the modeling. I would note, however,
15 that at least we've done some modeling. EPA,
16 again, has no facts in the record that show there
17 are going to be any impacts to that well. The
18 fact that Mr. Malott thinks it's going to be so
19 doesn't make it so, and his generalization that
20 this is going to happen doesn't help us if we
21 don't know the basis and he has some fundamental
22 facts to support that conclusion, and he doesn't
23 have any. They don't have a model that they have
24 projected to show that what we've done is wrong.
25 All they can do is snipe at the model that we

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1 have provided.
2 And, Mr. Chandler, if you could talk for
3 just a few minutes about what the model was
4 designed to do and address Mr. Malott's concerns
5 about its accuracy.
6 MR. MALONE: I have a couple of questions I
7 would like to pose first.
8 MR. HARRIS: Sure.
9 MR. MALONE: So if I understand you
10 correctly, the vertical and the horizontal extent
11 of the contamination is somewhat defined, but not
12 completely defined?
13 MR. HARRIS: We believe it's -- if I could,
14 Mr. Malone, let me refer back to -- if I can find
15 it here -- the '96 data. What is interesting --
16 what we're saying here is that these wells with
17 the squiggly lines around them represent
18 situations where we have found the concentration
19 to be below the drinking water limit. And so we
20 think from a horizontal standpoint -- I mean,
21 what Mr. Malott is suggesting is that somehow the
22 plume will act strangely and will shoot out this
23 way between MW-57 and MW-60 or will shoot out
24 strangely between MW-68 and MW-65, and therefore
25 the plumes all the way down here have snuck by

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1 these monitor wells. Well, under his scenario, I
2 guess we'll never get there because we keep
3 putting wells in. We'll put a well between these
4 two. Well, how do we know it doesn't shoot out
5 between those two? Well, we'll put another well.
6 How do we know it doesn't shoot out between
7 those? Pretty soon we've got 15 wells in there,
8 and, you know, the point is, well, Mr. Malott,
9 we've now got two feet of separation between the
10 wells. Is that too much? Do we need to put
11 another well in? When is enough enough? And
12 what Mr. Chandler has said in his declaration is
13 he's been doing this work
14 for -- what --
15 MR. CHANDLER: Twenty years.
16 MR. HARRIS: -- 20 years, teaches courses in
17 it and is saying, you don't see in this sort
18 of -- and we also have well-defined subsurface
19 geology -- the plume just ain't going to sneak
20 out that way. And most people in the field would
21 recognize that, that at some point you have got
22 to call it quits. And what we're saying is that
23 there is adequate description here based upon the
24 subsurface geology in these wells to know that
25 we've got a horizontal description. We think

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1 it's there.
2 From a vertical standpoint, take a look
3 here. For instance, if you take a look at this
4 cross-section down at the bottom, which is A-A,
5 which runs down sort of through the center of the
6 plume, we have wells down here at the facility
7 and wells on the front end. This is what was
8 referred to as the keel. Again, what Mr. Malott
9 is suggesting is that somehow the plume does
10 something funny in between Well #40 here and Well
11 #48, that instead of just following this line, it
12 somehow drops down to the center of the earth and
13 comes back up. It just doesn't happen that way
14 once you know what the subsurface geology is.
15 You have got to exercise some judgment here.
16 Otherwise, we would be putting in a well every
17 five feet.
18 There was one area where we agreed that it
19 might be worthwhile to confirm what we thought
20 the plume was doing, and that was on
21 Cross-section D-D prime, and that's depicted in
22 here by a dotted line. Mr. Chandler put that
23 dotted line in to indicate that he didn't feel
24 real comfortable that that's where the bottom of
25 the plume was in the vertical direction. We

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1 think that's where it is.
2 We would be willing to go forward with our
3 remedy without having to drop another well there,
4 but simply for purposes of confirming and putting
5 the agency at ease, we're were willing to put in
6 one additional well there, and that was the
7 subject of the discussion in September in Santa
8 Fe, and we left that meeting with the
9 understanding that all parties were willing to
10 allow us to go forward to put that well in there
11 and to move forward with some other testing that
12 was required.
13 So except for that one instance, we are
14 satisfied that the current well structure
15 adequately defines the plume both vertically and
16 horizontally, and if EPA would follow the same
17 criteria it used in '91, it would be satisfied,
18 but they've changed apparently the rules of the
19 game on us in '96.
20 MR. MALONE: I have one more question for
21 you. It seems like Sparton and the EPA agrees on
22 certain aspects of a remedy. If you could just
23 put it in a nutshell, what do you think EPA and
24 Sparton agree on?
25 MR. HARRIS: EPA and Sparton agree that soil

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1 vapor extraction needs to be done on-site. EPA
2 and Sparton agree that on-site groundwater
3 containment needs to be enhanced. They disagree
4 at this point on how much enhancement is
5 required. Sparton's position is, let us do some
6 enhancement, reevaluate. EPA's position, at
7 least as I understand it, is, no, study it
8 further, then put in some more wells and then see
9 where we are. EPA and Sparton agree that
10 off-site containment is appropriate.
11 MR. MALONE: What about the extent of
12 off-site containment?
13 MR. HARRIS: There are two aspects to that,
14 Mr. Malone. When I say off-site containment, I'm
15 talking about putting a well at the leading edge
16 of the plume to prevent that from moving
17 forward. Where we dis -- I'm not even sure we
18 disagree on the extent. EPA believes that it may
19 be one to three wells. We think, based on all
20 the analysis we've done, that one well will do
21 it, but we have not foreclosed the possibility
22 that we could be wrong. And what we have said in
23 our submissions is, we want to put in the one
24 well, if it works, it works, if it doesn't, allow
25 us to continue with the one well while we

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1 determine what else needs to be done. If I
2 understand EPA's position, they want us to study,
3 come to a conclusion whether it's one well or
4 three wells before we actually implement the
5 containment.
6 Where we disagree significantly is on
7 whether anything more than off-site containment
8 is necessary. EPA wants to undertake a series of
9 wells -- or wants us to install a series of wells
10 in the interior of the plume in an effort to
11 restore the aquifer, in their view, more quickly
12 than if we put in a one-well containment or
13 two-well containment system, whatever it is. Our
14 opposition to that is based on our belief that
15 the conditions of that aquifer and the nature of
16 the material there will prevent any effective
17 restoration in a reasonable period of time and
18 that, in fact, more aggressive pumping has a
19 bunch of detriments associated with it. First,
20 it pulls out a tremendous amount of water from
21 the system. Secondly -- and Mr. Chandler speaks
22 to this in his declaration -- if you don't run it
23 very precisely, you can overstress the system,
24 and that could actually cause you to remove less
25 material than if you ran it more slowly, and in

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1 our view, it's going to be throwing good money
2 after bad.
3 The last area that I guess we agree on is
4 that we've got to do something with the water
5 that we recover. And I'm not sure we disagree on
6 where it should go, because if I understand EPA's
7 position, they haven't made a final decision on
8 what to do with that water, if I understand Mr.
9 Pearson's statements, that they have not ruled
10 out discharge to the arroyo, nor have we ruled
11 out other options. It's just at this point
12 discharge to the arroyo is to us the most
13 cost-effective and most environmentally friendly
14 and best from a water conservation standpoint and
15 therefore is also one that my client can afford
16 and doesn't have to tinker with, as I think -- as
17 we went through. And so that's why we've
18 indicated some frustration with -- at least we've
19 got a target, and we're still waiting for EPA's
20 target because it seems to be based more on
21 studying the situation.
22 But I think that fairly -- I mean, one way
23 to look at it is we're not very far apart, but to
24 say that, one has to assume that it's not very --
25 that this issue of interior wells and where you

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1 go with the water -- how important those
2 particular issues are. They're obviously
3 important to my client from a cost standpoint,
4 and their point in this proceeding has -- what
5 we've attempted to convey to you is we think that
6 what we have proposed does everything that EPA's
7 remedy would do at a much lower cost and that one
8 could afford, one that is necessary as that term
9 is defined in the statute, and one that meets all
10 of the criteria. And if you have two -- my
11 understanding of EPA's policy is if you have two
12 remedies, both of which meet all of the criteria
13 and one is cheaper than the other, then you
14 should go with the cheaper one, especially in
15 this case where we view ourselves from an
16 implementability standpoint and long-term
17 effectiveness being more effective than what EPA
18 has proposed, because ultimately discharge to the
19 arroyo is easier to deal with and handle than
20 reinjection is. The other point is that the
21 fewer wells you have, the less intrusion you have
22 in the community and the less likelihood you have
23 of somebody bumping into one. It just becomes
24 much simpler and you just have less risk down the
25 road, and we think it accomplishes exactly the

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1 same result.
2 MR. MALONE: Thank you.
3 MR. HARRIS: And I think we were talking a
4 little bit about modeling, so Mr. Chandler is
5 going to talk about that for a second.
6 MR. CHANDLER: Sure. Thanks. First off,
7 Mr. Malott questioned the use of the model code.
8 The model code that we used was a PC-executable
9 version of what was originally a FORTRAN model to
10 be run on a mainframe computer that the
11 Department of Energy had developed at Oakridge
12 National Laboratory. It's called Analytical
13 Transit 123-D, or we call it AT-123-D. There are
14 a variety of PC versions of AT-123-D around. We
15 had used one that Harding Lawson had developed
16 years ago. A gentleman named Eric Laplim
17 (spelled phonetically) had provided this.
18 It's -- the only difference between it and the
19 mainframe version is -- like I said, it is
20 compatible with a PC. It was configured to run
21 on a personal computer, not on the mainframe.
22 The input and output form is almost identical to
23 the mainframe version.
24 With respect to the actual model, the
25 purpose of the model, as stated both in the CMS

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1 where it was first included and in subsequent
2 responses to it, as we indicated, it was an
3 attempt to be a simulation to try and show
4 general plume movement characteristics. We
5 recognize that because of the complex subsurface
6 conditions, that to try to come up with an exact
7 model is somewhat problematical.
8 Secondly, there's some misinformation
9 regarding the length of time that a release
10 occurred, what the quantity of release was. What
11 we tried to do is make a best judgment case of
12 what a realistic time frame for a release was,
13 what an average concentration was for that
14 release. In two cases -- we looked first at a
15 continual release where the release is ongoing
16 for an extended period of years. That's the
17 continual sources model that you saw in the
18 exhibit. We also looked at a source that was
19 interrupted after 20 years which we thought might
20 represent the -- a closure of the facilities on
21 the site that occurred in the mid-1980s. There
22 was approximately a 20-year window that releases
23 could have occurred. The attempt was to show the
24 movement of the leading edge of the plume more or
25 less to give some indication of how rapidly or in

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1 what time frame contamination might reach the New
2 Mexico Utilities Well #2 on a very simplistic
3 basis.
4 There are two things that are very obvious.
5 If you look at the exhibits, even on a continual
6 release which was modeled, the plume achieves --
7 at some distance achieves a more or less
8 equilibrium-type configuration with respect to
9 higher concentrations. Again, though, we were
10 interested in looking more at the leading edge of
11 the plume as it extends out. In the interrupted
12 source model, we were also looking at the idea of
13 a slug detaching and moving away from the source
14 area and moving out toward the New Mexico
15 Utilities well, which the model showed. There is
16 analytical data that we've obtained from our
17 continuing sampling to date -- we indicate that
18 that's exactly what is occurring. Again, I think
19 we're in agreement in that Mr. Malott has pointed
20 out that the model is very simplistic. I think
21 we would agree. I think we pointed that out.
22 (Mr. Chandler and Mr. Harris confer.)
23 MR. CHANDLER: Yeah, there was a question
24 made that we didn't simulate enough mass with the
25 release. That could be a valid observation. It

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1 would be -- if you doubled the amount of mass
2 that was released, then you would expect to see a
3 corresponding increase in the concentrations, but
4 you wouldn't expect to see it change in the time
5 that it took to reach out. Again, we're making a
6 lot of assumptions here, too, that the New Mexico
7 Utilities well will be there for 100 years or 200
8 years, and that's probably not a realistic
9 assumption either. A model is no more realistic
10 than you can make it, and there's a lot of
11 constraints; time and money is one. Sparton
12 spent a lot of money previously back in the
13 mid-eighties modeling -- this site has been
14 modeled twice, to my knowledge. I believe EPA
15 modeled it once before, and Sparton modeled it
16 once before with disparate results in both
17 occasions. What we believed is that we had a
18 history from like the mid-1980s to, oh, 1991 --
19 we had a history of how the plume had moved, and
20 what we tried to do was come up with a model that
21 more or less matched the plume footprint, if you
22 will, and then we used that matching the plume
23 footprint to try to use a model that was
24 calibrated only to that footprint to try to
25 predict the future movement of that plume,

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1 nothing more, nothing less.
2 MR. HARRIS: Apart from the model, the other
3 issue that was raised was the distance residual
4 DNAPL by Mr. Malott. He says that it's not
5 anticipated. He doesn't provide any factual
6 basis, nor is there anything in the record to
7 suggest how EPA Region 6 has reached that
8 conclusion. What we have submitted is the fact
9 that at sites across the country -- and we give
10 examples of it -- where there are silts and clays
11 present that the solvents in the dissolve phase
12 will, as I use my very nontechnical term, glom
13 onto these silts and clays and make remediation
14 more difficult. Again, we've got facts, and the
15 facts are site studies from the National Research
16 Counsel and EPA's own documents that show this
17 phenomenon occurring, and there are no facts,
18 again, that Region 6 has put in the record to
19 suggest that condition does not exist at this
20 site. If it does exist, then it is going to
21 impede and prevent quite probably restoration as
22 EPA has defined it.
23 I'm also somewhat amazed that EPA says that
24 they have never looked at the composition of
25 silts and clays, that this is the first time they

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1 have ever thought about this particular problem
2 and don't know whether what we've put up is
3 accurate or not. It seems to me that if one is
4 attempting to analyze what is an appropriate
5 response, that you would want to have taken a
6 look at the composition of silts and clays to
7 begin with, and we have provided data that's
8 going to be taken from the logs, so it's very
9 easy to take a look at those and compare what
10 we've said to what is actually in the logs.
11 Apparently EPA hasn't done that yet.
12 With respect to -- and I guess they
13 apparently agree that if our percentages are
14 right on there, that there are significant
15 problems associated with the removal of this
16 material. There are no facts in the record and
17 they haven't said anything today to suggest that
18 if our percentages are correct, that what we have
19 said is accurate, and that is that there's going
20 to be a real difficulty in trying to restore this
21 plume to levels below MCLs.
22 With respect to the cost of reinjection, we
23 haven't sought to dismiss that possibility out of
24 hand, but we've taken it on from a factual
25 standpoint and attempted to identify all of the

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1 problems that are associated with it and all of
2 the costs that are associated with it. I find it
3 interesting that they've given us two sites, one
4 in South Valley and another in Arizona where
5 reinjection has been successful. We point out
6 why we don't think it's been that successful and
7 why the geology is different certainly between
8 those two sites. But I would point -- I would
9 remind you that we had asked for discovery on
10 this particular point for this very reason. We
11 think that there are literally tens, if not
12 hundreds, of sites out there in Region 6 where
13 there have been difficulties with reinjection of
14 the type we've pointed out, that there's a track
15 record that shows that technically it's very
16 difficult and it's very expensive, and we've got
17 an option here that avoids those technical
18 difficulties and avoids those costs and achieves
19 all of the objectives that EPA would otherwise
20 wasn't.
21 I'm personally familiar with one site in
22 Texas where the agency decided on its own to do
23 reinjection. The site worked for, I think, maybe
24 two months, and then had to be shut down for over
25 two years because the reinjection wells got

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1 immediately clogged. And that's just one
2 example. I think there are others. And that's
3 why we wanted to get into that discovery, was to
4 be able to establish for you that when we make
5 these conclusions, it's based upon the experience
6 that the agency has said for them not to share
7 that and take that into account of their
8 institutional expertise here, which I think is
9 inappropriate.
10 We disagree -- again, we disagree with the
11 way they've characterized what their numbers were
12 and the way they've characterized the South
13 Valley site, but, again -- and I know I'm beating
14 a dead horse here, but I want to make sure the
15 record is clear -- this is, again, an example of
16 a situation where if we had an opportunity to
17 undertake some discovery, if we had an
18 opportunity to do depositions or direct or
19 cross-examination, we could much more easily get
20 to the bottom of those disputes. This format
21 just doesn't allow us to do that.
22 EPA apparently has not looked at the net
23 water loss problem that we have raised. There's
24 nothing in the administrative record here that
25 suggests they ever considered the fact that

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1 through reinjection you're going to lose more
2 water than if you go to the Calabacillas Arroyo.
3 Mr. Malott was not disagreeing with our numbers,
4 and there's nothing I'm aware of in the
5 administrative record that suggests that our
6 percentage reduction is any way disputed by the
7 agency. Apparently the agency hasn't looked at
8 production of hazardous waste and how that
9 compares between the two alternatives.
10 If I understood their comments on technical
11 impracticality, they've suggested that they need
12 more information but have never told us what that
13 additional information is and have never said
14 that if we have insufficient information, why it
15 is insufficient. We've pointed out where we
16 satisfy all the factors, and Mr. Chandler's
17 declaration, I think, clearly establishes the
18 conditions that show, in our view, to be
19 technically impracticable. And our point, Mr.
20 Malone, is that if we put in the containment
21 well, we'll be able to run that and, in our view,
22 demonstrate all of those concerns in the field.
23 If they don't demonstrate it, then EPA can say,
24 fine, you haven't demonstrated that, now we can
25 ask for more. EPA, if I understand it, they want

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1 us to study it, then based on that study put in a
2 bunch of wells, and then if the wells don't work
3 after we've spent significant capital costs, then
4 we can apparently shut them down after we've kind
5 of covered the area in wells and pipes and
6 everything else. We think, again, perhaps we're
7 doing it a little bit backwards there.
8 With respect to the current pump and treat
9 system, I'm not sure Mr. Malott really answered
10 your question. I thought it went to how has it
11 removed material from the site. It has removed
12 some material, but it hasn't come close to
13 achieving MCLs and, I think for all the reasons
14 that we believe exist at this site, make it
15 technically impracticable.
16 Mr. Malott complained about the size of the
17 system or its rate, but it is, in our view,
18 effectively capturing. One of our consultants,
19 Battelle Institute in Ohio, took a look at our
20 on-site system, and the information was shared
21 with EPA and NMED and concluded the on-site
22 system is effectively capturing the contaminants
23 on-site. It is a relatively slow system, but for
24 that type of geology, we think it is appropriate.
25 It is removing the VOCs, but it's been in

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1 operation for eight years, and consistent with
2 what Mr. Chandler has concluded, I don't think we
3 are ever going to get to MCLs in anybody in this
4 room's lifetime at any rate, nor would we be able
5 to do so even if we increased it. The
6 enhancement we were talking about was simply to
7 have wells with a greater degree of coverage for
8 the purpose of confirming that what we're doing
9 out there is actually taking place. It was
10 something that we could do to address a concern
11 EPA had even though we didn't have that
12 particular concern, but one we were willing to
13 do.
14 I believe that covers all of the points that
15 I had wanted to address. And, again, we believe
16 that we have shown that under 3008(h), which
17 requires that you identify the threat and explain
18 why it's necessary, that we have addressed what
19 we perceive to be a threat which is really lack
20 of a threat, but notwithstanding that, that what
21 we have proposed would be more than necessary to
22 address any current or potential -- potential
23 being in the future -- threat that might exist at
24 that location. We disagree obviously with EPA's
25 view that anytime the evidence exceeds the MCLs,

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1 there's a potential threat. The case they cite
2 doesn't stand for that proposition. There's a
3 footnote with one line of dicta that doesn't
4 stand for the proposition that they suggest.
5 Under their view, I guess, apparently if we had
6 some contamination out in the middle of the
7 desert and nobody lived within 1,000 miles of it,
8 we would still be obligated to go in and clean
9 that up. Perhaps there are reasons for doing
10 that, but it's difficult to say in that situation
11 that it's necessary to do that cleanup in order
12 to protect human health or the environment, and,
13 again, environment defined in terms of what
14 environmental receptors out there are impacted by
15 the presence of that material in the groundwater.
16 But we would ask -- I think we've asked for
17 a couple of things. I would ask, one, that the
18 Order be dismissed, but in the absence of the
19 Order being dismissed, that it be modified to
20 specify the type of remediation that we have
21 specifically proposed, recognizing that such a
22 specification does not in any way limit EPA from
23 taking action in the future if what is specified
24 in the Order turns out to be not sufficient to
25 protect human health and the environment, and we

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1 think what we have proposed is consistent with
2 what Congress intended under Section 3008(h) and
3 would ask you to so adopt.
4 MR. MALONE: Thank you for your comments.
5 Before concluding this hearing, I just want to
6 inform everyone as to what happens after today.
7 After receiving a transcript, which, you know,
8 there may be some comments on it. I know -- I've
9 talked to the court reporter, and she said, you
10 know, I'm going to be talking to you about this,
11 and I just told her to fax me a list of the
12 questions that she has. So I will respond to her
13 comments and her questions, and we can get that
14 finalized. And if there's something that I need
15 clarification on, what I will do is give both of
16 the parties a call and say, look, guys, I need
17 some help on this.
18 But after the transcript is complete, I will
19 review the transcript and I will review all the
20 information that has been made part of this 40
21 C.F.R. Part 24 proceeding and write a recommended
22 decision. After writing that recommended
23 decision, it will be issued to both parties. It
24 will also be issued to the Regional
25 Administrator. Upon receipt by both parties, you

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1 have a 21-day window to draft comments. After
2 you have drafted your comments and the Regional
3 Administrator has reviewed my decision, she will
4 make a final decision once again after reviewing
5 your comments.
6 I want to thank both parties for their
7 participation today. I thought the presentations
8 were certainly enlightening, and I look forward
9 to getting a final transcript back. And unless
10 there are any further questions or things that
11 you want to clarify, we can conclude the
12 proceeding, but it seems like Mr. Pearson has a
13 question, so --
14 MR. PEARSON: Just a couple of minor things.
15 In regard to service of the recommended decision,
16 since it's 21 days for date of service and I
17 usually get mine before Jim's and, in essence,
18 mine will probably be filed before his is filed,
19 I would just like the Court not to allow any
20 advantages, to somehow ensure that we get service
21 at the same time, whether that means I have to
22 wait a few days, you know, so -- or hand-deliver
23 it to both of us or however it works, but I would
24 like you to take that into consideration. I
25 don't want to get any advantage, but I don't want

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1 to have the possibility of my brief sitting
2 there, them coming over and looking at it and
3 then making modifications. That's the only
4 thing.
5 And one last item. You have mentioned
6 before about whether we would want to respond to
7 some of the exhibits. I would just ask that --
8 we are not sure at this time whether there's any
9 need to, and we would like to get back to you in
10 a few days on whether there's any need to, and at
11 that time then the Court can make any decision as
12 to whether he allows Mr. Harris to respond to
13 what we submit, briefing times, that sort of
14 thing. We just need a few days to look at the
15 exhibits, and I would want something like maybe
16 possibly a week from Friday.
17 MR. MALONE: So you would like April 4th to
18 be --
19 MR. PEARSON: Yes. And that would just be
20 to let the Court know whether we have -- we would
21 like to respond to any of the exhibits.
22 MR. MALONE: Okay.
23 MR. PEARSON: We may or may not. We just --
24 MR. MALONE: If there are no objections from
25 the Respondent, April 4th seems like that would

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1 be a reasonable date to allow the EPA to perform
2 the tribune of whether or not it would like to
3 address the exhibits submitted by the
4 Respondents.
5 MR. HARRIS: I don't want -- we may object
6 to their ability to file anything else, but I
7 don't have any objection giving them until April
8 4th to make that decision. Obviously if they
9 don't want to do anything, it moots my need to
10 make any further comment to the Presiding
11 Officer.
12 MR. MALONE: With respect to service of the
13 recommended decision, Mr. Harris, if you would
14 like to have someone, a courier come over to the
15 agency the day that it's issued --
16 MR. HARRIS: Yeah, if somebody lets me know,
17 I would be happy to do that.
18 MR. MALONE: Okay. Well, that's what I will
19 do. I will make that commitment. The day that
20 the recommended decision is filed, I will make
21 sure to give your office a call and you can have
22 someone to come over and pick it up.
23 MR. HARRIS: Okay.
24 MR. MALONE: Well, thank you, gentlemen.
(End of Proceedings.)
25

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1 STATE OF TEXAS *
2 COUNTY OF DALLAS *
3 I, Susan Boudin, Certified Shorthand Reporter in and for
4 the State of Texas, do hereby certify that the above
5 contains a true and correct transcription of all
6 proceedings which occurred at the EPA Hearing and were
7 reported by me.
8 I further certify that the transcription of the proceedings
9 truly and correctly reflects the exhibits, if any, offered
10 by the respective parties.
11 I further certify that I am neither attorney for nor
12 counsel for nor related to nor employed by any of the
13 parties to which this Hearing is taken and further that I
14 am not a relative or employee of any attorney or counsel
15 employed by the parties hereto or financially interested in
16 the action.
17 GIVEN UNDER MY HAND AND SEAL OF OFFICE on this the 15th day
18 of April, 1997
19 SUSAN E. BOUDIN, CSR #4185
20 Certified Shorthand Reporter
in and for the State of Texas
21 QUICK TRANSCRIPTS OF DALLAS
(972) 442-4161
22 310 Woodhollow
Wylie, Texas 75098
23 My Commission expires: 12/31/97
24
25

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

April 3, 1997

HAND DELIVERED

Ms. Monica E. Frazier
Acting Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Frazier:

Please file the enclosed document in the above-entitled matter.

Sincerely,

Evan L. Pearson
Senior Enforcement Counsel

Enclosures

cc: Honorable George Malone, III
James B. Harris

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IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	)	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

REQUEST TO SET SCHEDULE FOR SUBMITTING
EPA'S RESPONSE TO RESPONDENT'S EXHIBITS

At the administrative hearing on March 27, 1997, the undersigned objected to the use of certain exhibits by the Respondent on the grounds that the exhibits were not taken directly out of the administrative record as it existed as of March 14, 1997, and thus not part of the administrative record in this case. The Presiding Officer stated at the hearing that EPA would be allowed to file a post-hearing response to those exhibits. At the conclusion of the hearing, the undersigned requested that it be allowed to wait until April 4, 1997, to make a decision as to whether to submit a response to the Respondent's exhibits.

After review of the exhibits, EPA does wish to submit a response. EPA requests that it be allowed to submit a response by April 15, 1997. The reason for this time frame is that the undersigned will need technical assistance to prepare a response. These persons will either be in training or on an inspection during the week of April 7 - 11, 1997.

The Presiding Officer's authority to allow this submission is set forth in 40 C.F.R. §§ 24.14(e) and 24.15(b). Therefore, EPA respectfully requests that it be allowed to submit its response by April 15, 1997.

Dated this 3rd day of April, 1997.

Respectfully submitted,

Evan L. Pearson
Senior Enforcement Counsel
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX - (214) 665-3177

010127

CERTIFICATE OF SERVICE

I hereby certify that on the 3rd day of April, 1997, the original of the foregoing was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by the methods indicated below:

HAND DELIVERED

Honorable George Malone, III
Acting Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

FIRST CLASS MAIL

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

Eva L Pen

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

April 3, 1997

HAND DELIVERED

Ms. Monica E. Frazier
Acting Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Frazier:

Please file the enclosed document in the above-entitled matter.

Sincerely,

Evan L. Pearson
Senior Enforcement Counsel

Enclosures

cc: Honorable George Malone, III
James B. Harris
Susan Boudin

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	)	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

SUBMISSION OF COPIES OF EPA EXHIBITS

The U.S. Environmental Protection Agency, Region 6 (EPA), by and through its attorney, Evan Pearson, hereby files a copy of the three exhibits that it used at the administrative hearing on March 27, 1997. These three exhibits were mounted on large posterboards for easy viewing during the hearing. EPA inadvertently did not provide smaller copies of these documents to the Court and opposing counsel. These exhibits were marked at the hearing as Government Exhibits 1, 2, and 3.

Dated this 3rd day of April, 1997.

Respectfully submitted,

Evan L. Pearson

Evan L. Pearson
Senior Enforcement Counsel
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX - (214) 665-3177

CERTIFICATE OF SERVICE

I hereby certify that on the 3rd day of April, 1997, the original of the foregoing was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by the methods indicated below:

HAND DELIVERED

Honorable George Malone, III
Acting Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

FIRST CLASS MAIL

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
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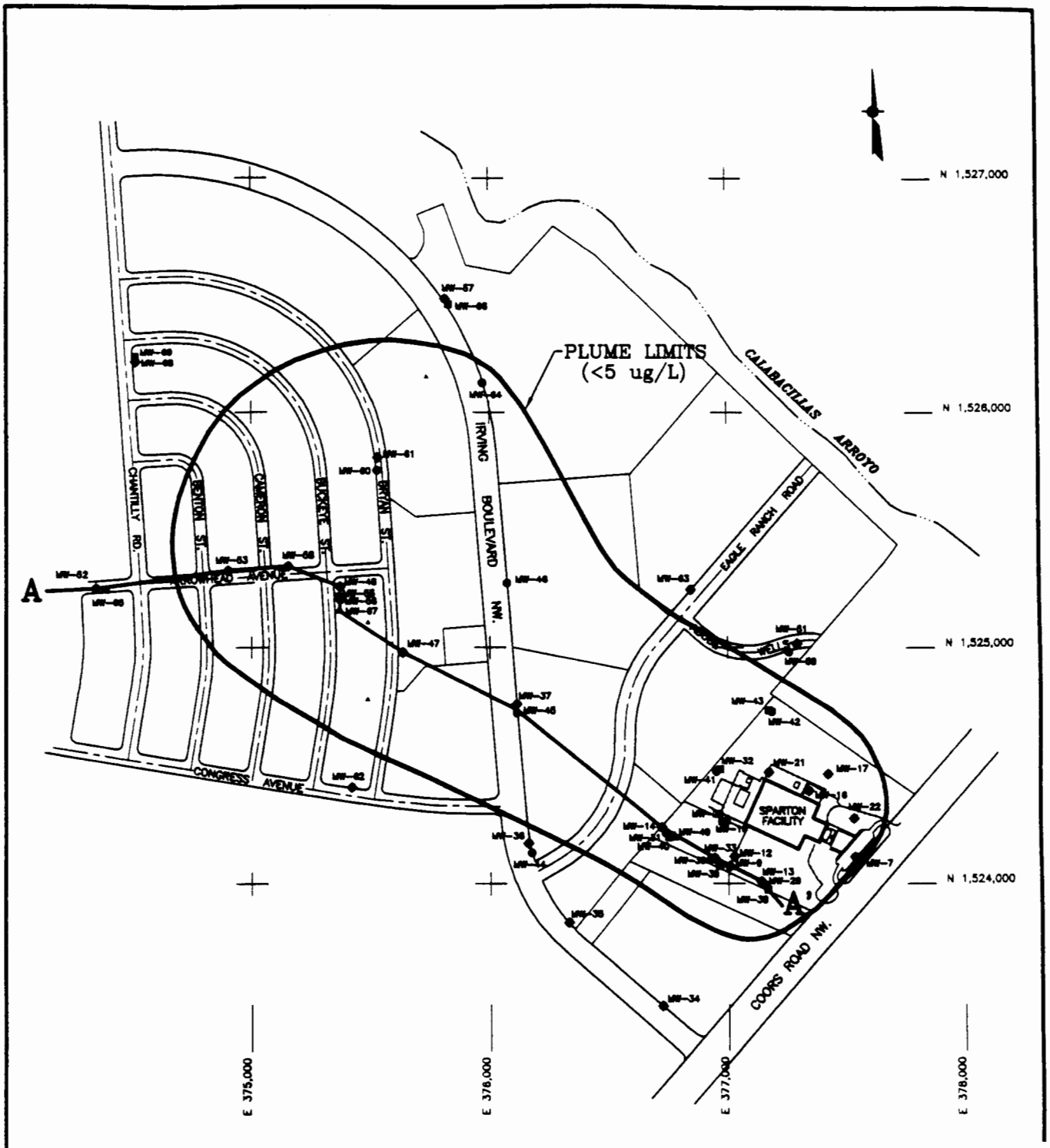

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M&E Metcalf & Eddy	SPARTON TECHNOLOGY, INC. PLUME MAP ALBUQUERQUE, NEW MEXICO	Project Number 166022 File Name SP-COL22 / Figure 1

FOUR THRESHOLD CRITERIA

- Overall Protection of human health and the environment
- Attain media cleanup standards
- Control the sources of releases
- Comply with standards for management of wastes

FIVE BALANCING CRITERIA

- Long-term reliability and effectiveness
- Reduction of toxicity, mobility, or volume of wastes
- Short-term effectiveness
- Implementability
- Cost

TWO MODIFYING CRITERIA

- State acceptance
- Community acceptance

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Task IX: Justification And Recommendation Of The Corrective Measure Or Measures

... The U.S. EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks III and IX. At a minimum, the following criteria will be used to justify the final corrective measure or measures

A. TECHNICAL

1. Performance

2. Reliability

3. Implementability

4. Safety

B. HUMAN HEALTH

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health

C. ENVIRONMENTAL

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The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored

ERNMENT
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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)
	) U.S. EPA DOCKET NO.
SPARTAN TECHNOLOGY, INC.	) RCRA VI-001(h)-96-H
ALBUQUERQUE, NEW MEXICO	)
	)
EPA I.D. NO. NMD083212332	) ORDER SETTING
	) SCHEDULE TO RESPOND TO
	) RESPONDENT'S EXHIBITS
RESPONDENT	)

BACKGROUND

This action before me involves an April 3, 1997, unopposed request by the Environmental Protection Agency (EPA) to set a schedule for submission of a response to additional information entered into the March 27, 1997, public hearing record by the Respondent, Spartan Technology, Inc. At the March 27, 1997, public hearing, counsel for the Respondent presented 14 exhibits which were made part of the hearing record. The hearing record is currently being finalized by the court reporter.

The public hearing was scheduled after the Respondent filed a request for a hearing dated October 18, 1996, in response to the EPA's issuance of a September 16, 1996, initial administrative order under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h). The public hearing proceedings for initial administrative orders issued under Section 3008(h) are governed by the EPA regulations

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at 40 C.F.R. Part 24, the Rules Governing Issuance of and Administrative Hearings on Interim Status Corrective Action Orders. Because the September 16, 1996, initial administrative order requires specified corrective measures, Subpart C of 40 C.F.R. Part 24, is applicable to this adjudicatory proceeding.

More specific to the action before me, pursuant to 40 C.F.R. § 24.14(e), the Presiding Officer may order either party to submit additional information in whatever form he deems appropriate, either before, at or after the public hearing.

THE RESPONDENT'S EXHIBITS

While the EPA requests that it be allowed until April 15, 1997, to submit a response to the Respondent's 14 exhibits entered into the public hearing record, in my discretion pursuant to 40 C.F.R. § 24.14(e), I find that April 22, 1997, is an appropriate date for both EPA and the Respondent to present their respective views on the facts and the law applicable to the exhibits at issue.

The interest of justice and conservation of resources substantiates a dual response to the Respondent's 14 exhibits entered into the public hearing record. Both parties will be allowed to comment on the Respondent's exhibits, thereby providing equal access in the development of the record for this proceeding. The parties dual submission of their final position on the facts and the law applicable to the Respondent's exhibits will also conserve the expenditure of additional resources

regarding these exhibits. In addition, the dual submission should provide full disclosure of adequate information to resolve any questions of law or fact regarding the exhibits. As such, this Order is tailored to serve these important interests germane to both parties, and this tribunal.

Therefore, on or before April 22, 1997, both parties are required to provide their final, respective positions regarding the Respondent's exhibits in a manner consistent with this Order.

SO ORDERED this 9TH day of April 1997.

GEORGE MALONE, III
REGIONAL JUDICIAL OFFICER, ACTING

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PS Form 3800, March 1993

010138

In the Matter of Spartan Technology, Inc., Respondent
Docket No. RCRA VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Monica E. Frazier, Acting Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing Order dated April 9, 1997, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. Thompson & Knight 1700 Pacific Avenue Suite 3300 Dallas, Texas 75201	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED
Mr. Evan Pearson, Senior Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Date:

Monica E. Frazier
Regional Hearing Clerk, Acting

010139

THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

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FORT WORTH
HOUSTON
MONTERREY, MEXICO

DIRECT DIAL:

(214) 969-1102

April 18, 1997

Via Hand Delivery
Ms. Monica Frazier
Acting Regional Hearings Clerk
Office of the Regional Hearings Examiner
U.S.E.P.A.
1445 Ross Avenue
Dallas, Texas 75202

Re: *In the Matter of Sparton Technology, Inc.*; U.S. EPA Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Frazier:

Enclosed is an original and one (1) copy of Request of Respondent for Reconsideration of Order Setting Schedule to Respond to Respondent's Exhibits. Please accept the original for filing and return the file-marked copy to the courier delivering this information to you. I understand that you do not require an additional copy for your files.

Your assistance is appreciated.

Yours very truly,

James B. Harris

JBH:lmi
Enclosures

cc: Mr. Evan Pearson, U.S.E.P.A
40310 00001 LERA 58562

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

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IN THE MATTER OF:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 COORS ROAD NW ALBUQUERQUE, NM 87114	))	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H
	)	
EPA I.D. No. NMD083212332	)	
	)	
RESPONDENT	)	
	)	

REQUEST OF RESPONDENT FOR RECONSIDERATION OF ORDER SETTING SCHEDULE TO RESPOND TO RESPONDENT'S EXHIBITS

Sparton Technology, Inc. ("Sparton") respondent in the above proceeding requests that for the following reasons an April 9, 1997, Order Setting Schedule to Respond to Respondent's Exhibit be reconsidered and set aside or modified:

I.

INTRODUCTORY STATEMENT

At a hearing held on March 27, 1997, Sparton used fourteen exhibits in the presentation of its position. Six of those were enlargements of documents included in previous submissions to the agency. Eight of the exhibits involved the presentation of information already before EPA Region 6. Much of the information in those eight exhibits has been before the agency for several years. The other information was taken from submissions developed by the agency or its contractors, or included in pleadings Sparton filed

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in this matter. None of the information presented in the exhibits was "new", in the sense that it was presented to EPA Region 6 for the first time at the hearing on March 27, 1997.

At the conclusion of the hearing, EPA Region 6 requested that it have until April 4, 1997, to decide whether it wanted to request leave to further comment on Sparton's exhibits. On April 3, 1997, EPA Region 6 filed a request to submit a "response," apparently to all of Sparton's exhibits. No reason was advanced for why EPA wanted or needed to file such a "response."

Before Sparton could file a reply within the ten days previously established as the period for responding to motions in this proceeding (see Exhibit "A" attached hereto and incorporated herein), the presiding officer on April 9, 1997, entered an order directing both parties to "present their respective views on the facts and law applicable to the exhibits at issue."[1]

II.

ARGUMENT AND AUTHORITY

A. The April 9, 1997, order represents an abuse of discretion.

Sparton does not dispute that pursuant to 40 C.F.R. § 24.14(e) the presiding officer has the "discretion" to order that additional information be submitted. But, Sparton reads § 24.14(e), as it applies to post-hearing submissions, as limited to situations where the presiding officer needs information to fully understand the nature of the dispute. The portion of § 24.14(e) relied upon by the presiding officer in the April 9, 1997, order was not intended

[1] The April 9, 1997, order states EPA's April 3, 1997, order was unopposed. That statement is incorrect. Sparton was preparing a response when the order was received. At the hearing, Sparton had only agreed to provide EPA until April 4, 1997, to decide whether it wanted to request leave to submit information regarding the exhibits.

to provide either party a right to submit post-hearing information simply because they would like to expand upon their position.

In the April 9, 1997, order the presiding officer does not indicate he was confused in any way by the exhibits submitted by Sparton or that he needed further information to understand their meaning. Unless such confusion existed in the mind of the presiding officer, he was without authority under § 24.14(e) to grant EPA the right to submit additional information.

In fact, the order is devoid of any reasoned justification for granting EPA, Region 6 the right to submit additional information. The order, reduced to its essentials, grants the relief requested, solely because EPA asked for it. Sparton submits such a decision, by definition, is an abuse of discretion.

B. <u>In its motion EPA does not identify why it needs to submit additional information.</u>

All of the information contained in Sparton's exhibits was before the agency prior to the March 27, 1997, hearing. Therefore, EPA was in a position to comment on those exhibits at the hearing. EPA never explains why it was unable to adequately respond to the exhibits on March 27, 1997, or why it now needs to respond to the exhibits.

The April 9, 1997, order fails to identify any reason why additional information is necessary. The order does make passing reference to "full disclosure of adequate information to resolve any questions of law or fact regarding the exhibits." Interestingly, neither EPA, Region 6 nor the presiding officer identify any "questions of law or fact regarding the exhibits." Of course, it is difficult to see how there could be any given that EPA was already aware of all the information in the exhibits, and for most of the information the agency already had several opportunities to comment and make its position clear. What is more

curious is that the presiding officer is now interested in "full disclosure of adequate information," when just prior to the hearing he rejected the submission by Sparton of additional documents that met the requirements of § 24.14(e).

C. Requiring a dual submission is neither fair nor impartial.

The presiding officer is directed by 40 C.F.R. § 24.15(a) to "conduct the hearing in a fair and impartial manner." Requiring a dual submission (assuming that EPA should be allowed, in the first instance, to submit any information, a condition Sparton disputes) is inconsistent with this charge.

The procedural regulations applicable to this matter consistently provide Sparton the right to open and close. This concept was carried forward in the scheduling order for this matter. The April 9, 1997, order denies Sparton this right. If EPA has a right to comment on exhibits that only contain information already before the agency prior to the hearing, Sparton should likewise be allowed to respond to EPA's arguments. Sparton's position on the exhibits has already been made clear. EPA's submission will necessarily contain new information that Sparton has not seen and cannot anticipate. It should be given an appropriate period to review and respond to such information.

III.

CONCLUSION

EPA has not demonstrated that any of the information contained in Sparton's exhibits was not before the agency, prior to the March 27, 1997, hearing or that it could not have adequately responded to that information at the hearing. In the absence of such a showing the motion should have been denied.

If EPA is allowed to submit new information, then to ensure fairness and impartiality, and in order to continue Sparton's procedural right to open and close, Sparton should have the same time period as EPA (26 days) to respond to what EPA submits.

Respectfully submitted,

THOMPSON & KNIGHT
A Professional Corporation

By: _____
James B. Harris
Attorney
State Bar No. 09065400

1700 Pacific Avenue, Suite 3300
Dallas, Texas 75201
(214) 969-1700
FAX (214) 969-1751

ATTORNEYS FOR RESPONDENT

CERTIFICATE OF SERVICE

On the 18th day April, 1997, a true and correct copy of the aforementioned document was served upon Evan Pearson, Esq., United States Environmental Protection Agency, Region 6, 1445 Ross Avenue, Dallas, Texas 75202-2733 via hand-delivery.

_____
James B. Harris

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REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)	
	)	U.S. EPA DOCKET NO.
SPARTON TECHNOLOGY, INC.	)	RCRA VI-001(h)-96-H
ALBUQUERQUE, NEW MEXICO	)	
	)	
EPA I.D. NO. NMD083212332	)	ORDER DENYING RESPONDENT'S
	)	REQUEST FOR RECONSIDERATION
	)	
RESPONDENT	)	

BACKGROUND

This action before me involves an April 18, 1997, request by the Respondent, Sparton Technology, Inc. (Respondent), for reconsideration of the April 9, 1997, schedule setting a deadline for submission of post-hearing information. At the March 27, 1997, public hearing, counsel for the Respondent presented 14 exhibits which were made part of the hearing record. The hearing record is currently being finalized by the court reporter.

The public hearing was scheduled after the Respondent filed a request for a hearing dated October 18, 1996, in response to the EPA's issuance of a September 16, 1996, initial administrative order under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h). The public hearing proceedings for initial administrative orders issued under Section 3008(h) are governed by the EPA regulations at 40 C.F.R. Part 24, the Rules Governing Issuance of and

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Administrative Hearings on Interim Status Corrective Action Orders. Because the September 16, 1996, initial administrative order requires specified corrective measures, Subpart C of 40 C.F.R. Part 24, is applicable to this adjudicatory proceeding.

DISCUSSION

While the Respondent contends that the April 9, 1997, order is deficient because it represents an abuse of discretion, unfairly requires dual submission of additional information and the EPA failed to identify why it needs to submit post-hearing information, the Respondent overlooks the fact that as Presiding Officer, it is my duty to ensure that both parties are allowed the opportunity to submit information designed to fully and adequately develop the record.[1] Thus far, the record evidences the Respondent's presentation of its case by inclusion of the request for a hearing, submission of a brief on the facts and the law, submission of additional information and brief on the facts and the law, submission of verbal and additional documentary information (exhibits) at the public hearing.[2]

---

[1] Although the Respondent asserts otherwise, the EPA need not identify why it is necessary to respond to the Respondent's exhibits. The April 9, 1997, order issued pursuant to 40 C.F.R. § 24.14(e), was based on the need to fully develop the record with respect to the Respondent's exhibits submitted at the public hearing.

[2] The administrative record, consisting of approximately 9,000 pages of information, filed by the EPA along with the initial administrative order, also evidences detailed participation by the Respondent in this proceeding.

In my discretion as Presiding Officer, I allowed the Respondent to submit additional documentary information at the public hearing despite the imposition of a rigorous regulatory standard. Under 40 C.F.R. § 24.15(b), "any ... presentation by [R]espondent may include new documents only to the extent that [R]espondent can demonstrate that, through no fault of its own, such documents could not have been submitted before [the] hearing in accordance with the requirements of § 24.14(c) and (e)." Some of the Respondent's 14 exhibits were new documents. See Respondent's request for reconsideration, p. 1. Thus, a post-hearing submission by the EPA and Respondent is warranted, as it will provide both parties the opportunity to fully develop issues of law and fact regarding all fourteen exhibits, including the new documents.

Furthermore, this federal administrative adjudication provides the Respondent with the same safeguards presented to the EPA.[3] At the March 27, 1997, public hearing the EPA was faced with responding to new documents. As such, the EPA did not have advance notice to prepare a factual and legal argument regarding the new documents. The relief granted consists of a dual

---

[3] The Respondent erroneously asserts that Sparton has the right to open and close under 40 C.F.R. Part 24. See Respondent's request for reconsideration, p. 4. 40 C.F.R § 24.14(e) provides the Presiding Officer with authority to order submission of additional information in whatever form he deems appropriate. In addition, 40 C.F.R. § 24.15(b) provides the Presiding Officer with the discretion to grant the EPA with leave to respond to information submitted by the Respondent.

submission of each party's position on the law and the facts regarding all exhibits, including the new documents. I find that this process will not provide either party with an advantage in this matter. However, this process will lead to greater development of the record in this proceeding. Both parties final position regarding the exhibits may contain new information unanticipated by the other party. Moreover, the final position by the parties may also disclose adequate information to resolve contested issues in this proceeding.

ORDER

For the reasons provided above, I find that the April 9, 1997, order failed to constitute a clearly erroneous application of the pertinent regulatory standard. There was no abuse of discretion pursuant to 40 C.F.R. § 24.14(e). Consequently, the Respondent's request for reconsideration lacks merit, and is therefore denied.

SO ORDERED this 21ST day of April 1997.

GEORGE MALONE, III
REGIONAL JUDICIAL OFFICER, ACTING

In the Matter of Sparton Technology, Inc., Respondent
Docket No. RCRA VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Monica E. Frazier, Acting Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing Order dated April 21, 1997, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. Thompson & Knight 1700 Pacific Avenue Suite 3300 Dallas, Texas 75201	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED
Mr. Evan Pearson, Senior Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Date:

Monica E. Frazier
Regional Hearing Clerk, Acting

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THOMPSON & KNIGHT
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS

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MONTERREY, MEXICO

DIRECT DIAL:

(214) 969-1102

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EPA REGION VI

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April 18, 1997

Ms. Monica Frazier
Acting Regional Hearings Clerk
Office of the Regional Hearings Examiner
U.S.E.P.A.
1445 Ross Avenue
Dallas, Texas 75202

Re: *In the Matter of Sparton Technology, Inc.*; U.S. EPA Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Frazier:

Today we filed a Request of Respondent for Reconsideration of Order Setting Schedule to Respond to Respondent's Exhibits (the "Request"). We inadvertently failed to attach Exhibit "A". Enclosed are two copies of that exhibit. Please attach one copy to the Request and return the other to me, file-marked, in the self-addressed stamped envelope provided.

By copy of this letter, a copy of Exhibit "A" to the Request is being forwarded to Evan Pearson, Senior Enforcement Counsel.

Thank you.

With kindest regards,

Laurie M. Infante

Laurie M. Infante
Legal Assistant to
James B. Harris

:lmi
Enclosures
cc: Mr. Evan Pearson, U.S.E.P.A (w/enclosures)
40310 00001 LERA 58575

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733
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REGION VI

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REGIONAL HEARING CLERK
EPA REGION VI

November 15, 1996

Mr. James B. Harris, Esq.
THOMPSON & KNIGHT
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

RE: Sparton Technology, Inc. - Docket RCRA-VI-001(h)-96-H

Dear Mr. Harris:

I have received your letter of November 13, 1996, concerning the referenced RCRA action by the EPA. Our apologies for not enclosing the memorandum from the Regional Administrator; I do not know how that happened.

I am enclosing it this time around. I am also FAXing it. Mr. Pearson has indeed filed a motion to set a schedule for the matter, based somewhat on the schedules suggested in 40 C.F.R. 24.14. Experience has shown that the setting of a hearing date within 45 days of a scheduling order as contemplated by 24.14 is not sufficient time for Respondent to pursue its other rights, such as the submission of questions to the EPA. The 90-day period suggested in the motion would appear to be more realistic.

It is also my belief that the motion was as much concerned with vacation and holiday schedules as it was in keeping the docket moving. Part 24 is silent on motions *per se*, but I view the instant motion, as with all motions in administrative or federal procedure, to require a response. I would note, however, that Part 24.04(e) states that service of all other pleadings (not an initial or final administrative order) is complete upon mailing. Most of the EPA procedural regulations require a response within 10 days of receipt of a motion [see, for instance, Part 22.16(b)]. My authority to act on the motion and any other proceeding is contained in the enclosed memorandum, as contemplated by Part 24.06. I can in this case provide more time for response (see 24.14(b).

Accordingly, I would expect to receive a response to the motion by the close of business November 26, 1996. The motion by Mr. Pearson does not suggest calendar dates, but instead only a schedule of time intervals. If you agree with the time periods, you need not respond. If you want to suggest other time intervals, you should respond.

If you do not respond to the motion, I will set a schedule of prehearing proceedings that adhere to the regulations and perhaps

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EXHIBIT
"A"

the motion, leading to a hearing late in the first quarter of 1997. A response would probably trigger a conference call to establish a schedule satisfactory to your client and the EPA.

Sincerely,

Mark E. Chandler
Regional Judicial Officer

Enclosure: a/s

cc: E. Pearson, Esq.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

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October 31, 1996

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REGIONAL HEARING CLERK
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MEMORANDUM

SUBJECT: Designation of Presiding Officer in RCRA Docket No. VI-001(h)-96-H

FROM: Jane N. Saginaw
Regional Administrator (6A)

TO: Mark E. Chandler
Regional Judicial Officer (6RC-HO)

The Director of the Compliance Assurance and Enforcement Division isuued a RCRA 3008(h) Initial Corrective Action Order against Sparton Technology, Inc., in Albuquerque, New Mexico, on September 16, 1996.

Sparton Technology responded to the order timely on October 18, 1996, disputing the order and requesting a 40 C.F.R. 24, Part C public hearing. Section 24.06 of Part 24 provides that:

> Upon a receipt of a request for the hearing, the Regional Administrator shall designate a Presiding Officer to conduct the hearing and preside over the proceedings.

Further, Section 24.13 provides that the "Presiding Officer shall be either the Regional Judicial Officer" or another agency attorney not previously connected with the case.

Accordingly, I hereby designate Mark E. Chandler, the standing Regional Judicial Officer as the Presiding Officer in this case. All pleadings and other proceedings shall be directed to him or the Regional Hearing Clerk.

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Ms. Monica Frazier
Acting Regional Hearings Clerk
Office of the Regional Hearings Examiner
U.S.E.P.A.
1445 Ross Avenue
Dallas, Texas 75202

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

April 22, 1997

HAND DELIVERED

Ms. Monica E. Frazier
Acting Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Frazier:

Please file the enclosed EPA's Response to the Exhibits Submitted by Respondent in the above-entitled matter.

Sincerely,

Evan L. Pearson
Senior Attorney

Enclosure

cc: Honorable George Malone, III
James B. Harris

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

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EPA REGION VI

IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

EPA'S RESPONSE TO EXHIBITS SUBMITTED BY RESPONDENT

The United States Environmental Protection Agency, Region 6 (EPA), by and through its attorney, Evan Pearson, hereby files its response to the exhibits submitted by the Respondent at the administrative hearing that were not taken directly out of the administrative record as it existed as of March 14, 1997. This response is submitted pursuant to the Order of the Presiding Officer dated April 9, 1997. As shown below, the Respondent's exhibits are either misleading an/or contain errors.

A. EXHIBIT 1 - APPROXIMATE RFI PLUME LIMITS (6/91)

Exhibit 1 claims to represent the approximate plume limits as of June 1991, that were set forth in the RCRA Facility Investigation (RFI) Report. However, if one compares Exhibit 1 to the actual plume limits set forth in the RFI Report [Figure 55 - Administrative Record (AR) at p. 000116], Exhibit 1 shows more extensive contamination than reported in the RFI Report. Apparently, the Respondent found it necessary to reinterpret the RFI data.

B. EXHIBIT 3 - LOCATION OF WELLS RELATIVE TO PLUME

Exhibit 3, as originally prepared by the Respondent did not have New Mexico Utilities (NMU) Well No. 2, or another permitted NMU well location marked on the posterboard. The Respondent later marked these two locations on the posterboard. EPA wants to ensure that the official Exhibit 3 (which was submitted to the Presiding Officer) has these two locations marked on the exhibit. Furthermore, Exhibit 3 omitted another NMU permitted well location near the Sparton facility (AR at p. 003791). Because the Respondent has omitted a permitted well location on Exhibit 3, EPA objects to this exhibit as not being a true and accurate representation of the well locations (both actual and permitted), unless the additional permitted well location near the Sparton facility is added to Exhibit 3. A copy of the map showing the location of the additional permitted well location is attached as Exhibit 1.

C. EXHIBIT 8 - PERCENT SILT/CLAY IN DEEPER MONITOR WELLS

Respondent's Exhibit No. 8 is titled "Percent Silt/Clay in Deeper Monitor Wells",and consists of a map of the Sparton Technology's Coors Road facility and its surrounding area with the locations of monitoring wells installed by the Respondent. The interpreted purpose of the Respondent's Exhibit No. 8 is to visually support its contention that the aquifer impacted by the contaminant plume originating from the Sparton facility cannot be restored to the cleanup goals, since the contaminants such as trichloroethylene (TCE), could potentially adsorb onto the silt

and clay. Next to selected monitoring wells on this map, the Respondent has presented what it claims is the percent of the saturated logged interval containing silt/clay over the total logged saturated interval in feet. However, the title of Exhibit No. 8 is obviously misleading because the map does not represent the percent silt/clay in deeper monitor wells, but instead is supposed to represent the percent of the saturated interval containing silt/clay. As will be shown in the following data summary, where the saturated interval does contain silt/clay, the silt/clay forms only a minor fraction of the sediments present.

While the majority of the data from the boring logs of the monitoring wells is available in the Administrative Record (AR at pp. 000364 - 000482),[1] Sparton's interpretation of the data has not been presented elsewhere in the Administrative Record for EPA review and comment. In addition, summary tables supporting these interpretations were never presented by the Respondent in the Administrative Record. Thus, their accuracy could not be verified at the hearing.

In order to verify the accuracy of the Respondent's claim, EPA first determined the depth at which the subsurface sediment would be saturated (Total Logged Saturated Interval of Exhibit 8). Since the Respondent did not state how the measuring point was established for determining the Total Logged Saturated Interval (feet), EPA prepared Table 1 which establishes the depth

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[1]The boring logs from MW-65 and MW-67 (which were installed in July 1996) are attached as Exhibit 2.

to ground water at each well within the off-site contaminant plume. The measuring point elevation was obtained from the boring logs in the RFI Report (AR at pp. 000108 - 000109). The ground water elevations are from data collected by the Respondent on August 3, 1995. Exhibit 3. For the purposes of this response, EPA only evaluated those wells within the off-site contaminant plume. EPA has acknowledged the existence of fine-grained material (silt/clay) beneath the Sparton facility; however, it is EPA's contention that the fine-grained material is not laterally continuous, and is not present in significant amounts within the area effected by the off-site contaminant plume.

TABLE 1

DEPTH TO GROUND WATER - SPARTON TECHNOLOGY, INC.

Well No.	Measuring Point Elevation (ft)	Ground Water Elevation (ft) (8/03/95)	Depth to Ground Water (ft)
MW-37	5091.66	4970.83	120.83
MW-45	5090.11	4970.82	119.29
MW-46	5118.98	4969.71	149.27
MW-47	5155.83	4969.40	186.43
MW-48	5168.31	4968.73	199.58
MW-53	5164.24	4967.97	196.27
MW-55	5168.61	4968.13	200.48
MW-56	5168.61	4968.17	200.44
MW-58	5168.89	4968.39	200.5
MW-60	5133.62	4968.37	165.25

Well No.	Measuring Point Elevation (ft)	Ground Water Elevation (ft) (8/03/95)	Depth to Ground Water (ft)
MW-61	5133.98	4968.41	165.57
MW-62	5075.00	4970.15	104.85
MW-64	5097.84	4968.64	129.2
MW-65*	--	--	192*
MW-67*	--	--	209*

* Depth to ground water obtained from construction diagram of the monitoring wells provided by the Respondent.

The depth to water was used to establish the depth at which the subsurface sediments would be saturated. EPA then reviewed the saturated portion of the boring logs for those wells within the off-site contaminant plume as described by the Respondent's personnel during drilling operations. Table 2 provides the depth and a description of the subsurface sediments encountered during the drilling operations. The length of each of the saturated logged borings was calculated by subtracting the depth to water from the bottom of the boring.

TABLE 2

DESCRIPTION OF SATURATED BORING LOGS

Well No.	Depth Below Land Surface (ft)	Description	Length of Saturated Log (ft)	Thickness of Saturated Interval Containing Silt/Clay (ft)
MW-37	120.83-126.5	Very coarse sand to granular gravel (SP)	5.67	0

Well No.	Depth Below Land Surface (ft)	Description	Length of Saturated Log (ft)	Thickness of Saturated Interval Containing Silt/Clay (ft)
MW-45	119.29-128 128-136 136-136.5 136.5-141.5 141.5-141.8 141.8-145 145-153	gray sandy gravel (GP) brown & gray medium to coarse sand (SP) light brown silty clay (CL) brown & gray medium to coarse sand (SP) 3-inch clay layer (CL) brown & gray medium to coarse sand (SP) brown & gray fine to coarse sand (SW)	33.71	0.8
MW-46	149.27-165 165-182	brown & gray sandy gravel (GP) (slightly clayey) brown fine to coarse sand (SW)	32.73	15.73
MW-47	186.43-197	brown, gray, & black gravelly sand (SP)	10.57	0
MW-48	199.58-209	brown & gray sandy gravel (GP)	9.42	0
MW-53	196.27-198 198-204 204-206	brown, gray, black, & tan sandy gravel (GP) brown fine to medium sand (SP) tan sandy clay (CL)	9.73	2.0
MW-55	200.48-221 221-225 225-243 243-267	brown & gray sandy gravel (GP) brown medium to coarse sand (SW) brown sandy clay (CL) brown & gray fine to coarse sand (SW)	66.52	18.0
MW-56	200.44-210 210-232	black & gray sandy gravel (GW) brown & black fine to coarse sand (SW)	31.56	0
MW-58	200.5-211	brown, gray & black sandy gravel (GP)	10.5	0
MW-60	165.25-176 176-197	brown & gray gravel (GP) with occasional clay dark brown & black fine sand (SP)	31.75	10.75
MW-61	165.57-177	dark brown fine to medium sand (SP)	11.43	0
MW-62	104.85-115	tan medium to coarse sand (SW)	10.15	0
MW-64	129.2-136 136-153	tan, brown & gray clayey gravel (GC) dark brown & black fine to medium sand (SP)	23.8	6.8
MW-65	192-195 195-210 210-230 230-240 240-245 245-260 260-270 270-275	clayey very fine sand and some white clay fine sand to granule gravel medium sand to small pebble gravel very fine sand to granule gravel sandy clay fine sand to very coarse sand coarse sand to small pebble gravel medium sand to very coarse sand	83	8.0

Well No.	Depth Below Land Surface (ft)	Description	Length of Saturated Log (ft)	Thickness of Saturated Interval Containing Silt/Clay (ft)
MW-67	209-210 210-230 230-255 255-275 275-310 310-320 320-330 330-360 360-363 363-390	very fine sand to granule gravel clayey very fine sand to granule gravel clayey very fine sand to granule gravel and clay fine sand to small pebble gravel fine sand to small pebble gravel and clay fine sand to granule gravel medium sand to small pebble gravel fine sand to coarse sand clay fine sand to coarse sand	181	8.3

A comparison of the percentage of the saturated interval containing silt/clay within the boring logs of monitoring wells completed within the off-site plume as determined by the Respondent and EPA is provided in Table 3 below. This percentage is obtained by dividing the thickness of the saturated interval containing silt/clay by the length of the total saturated interval. A significant error was noted for MW-45, where the Respondent calculated a percentage of 43% for the saturated interval containing silt/clay while EPA calculated a percentage of 2% [0.8/33.71] for the same interval.

TABLE 3

DATA COMPARISON

Well No.	% of Saturated Interval Containing Silt/Clay - Sparton	% of Saturated Interval Containing Silt/Clay - EPA
MW-37	*	0
MW-45	43	2

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Well No.	% of Saturated Interval Containing Silt/Clay - Sparton	% of Saturated Interval Containing Silt/Clay - EPA
MW-46	48	48
MW-47	*	0
MW-48	*	0
MW-53	*	21
MW-55	33	27
MW-56	0	0
MW-58	*	0
MW-60	31	34
MW-61	*	0
MW-62	*	0
MW-64	24	29
MW-65	10	10
MW-67	44	46

* values not provided by Sparton

The interpreted purpose of the Respondent's Exhibit No. 8 is to visually support their contention that the aquifer impacted by the contaminant plume originating from the Sparton facility cannot be restored to the cleanup goals, since the contaminants such as trichloroethylene (TCE), could potentially adsorb onto the silt and clay. EPA Brief, Exhibit 14, page 5. However, what the Respondent failed to indicate is that where silt and clay did occur in the saturated interval, the silt/clay forms only a minor fraction of the sediments present.

Table 4 illustrates the length (feet) of sediments in the saturated interval by relative percentage of sand and gravel. Using the boring log for MW-46 as an example, the interval between 149.27 and 165 feet is described as a brown and gray sandy gravel which is slightly clayey and is designated as GP using the Unified Soil Classification System (attached as Exhibit 4). The designation of "GP" in the Unified Soil Classification System is described as poorly-graded gravel with sand and less than 5% fines (silt/clay). Since the geologist responsible for logging the boring designated the interval as "GP", it must be assumed that any silt and clay found within this interval must have been present in trace amounts (5% or less). Thus, while silt/clay may be present in 48% of the saturated interval in MW-46, this same portion of the saturated interval is composed of 95% or greater of sand and gravel. For the entire saturated interval in MW-46, 17 feet is composed of 100% sands and gravels, and 15.73 feet is composed of 95% or greater sand and gravel. Such minor amounts of silt and clay are not a significant factor in the restoration potential of the aquifer. In fact, Table 4 illustrates that the vast majority of the sediment in the saturated interval ranges from 90% to 100% sand and gravel.

TABLE 4

THICKNESS (FEET) OF THE SATURATED INTERVAL CONTAINING VARIOUS PERCENTAGES OF SAND AND GRAVEL IN SPARTON BORING LOGS

Well No.	Total Thickness of the Saturated Interval	Thickness of Sand and Gravel Composition			
		100%	≥95%	≥90%	<90%
MW-37	5.67 ft	5.67 ft.			
MW-45	33.71 ft.	32.91 ft.			0.8 ft.
MW-46	32.73 ft.	17.0 ft.	15.73 ft.		
MW-47	10.57 ft.	10.57 ft.			
MW-48	9.42 ft.	9.42 ft.			
MW-53	9.73 ft.	7.73 ft.			2.0 ft.
MW-55	66.52 ft.	48.52 ft.			18.0 ft.
MW-56	31.56 ft.	31.56 ft.			
MW-58	10.5 ft.	10.5 ft.			
MW-60	31.75 ft.	21.0 ft.	10.75 ft.		
MW-61	11.43 ft.	11.43 ft.			
MW-62	10.15 ft.	10.15 ft.			
MW-64	23.8 ft.	17.0 ft.		6.8 ft.	
MW-65	83.0 ft.	75.0 ft.			8.0 ft.
MW-67	181.0 ft.	98.0 ft.		80.0 ft.	3.0 ft.

Therefore, the combination of a low silt/clay content in the aquifer, and the fact that TCE has a relatively low sorption potential in the aquifer material (EPA Brief, Exhibit 14, page 5), demonstrate that restoration is a feasible goal at this site.

D. EXHIBIT 12 - EPA PROPOSED REMEDIAL ALTERNATIVE WITH VOC REMOVAL ONLY

Exhibit 12 consists of a flow diagram of the Respondent's interpretation of a remedial alternative proposed by EPA, and focused on pretreatment steps supposedly associated with reinjection of treated ground water. However, EPA has provided its own diagram of a conceptual ground water treatment system in Attachment 1 of Exhibit 17 of its February 25, 1997 Brief (EPA Brief). A comparison of the Respondent's Exhibit No. 12 to EPA's conceptual model reveals the Respondent misinterpreted EPA's position.

The Respondent identified four treatment issues required to reinject ground water in Exhibit No. 12 that EPA supposedly did not include in its conceptual ground water treatment system. These four treatment issues are: (1) filtration; (2) pH adjustment; (3) air removal; and (4) chlorination. However, each of these steps have been accounted for by EPA in the conceptual ground water treatment system.

Attachment 1 of Exhibit 17 of EPA's Brief presents a conceptual ground water treatment system which would effectively remove VOCs and chromium from extracted ground water. In this conceptual ground water treatment system, adjustment of pH in the extracted ground water occurs in the stripper by the addition of carbon dioxide gas (No. 2 of the Description of the Conceptual System, page 2-3 of Exhibit 17 of EPA's Brief). This step is provided to prevent precipitation of solids and subsequent fouling of the air stripper. This adjustment is not dependent on

ground water reinjection, but is a prudent step to prevent excessive operation and maintenance (O&M) costs for the air stripper. This step should be included in the treatment system whether the treated ground water is reinjected into the aquifer by reinjection wells or discharged into the Calabacillas Arroyo. Further pH adjustment, dependent only on reinjection, would be unnecessary. Thus, EPA has accounted for pH adjustment in its conceptual ground water treatment system.

In the conceptual ground water treatment system, filtration and air removal of the extracted ground water are accomplished through the use of equalization tanks and sand filters (Figure No. 1 in Attachment No. 1 of the Description of the Conceptual System, Exhibit 17 of EPA's Brief). Filtration of the treated ground water is also recommended whether the treated ground water is reinjected into the aquifer via reinjection wells or discharged into the Calabacillas Arroyo. Filtration should prevent the discharge pipelines or reinjection wells from clogging. In addition, passing the treated ground water through a sand filter for solids removal and a surge tank, as described in EPA's conceptual treatment system, prior to its discharge, will effectively remove entrained air. Thus, a separate step for air removal as depicted in the Respondent's Exhibit No. 10 is not necessary, and is not dependent on whether the treated ground water is reinjected or discharged into the Calabacillas Arroyo. Thus, EPA has accounted for filtration and air removal in its conceptual ground water treatment system.

Given the low biochemical oxygen demand (BOD) of most ground water, it is not likely that significant biological growth will occur in the injection wells. EPA Brief, Exhibit 10, Page 2. Since acidification is already included in the conceptual treatment process, this acidification would reduce the already small potential for any iron bacteria fouling. Thus, chlorination of the treated ground water prior to reinjection has not been shown to be necessary.

Thus, the diagram of the conceptual ground water treatment system presented in Attachment 1 of Exhibit 17 of EPA's Brief demonstrates a realistic treatment system which would effectively remove VOCs and chromium from the extracted ground water. Filtration and pH adjustment would be required even if the treated ground water is discharged into the Calabacillas Arroyo. EPA's proposed treatment train also does not require a separate step for air removal. Finally, chlorination of the treated ground water has not been shown to be necessary. Therefore, the Respondent's Exhibit 12 does not accurately represent EPA's proposed treatment train.

E. EXHIBIT 13 - COST COMPARISONS - 600 GPM EPA FDRTC ALTERNATIVE 4

Respondent's Exhibit No. 13 consists of a table which purports to compare EPA estimated costs from the Final Decision and Response to Comments (FDRTC) document and EPA's Brief, with the estimated costs from the Respondent's Final Corrective Measures Study (CMS) Report dated May 6, 1996. Once again, this Exhibit mischaracterizes EPA's position.

First of all, as to the cost of ground water monitoring wells, the FDRTC estimated a cost of $400,000 for 20 wells. This calculation was based on Respondent's estimate of $70,000 to $80,000 for four wells ($17,500 to $20,000 per well). CMS Report at p. VII-6 [AR at p. 005618]. EPA used the higher figure of $20,000 per well. EPA did not imply that additional monitoring wells would only be installed outside the plume. On the contrary, EPA stated that additional monitoring wells were needed to define the horizontal and vertical extent of the contaminant plume [FDRTC at p. 19, AR at p. 008625]. It should be obvious that you need to install monitoring wells inside the plume in order to determine the vertical extent of the contamination. Therefore, the Respondent is deliberately mischaracterizing EPA's position. Thus, the $400,000 figure, which was based on the Respondent's CMS Report, was used to estimate costs in the FDRTC and in EPA's Brief.

The Respondent has estimated that costs for the installation of 20 ground water monitoring wells would cost $600,000. The table indicates that the Respondent has differentiated costs between monitoring wells installed outside the contaminant plume from monitoring wells installed inside the contaminant plume. Based on figures presented on page VII-6 of the CMS Report [AR at p. 005618], the Respondent used the $20,000 figure for monitoring well installed outside the contaminant plume, and $40,000 for monitoring wells installed inside the plume. Without any supporting documentation, Sparton estimated that it would cost

$40,000 to install monitoring wells inside the plume. This figure was apparently based on its estimate that it would cost $40,000 to $50,000 to install a deep well in cluster no. 9. Id. However, the Respondent has not provided documentation, either in its CMS Report or in this proceeding, substantiating the significant difference in costs between monitoring wells installed within the contaminant plume, and monitoring wells installed outside the contaminant plume. Furthermore, the Respondent failed to specify how it determined that ten wells would be installed inside the plume (thus inflating the cost), as opposed to three or five wells.

Second, EPA did not deliberately exclude the capital costs and operation and maintenance (O&M) costs of soil vapor extraction (SVE) in its cost summary on page 62 of EPA's Brief, as the Respondent implies. In its Brief, EPA recalculated the costs of extraction and reinjection wells using its own data, as opposed to the Respondent's data from the CMS Report. EPA determined that the Respondent inflated its costs in the CMS Report. EPA Brief at p. 62. EPA did not include SVE costs in its recalculation of costs because the Respondent never raised this issue in its Brief.

Third, the Respondent implies that additional on-site extraction wells were not included in EPA's cost estimate (both capital and O&M costs) for interim measure (IM) expansion. Once again, the Respondent deliberately mischaracterizes EPA's position. The costs of an additional on-site extraction wells

were included in the costs for the Expanded Ground Water Extraction. FDRTC at pp. 24 and 27 [AR at pp. 008630 and 33].

Fourth, Exhibit No. 13 also presents differences in capital costs for the installation of an expanded ground water extraction system. In the FDRTC document, EPA estimated a cost of $306,250 for the installation of three stainless steel extraction wells and associated pumps, piping, and electric service. This figure was taken directly from the Respondent's CMS Report. CMS Report at p. VII-23 [AR at p. 005635]. In its Brief, EPA estimated a cost of $346,250 for the installation of three, low carbon steel cased extraction wells and associated pumps and electrical service. This cost also includes the cost of a pilot hole. A breakdown of these costs is included in Table 2A, Attachment 2 of Exhibit 17 of EPA's Brief.

According to the Respondent's Exhibit No. 13, the Respondent estimates $346,250 for the installation of the expanded ground water extraction system, plus an additional $100,000 for electric service and piping. However, the Respondent's estimate presented in Exhibit No. 13 is not consistent with that of the CMS Report. In Figure 26 of the CMS Report, the Respondent estimates the cost for electric service and piping was estimated to be $80,000, not $100,000. CMS Report at p. VII-23 [AR at p. 005635].

Fifth, EPA has based its O&M costs on the realistic perspective of operating and maintaining the entire extraction/treatment/ injection system, and not on each treatment alternative; therefore, as reflected in the table, a cost of

$143,308 is estimated for the annual O&M for the extraction/treatment/ injection system. A breakdown of these costs is presented in Table 2D, Attachment 2 of Exhibit No. 17 EPA's Brief. However, one difference in the table's O&M costs is significant enough to be addressed. The Respondent estimates an annual cost of $2,000,000 for the management of waste residue generated from the treatment of metals in the extracted ground water. Although no documentation was provided by the Respondent to support this excessive cost estimate, EPA did address these costs in reviewing the Respondent's CMS Report. EPA determined that the $2,000,000 cost estimate "does not appear to be realistic given the site data and conditions, and the technology." AR at p. 008428.

Finally, Exhibit No. 13 states that EPA's O&M costs for the Expanded Ground Water Extraction System does not include depreciation. As EPA stated in its June 20, 1996 Technical Review of the CMS Report (Technical Review):

> A lack of supporting information to verify the costs estimates presents a level of uncertainty in which the cost estimates appear to contain unverified values or appear to be the result of inconsistencies in the cost estimating. Most of the cost tables include an entry of "Depreciation" or "Maintenance, Depreciation". Depreciation is not included in the cost elements in Task VIII.B of the Corrective Action Plan. The line items of "Depreciation" and "Maintenance, Depreciation", without explanation, amount to 10% of capital costs even when "Maintenance is given as a separate line item.

Technical Review at p. 12 [AR at p. 008378].

Therefore, by including depreciation as a cost element in its CMS Report, the Respondent has increased the estimated cost of the project.

F. EXHIBIT 14 - REMEDY COMPARISON

Exhibit 14 misrepresents both the position and the estimated costs of EPA's proposed remedy in the following manner:

1. Multiple Treatment - The term "multiple treatment" utilized by the Respondent is actually removal of VOCs, plus removal of chromium (if required) from the recovered ground water. Whether the levels of chromium are high enough to require treatment prior to disposal of the treated ground water will be determined during the design phase of the remedy. However, under the Respondent's proposed remedy, the Respondent needs an NPDES permit to discharge to the Calabacillas Arroyo. The NPDES permit may also set limits for chromium and other metals in the discharges. If this occurs, then the Respondent may also have to treat for chromium, depending upon the concentrations in the recovered ground water.

2. Ground Water Plume Containment - The Respondent's claim is based on a one-well ground water extraction system to contain the plume. However, the Respondent has not presented any documentation based on aquifer characteristics in the off-site area showing that a one well containment system will contain the plume. In addition, the Respondent's alternative has not been demonstrated to even contain the source area beneath the Sparton facility. Thus, the Respondent's claim that its recommended

alternative will contain the plume is unsupported. In addition, the Respondent's costs are based on one well. If one well is insufficient, then the Respondent's costs will also increase.

3. Remediation Timeframe - The use of the term "Remediation Timeframe" is misleading, because the Respondent has never demonstrated that its proposed remedy will achieve the same results as EPA's remedy over the same time frame. EPA's remedy requires the active removal of contaminants throughout the plume. The Respondent is relying on contaminant removal only at the leading edge of the contaminant plume.

4. Net Water Loss - There is no documentation in the administrative record that EPA's proposed remedy would result in a net water loss of 3 - 8% or 5 - 10%. However, it is interesting to note that the Respondent has somehow theorized that its use of an air stripper for VOC removal results in a lower water loss (1 - 3%) than an air stripper used in EPA's remedy (3 - 8%).

5. Significant Production of Potentially Hazardous Waste

If chromium has to be removed from the ground water prior to reinjection, waste will be generated as part of the process. However, as previously stated, the NPDES permit may also require the Respondent to remove chromium prior to discharge into the Calabacillas Arroyo. Therefore, the Respondent's remedy may also produce additional wastes as part of the treatment process.

6. Capital Costs and Operation and Maintenance Costs - EPA recalculated the costs for the extraction wells, ground water

treatment, and injection wells, but did not recalculate the costs of the additional ground water monitoring wells, the existing on-site ground water extraction system, or the soil vapor extraction (SVE) system. EPA Brief at p. 62. This is because the Respondent did not raise these issues in its Brief. However, if the costs for the additional ground water monitoring wells, the existing on-site ground water extraction system, and the SVE system from the FDRTC (and set forth below) are added to EPA's recalculated costs for the extraction and injection wells and treatment systems from page 62 of EPA's Brief, the new costs would be as follows:

Ground Water Monitoring

Capital Cost: $400,000
Operation & Maintenance: $160,000/year

Existing Ground Water Extraction System

Operation & Maintenance: $25,000/year

Soil Vapor Extraction System

Capital Cost: $150,000
Operation & Maintenance: $28,000/Years 1-3

REVISED TOTAL COST - ALTERNATIVE 4

Water Treatment Without Ion Exchange for Metals Removal
(Discharge to Arroyo)

Present Worth Cost: $9,397,486
Total Capital Cost: $1,815,488
Total Operation & Maintenance: $516,308/Years 1 - 3
$488,308/Years 4 - 30

Water Treatment With Ion Exchange for Metals Removal (Discharge to Arroyo)

Present Worth Cost: $9,644,536
Total Capital Cost: $2,062,538
Total Operation & Maintenance: $516,308/Years 1 - 3
$488,308/Years 4 - 30

Water Treatment Without Ion Exchange for Metals Removal (Reinjection)

Present Worth Cost: $9,557,242
Total Capital Cost: $1,975,244
Total Operation & Maintenance: $516,308/Years 1 - 3
$488,308/Years 4 - 30

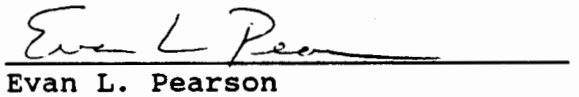
Water Treatment With Ion Exchange for Metals Removal (Reinjection)

Present Worth Cost: $9,804,292
Total Capital Cost: $2,222,294
Total Operation & Maintenance: $516,308/Years 1 - 3
$488,308/Years 4 - 30

A copy of the present worth calculations are attached as Exhibit 5 and incorporated by reference. Therefore, it is clear that the Respondent greatly overestimated the costs of the ground water extraction and treatment system.

Dated this 22nd day of April, 1997.

Respectfully submitted,



Evan L. Pearson
Senior Attorney
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
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CERTIFICATE OF SERVICE

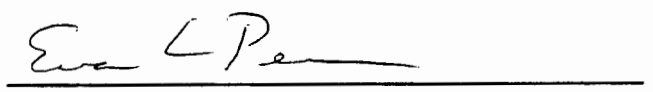
I hereby certify that on the 22nd day of April, 1997, the original of the foregoing EPA's Response to Exhibits Submitted by Respondent was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that a true and correct copy was sent to the following by the methods indicated below:

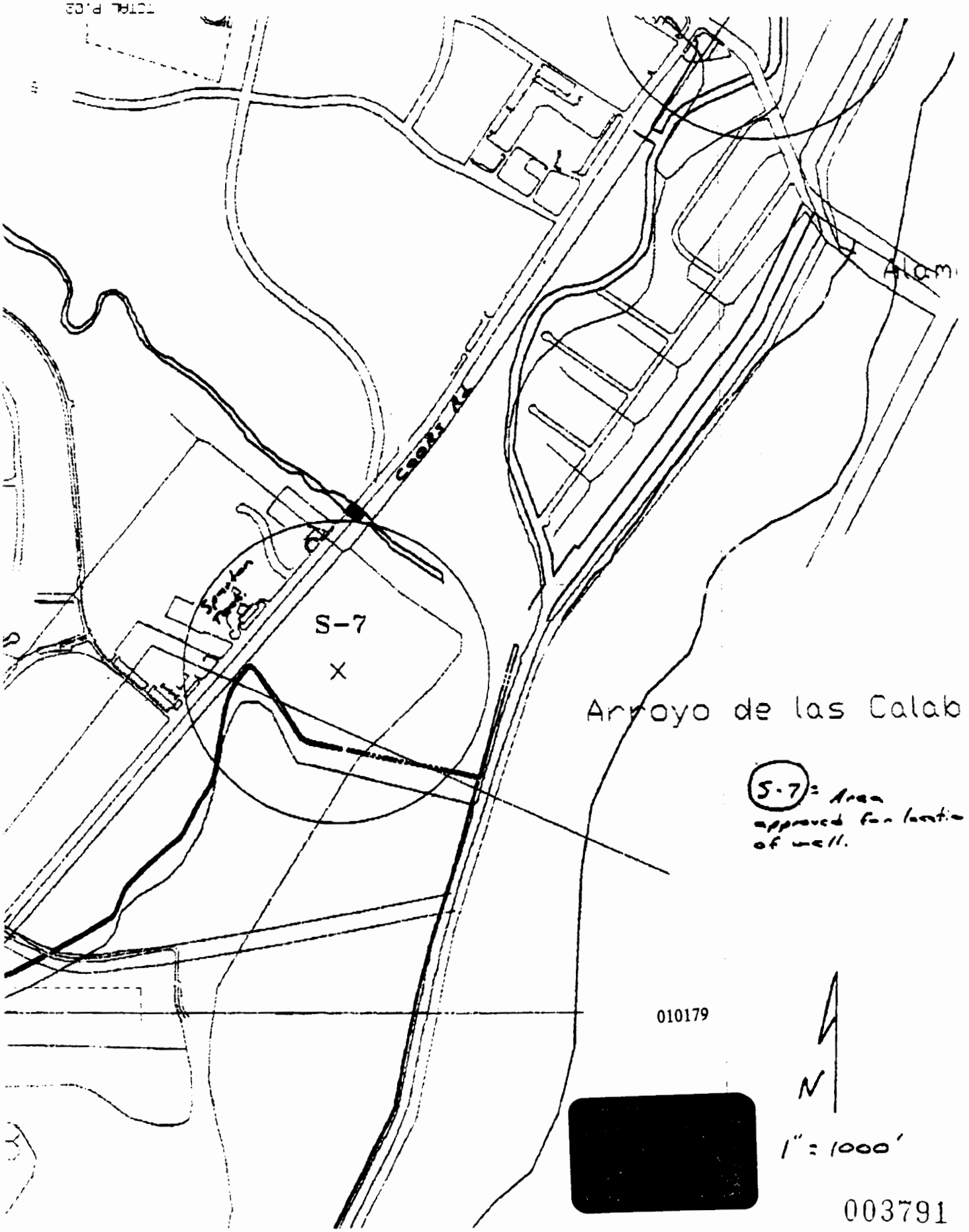
HAND DELIVERED

Honorable George Malone, III
Acting Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

FIRST CLASS MAIL

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693





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[redacted]

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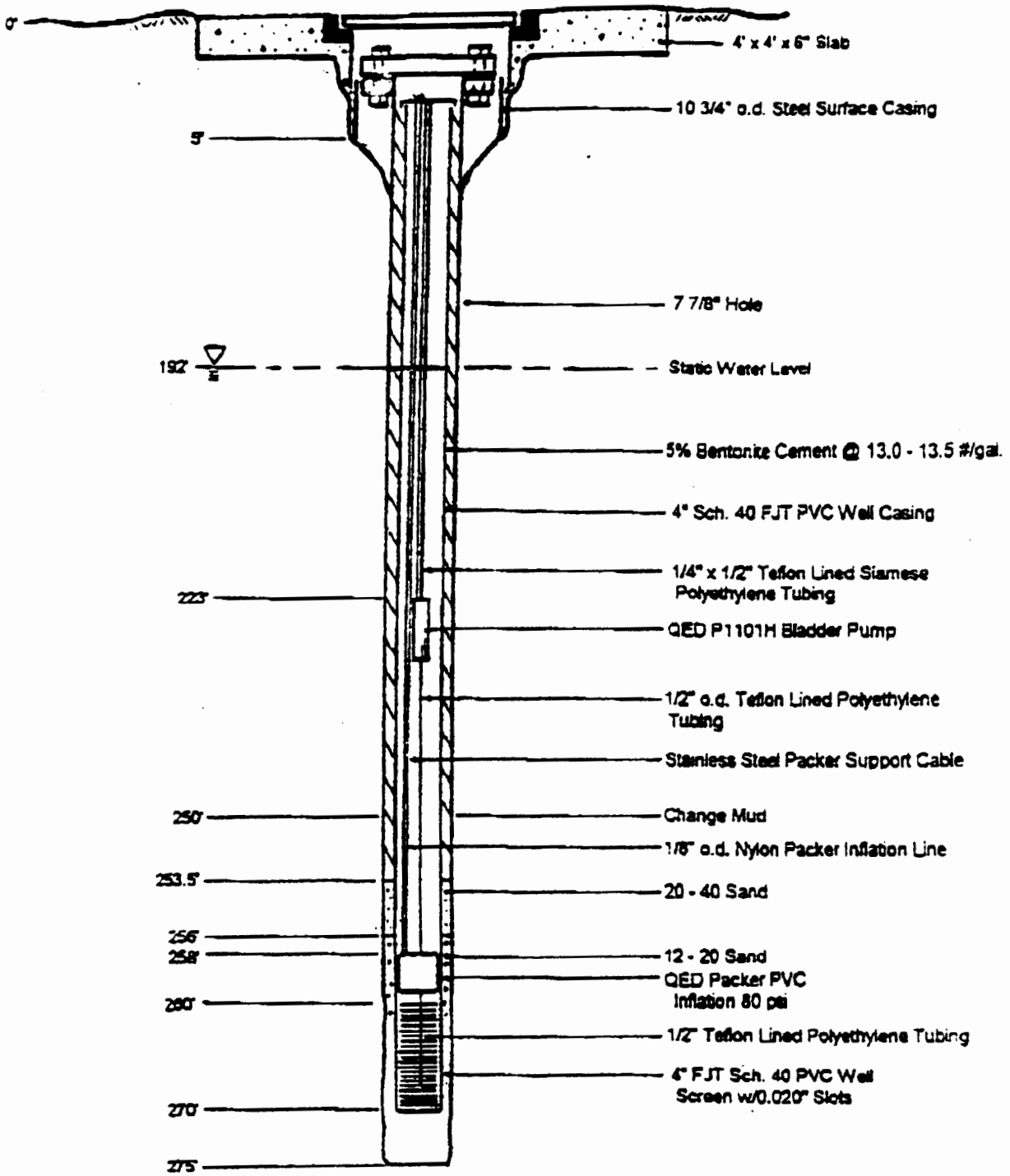

FIGURE 2

MW-65 CONSTRUCTION DIAGRAM

010180

METRIC
Corporation

SAMPLE LOG
Continued

Borehole Number MW-65 Borehole Location N1525277.92 E374343.87

Depth (feet)	Thickness (feet)	Stratigraphic Description
175 - 180	5.0	Pale yellowish brown (10YR 6/2) and ??N4??, well sorted, sub-angular to sub-rounded, small pebble gravel.
180 - 195	15.0	Moderate yellowish brown (10YR 5/4) clayey very fine sand and some white (N9) clay.
195 - 210	15.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-rounded, fine sand to granule gravel.
210 - 230	20.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-rounded to rounded, medium sand to small pebble gravel.
230 - 240	10.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-rounded to rounded, very fine sand to granule gravel.
240 - 245	5.0	Light brown (5YR 6/4) sandy clay.
245 - 260	15.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-rounded, fine sand to very coarse sand.
260 - 270	10.0	Pale yellowish brown (10YR 6/2), medium sorted, sub-rounded, coarse sand to small pebble gravel.
270 - 275	5.0	Pale yellowish brown (10YR 6/2), medium sorted, sub-rounded to rounded, medium sand to very coarse sand.

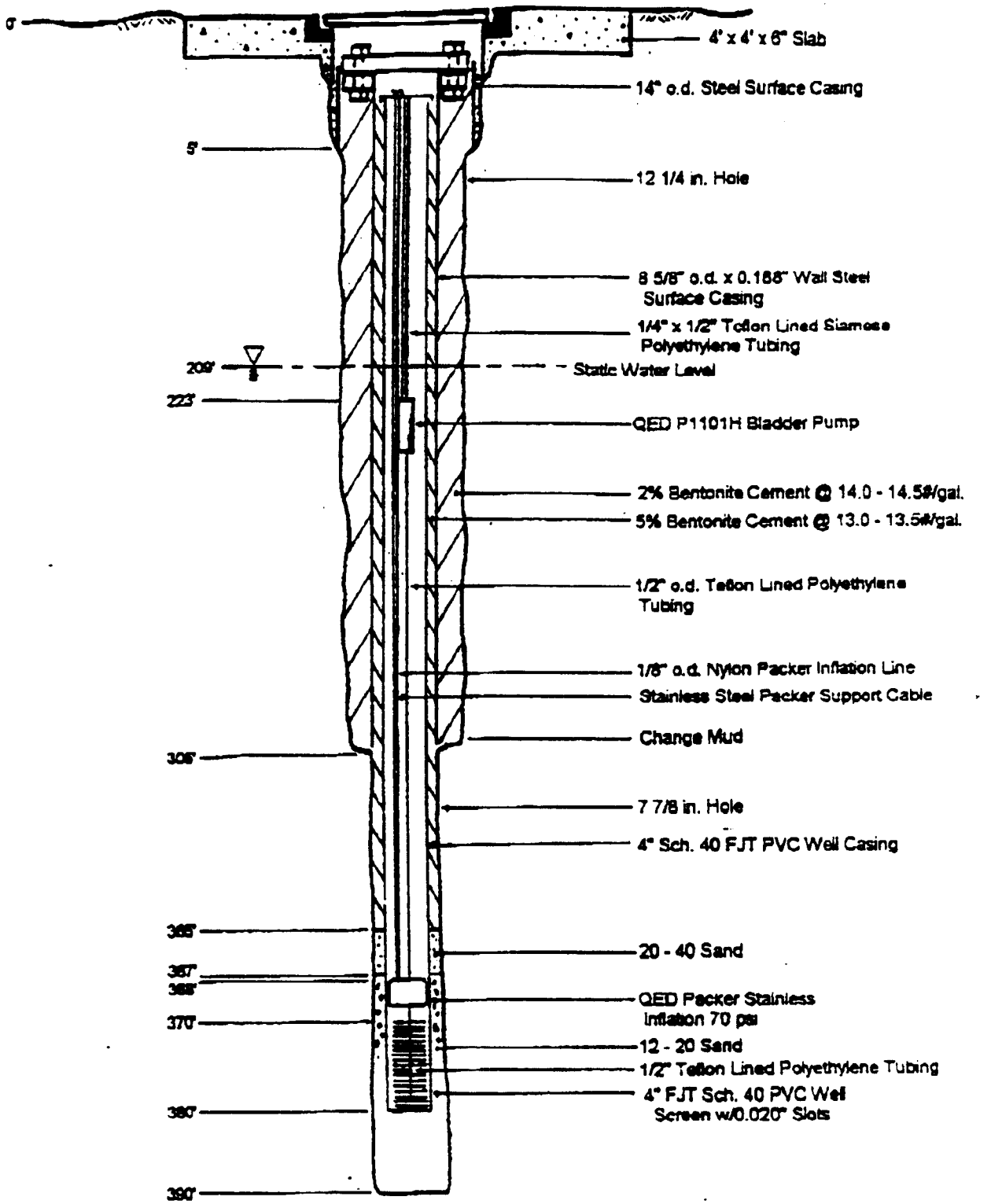

FIGURE 4

010182

MW-67 CONSTRUCTION DIAGRAM

METRIC
Corporation

SAMPLE LOG

Borehole Number MW-67 Borehole Location N1525220.38 E375352.47

Property Owner Sparton Technology, Inc.

Sample Logger Peter H. Metzner, Metric Corporation

Driller Rodgers Environmental Services, Inc.

Drilling Medium Mud Rotary

Date of Completion 7-15-96 Ground Elevation 5169.21

Depth (feet)	Thickness (feet)	Stratigraphic Description
0 - 5	5.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, fine sand to small pebble gravel.
5 - 15	10.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to granule gravel.
15 - 40	25.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to very coarse sand with some clay..
40 - 55	15.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to pebble gravel with some clay.
55 - 60	5.0	Pale yellowish brown (10YR 6/2) sandy clay.
60 - 80	20.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to small pebble gravel.

METRIC
Corporation

SAMPLE LOG
Continued

Borehole Number MW-67 Borehole Location N1525220.38 E375352.47

Depth (feet)	Thickness (feet)	Stratigraphic Description
80 - 105	25.0	Pale yellowish brown (10YR 6/2), medium sorted, sub-angular to sub-rounded, clayey very fine sand to coarse sand.
105 - 110	5.0	Pale yellowish brown (10YR 6/2), medium sorted, sub-rounded, medium sand to very coarse sand.
110 - 140	30.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to granule gravel and clay.
140 - 145	5.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, fine sand to very coarse sand.
145 - 170	25.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular, very fine sand to granule gravel and clay.
170 - 190	20.0	Pale yellowish brown (10YR 6/2), medium sorted, sub-angular, medium sand to very coarse sand.
190 - 200	10.0	Pale yellowish brown (10YR 6/2), medium sorted, angular to sub-angular, very coarse sand to small pebble gravel.
200 - 210	10.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, very fine sand to granule gravel.

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To Vince Makett	From Ron Pino
Co. EPA	Co. NMED
Dept.	Phone #
Fax # 214-665-7446	Fax #

METRIC
Corporation

SAMPLE LOG
Continued

Borehole Number MW-67 Borehole Location N1525220.38 E375352.47

Depth (feet)	Thickness (feet)	Stratigraphic Description
210 - 230	20.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to granule gravel.
230 - 255	25.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, clayey very fine sand to granule gravel and clay.
255 - 275	20.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular, fine sand to small pebble gravel.
275 - 310	35.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, fine sand to small pebble gravel and clay.
310 - 320	10.0	Pinkish gray (5YR 8/1), poorly sorted, sub-angular to sub-rounded, fine sand to granule gravel.
320 - 330	10.0	Pale yellowish brown (10YR 6/2), poorly sorted, sub-angular to sub-rounded, medium sand to small pebble gravel.
330 - 360	30.0	Pale yellowish brown (10 YR 6/2), medium sorted, sub-rounded to rounded, fine sand to coarse sand.
360 - 363	3.0	Pale yellowish brown (10YR 6/2) clay.
363 - 390	27.0	Pale yellowish brown (10 YR 6/2), medium sorted, sub-rounded to rounded, fine sand to coarse sand.

SPARTON TECHNOLOGY, INC.

Date: 03/25/96
To: R. Pine NMED-GWPRB
Page: 1 of 2

Re: Static Water Level Sounder Wells
From: J. Wakefield
File: SRDBF.WQ1

WELL No.	WLE 09/30/92	WLE 10/13/92	WLE 10/26/92	WLE 11/11/92	WLE 11/25/92	WLE 12/10/92	WLE 12/22/92	WLE 01/07/93	WLE 01/20/93	WLE 05/18/93	WLE 07/30/93
PZ-1	4961.88	4962.06	4962.17	4961.96	4961.84	4961.97	4962.10	4962.38	4962.08	4961.95	4961.43
W-34	4977.99	4978.14	4978.05	4977.50	4977.04	4976.63	4976.37	4976.09	4975.90	4976.60	4977.66
W-35	4975.24	4975.35	4975.42	4975.15	4974.87	4974.58	4974.38	4974.16	4972.70	4974.17	4974.60
MW-36	4973.67	4973.77	4973.86	4973.65	4973.44	4973.22	4973.08	4972.94	4972.75	4972.77	4973.28
MW-37	4972.18	4972.28	4972.32	4972.18	4972.01	4971.88	4971.78	4971.74	4971.57	4971.52	4971.71
MW-44	4973.74	4973.87	4973.94	4973.73	4973.51	4973.29	4973.13	4973.00	4972.80	4971.84	4973.38
MW-45	4972.21	4972.32	4972.37	4972.21	4972.04	4971.90	4971.81	4971.77	4971.61	4971.56	[illegible]71.80
MW-46	4971.07	4971.16	4971.23	4971.08	4970.97	4970.88	4970.83	4970.86	4970.70	4970.61	4970.66
MW-47	4970.82	4970.96	4971.01	4970.83	4970.75	4970.66	4970.63	4970.60	4970.50	4970.25	4970.43
MW-48	4970.12	4970.24	4970.28	4970.10	4970.03	4969.99	4970.00	4970.06	4969.91	4969.61	4969.64
MW-50	4965.22	4965.35	4965.37	4965.11	4964.94	4965.00	4964.82	4965.06	4964.74	4964.76	4964.58
MW-52	4967.98	4968.10	4968.15	4967.93	4967.81	4967.82	4967.89	4968.04	4967.80	4967.60	4967.57
MW-53	4969.40	4969.52	4969.55	4969.38	4969.27	4969.28	4969.34	4969.46	4969.27	4968.96	4969.10
MW-54	4969.95	4970.06	4970.02	4970.01	4969.96	4969.91	4969.89	4969.87	4969.81	4969.62	4969.57
MW-55	4969.61	4969.71	4969.76	4969.56	4969.47	4969.41	4969.42	4969.47	4969.29	4969.15	4969.18
MW-56	4970.11	4970.22	4970.27	4970.08	4970.01	4969.96	4969.97	4970.03	4969.88	4969.61	4969.71
MW-57	4969.55	4969.62	4969.64	4969.57	4969.52	4969.04	4969.49	4969.55	4969.39	4969.25	4969.17
MW-58	4969.79	4969.91	4969.96	4969.77	4969.68	4969.66	4969.71	4969.80	4969.62	4969.34	4969.51
V-59	4973.36	4973.45	4973.50	4973.25	4973.08	4972.93	4972.83	4972.73	4972.62	4972.76	4972.85
MW-60	4969.78	4969.90	4969.94	4969.76	4969.70	4969.68	4969.70	4969.75	4969.61	4969.37	4970.24
MW-61	4969.79	4969.90	4969.94	4969.75	4969.71	4969.69	4969.73	4969.78	4969.65	4969.38	4969.37
MW-62	4971.49	4971.62	4971.66	4971.55	4971.42	4971.30	4971.23	4971.14	4971.03	4970.83	4971.17
MW-63	4979.01	4979.13	4979.23	4979.26	4979.25	4979.14	4979.01	4978.82	4978.69	4978.13	4977.74
MW-64	4969.95	4970.03	4970.07	4969.96	4969.89	4969.85	4969.86	4969.93	4969.76	4969.59	4969.57

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WELL No.	WLE 10/08/93	WLE 12/08/93	WLE 03/28/94	WLE 04/07/94	WLE 07/19/94	WLE 10/31/94	WLE 02/15/95	WLE 04/24/95	WLE 08/03/95	WLE 10/13/95	WLE 01/17/96
PZ-1	4961.47		4961.65	4961.47	4960.74	4960.28	4960.83	4960.87	4960.20	4959.79	4959.34
MW-34	4977.39	4975.76	4974.74	4975.40	4977.03	4977.12	4975.09	4975.36	4976.88	4976.02	4974.88
MW-35	4974.83	4973.97	4972.80	4973.03	4974.26	4974.30	4972.93	4973.08	4974.07	4973.42	4972.66
MW-36	4973.28	4972.52	4971.83	4971.97	4972.68	4972.65	4971.73	4971.82	4972.41	*1	*1
MW-37	4971.78	4971.42	4970.78	4970.82	4971.04	4971.05	4970.40	4970.57	4970.83	*1	*1
MW-44	4973.39	4972.58	4971.92	4972.00	4972.70	4972.73	4971.89	4971.87	4972.47	4972.03	4971.54
MW-45	4971.78	4971.42	4970.83	4970.81	4971.13	4971.11	4970.63	4970.54	4970.82	4970.82	4970.18
MW-46	4970.60	4970.48	4970.00	4969.91	4969.96	4969.95	4969.51	4969.62	4969.71	4969.35	4969.15
MW-47	4970.46	4970.11	4969.84	4969.71	4969.81	4969.64	4969.41	4969.30	4969.40	4969.16	4968.83
MW-48	4969.61	4969.68	4969.31	4969.18	4969.05	4968.85	4968.86	4968.68	4968.73	4968.50	4968.26
MW-50	4964.57		4964.48	4964.34	4963.90	4963.17	4963.37	4963.44	4963.11	4962.82	4962.28
MW-52	4967.62	4967.31	4967.29	4967.25	4966.89	4966.55	4966.60	4966.53	4966.43	4966.16	4965.85
MW-53	4968.96	4968.92	4968.78	4968.66	4968.33	4968.02	4968.17	4968.00	4967.97	4967.77	4967.52
MW-54	4969.44		4969.06	4969.01	4968.87	4968.84	4968.79	4968.62	4968.54	4968.31	4967.97
MW-55	4969.08	4968.87	4968.68	4968.61	4968.43	4968.32	4968.23	4968.15	4968.13	4967.79	4967.44
MW-56	4969.63	4969.58	4969.31	4969.19	4969.01	4968.86	4968.83	4968.69	4968.71	4968.49	4968.22
MW-57	4969.06	4968.94	4968.82	4968.67	4968.49	4968.35	4968.38	4968.26	4968.17	4967.81	4967.67
MW-58	4969.37	4969.44	4969.12	4968.99	4968.74	4968.50	4968.55	4968.40	4968.39	4968.18	4967.98
MW-59	4972.82	4972.26	4971.76	4971.98	4972.23	4972.43	4971.83	4971.73	4972.00	4971.58	4971.02
MW-60	4969.25	4969.25	4969.07	4969.01	4968.73	4968.54	4968.60	4968.37	4968.37	4968.13	4967.82
MW-61	4969.43	4969.40	4969.11	4969.07	4968.80	4968.55	4968.62	4968.40	4968.41	4968.19	4967.87
MW-62	4971.13	4970.84	4970.22	4970.13	4970.39	4970.36	4970.08	4969.96	4970.15	*1	*1
MW-63	4978.48	4978.60	4977.35	4977.12	4978.44	4980.08	4981.20	4979.29	4979.28	4978.72	4977.75
MW-64	4969.48	4969.52	4969.19	4969.04	4968.90	4968.77	4968.94	4968.62	4968.64	4968.37	4968.14

*1 Airlines installed in these wells see AR Report for WLE.

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GOVERNMENT EXHIBIT 4

Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)[1]

This standard is issued under the fixed designation D 2488; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This practice covers procedures for the description of soils for engineering purposes.

1.2 This practice also describes a procedure for identifying soils, at the option of the user, based on the classification system described in Test Method D 2487. The identification is based on visual examination and manual tests. It must be clearly stated in reporting an identification that it is based on visual-manual procedures.

1.2.1 When precise classification of soils for engineering purposes is required, the procedures prescribed in Test Method D 2487 shall be used.

1.2.2 In this practice, the identification portion assigning a group symbol and name is limited to soil particles smaller than 3 in. (75 mm).

1.2.3 The identification portion of this practice is limited to naturally occurring soils (disturbed and undisturbed).

NOTE 1—This practice may be used as a descriptive system applied to such materials as shale, claystone, shells, crushed rock, etc. (See Appendix X2).

1.3 The descriptive information in this practice may be used with other soil classification systems or for materials other than naturally occurring soils.

1.4 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific precautionary statements see Section 8.

1.5 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 *ASTM Standards:*

D 653 Terminology Relating to Soil, Rock, and Contained Fluids[2]

D 1452 Practice for Soil Investigation and Sampling by Auger Borings[2]

D 1586 Method for Penetration Test and Split-Barrel Sampling of Soils[2]

D 1587 Practice for Thin-Walled Tube Sampling of Soils[2]

D 2113 Practice for Diamond Core Drilling for Site Investigation[2]

D 2487 Classification of Soils for Engineering Purposes (Unified Soil Classification System)[2]

D 4083 Practice for Description of Frozen Soils (Visual-Manual Procedure)[2]

3. Terminology

3.1 *Definitions:*

3.1.1 Except as listed below, all definitions are in accordance with Terminology D 653.

NOTE 2—For particles retained on a 3-in. (75-mm) US standard sieve, the following definitions are suggested:

Cobbles—particles of rock that will pass a 12-in. (300-mm) square opening and be retained on a 3-in. (75-mm) sieve, and

Boulders—particles of rock that will not pass a 12-in. (300-mm) square opening.

3.1.1.2 *clay*—soil passing a No. 200 (75-μm) sieve that can be made to exhibit plasticity (putty-like properties) within a range of water contents, and that exhibits considerable strength when air-dry. For classification, a clay is a fine-grained soil, or the fine-grained portion of a soil, with a plasticity index equal to or greater than 4, and the plot of plasticity index versus liquid limit falls on or above the "A" line (see Fig. 3 of Test Method D 2487).

3.1.1.3 *gravel*—particles of rock that will pass a 3-in. (75-mm) sieve and be retained on a No. 4 (4.75-mm) sieve with the following subdivisions:

coarse—passes a 3-in. (75-mm) sieve and is retained on a ¾-in. (19-mm) sieve.

fine—passes a ¾-in. (19-mm) sieve and is retained on a No. 4 (4.75-mm) sieve.

3.1.1.4 *organic clay*—a clay with sufficient organic content to influence the soil properties. For classification, an organic clay is a soil that would be classified as a clay, except that its liquid limit value after oven drying is less than 75 % of its liquid limit value before oven drying.

3.1.1.5 *organic silt*—a silt with sufficient organic content to influence the soil properties. For classification, an organic silt is a soil that would be classified as a silt except that its liquid limit value after oven drying is less than 75 % of its liquid limit value before oven drying.

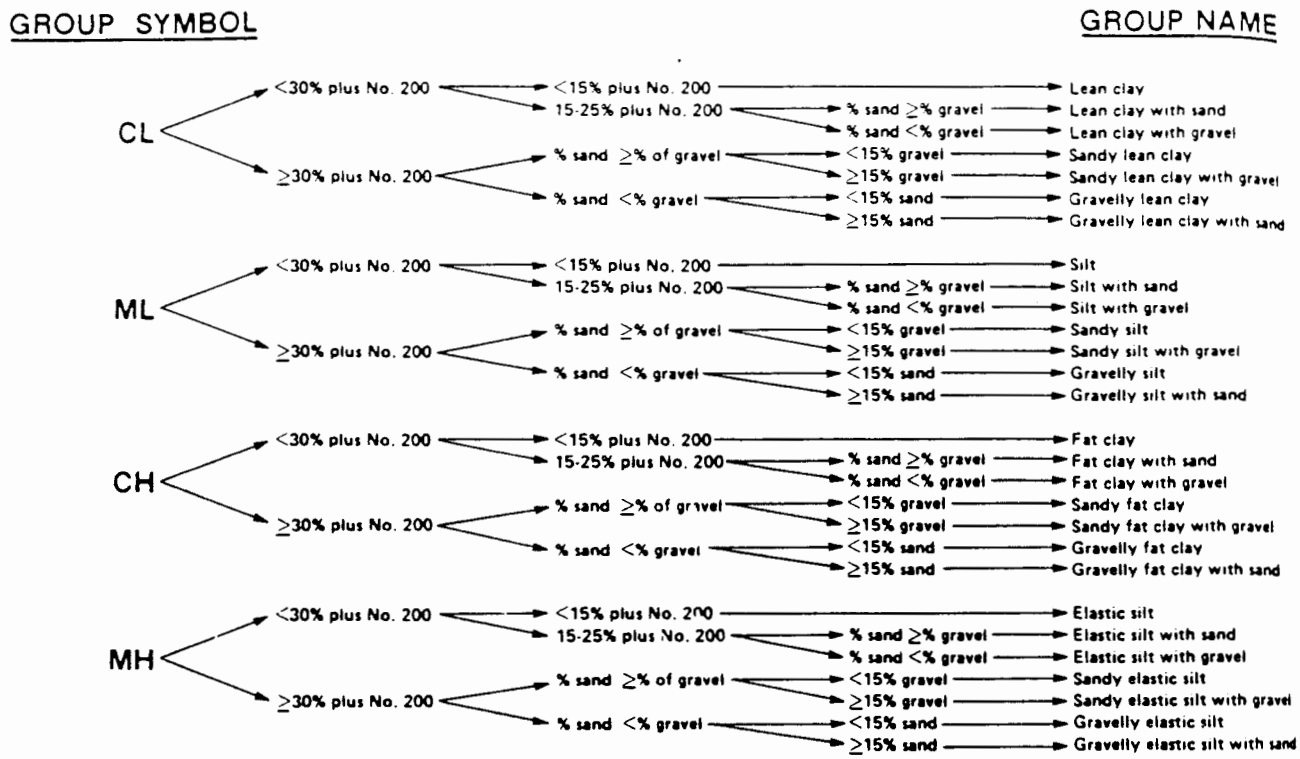
3.1.1.6 *peat*—a soil composed primarily of vegetable tissue in various stages of decomposition usually with an organic odor, a dark brown to black color, a spongy consistency, and a texture ranging from fibrous to amorphous.

3.1.1.7 *sand*—particles of rock that will pass a No. 4

[1] This practice is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.07 on Identification and Classification of Soils.

Current edition approved Sept. 15, 1993. Published November 1993. Originally published as D 2488 - 66 T. Last previous edition D 2488 - 90.

[2] *Annual Book of ASTM Standards*, Vol 04.08.



NOTE—Percentages are based on estimating amounts of fines, sand, and gravel to the nearest 5 %.

FIG. 1a Flow Chart for Identifying Inorganic Fine-Grained Soil (50 % or more fines)

(4.75-mm) sieve and be retained on a No. 200 (75-μm) sieve with the following subdivisions:

coarse—passes a No. 4 (4.75-mm) sieve and is retained on a No. 10 (2.00-mm) sieve.

medium—passes a No. 10 (2.00-mm) sieve and is retained on a No. 40 (425-μm) sieve.

fine—passes a No. 40 (425-μm) sieve and is retained on a No. 200 (75-μm) sieve.

3.1.1.8 *silt*—soil passing a No. 200 (75-μm) sieve that is nonplastic or very slightly plastic and that exhibits little or no strength when air dry. For classification, a silt is a fine-grained soil, or the fine-grained portion of a soil, with a plasticity index less than 4, or the plot of plasticity index versus liquid limit falls below the "A" line (see Fig. 3 of Test Method D 2487).

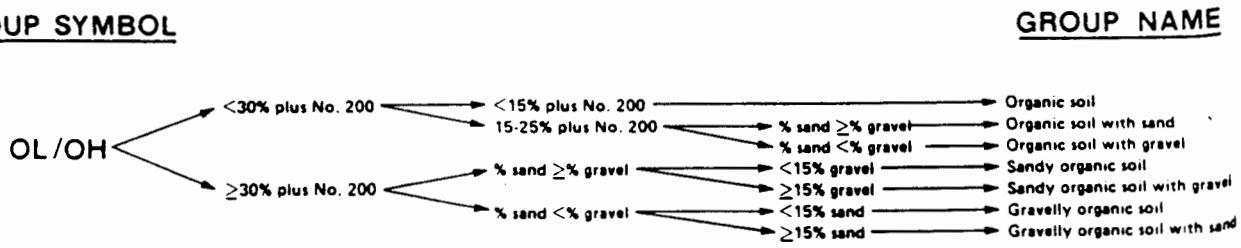
4. Summary of Practice

4.1 Using visual examination and simple manual tests, this practice gives standardized criteria and procedures for describing and identifying soils.

4.2 The soil can be given an identification by assigning a group symbol(s) and name. The flow charts, Figs. 1a and 1b for fine-grained soils, and Fig. 2, for coarse-grained soils, can be used to assign the appropriate group symbol(s) and name. If the soil has properties which do not distinctly place it into a specific group, borderline symbols may be used, see Appendix X3.

NOTE 3—It is suggested that a distinction be made between *dual symbols* and *borderline symbols*.

Dual Symbol—A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC, CL-ML used to indicate that the soil has been identified as having the properties of a classification in accordance with Test Method D 2487 where two symbols are required. Two symbols are required when the soil has between 5 and 12 % fines or



NOTE—Percentages are based on estimating amounts of fines, sand, and gravel to the nearest 5 %.

FIG. 1b Flow Chart for Identifying Organic Fine-Grained Soil (50 % or more fines)

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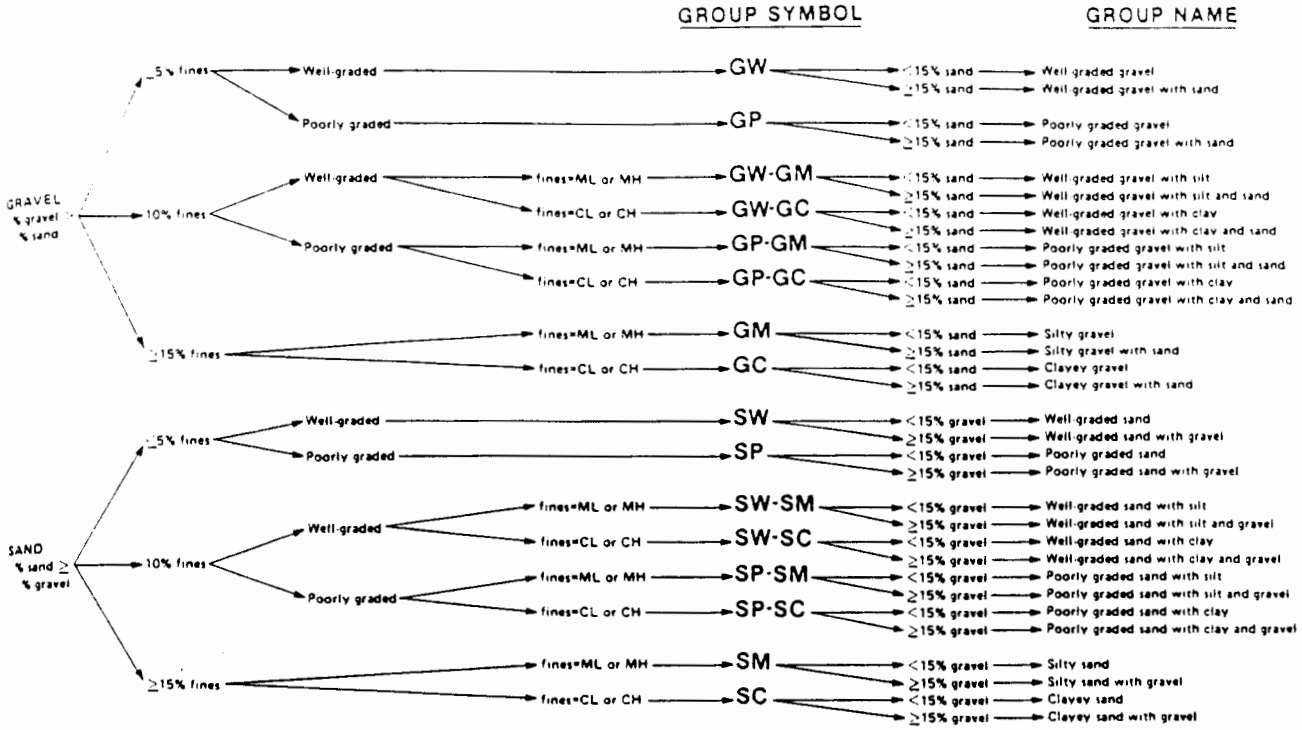

NOTE—Percentages are based on estimating amounts of fines, sand, and gravel to the nearest 5 %.

FIG. 2 Flow Chart for Identifying Coarse-Grained Soils (less than 50 % fines)

when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

Borderline Symbol—A borderline symbol is two symbols separated by a slash, for example, CL/CH, GM/SM, CL/ML. A borderline symbol should be used to indicate that the soil has been identified as having properties that do not distinctly place the soil into a specific group (see Appendix X3).

5. Significance and Use

5.1 The descriptive information required in this practice can be used to describe a soil to aid in the evaluation of its significant properties for engineering use.

5.2 The descriptive information required in this practice should be used to supplement the classification of a soil as determined by Test Method D 2487.

5.3 This practice may be used in identifying soils using the classification group symbols and names as prescribed in Test Method D 2487. Since the names and symbols used in this practice to identify the soils are the same as those used in Test Method D 2487, it shall be clearly stated in reports and all other appropriate documents, that the classification symbol and name are based on visual-manual procedures.

5.4 This practice is to be used not only for identification of soils in the field, but also in the office, laboratory, or wherever soil samples are inspected and described.

5.5 This practice has particular value in grouping similar soil samples so that only a minimum number of laboratory tests need be run for positive soil classification.

NOTE 4—The ability to describe and identify soils correctly is learned more readily under the guidance of experienced personnel, but it may also be acquired systematically by comparing numerical laboratory test results for typical soils of each type with their visual and manual characteristics.

5.6 When describing and identifying soil samples from a given boring, test pit, or group of borings or pits, it is not necessary to follow all of the procedures in this practice for every sample. Soils which appear to be similar can be grouped together; one sample completely described and identified with the others referred to as similar based on performing only a few of the descriptive and identification procedures described in this practice.

5.7 This practice may be used in combination with Practice D 4083 when working with frozen soils.

6. Apparatus

6.1 *Required Apparatus:*

6.1.1 *Pocket Knife or Small Spatula.*

6.2 *Useful Auxiliary Apparatus:*

6.2.1 *Small Test Tube and Stopper* (or jar with a lid).

6.2.2 *Small Hand Lens.*

7. Reagents

7.1 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean water from a city water supply or natural source, including non-potable water.

7.2 *Hydrochloric Acid*—A small bottle of dilute hydrochloric acid, HCl, one part HCl (10 *N*) to three parts water (This reagent is optional for use with this practice). See Section 8.

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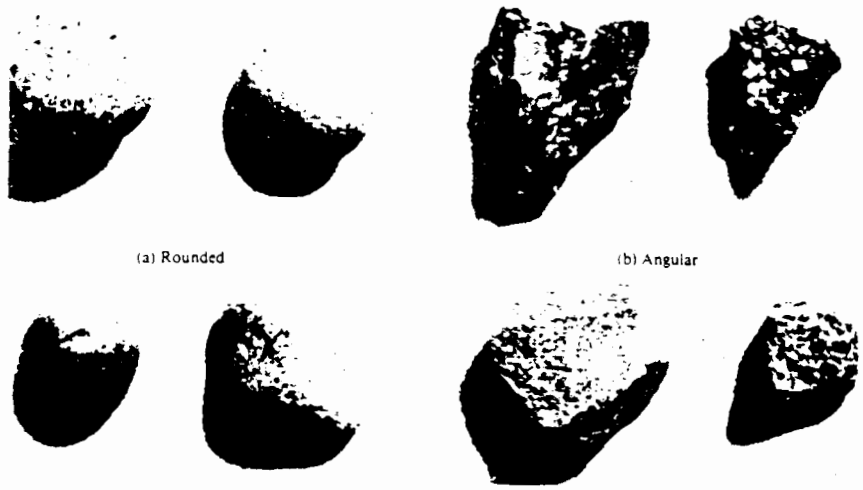

FIG. 3 Typical Angularity of Bulky Grains

8. Safety Precautions

8.1 When preparing the dilute HCl solution of one part concentrated hydrochloric acid (10 *N*) to three parts of distilled water, slowly add acid into water following necessary safety precautions. Handle with caution and store safely. If solution comes into contact with the skin, rinse thoroughly with water.

8.2 **Caution**—Do not add water to acid.

9. Sampling

9.1 The sample shall be considered to be representative of the stratum from which it was obtained by an appropriate, accepted, or standard procedure.

NOTE 5—Preferably, the sampling procedure should be identified as having been conducted in accordance with Practices D 1452, D 1587, or D 2113, or Method D 1586.

9.2 The sample shall be carefully identified as to origin.

NOTE 6—Remarks as to the origin may take the form of a boring number and sample number in conjunction with a job number, a geologic stratum, a pedologic horizon or a location description with respect to a permanent monument, a grid system or a station number and offset with respect to a stated centerline and a depth or elevation.

9.3 For accurate description and identification, the minimum amount of the specimen to be examined shall be in accordance with the following schedule:

Maximum Particle Size, Sieve Opening	Minimum Specimen Size, Dry Weight
4.75 mm (No. 4)	100 g (0.25 lb)
9.5 mm (3/8 in.)	200 g (0.5 lb)
19.0 mm (3/4 in.)	1.0 kg (2.2 lb)
38.1 mm (1 1/2 in.)	8.0 kg (18 lb)
75.0 mm (3 in.)	60.0 kg (132 lb)

NOTE 7—If random isolated particles are encountered that are significantly larger than the particles in the soil matrix, the soil matrix can be accurately described and identified in accordance with the preceeding schedule.

9.4 If the field sample or specimen being examined is smaller than the minimum recommended amount, the report shall include an appropriate remark.

TABLE 1 Criteria for Describing Angularity of Coarse-Grained Particles (see Fig. 3)

Description	Criteria
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular	Particles are similar to angular description but have rounded edges
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges
Rounded	Particles have smoothly curved sides and no edges

10. Descriptive Information for Soils

10.1 *Angularity*—Describe the angularity of the sand (coarse sizes only), gravel, cobbles, and boulders, as angular, subangular, subrounded, or rounded in accordance with the criteria in Table 1 and Fig. 3. A range of angularity may be stated, such as: subrounded to rounded.

10.2 *Shape*—Describe the shape of the gravel, cobbles, and boulders as flat, elongated, or flat and elongated if they meet the criteria in Table 2 and Fig. 4. Otherwise, do not mention the shape. Indicate the fraction of the particles that have the shape, such as: one-third of the gravel particles are flat.

10.3 *Color*—Describe the color. Color is an important property in identifying organic soils, and within a given

TABLE 2 Criteria for Describing Particle Shape (see Fig. 4)

The particle shape shall be described as follows where length, width, and thickness refer to the greatest, intermediate, and least dimensions of a particle, respectively.

Flat	Particles with width/thickness > 3
Elongated	Particles with length/width > 3
Flat and elongated	Particles meet criteria for both flat and elongated

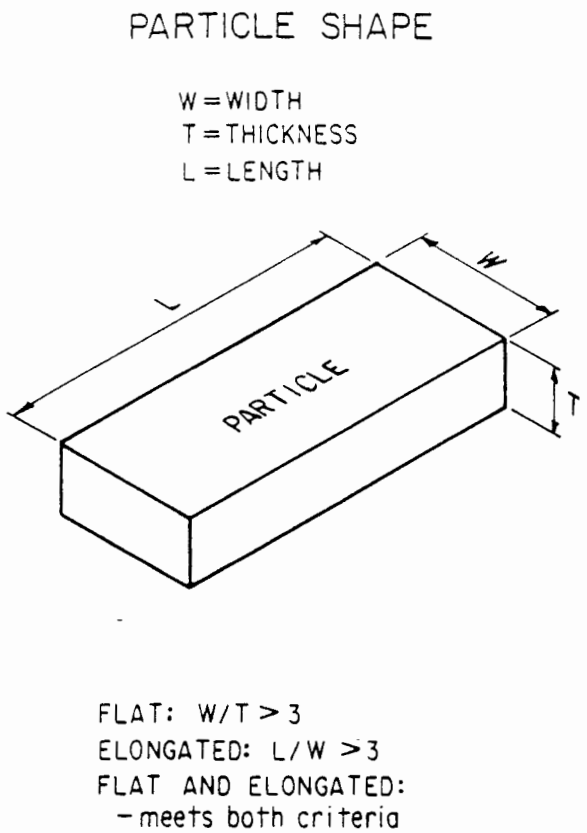

FIG. 4 Criteria for Particle Shape

TABLE 3 Criteria for Describing Moisture Condition

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

locality it may also be useful in identifying materials of similar geologic origin. If the sample contains layers or patches of varying colors, this shall be noted and all representative colors shall be described. The color shall be described for moist samples. If the color represents a dry condition, this shall be stated in the report.

10.4 *Odor*—Describe the odor if organic or unusual. Soils containing a significant amount of organic material usually have a distinctive odor of decaying vegetation. This is especially apparent in fresh samples, but if the samples are dried, the odor may often be revived by heating a moistened sample. If the odor is unusual (petroleum product, chemical, and the like), it shall be described.

10.5 *Moisture Condition*—Describe the moisture condition as dry, moist, or wet, in accordance with the criteria in Table 3.

10.6 *HCl Reaction*—Describe the reaction with HCl as none, weak, or strong, in accordance with the criteria in Table 4. Since calcium carbonate is a common cementing agent, a report of its presence on the basis of the reaction with dilute hydrochloric acid is important.

TABLE 4 Criteria for Describing the Reaction With HCl

Description	Criteria
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

TABLE 5 Criteria for Describing Consistency

Description	Criteria
Very soft	Thumb will penetrate soil more than 1 in. (25 mm)
Soft	Thumb will penetrate soil about 1 in. (25 mm)
Firm	Thumb will indent soil about 1/4 in. (6 mm)
Hard	Thumb will not indent soil but readily indented with thumbnail
Very hard	Thumbnail will not indent soil

10.7 *Consistency*—For intact fine-grained soil, describe the consistency as very soft, soft, firm, hard, or very hard, in accordance with the criteria in Table 5. This observation is inappropriate for soils with significant amounts of gravel.

10.8 *Cementation*—Describe the cementation of intact coarse-grained soils as weak, moderate, or strong, in accordance with the criteria in Table 6.

10.9 *Structure*—Describe the structure of intact soils in accordance with the criteria in Table 7.

10.10 *Range of Particle Sizes*—For gravel and sand components, describe the range of particle sizes within each component as defined in 3.1.2 and 3.1.6. For example, about 20 % fine to coarse gravel, about 40 % fine to coarse sand.

10.11 *Maximum Particle Size*—Describe the maximum particle size found in the sample in accordance with the following information:

10.11.1 *Sand Size*—If the maximum particle size is a sand size, describe as fine, medium, or coarse as defined in 3.1.6. For example: maximum particle size, medium sand.

10.11.2 *Gravel Size*—If the maximum particle size is a gravel size, describe the maximum particle size as the smallest sieve opening that the particle will pass. For example, maximum particle size, 1 1/2 in. (will pass a 1 1/2-in. square opening but not a 3/4-in. square opening).

10.11.3 *Cobble or Boulder Size*—If the maximum particle size is a cobble or boulder size, describe the maximum dimension of the largest particle. For example: maximum dimension, 18 in. (450 mm).

10.12 *Hardness*—Describe the hardness of coarse sand and larger particles as hard, or state what happens when the particles are hit by a hammer, for example, gravel-size particles fracture with considerable hammer blow, some gravel-size particles crumble with hammer blow. "Hard" means particles do not crack, fracture, or crumble under a hammer blow.

10.13 Additional comments shall be noted, such as the presence of roots or root holes, difficulty in drilling or augering hole, caving of trench or hole, or the presence of mica.

10.14 A local or commercial name or a geologic interpre-

TABLE 6 Criteria for Describing Cementation

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

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TABLE 7 Criteria for Describing Structure

Description	Criteria
Stratified	Alternating layers of varying material or color with layers at least 6 mm thick; note thickness
Laminated	Alternating layers of varying material or color with the layers less than 6 mm thick; note thickness
Fissured	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided	Fracture planes appear polished or glossy, sometimes striated
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness
Homogeneous	Same color and appearance throughout

tati n of the soil, or both, may be added if identified as such.

10.15 A classification or identification of the soil in accordance with other classification systems may be added if identified as such.

11. Identification of Peat

11.1 A sample composed primarily of vegetable tissue in various stages of decomposition that has a fibrous to amorphous texture, usually a dark brown to black color, and an organic odor, shall be designated as a highly organic soil and shall be identified as peat, PT, and not subjected to the identification procedures described hereafter.

12. Preparation for Identification

12.1 The soil identification portion of this practice is based on the portion of the soil sample that will pass a 3-in. (75-mm) sieve. The larger than 3-in. (75-mm) particles must be removed, manually, for a loose sample, or mentally, for an intact sample before classifying the soil.

12.2 Estimate and note the percentage of cobbles and the percentage of boulders. Performed visually, these estimates will be on the basis of volume percentage.

NOTE 8—Since the percentages of the particle-size distribution in Test Method D 2487 are by dry weight, and the estimates of percentages for gravel, sand, and fines in this practice are by dry weight, it is recommended that the report state that the percentages of cobbles and boulders are by volume.

12.3 Of the fraction of the soil smaller than 3 in. (75 mm), estimate and note the percentage, by dry weight, of the gravel, sand, and fines (see Appendix X4 for suggested procedures).

NOTE 9—Since the particle-size components appear visually on the basis of volume, considerable experience is required to estimate the percentages on the basis of dry weight. Frequent comparisons with laboratory particle-size analyses should be made.

12.3.1 The percentages shall be estimated to the closest 5 %. The percentages of gravel, sand, and fines must add up to 100 %.

12.3.2 If one of the components is present but not in sufficient quantity to be considered 5 % of the smaller than 3-in. (75-mm) portion, indicate its presence by the term *trace*, for example, trace of fines. A trace is not to be considered in the total of 100 % for the components.

13. Preliminary Identification

13.1 The soil is *fine grained* if it contains 50 % or more fines. Follow the procedures for identifying fine-grained soils of Section 14.

13.2 The soil is *coarse grained* if it contains less than 50 % fines. Follow the procedures for identifying coarse-grained soils of Section 15.

14. Procedure for Identifying Fine-Grained Soils

14.1 Select a representative sample of the material for examination. Remove particles larger than the No. 40 sieve (medium sand and larger) until a specimen equivalent to about a handful of material is available. Use this specimen for performing the dry strength, dilatancy, and toughness tests.

14.2 *Dry Strength:*

14.2.1 From the specimen, select enough material to mold into a ball about 1 in. (25 mm) in diameter. Mold the material until it has the consistency of putty, adding water if necessary.

14.2.2 From the molded material, make at least three test specimens. A test specimen shall be a ball of material about ½ in. (12 mm) in diameter. Allow the test specimens to dry in air, or sun, or by artificial means, as long as the temperature does not exceed 60°C.

14.2.3 If the test specimen contains natural dry lumps, those that are about ½ in. (12 mm) in diameter may be used in place of the molded balls.

NOTE 10—The process of molding and drying usually produces higher strengths than are found in natural dry lumps of soil.

14.2.4 Test the strength of the dry balls or lumps by crushing between the fingers. Note the strength as none, low, medium, high, or very high in accorance with the criteria in Table 8. If natural dry lumps are used, do not use the results of any of the lumps that are found to contain particles of coarse sand.

14.2.5 The presence of high-strength water-soluble cementing materials, such as calcium carbonate, may cause exceptionally high dry strengths. The presence of calcium carbonate can usually be detected from the intensity of the reaction with dilute hydrochloric acid (see 10.6).

14.3 *Dilatancy:*

14.3.1 From the specimen, select enough material to mold into a ball about ½ in. (12 mm) in diameter. Mold the material, adding water if necessary, until it has a soft, but not sticky, consistency.

14.3.2 Smooth the soil ball in the palm of one hand with the blade of a knife or small spatula. Shake horizontally, striking the side of the hand vigorously against the other hand several times. Note the reaction of water appearing on

TABLE 8 Criteria for Describing Dry Strength

Description	Criteria
None	The dry specimen crumbles into powder with mere pressure of handling
Low	The dry specimen crumbles into powder with some finger pressure
Medium	The dry specimen breaks into pieces or crumbles with considerable finger pressure
High	The dry specimen cannot be broken with finger pressure. Specimen will break into pieces between thumb and a hard surface
Very high	The dry specimen cannot be broken between the thumb and a hard surface

TABLE 9 Criteria for Describing Dilatancy

Description	Criteria
None	No visible change in the specimen
Slow	Water appears slowly on the surface of the specimen during shaking and does not disappear or disappears slowly upon squeezing
Rapid	Water appears quickly on the surface of the specimen during shaking and disappears quickly upon squeezing

TABLE 10 Criteria for Describing Toughness

Description	Criteria
Low	Only slight pressure is required to roll the thread near the plastic limit. The thread and the lump are weak and soft
Medium	Medium pressure is required to roll the thread to near the plastic limit. The thread and the lump have medium stiffness
High	Considerable pressure is required to roll the thread to near the plastic limit. The thread and the lump have very high stiffness

the surface of the soil. Squeeze the sample by closing the hand or pinching the soil between the fingers, and note the reaction as none, slow, or rapid in accordance with the criteria in Table 9. The reaction is the speed with which water appears while shaking, and disappears while squeezing.

14.4 *Toughness:*

14.4.1 Following the completion of the dilatancy test, the test specimen is shaped into an elongated pat and rolled by hand on a smooth surface or between the palms into a thread about ⅛ in. (3 mm) in diameter. (If the sample is too wet to roll easily, it should be spread into a thin layer and allowed to lose some water by evaporation.) Fold the sample threads and reroll repeatedly until the thread crumbles at a diameter of about ⅛ in. The thread will crumble at a diameter of ⅛ in. when the soil is near the plastic limit. Note the pressure required to roll the thread near the plastic limit. Also, note the strength of the thread. After the thread crumbles, the pieces should be lumped together and kneaded until the lump crumbles. Note the toughness of the material during kneading.

14.4.2 Describe the toughness of the thread and lump as low, medium, or high in accordance with the criteria in Table 10.

14.5 *Plasticity*—On the basis of observations made during the toughness test, describe the plasticity of the material in accordance with the criteria given in Table 11.

14.6 Decide whether the soil is an *inorganic* or an *organic* fine-grained soil (see 14.8). If inorganic, follow the steps given in 14.7.

14.7 *Identification of Inorganic Fine-Grained Soils:*

TABLE 11 Criteria for Describing Plasticity

Description	Criteria
Nonplastic	A ⅛-in. (3-mm) thread cannot be rolled at any water content
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit

14.7.1 Identify the soil as a *lean clay*, CL, if the soil has medium to high dry strength, no or slow dilatancy, and medium toughness and plasticity (see Table 12).

14.7.2 Identify the soil as a *fat clay*, CH, if the soil has high to very high dry strength, no dilatancy, and high toughness and plasticity (see Table 12).

14.7.3 Identify the soil as a *silt*, ML, if the soil has no to low dry strength, slow to rapid dilatancy, and low toughness and plasticity, or is nonplastic (see Table 12).

14.7.4 Identify the soil as an *elastic silt*, MH, if the soil has low to medium dry strength, no to slow dilatancy, and low to medium toughness and plasticity (see Table 12).

NOTE 11—These properties are similar to those for a lean clay. However, the silt will dry quickly on the hand and have a smooth, silky feel when dry. Some soils that would classify as MH in accordance with the criteria in Test Method D 2487 are visually difficult to distinguish from lean clays, CL. It may be necessary to perform laboratory testing for proper identification.

14.8 *Identification of Organic Fine-Grained Soils:*

14.8.1 Identify the soil as an *organic soil*, OL/OH, if the soil contains enough organic particles to influence the soil properties. Organic soils usually have a dark brown to black color and may have an organic odor. Often, organic soils will change color, for example, black to brown, when exposed to the air. Some organic soils will lighten in color significantly when air dried. Organic soils normally will not have a high toughness or plasticity. The thread for the toughness test will be spongy.

NOTE 12—In some cases, through practice and experience, it may be possible to further identify the organic soils as organic silts or organic clays, OL or OH. Correlations between the dilatancy, dry strength, toughness tests, and laboratory tests can be made to identify organic soils in certain deposits of similar materials of known geologic origin.

14.9 If the soil is estimated to have 15 to 25 % sand or gravel, or both, the words "with sand" or "with gravel" (whichever is more predominant) shall be added to the group name. For example: "lean clay with sand, CL" or "silt with gravel, ML" (see Figs. 1a and 1b). If the percentage of sand is equal to the percentage of gravel, use "with sand."

14.10 If the soil is estimated to have 30 % or more sand or gravel, or both, the words "sandy" or "gravelly" shall be added to the group name. Add the word "sandy" if there appears to be more sand than gravel. Add the word "gravelly" if there appears to be more gravel than sand. For example: "sandy lean clay, CL", "gravelly fat clay, CH", or "sandy silt, ML" (see Figs. 1a and 1b). If the percentage of sand is equal to the percent of gravel, use "sandy."

15. Procedure for Identifying Coarse-Grained Soils (Contains less than 50 % fines)

15.1 The soil is a *gravel* if the percentage of gravel is estimated to be more than the percentage of sand.

TABLE 12 Identification of Inorganic Fine-Grained Soils from Manual Tests

Soil Symbol	Dry Strength	Dilatancy	Toughness
ML	None to low	Slow to rapid	Low or thread cannot be formed
CL	Medium to high	None to slow	Medium
MH	Low to medium	None to slow	Low to medium
CH	High to very high	None	High

15.2 The soil is a *sand* if the percentage of gravel is estimated to be equal to or less than the percentage of sand.

15.3 The soil is a *clean gravel* or *clean sand* if the percentage of fines is estimated to be 5 % or less.

15.3.1 Identify the soil as a *well-graded gravel*, GW, or as a *well-graded sand*, SW, if it has a wide range of particle sizes and substantial amounts of the intermediate particle sizes.

15.3.2 Identify the soil as a *poorly graded gravel*, GP, or as a *poorly graded sand*, SP, if it consists predominantly of one size (uniformly graded), or it has a wide range of sizes with some intermediate sizes obviously missing (gap or skip graded).

15.4 The soil is either a *gravel with fines* or a *sand with fines* if the percentage of fines is estimated to be 15 % or more.

15.4.1 Identify the soil as a *clayey gravel*, GC, or a *clayey sand*, SC, if the fines are clayey as determined by the procedures in Section 14.

15.4.2 Identify the soil as a *silty gravel*, GM, or a *silty sand*, SM, if the fines are silty as determined by the procedures in Section 14.

15.5 If the soil is estimated to contain 10 % fines, give the soil a dual identification using two group symbols.

15.5.1 The first group symbol shall correspond to a clean gravel or sand (GW, GP, SW, SP) and the second symbol shall correspond to a gravel or sand with fines (GC, GM, SC, SM).

15.5.2 The group name shall correspond to the first group symbol plus the words "with clay" or "with silt" to indicate the plasticity characteristics of the fines. For example: "well-graded gravel with clay, GW-GC" or "poorly graded sand with silt, SP-SM" (see Fig. 2).

15.6 If the specimen is predominantly sand or gravel but contains an estimated 15 % or more of the other coarse-grained constituent, the words "with gravel" or "with sand" shall be added to the group name. For example: "poorly graded gravel with sand, GP" or "clayey sand with gravel, SC" (see Fig. 2).

15.7 If the field sample contains any cobbles or boulders, or both, the words "with cobbles" or "with cobbles and boulders" shall be added to the group name. For example: "silty gravel with cobbles, GM."

16. Report

16.1 The report shall include the information as to origin, and the items indicated in Table 13.

NOTE 13—*Example: Clayey Gravel with Sand and Cobbles, GC*—About 50 % fine to coarse, subrounded to subangular gravel; about 30 % fine to coarse, subrounded sand; about 20 % fines with medium plasticity, high dry strength, no dilatancy, medium toughness; weak reaction with HCl; original field sample had about 5 % (by volume) subrounded cobbles, maximum dimension, 150 mm.

In-Place Conditions—Firm, homogeneous, dry, brown

Geologic Interpretation—Alluvial fan

NOTE 14—Other examples of soil descriptions and identification are given in Appendixes X1 and X2.

NOTE 15—If desired, the percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages, as follows:

Trace—Particles are present but estimated to be less than 5 %
Few—5 to 10 %
Little—15 to 25 %
Some—30 to 45 %
Mostly—50 to 100 %

TABLE 13 Checklist for Description of Soils

1. Group name
2. Group symbol
3. Percent of cobbles or boulders, or both (by volume)
4. Percent of gravel, sand, or fines, or all three (by dry weight)
5. Particle-size range:
   Gravel—fine, coarse
   Sand—fine, medium, coarse
6. Particle angularity: angular, subangular, subrounded, rounded
7. Particle shape: (if appropriate) flat, elongated, flat and elongated
8. Maximum particle size or dimension
9. Hardness of coarse sand and larger particles
10. Plasticity of fines: nonplastic, low, medium, high
11. Dry strength: none, low, medium, high, very high
12. Dilatancy: none, slow, rapid
13. Toughness: low, medium, high
14. Color (in moist condition)
15. Odor (mention only if organic or unusual)
16. Moisture: dry, moist, wet
17. Reaction with HCl: none, weak, strong

For intact samples:

18. Consistency (fine-grained soils only): very soft, soft, firm, hard, very hard
19. Structure: stratified, laminated, fissured, slickensided, lensed, homogeneous
20. Cementation: weak, moderate, strong
21. Local name
22. Geologic interpretation
23. Additional comments: presence of roots or root holes, presence of mica, gypsum, etc., surface coatings on coarse-grained particles, caving or sloughing of auger hole or trench sides, difficulty in augering or excavating, etc.

16.2 If, in the soil description, the soil is identified using a classification group symbol and name as described in Test Method D 2487, it must be distinctly and clearly stated in log forms, summary tables, reports, and the like, that the symbol and name are based on visual-manual procedures.

17. Precision and Bias

17.1 This practice provides qualitative information only, therefore, a precision and bias statement is not applicable.

18. Keywords

18.1 classification; clay; gravel; organic soils; sand; silt; soil classification; soil description; visual classification

APPENDIXES

(Nonmandatory Information)

X1. EXAMPLES OF VISUAL SOIL DESCRIPTIONS

X1.1 The following examples show how the information required in 16.1 can be reported. The information that is included in descriptions should be based on individual circumstances and need.

X1.1.1 *Well-Graded Gravel with Sand (GW)*—About 75 % fine to coarse, hard, subangular gravel; about 25 % fine to coarse, hard, subangular sand; trace of fines; maximum size, 75 mm, brown, dry; no reaction with HCl.

X1.1.2 *Silty Sand with Gravel (SM)*—About 60 % predominantly fine sand; about 25 % silty fines with low plasticity, low dry strength, rapid dilatancy, and low toughness; about 15 % fine, hard, subrounded gravel, a few gravel-size particles fractured with hammer blow; maximum size, 25 mm; no reaction with HCl (Note—Field sample size smaller than recommended).

In-Place Conditions—Firm, stratified and contains lenses of silt 1 to 2 in. (25 to 50 mm) thick, moist, brown to gray; in-place density 106 lb/ft^3; in-place moisture 9 %.

X1.1.3 *Organic Soil (OL/OH)*—About 100 % fines with low plasticity, slow dilatancy, low dry strength, and low toughness; wet, dark brown, organic odor; weak reaction with HCl.

X1.1.4 *Silty Sand with Organic Fines (SM)*—About 75 % fine to coarse, hard, subangular reddish sand; about 25 % organic and silty dark brown nonplastic fines with no dry strength and slow dilatancy; wet; maximum size, coarse sand; weak reaction with HCl.

X1.1.5 *Poorly Graded Gravel with Silt, Sand, Cobbles and Boulders (GP-GM)*—About 75 % fine to coarse, hard, subrounded to subangular gravel; about 15 % fine, hard, subrounded to subangular sand; about 10 % silty nonplastic fines; moist, brown; no reaction with HCl; original field sample had about 5 % (by volume) hard, subrounded cobbles and a trace of hard, subrounded boulders, with a maximum dimension of 18 in. (450 mm).

X2. USING THE IDENTIFICATION PROCEDURE AS A DESCRIPTIVE SYSTEM FOR SHALE, CLAYSTONE, SHELLS, SLAG, CRUSHED ROCK, AND THE LIKE

X2.1 The identification procedure may be used as a descriptive system applied to materials that exist in-situ as shale, claystone, sandstone, siltstone, mudstone, etc., but convert to soils after field or laboratory processing (crushing, slaking, and the like).

X2.2 Materials such as shells, crushed rock, slag, and the like, should be identified as such. However, the procedures used in this practice for describing the particle size and plasticity characteristics may be used in the description of the material. If desired, an identification using a group name and symbol according to this practice may be assigned to aid in describing the material.

X2.3 The group symbol(s) and group names should be placed in quotation marks or noted with some type of distinguishing symbol. See examples.

X2.4 Examples of how group names and symbols can be incororated into a descriptive system for materials that are not naturally occurring soils are as follows:

X2.4.1 *Shale Chunks*—Retrieved as 2 to 4-in. (50 to 100-mm) pieces of shale from power auger hole, dry, brown, no reaction with HCl. After slaking in water for 24 h, material identified as "Sandy Lean Clay (CL)"; about 60 % fines with medium plasticity, high dry strength, no dilatancy, and medium toughness; about 35 % fine to medium, hard sand; about 5 % gravel-size pieces of shale.

X2.4.2 *Crushed Sandstone*—Product of commercial crushing operation; "Poorly Graded Sand with Silt (SP-SM)"; about 90 % fine to medium sand; about 10 % nonplastic fines; dry, reddish-brown, strong reaction with HCl.

X2.4.3 *Broken Shells*—About 60 % gravel-size broken shells; about 30 % sand and sand-size shell pieces; about 10 % fines; "Poorly Graded Gravel with Sand (GP)."

X2.4.4 *Crushed Rock*—Processed from gravel and cobbles in Pit No. 7; "Poorly Graded Gravel (GP)"; about 90 % fine, hard, angular gravel-size particles; about 10 % coarse, hard, angular sand-size particles; dry, tan; no reaction with HCl.

X3. SUGGESTED PROCEDURE FOR USING A BORDERLINE SYMBOL FOR SOILS WITH TWO POSSIBLE IDENTIFICATIONS.

X3.1 Since this practice is based on estimates of particle size distribution and plasticity characteristics, it may be difficult to clearly identify the soil as belonging to one category. To indicate that the soil may fall into one of two possible basic groups, a borderline symbol may be used with the two symbols separated by a slash. For example: SC/CL or CL/CH.

X3.1.1 A borderline symbol may be used when the

percentage of fines is estimated to be between 45 and 55 %. One symbol should be for a coarse-grained soil with fines and the other for a fine-grained soil. For example: GM/ML or CL/SC.

X3.1.2 A borderline symbol may be used when the percentage of sand and the percentage of gravel are estimated to be about the same. For example: GP/SP, SC/GC, GM/SM. It is practically impossible to have a soil that would have a borderline symbol of GW/SW.

X3.1.3 A borderline symbol may be used when the soil could be either well graded or poorly graded. For example: GW/GP, SW/SP.

X3.1.4 A borderline symbol may be used when the soil could either be a silt or a clay. For example: CL/ML, CH/MH, SC/SM.

X3.1.5 A borderline symbol may be used when a fine-grained soil has properties that indicate that it is at the boundary between a soil of low compressibility and a soil of high compressibility. For example: CL/CH, MH/ML.

X3.2 The order of the borderline symbols should reflect similarity to surrounding or adjacent soils. For example: soils in a borrow area have been identified as CH. One sample is considered to have a borderline symbol of CL and CH. To show similarity, the borderline symbol should be CH/CL.

X3.3 The group name for a soil with a borderline symbol should be the group name for the first symbol, except for:

CL/CH lean to fat clay
ML/CL clayey silt
CL/ML silty clay

X3.4 The use of a borderline symbol should not be used indiscriminately. Every effort shall be made to first place the soil into a single group.

X4. SUGGESTED PROCEDURES FOR ESTIMATING THE PERCENTAGES OF GRAVEL, SAND, AND FINES IN A SOIL SAMPLE

X4.1 *Jar Method*—The relative percentage of coarse- and fine-grained material may be estimated by thoroughly shaking a mixture of soil and water in a test tube or jar, and then allowing the mixture to settle. The coarse particles will fall to the bottom and successively finer particles will be deposited with increasing time; the sand sizes will fall out of suspension in 20 to 30 s. The relative proportions can be estimated from the relative volume of each size separate. This method should be correlated to particle-size laboratory determinations.

X4.2 *Visual Method*—Mentally visualize the gravel size particles placed in a sack (or other container) or sacks. Then, do the same with the sand size particles and the fines. Then, mentally compare the number of sacks to estimate the percentage of plus No. 4 sieve size and minus No. 4 sieve size present. The percentages of sand and fines in the minus sieve size No. 4 material can then be estimated from the wash test (X4.3).

X4.3 *Wash Test (for relative percentages of sand and fines)*—Select and moisten enough minus No. 4 sieve size material to form a 1-in (25-mm) cube of soil. Cut the cube in half, set one-half to the side, and place the other half in a small dish. Wash and decant the fines out of the material in the dish until the wash water is clear and then compare the two samples and estimate the percentage of sand and fines. Remember that the percentage is based on weight, not volume. However, the volume comparison will provide a reasonable indication of grain size percentages.

X4.3.1 While washing, it may be necessary to break down lumps of fines with the finger to get the correct percentages.

X5. ABBREVIATED SOIL CLASSIFICATION SYMBOLS

X5.1 In some cases, because of lack of space, an abbreviated system may be useful to indicate the soil classification symbol and name. Examples of such cases would be graphical logs, databases, tables, etc.

X5.2 This abbreviated system is not a substitute for the full name and descriptive information but can be used in supplementary presentations when the complete description is referenced.

X5.3 The abbreviated system should consist of the soil classification symbol based on this standard with appropriate lower case letter prefixes and suffixes as:

Prefix:	Suffix:
s = sandy	s = with sand
g = gravelly	g = with gravel
	c = with cobbles
	b = with boulders

X5.4 The soil classification symbol is to be enclosed in parenthesis. Some examples would be:

Group Symbol and Full Name	Abbreviated
CL, Sandy lean clay	s(CL)
SP-SM, Poorly graded sand with silt and gravel	(SP-SM)g
GP, poorly graded gravel with sand, cobbles, and boulders	(GP)scb
ML, gravelly silt with sand and cobbles	g(ML)sc

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X6. RATIONALE

Changes in this version from the previous version, D 2488 – 90, include the addition of X5 on Abbreviated Soil Classification Symbols.

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010198

COST ANALYSIS WORKSHEET
GROUND WATER EXTRACTION SYSTEM - 600 GPM - DISCHARGE TO ARROYO
WATER TREATMENT WITHOUT ION EXCHANGE FOR METALS REMOVAL; INCLUDES MONITORING WELL COSTS

COST COMPONENT	COST/YEAR	COST OCCURS					
	0	1	2	3	4	5	6
Capital Costs	1815488						
O&M Costs	0	516308	516308	516308	488308	488308	488308
Annual Expenditures	1815488	516308	516308	516308	488308	488308	488308
Discount Factor (5%)	1	0.952	0.907	0.863	0.822	0.783	0.746
Present Worth	1815488	491525.2	468291.3	445573.8	401389.1	382345.1	364277.7

7	8	9	10	11	12	13	14	15	16	17
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
0.711	0.677	0.645	0.614	0.585	0.557	0.53	0.505	0.481	0.458	0.436
347186.9	330584.5	314958.6	299821.1	285660.1	271987.5	258803.2	246595.5	234876.1	223645.0	212902.2

18	19	20	21	22	23	24	25	26	27	28
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
0.416	0.396	0.377	0.359	0.342	0.326	0.31	0.295	0.281	0.268	0.255
203136.1	193369.9	184092.1	175302.5	167001.3	159188.4	151375.4	144050.8	137214.5	130866.5	124518.5

TOTAL PRESENT WORTH COST

29	30	
488308	488308	
488308	488308	
0.243	0.231	
118658.8	112799.1	9397486.

010202

COST ANALYSIS WORKSHEET
GROUND WATER EXTRACTION SYSTEM - 600 GPM - DISCHARGE TO ARROYO
WATER TREATMENT INCLUDES ION EXCHANGE FOR METALS REMOVAL; INCLUDES MONITORING WELL COSTS

COST COMPONENT	COST/YEAR	COST OCCURS					
	0	1	2	3	4	5	6
Capital Costs	2062538						
O&M Costs	0	516308	516308	516308	488308	488308	488308
Annual Expenditures	2062538	516308	516308	516308	488308	488308	488308
Discount Factor (5%)	1	0.952	0.907	0.863	0.822	0.783	0.746
Present Worth	2062538	491525.2	468291.3	445573.8	401389.1	382345.1	364277.7

7	8	9	10	11	12	13	14	15	16	17
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
0.711	0.677	0.645	0.614	0.585	0.557	0.53	0.505	0.481	0.458	0.436
347186.9	330584.5	314958.6	299821.1	285660.1	271987.5	258803.2	246595.5	234876.1	223645.0	212902.2

18	19	20	21	22	23	24	25	26	27	28
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
0.416	0.396	0.377	0.359	0.342	0.326	0.31	0.295	0.281	0.268	0.255
203136.1	193369.9	184092.1	175302.5	167001.3	159188.4	151375.4	144050.8	137214.5	130866.5	124518.5

TOTAL PRESENT WORTH COST

29	30	
488308	488308	
488308	488308	
0.243	0.231	
118658.8	112799.1	9644536.

010206

COST ANALYSIS WORKSHEET
GROUND WATER EXTRACTION SYSTEM - 600 GPM - REINJECTION
WATER TREATMENT WITHOUT ION EXCHANGE FOR METALS REMOVAL; INCLUDES MONITORING WELL COSTS

COST COMPONENT	COST/YEAR COST OCCURS						
	0	1	2	3	4	5	6
Capital Costs	1975244						
O&M Costs	0	516308	516308	516308	488308	488308	488308
Annual Expenditures	1975244	516308	516308	516308	488308	488308	488308
Discount Factor (5%)	1	0.952	0.907	0.863	0.822	0.783	0.746
Present Worth	1975244	491525.2	468291.3	445573.8	401389.1	382345.1	364277.7

7	8	9	10	11	12	13	14	15	16	17
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
0.711	0.677	0.645	0.614	0.585	0.557	0.53	0.505	0.481	0.458	0.436
347186.9	330584.5	314958.6	299821.1	285660.1	271987.5	258803.2	246595.5	234876.1	223645.0	212902.2

18	19	20	21	22	23	24	25	26	27	28
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
0.416	0.396	0.377	0.359	0.342	0.326	0.31	0.295	0.281	0.268	0.255
203136.1	193369.9	184092.1	175302.5	167001.3	159188.4	151375.4	144050.8	137214.5	130866.5	124518.5

TOTAL PRESENT WORTH COST

29	30	
488308	488308	
488308	488308	
0.243	0.231	
118658.8	112799.1	9557242.

010210

COST ANALYSIS WORKSHEET
GROUND WATER EXTRACTION SYSTEM - 600 GPM - REINJECTION
WATER TREATMENT INCLUDES ION EXCHANGE FOR METALS REMOVAL; INCLUDES MONITORING WELL COSTS

COST COMPONENT	COST/YEAR	COST OCCURS					
	0	1	2	3	4	5	6
Capital Costs	2222294						
O&M Costs	0	516308	516308	516308	488308	488308	488308
Annual Expenditures	2222294	516308	516308	516308	488308	488308	488308
Discount Factor (5%)	1	0.952	0.907	0.863	0.822	0.783	0.746
Present Worth	2222294	491525.2	468291.3	445573.8	401389.1	382345.1	364277.7

7	8	9	10	11	12	13	14	15	16	17
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
0.711	0.677	0.645	0.614	0.585	0.557	0.53	0.505	0.481	0.458	0.436
347186.9	330584.5	314958.6	299821.1	285660.1	271987.5	258803.2	246595.5	234876.1	223645.0	212902.2

18	19	20	21	22	23	24	25	26	27	28
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
488308	488308	488308	488308	488308	488308	488308	488308	488308	488308	488308
0.416	0.396	0.377	0.359	0.342	0.326	0.31	0.295	0.281	0.268	0.255
203136.1	193369.9	184092.1	175302.5	167001.3	159188.4	151375.4	144050.8	137214.5	130866.5	124518.5

TOTAL PRESENT WORTH COST

29	30	
488308	488308	
488308	488308	
0.243	0.231	
118658.8	112799.1	9804292.

010214

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

July 9, 1997

MEMORANDUM

SUBJECT: In the Matter of Sparton Technology, Inc.
Docket No. RCRA VI-001(h)-96-H

FROM: George Malone, III
Regional Judicial Officer, Acting (6RC-HO)

TO: Jerry Clifford
Acting Regional Administrator (6RA)

Attached is a copy of the Recommended Decision for the above RCRA 40 C.F.R. Part 24 proceeding. Although there is no need for immediate action at this point, you are required by regulation to make the final decision after the parties are afforded the opportunity to comment on the Recommended Decision.

Each party has 21 days from issuance of the Recommended Decision to submit comments. Thereafter, your final decision should follow as soon as practicable. The final decision must be based upon the entire record, including comments submitted by the parties. When making the final decision you may decide to modify, withdraw or issue the Initial Order as originally drafted. I will prepare the final decision upon your request.

I would be happy to brief you on the significant issues in this action. Should you have any questions or concerns, please contact me at X8030. Thank you for your time and attention concerning this matter.

cc: Walter L. Sutton (w/ Attachment)

Attachment

010215

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REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)	
	)	U.S. EPA DOCKET NO.
SPARTON TECHNOLOGY, INC.	)	RCRA VI-001(h)-96-H
ALBUQUERQUE, NEW MEXICO	)	
	)	
EPA I.D. NO. NMD083212332	)	RECOMMENDED DECISION
	)	
RESPONDENT	)	

INTRODUCTION

The Environmental Protection Agency (EPA) filed and issued an initial administrative order (Initial Order) on September 16, 1996, against Sparton Technology, Inc., the Respondent, requiring corrective action under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h).[1] Respondent received a copy of the Initial Order on September 18, 1996. On October 18, 1996, Respondent filed a request for a public hearing regarding the Initial Order issued by the EPA.

This recommended decision provides analysis concerning many issues of law and fact, as Respondent's request for a public

[1] Along with the Initial Order, EPA provided a copy of the administrative record and filed an administrative record index with the Regional Hearing Clerk. The Regional Hearing Clerk made the administrative record and index available for review during normal business hours. The Initial Order issued in this case requires corrective action including soil vapor extraction, groundwater extraction and treatment, and reinjection of treated groundwater or reuse at the surface.

010216

hearing identified numerous disputes. For the reasons set forth in the discussion below, I recommend the following decision to the EPA Regional Administrator for Region 6.

STATUTORY BACKGROUND

RCRA was enacted in 1976 to establish a comprehensive cradle-to-grave program for regulating the treatment, storage and disposal of hazardous waste. While Section 3005 requires facilities that treat, store or dispose of hazardous waste, to obtain a permit from either EPA or an authorized state (See 42 U.S.C. § 6925), Congress realized EPA did not have the resources to issue final permits to all affected facilities within the statutory time-frame allowed. Thus, Congress enacted Section 3005(e), which set forth the requirements for facilities in operation before November 19, 1980. In addition to satisfying all requirements found in Section 3005(e), facilities in operation before November 19, 1980, must apply for a permit before they are allowed to operate under interim status. Interim status authorizes facilities to treat, store and dispose of hazardous waste until a final permit decision is made by EPA or an authorized state.

Additionally, Congress amended RCRA in 1984 with passage of the Hazardous and Solid Waste Amendments (HSWA). HSWA provided EPA with authority to require permitted or interim status owners and operators of treatment, storage and disposal facilities to investigate and clean-up hazardous waste or constituents released

into the environment. See 42 U.S.C. §§ 6924(u), (v) and 6928(h). The investigation and clean-up of hazardous waste is referred to as corrective action in Section 3008(h). See 42 U.S.C. §§ 6928(h).

EPA's corrective action authority allows issuance of initial administrative orders to interim status owners and operators. See 42 U.S.C. § 6928(h).[2] Upon request for a public hearing by the recipient of an order issued under Section 3008(h), EPA is required to conduct a public hearing if the request was made within 30 days of service of the order. In 1988, EPA promulgated regulations to govern public hearing proceedings under Section 3008(h).

REGULATORY BACKGROUND

Any order issued under Section 3008(h) of RCRA requiring corrective action is subject to the Rules Governing Issuance of and Administrative Hearings on Interim Status Corrective Action Orders (Rules), found at 40 C.F.R. Part 24. If the initial administrative order requires a respondent to undertake specified corrective measures, either alone or in conjunction with the RCRA Facility Investigation or Corrective Measures Study, then procedures in 40 C.F.R. Part 24, Subpart C (Hearings on Orders Requiring Corrective Measures), govern.

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[2] When an administrative order is issued unilaterally under RCRA Section 3008(h), the order is referred to as an initial administrative order. See 40 C.F.R. § 24.02(a).

Subpart C provides more formality than 40 C.F.R. Part 24, Subpart B (Hearings on Orders Requiring Investigations or Studies), with respect to the submission of evidence and argument before and at hearings. An example of heightened formality provided in Subpart C proceedings, include a respondent's right to request permission to submit up to 25 written questions to the EPA concerning "issues of material fact in the order." See 40 C.F.R. § 24.14(d). However, both Subpart B and C, are informal adjudicatory procedures that do not afford the parties to the hearing the right to either, call or cross-examine witnesses. See 40 C.F.R. §§ 24.11, 24.15. Under 40 C.F.R. § 24.15, the Presiding Officer may question the representatives of each party, but does not possess authority akin to formal EPA procedures found at 40 C.F.R. § 22.04(c).

Although the Presiding Officer recommends a decision to the Regional Administrator, the parties have the opportunity to file comments on the recommended decision within 21 days of service of the recommendation. See 40 C.F.R. § 24.17. The governing rules require the Regional Administrator to issue a final decision on initial administrative orders based upon the administrative record. See 40 C.F.R. § 24.18. However, before the Regional Administrator issues a final decision, pursuant to 40 C.F.R. § 24.06, the Regional Administrator is required to designate a Presiding Officer to preside over pre-hearing, public hearing, and post-hearing proceedings.

The Presiding Officer is authorized to issue orders governing the pre-hearing, public hearing, and post-hearing proceedings. For example, these orders would normally include scheduling the public hearing, setting the agenda for the public hearing, scheduling submission of each party's memorandum on the facts and the law, deciding whether responses to a respondent's questions presented are warranted, scheduling submission of additional information before the hearing, and scheduling submission of post-hearing information. See 40 C.F.R. § 24.14.

PROCEDURAL BACKGROUND

After EPA filed and issued the Initial Order requiring corrective action and Respondent requested a hearing, EPA filed a motion dated October 21, 1996, with this tribunal requesting a schedule for pre-hearing submissions and a hearing date. On October 31, 1996, the Regional Administrator designated a Presiding Officer to conduct the public hearing for this case.[3] This tribunal filed a pre-hearing and hearing schedule on December 16, 1996. That schedule was modified on January 30, 1997.

Consistent with the modified prehearing schedule, on February 4, 1997, Respondent filed its memorandum and position on the facts, the law and the relief sought by EPA. Respondent also

[3] Because the originally designated Presiding Officer is no longer employed by EPA, the Regional Administrator appointed the current Acting Regional Judicial Officer as Presiding Officer on January 6, 1997.

filed a request to submit written questions to EPA on February 10, 1997, which was denied on February 18, 1997. On March 14, 1996, Respondent submitted additional information supporting its position on the facts, law, and relief sought by EPA.

With respect to the public hearing held on March, 27, 1997, this tribunal issued an order setting the hearing agenda on March 21, 1997. On the same date, this tribunal denied both parties request to submit additional information. During the public hearing held at the Regional office in Dallas, Texas, 14 exhibits were entered into the hearing record on behalf of Respondent, while three were admitted for EPA.

EPA requested the opportunity to file a post-hearing response to Respondent's 14 exhibits during the public hearing and on April 3, 1997. This tribunal ordered that a response was appropriate, and directed both parties to submit post-hearing responses by April 22, 1997. Respondent's April 18, 1997, request for reconsideration of the post-hearing response order was denied on April 21, 1997. The transcript of the public hearing was finalized on April 15, 1997, and received by this tribunal shortly thereafter.

SCOPE AND STANDARD OF REVIEW

The scope and standard of review for this proceeding are limited to assessing the validity of the Initial Order under applicable federal laws and regulations. Pursuant to applicable law found at Section 3008(h), before EPA initiates corrective

action, the EPA Administrator makes a determination that there is, or has been a release of hazardous waste into the environment, from a facility authorized to operate under RCRA Section 3005(e). Once that determination is made, EPA may issue an order requiring corrective action or other response measures deemed necessary to protect human health and environment. See 42 U.S.C. § 6928(h). When EPA issues a corrective action order under Section 3008(h), the order must state with reasonable specificity the nature of the required response and time-frame for compliance. See 42 U.S.C. § 6928(h).

Applicable federal regulations require the Presiding Officer to review and evaluate the entire administrative record and, prepare and file a recommended decision with the Regional Administrator. See 40 C.F.R. § 24.17. The recommended decision must be based on the entire administrative record and provide an explanation, with citation to the record for any decision to modify, withdraw or issue the order without change. See 40 C.F.R. § 24.17.

Before issuing a recommended decision, the Presiding Officer performs a sequential evaluation of the case. First, the Presiding Officer must address all "material issues of fact or law properly raised by respondent," and must recommend that the order be modified, withdrawn or issued without modification. See 40 C.F.R. § 24.17. The recommended decision need not address immaterial issues of fact or law. This tribunal interprets the

phrase "material issues of fact or law properly raised by respondent," to be analogous to the federal summary judgment standard set forth in Fed. R. Civ. P. 56. Therefore, a respondent must show that any factual issue identified is material. A factual issue is material when under applicable law, the fact might affect the outcome of the proceeding. In addition, factual issues must be properly raised. That is, a respondent must follow procedures set forth in 40 C.F.R. Part 24, and present sufficient probative evidence from which a reasonable decision maker could find in respondent's favor, by a preponderance of the evidence. If, on the other hand, the evidence, viewed in a light most favorable to a respondent, is such that no reasonable decision maker could find in respondent's favor, then it is appropriate for this tribunal to deny a respondent's requested relief provision.[4]

Second, if the Presiding Officer finds that any contested relief provision in the order is unsupported by a "preponderance of the evidence" in the record, the Presiding Officer shall recommend that the order be modified and issued on terms that are supported by the record, or withdrawn. See 40 C.F.R. § 24.17.

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[4] A detailed analysis on the "genuine issue of material fact" standard can be found in numerous sources. Two examples include the Supreme Court review in Celetox v. Catrett, 477 U.S. 317 (1986), and the Environmental Appeals Board in, In re Mayaguez Regional Sewage Plant, 4 E.A.D. 772, 780 (EAB 1993), aff'd sub nom. Puerto Rico Aqueduct and Sewer Authority v. U.S. EPA, 35 F.3d 600 (1st. Cir. 1994).

This tribunal interprets the phrase "preponderance of the evidence" to mean evidence that is of greater weight or more convincing than other evidence offered in opposition. Stated differently, the phrase means evidence when taken as a whole, shows that the fact sought to be proved is more probable than not. The "preponderance of the evidence" standard has been interpreted to mean "evidence that a reasonable person would accept as sufficient to find a contested fact more probably true than untrue." Sanders v. U.S. Postal Service, 801 F.2d 1328, 1330 (Fed. Cir. 1986).

DISCUSSION

A. The Administrator's Determination

Jurisdiction. Respondent sets forth jurisdictional arguments to issuance of the Initial Order. Specifically, Respondent argues the Region's Compliance Assurance and Enforcement Division Director does not have the authority to issue the September 16, 1996, Section 3008(h) Order. See Respondent's Protective Response and Request for Hearing, p. 2. Respondent believes only the EPA Administrator has the authority to issue Orders under Section 3008(h), and Congress did not intend for such authority to be delegated. In addition, Respondent contends if such authority could be delegated, it was only intended to extend to Regional Administrators, and not lower level employees.

EPA counters by asserting that the authority to issue the Initial Order was properly delegated to the Regional Administrator and further delegated to the Director of Compliance Assurance and Enforcement Division. In addition, EPA notes Respondent's citation to pertinent delegations of authority in its proposed Initial Order, included in Attachment E of its memorandum on the facts, law and relief sought by EPA. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 58; and Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, Attachment E, p. 1.

Upon review of the administrative record and submissions of both Respondent and EPA in this Part 24 proceeding, there is no information indicating that the Director of Compliance Assurance and Enforcement does not possess authority to issue the Initial Order in question. See Administrative Record, pp. 008429-008434. However, it is clear that when making a Section 3008(h) determination, the Regional Administrator may rely on his/her representative's recommendation. See United States v. Environmental Waste Control, 710 F. Supp. 1172, 1228 (N.D. Ind. 1989). Moreover, the District of Columbia Circuit Court of Appeals has already upheld 40 C.F.R. Part 24, which in part, demonstrates that the EPA Administrator can delegate to his/her subordinates, the authority to issue and make final decisions concerning Section 3008(h) initial orders. See Chemical Waste

Management v. U.S. EPA, 873 F.2d 1477 (D.C. Cir. 1989). For example, 40 C.F.R. § 24.02(b), in part, requires that initial orders be issued by persons other than the Regional Administrator when an EPA Regional Office is the issuer, rather than EPA Headquarters. This is consistent with 40 C.F.R. § 24.18, which directs the Regional Administrator to make the final decision for contested initial orders.

Based upon the delegation of authority cited by both parties in submissions to this tribunal and included in the administrative record, and review of 40 C.F.R. Part 24, the preponderance of the evidence demonstrates that the Director of the Compliance Assurance and Enforcement Division is empowered to issue initial orders, including the one at issue here. However, the Initial Order should be modified to cite the correct date for the applicable delegation of authority. The administrative record indicates that the pertinent delegation of authority is "July 27, 1995," not April 16, 1985, as cited by both parties. See Administrative Record, p. 008433.

Administrative Record. Next, Respondent contends the administrative record does not support the relief ordered by EPA, and is neither complete nor accurate. Respondent believes the Initial Order was based upon political factors, bad faith and improper motives, instead of technical considerations, and was decided before the record was developed. In addition, Respondent

affirmatively asserts the Initial Order should be dismissed because it is based on the administrative record and not the administrative order on consent (AOC) for corrective measures study (CMS). Respondent claims the CMS sets forth the requirements to be considered when selecting the remedy, not the proposed corrective action rules. See Respondent's Protective Response and Request for Hearing, pp. 2, 4, 8, 18 and 19; Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 1-2; and Additional Information Supporting Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 12.

With respect to the administrative record, EPA responds by noting the administrative record consists of almost 9,000 pages. Further, Respondent was provided the opportunity to submit documents to EPA for placement in the administrative record. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 58-59.

Despite numerous opportunities to explain how and why the administrative record was materially inadequate and/or incomplete, Respondent failed to do so. Thus, in all likelihood, Respondent waived this argument because it was not properly raised and pursued in accordance with applicable regulations. See U.S. EPA v. Environmental Waste Control Inc., 917 F.2d 327, 331 (7th Cir. 1990); and 40 C.F.R. § 24.14(c). These

opportunities include the submission of both, its opening position on the facts and the law, and additional information regarding its position on the facts and the law, and participation in the public hearing. Moreover, this tribunal thoroughly reviewed the administrative record in question, to determine its completeness and material accuracy.[5]

Review of the record shows that Respondent, EPA, the State of New Mexico, County of Bernalillo, City of Albuquerque, and the local community all participated in the final selection of a remedy to address site contamination. It demonstrates the final remedy decision was made only after technical sampling and analysis, the exchange of ideas and opinions, comments of experienced technical and legal representatives and informed citizens. The administrative record also shows that EPA provided reasons for accepting or rejecting various proposals. See Administrative Record, pp. 008640-008657. An example of the above findings includes Respondent's conduct of the RCRA facility investigation and CMS for the site. See Administrative Record, pp. 005490-005703, 005803-006023, 000001-000173. In addition, the administrative record indicates detailed public participation

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[5] The administrative record index was filed on September 16, 1996, the same date as the Initial Order, pursuant to 40 C.F.R. § 24.04. Respondent does not offer supporting information for its allegation that EPA pre-selected the final remedy before compilation of the administrative record. Section 24.17 of 40 C.F.R. Part 24 does not authorize relief for speculative concerns.

prior to the final remedy selection. See Administrative Record, pp. 008640-008657, 002274-002279, 002302-002380, 002664-002667, 002669-002685, 003647-003648.

The Administrative Procedures Act (APA), 5 U.S.C. § 706, by analogy, serves as a guide in determining circumstances which may warrant additions to an administrative record. Pursuant to case law interpreting the APA, such circumstances include: 1) When necessary to explain agency action; 2) When it appears the agency relied on documents or materials not included in the administrative record; 3) When necessary to explain complex matters; and 4) Where there is a strong showing of agency bad faith or improper behavior. See U.S. v. Seafab Metal Corp., 28 ERC 1231, 1233 (June 2, 1988). Because Respondent failed to explain its contentions and the record does not support a finding of any of the above factors, no relief can be granted under 40 C.F.R. § 24.17. Respondent's speculative concerns do not provide support a determination that the administrative record is inadequate. A Regional Administrator's decision is entitled to a presumption of regularity, See Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402, 415 (1971), and will not be set aside with supporting evidence. With these findings and reasons in mind, Respondent is not entitled to its requested relief concerning the administrative record.

In addressing Respondent's request that the Initial Order be dismissed because it is based upon the administrative record and

not the CMS in accordance with the AOC, EPA denies such relief should be granted. EPA contends the AOC for CMS does not on its face support Respondent's allegation that EPA was required to select Respondent's preferred remedy. Further, EPA explains that the AOC requires Respondent to identify corrective measures alternatives and "recommend" a remedy for selection. In addition, EPA asserts the AOC specifically provides, "EPA will select" the appropriate corrective measure for the site. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 56-57.

Not only does the administrative record fail to support Respondent's argument that the Initial Order should be based upon the CMS in accordance with the AOC, 40 C.F.R. § 24.03, the applicable regulation, does not support Respondent's contentions as well. See Administrative Record, p. 006071. This provision mandates EPA to produce a copy of the administrative record supporting the findings of fact, determinations of law, and relief sought in the initial administrative order. This administrative record must include all relevant documents and oral information reduced to writing, which EPA considered in developing and issuing the initial administrative order. From the language of 40 C.F.R. § 24.03(b), it is clear that any initial order must be based upon the administrative record produced by EPA, not an AOC for CMS as Respondent alleges. As mentioned earlier, these controlling regulations (40 C.F.R. Part

24) have been upheld. See Chemical Waste Management v. U.S. EPA, 873 F.2d 1477 (D.C. Cir. 1989). Therefore, Respondent's allegations and requested relief lack merit.

Because Respondent erroneously asserts the AOC for CMS and the final CMS provide the proper criteria governing the remedy selection process, this tribunal cannot grant any relief from the Initial Order on that basis. See Additional Information Supporting Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 12. Review of this particular issue, selection of corrective action remedies, has already been addressed by another administrative tribunal. Specifically, in the case, In re Delco Electronics Corporation, 5 EAD 475, 487 (EAB 1994),[6] the Environmental Appeals Board (EAB) held that an unexplained deviation or unreasoned justification from the approach to remedy selection outlined in the proposed Agency rule was unacceptable.

According to the proposed rule in question (Proposed 40 C.F.R. 264.525), it is proper to consider a remedy for implementation only if it satisfies four minimum standards, including: 1) The remedy is protective of human health and the environment; 2) The remedy attains media clean-up standards; 3) The remedy controls the sources of releases to reduce or eliminate further releases; and 4) The remedy complies with

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[6] The citation method utilized is based upon Environmental Appeals Board decisions placed in green bound volumes. The bound volumes are titled, Environmental Administrative Decisions (EAD).

standards for management of wastes. If, and only if, more than one remedy satisfies these minimum requirements, is further review necessary. Any additional remedy review would include the following: 1) Their long-term reliability and effectiveness; 2) The degree to which the remedies will reduce toxicity, mobility, or volume of the hazardous wastes and/ or constituents; 3) The remedies short-term effectiveness, and short-term risks they may pose; 4) Implementability of the remedies; 5) Costs of the remedies; 5) Affected State's acceptance and 6) Acceptance by the local community.

According to Respondent's argument and the record before this tribunal, there is no basis for concluding the AOC for CMS and the final CMS terminated on June 24, 1996, provide a reasoned justification to deviate from the Proposed 40 C.F.R. § 264.525 corrective action rule. Number one, Respondent's argument fails to demonstrate that it utilized the required two-step analysis to determine whether or not proper remedy selection factors were considered. Number two, from review of the final CMS terminated on June 24, 1996, Respondent did not demonstrate that minimum remedy selection standards were satisfied. See Administrative Record, pp. 005700-005703. Respondent's justification for selection of its recommended remedy discusses protectiveness to human health/environment, performance, reliability, and implementability. Without further explanation, Respondent failed to show that its recommended remedy satisfied the minimum remedy

selection standards. Consequently, Respondent's remedy selection factors are not justified here.

Affirmative Defenses. Furthermore, Respondent submits affirmative defenses that do not question the Administrator's authority to issue the Initial Order, but contends the Administrator's process for challenging the Initial Order is defective. Respondent believes the Initial Order is unenforceable because the procedures to challenge it violate due process and are unconstitutional. In short, Respondent believes the terms of the Initial Order deprives it of the opportunity to be heard, as there is no meaningful discovery and confrontation of opposing witnesses. In addition, Respondent contends the Initial Order is unenforceable because the procedures are biased, based on the fact that an administrative law judge did not preside over the proceedings. See Respondent's Protective Response and Request for Hearing, pp. 7 and 18; Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 12-13, and Public Hearing Record, pp. 9-12.

EPA contends all affirmative defenses alleged by Respondent must be supported by evidence sufficient to satisfy its burden of the proof. According to EPA, Respondent has not satisfied its burden of proof here. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 59. From the discussion below, it is evident that Respondent has not provided

the requisite legal or factual support to sustain its affirmative allegations.

As mentioned earlier, the procedures for disputing this Initial Order found at 40 C.F.R. Part 24 are constitutional. See Chemical Waste Management v. U.S. EPA, 873 F.2d 1477, 1483-1485 (D.C. Cir. 1989). Thus, to the extent Respondent challenges 40 C.F.R. Part 24, these claims lack merit, and do not affect the outcome of this proceeding. Although 40 C.F.R. § 24.15 expressly prohibits direct and cross-examination by the parties, the March 27, 1997, public hearing allowed Respondent to rebut information submitted by EPA officials. See Public Hearing Record, pp. 51-119, and 148-182. Respondent was afforded the opportunity to request permission for EPA to answer questions pursuant to 40 C.F.R. § 24.14(d); however, this tribunal found Respondent's questions were not properly before EPA for reasons set forth in 40 C.F.R. § 24.14(d). The informal rules found at 40 C.F.R. Part 24 provide this tribunal with the discretion to tailor proceedings in accordance with the circumstances of any given case. See Chemical Waste Management v. U.S. EPA, 873 F.2d 1477, 1482-1483 (D.C. Cir. 1989). Further, outside of a statutory or regulatory provision expressly providing so, there is no constitutional right to discovery in administrative proceedings. See Gilbert v. Johnson, 419 F.Supp. 859, 871-872 (N.D. Ga. 1976). Thus, Respondent's constitutional allegations concerning 40 C.F.R. Part 24, including the lack of meaningful discovery, has

no basis and is unsupported by applicable law and established facts.

Respondent alleges the Presiding Officer is biased because of institutional pressures, including personal and professional relationships with EPA officials responsible for enforcing Section 3008(h). As such, Respondent contends an administrative law judge should be assigned to this matter. Yet, applicable law and persuasive record evidence do not support Respondent's allegations. On its face, 40 C.F.R. § 24.06 directs EPA's Regional Administrator to designate a Presiding Officer for 40 C.F.R. Part 24 hearings, while 40 C.F.R. § 24.13 enumerates qualifications for any Presiding Officer.

There is no requirement that the Presiding Officer be an administrative law judge; however, the Presiding must be either the Regional Judicial Officer or an attorney employed by EPA.[7] The record also shows that neither the initial nor the current Presiding Officer were unqualified to preside over this administrative action. Consequently, Respondent's argument concerning the assignment of an administrative law judge to this action fails, as it is not supported by applicable law and credible record evidence.

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[7] The record includes November 15, 1996, and January 14, 1997, letters pertinent to Respondent's allegations. These letters demonstrate that both, the initially designated Presiding Officer, and current Presiding Officer, served as EPA's Regional Judicial Officer during their respective involvement in this Section 3008(h) action.

Apparently, Respondent overlooks the fact that government officials presiding over administrative actions enjoy the normal presumption of good faith, honesty and integrity, and this presumption must be refuted by undeniable proof. See Marine Shale Processors, Inc. V. U.S. EPA, 81 F.3d 1371, 1385 (5th Cir. 1996). Respondent's claims of institutional bias based upon alleged personal and professional relationships fail to demonstrate a risk of actual bias or prejudgment. See Public Hearing Record, p. 13. Respondent does not point to specific events, occurrences, where personal and professional relationships present a risk of actual bias or prejudgment by the Presiding Officer. For example, the record does not include any information demonstrating a continuing controversy between the Presiding Officer and Respondent. The record does not show that the Presiding Officer has any direct and substantial interest in the outcome. Nor does the record indicate that the Presiding Officer made public statements indicating prejudgment of adjudicative facts, thereby precluding an impartial decision of the action on the merits. Because Respondent failed to deliver such evidence, there is no risk of actual bias or prejudgement to overcome the presumption of good faith, honesty and integrity. See Withrow v. Larkin, 421 U.S. 35, 47 (1975).

Respondent's due process rights do not end with a public hearing. Clearly, the Presiding Officer only recommends a decision to the Regional Administrator. In part, 40 C.F.R. §

24.18 provides, "the Regional Administrator will either sign or modify such recommended decision, and issue it as a final decision." Here, before the Regional Administrator renders a final decision, Respondent has 21 days to submit comments on the recommended decision. See 40 C.F.R. § 24.17(b). The final decision is *in pectore judicis*, subject to possible influence, by Respondent. Respondent will have ample opportunity to comment on and scrutinize this Recommended Decision. Accordingly, the Respondent's due process claims are without legal merit in light of applicable law, and credible record evidence.

Additional Constitutional Defenses. Also, Respondent asserts similar defenses to those mentioned above which deserve attention. These arguments include Respondent's assertion that the submissions/agency approval/additional work, dispute resolution, reservation of rights, subsequent modification of the order, and termination and satisfaction provisions included in the Initial Order constitute a deprivation of Respondent's right to any meaningful hearing and/or judicial review. Although the Initial Order contains a dispute resolution provision, Respondent asserts it is defective because the provision limits judicial review and shifts the administrative burden proof to Respondent in resolving any disputes involving modifications to report or plans. See Respondent's Protective Response and Request for Hearing, p. 7; and Memorandum Regarding Sparton's Position on the

Facts, Law and Relief Sought by EPA, pp. 12-13.[8]

Although Respondent's allegations are numerous, EPA believes they are groundless, as they fail to cite to controlling legal authority. Further, EPA states that Respondent can invoke the dispute resolution provision of the Initial Order to address any concerns regarding the approval of submissions, and revisions to plans and reports. In addition, EPA believes the dispute resolution provision in the Initial Order satisfies due process requirements. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 44-48.

Upon review of the Initial Order and Respondent's arguments, it appears that Respondent's contentions have no merit here. The dispute resolution provision included in the Initial Order affords Respondent the opportunity to be heard. However, the EAB decision, In Re General Electric, 4 EAD 615 (EAB 1993), cited by EPA, relevant regulations and the administrative record, present due process concerns regarding the dispute resolution provision included in the Initial Order. See Administrative Record, pp. 008429-008434. The Fifth Amendment to the United States Constitution due process guarantees that before a deprivation of property occurs, the person being deprived must be given a notice of the impending deprivation and an opportunity for a hearing to

[8] Because this tribunal lacks jurisdiction to entertain the judicial review issue raised by Respondent, it will not be addressed here.

present reasons why such deprivation should not take place. See Matthews v. Eldridge, 424 U.S. 319, 333 (1976). While neither party specifically mentions a deprivation of property, the record demonstrates that substantial corrective action costs are associated with the contaminated groundwater and soil at the site. See Administrative Record, pp. 008627-008640, 008645. From the financial assurance terms of the Initial Order, the burden to pay for the clean-up is squarely upon Respondent's shoulders. This constitutes more than enough evidence to implicate a deprivation of property, as several courts have assumed without discussion that an Agency decision requiring a person to comply with a requirement of RCRA, can result in a deprivation of property for purposes of the due process clause. See Chemical Waste Management, Inc. v. U.S. EPA, 873 F.2d 1477, 1483 (D.C. Cir. 1989) and W.R. Grace & Co.--Conn. v. U.S. EPA, 959 F.2d 360, 365 (1st Cir. 1992).

The next relevant issue involves the need to determine what kind of hearing is appropriate for the Initial Order. The modification terms of the Initial Order affords the Respondent the opportunity to request a public hearing under 40 C.F.R. Part 24, for any modifications of the Initial Order. Once again, it is pertinent to mention that these regulations have been upheld by a court of law. However, with respect to revisions of reports or plans, the Initial Order provides a dispute resolution provision, designed to address impasses, if ary, between

Respondent and EPA. This aspect of the Initial Order deserves careful review.

The type of hearing afforded by this dispute resolution provision includes informal oral discussions between the project managers, written objections from Respondent to the Hazardous Waste Enforcement Branch Chief (Chief), and a reply from such Chief within 10 days of receipt of written objections. Within 10 days receipt of the Chief's reply, Respondent may re-assert its objections to the Director of Compliance Assurance and Enforcement (Director) and request an informal conference. At that point, the Director issues a written decision within 10 days from the date of the informal conference. When analyzing particular procedural safeguards, the following should be considered: 1) The private interests that will be affected by the official action; 2) The risks of an erroneous deprivation of such interest through the procedures used, and the probable value, if any, of additional or substitute procedural safeguards; and 3) The Government's interest, including the function involved and the fiscal and administrative burdens that the additional or substitute procedural requirement would entail. See Matthews v. Eldridge, 424 U.S. 319, 335 (1976).

Here, with respect to the private interests of Respondent, neither Respondent nor EPA addressed how any particular EPA revision to a submission by Respondent, including a plan or report, may affect Respondent. Yet, from the cost estimates

associated with EPA's selected remedy, revisions to plans and reports may very well be costly. See Administrative Record, pp. 008634-008635. The risk of erroneous deprivation appears negligible. The Director, through his technical and legal representatives, has demonstrated a thorough understanding of problems presented by the facility and corrective measures necessary to properly address the site. See Public Hearing Record, pp. 122-148.

Nonetheless, the policy used by the EAB in In Re General Electric, 4 EAD 615, 636 (EAB 1993),[9] and facts presented here, warrant review of the dispute resolution procedures included in the Initial Order. This review includes relevant 40 C.F.R. Part 24 procedures. Part 24 requires the Regional Administrator to make the final decision for initial orders where a public hearing has been requested. See 40 C.F.R. § 24.18. In this action, Respondent requested a public hearing on October, 18, 1996. As such, and in light of EPA's policy, fairness to Respondent regarding revisions to submissions, including plans or reports required by Initial Order, militates involvement of the final decision-maker. See In Re General Electric, 4 EAD 615, 636 (EAB 1993).

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[9] Although the cited case involves corrective action pursuant to a HSWA permit, the policy enunciated is clear. The policy provides that it is fair to involve the final decision-maker in disputes regarding revisions to corrective action plans or reports.

Under changed circumstances, this policy recommendation may be different. For example, if in this case, Respondent decided not to contest the Initial Order, then the dispute resolution provision included therein would be in conformity with relevant 40 C.F.R. Part 24 procedures. It is clear from the relevant regulation, 40 C.F.R. § 24.02(a), that initial orders become final orders either after issuance of a final decision by the Regional Administrator, or 30 days from issuance by the Director, if no hearing is requested. Because the Director would be the final decision-maker in the example provided, the policy used by the EAB and relevant regulation, would not support modification to the Initial Order's dispute resolution provision.

In determining the appropriate level of participation by the Regional Administrator, EPA's interests, including the fiscal and administrative burdens imposed, are factors which deserve consideration. In this action, Respondent elected to utilize the 40 C.F.R. Part 24 informal adjudicatory procedures, which in part, include participation in a public hearing. Any Agency action short of a modification to the Initial Order after the conduct of one public hearing, does not warrant the conduct of additional 40 C.F.R. Part 24 public hearings, due to scarce government resources. When EPA promulgated the informal adjudicatory procedures, it was clear that resources available to enforce Section 3008(h) were a significant concern. See Chemical Waste Management, Inc. v. U.S. EPA, 873 F.2d 1477, 1485 (D.C.

Cir. 1989).

Not only is it inappropriate to conduct additional public hearings to resolve disputes other than a modification to the Initial Order, there is no due process right to make an oral presentation before the Regional Administrator. See In Re General Electric, 4 EAD 615, 636 (EAB 1993). The record does not support a finding that oral presentations should be conducted before the Regional Administrator. First, it is highly evident that significant EPA resources have already been used in this action. Second, the final decision concerning this Initial Order will be issued by the Regional Administrator. Before the final decision is issued, the Regional Administrator will review comments on this Recommended Decision. Finally, the Regional Administrator's final decision will be based upon the entire record.

This tribunal recommends as a matter of policy, that the dispute resolution provision be modified. In accordance with the recommended modifications, the Regional Administrator may consult with the Regional Counsel or her/his designee in connection with disputes, if any, involving Respondent. The Regional Administrator will review Respondent's dispute reduced to writing concerning Respondent's submissions, including plans or reports. Also, the Regional Administrator will review the Director's written decision in response to the dispute. If the Regional Administrator deems modification of the written decision is

necessary, then the Director will make all required changes. The final written decision will be signed by the Regional Administrator. In addition, the final written decision will be issued to Respondent within 20 days from the date of the informal conference.

This tribunal does not believe these modifications to the Initial Order are unduly burdensome. These additional procedural safeguards preclude oral presentations before the Regional Administrator. In addition, the Regional Administrator is not required to draft the final written decision.

B. A Release Into The Environment

Respondent notes the operations involving the manufacture of electrical components began at the Coors Road site in 1961, and ceased in 1994. Since 1994, a machine shop has been operated at the site. In addition, spent chlorinated solvents associated with the manufacture of electric components were accumulated at the Coors Road site. Respondent expressed the "thought that there may have been releases of these solvents to the environment, which have impacted groundwater in the immediate vicinity of the Coors Road Plant." See Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 3.

The spent chlorinated solvents in question were specifically identified in a report written by Respondent's consultant, Mr.

Pierce Chandler. The report described the groundwater plume contaminated with chlorinated solvents at the Sparton facility. Plume constituents identified by Respondent are primarily trichlorethylene (TCE), 1,1,1 - Trichloroethane (TCA), 1,1 - Dichloroethylene (DCE) and Dichloromethane (DMA). Respondent's proposed Section 3008(h) order indicates that one or more following hazardous wastes and/or constituents were detected in the groundwater monitoring well at the facility: 1) trichloroethylene; 2) 1,1,1, trichloroethane; 3) 1,1 dichloroethylene; 4) methyl chloride; 5) tetrachloroethylene; 6) toluene; 7) benzene; and 8) chromium. See Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 9, Attachment A, p. 7, and Attachment E, p. 2.

EPA asserts that Respondent admitted to a release in the solvent storage sump at the facility. In addition, EPA explains that the term release should at a minimum include "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, escaping, leaching, dumping, or disposing into the environment." See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 10. Further, the proposed rules clarified that the definition of release also includes abandoned or discarded barrels, containers, and other closed receptacles containing hazardous wastes or other constituents, and releases permitted under other authorities. See Proposed Rule 40 C.F.R. §

264.501.

Aside from submissions by the parties, the administrative record shows that there was a release at the site. See Administrative Record, p. 005504. Other than its initial request for a public hearing, Respondent has not provided argument regarding this issue despite numerous opportunities to do so. Thus, it appears Respondent waived this argument because it was not properly raised and pursued in accordance with applicable regulations. See U.S. EPA v. Environmental Waste Control Inc., 917 F.2d 327, 331 (7th Cir. 1990); and 40 C.F.R. § 24.14(c). These opportunities include the submission of an initial brief, an additional information brief, and participation in the public hearing. At the public hearing Respondent stated, "we believe there are two fundamental issues that are presented in this proceeding, and the first is, what is the nature of the threat, if any, that's presented by the impacted ground water associated with Sparton's manufacturing facility, and secondly, what response is necessary." See Public Hearing Record, pp. 51-52.

More importantly, based on the weight of convincing information provided by the parties, there is no doubt there was a release at the site. As a matter of fact, careful review of the parties respective submissions regarding a release at the site, reveal that there is no actual ongoing controversy, and the issue is moot. See Honig v. Doe, 484 U.S. 305, 317 (1988). Simply put, both parties acknowledge that solvents have been

released into the soil and groundwater at the site.

While EPA concedes the term "environment," has not been defined in RCRA, it points to the legislative history to show that Section 3008(h) is not limited to any particular medium. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, page 11; and H.Rep. No. 1133, 98th Cong., 2nd Sess. 111-112 (1984). As noted above, the record, including submissions by the parties, demonstrates there has been a release into the soil and groundwater at the site. Accordingly, there is no live controversy regarding whether there was a release to the environment.

C. Hazardous Waste

Respondent disputes there has been a release of hazardous waste into the environment. At best, Respondent asserts, there has been a release of constituents of hazardous waste into the environment. See Respondent's Protective Response and Request for Hearing, pp. 3, 5.

In its response, EPA counters that the term "hazardous waste" as used in Section 3008(h), includes hazardous constituents which Respondent admits were released at the site. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 11-12. EPA cites United States v. Clow Water Systems, 701 F.Supp. 1345, 1356 (S.D. Ohio 1988), to support its position. In the case cited above, the court held

that EPA's interpretation of Section 3008(h) to encompass hazardous wastes and hazardous constituent was reasonable in light of the legislative history, and because hazardous constituents may pose a substantial present or potential hazard to human health or the environment. This interpretation is consistent with definition of hazardous waste and hazardous constituents included in the Subpart S Proposed Rules. See Proposed 40 C.F.R. § 265.501. Respondent has not offered any arguments setting forth authority to counter the EPA's position. Further, Respondent does not dispute groundwater testing results showing substantial levels of hazardous constituents in the groundwater at the site. See United States v. Environmental Waste Control, 710 F. Supp. 1172, 1226 (N.D. Ind. 1989).[10]

From the record including submissions by Respondent and EPA, and groundwater testing results, it is clear that hazardous constituents were released at the site. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 11-12, Attachment 1; and Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, Attachment A, pp. 7, 13-17, and Attachment E, p. 2. Accordingly, persuasive record evidence and applicable law support the conclusion that "hazardous waste," within the breadth of Section 3008(h), was

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[10] The hazardous constituents identified in groundwater testing results are listed in "A Release Into The Environment" section of this Recommended Decision.

released into the environment at the site.

D. From A Facility

While Respondent contends it is not the owner and operator of a hazardous waste management facility because it is not currently treating, storing or disposing of hazardous waste at the plant, a report written by Respondent's consultant identifies the Coors Road Plant as the "Sparton Technology Coors Road Facility." Respondent also admits operating the site from 1961 to date, and submitting a permit application under RCRA Subtitle C. See Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, Attachment A Cover Page, and p. 1; and Respondent's Protective Response and Request for Hearing, pp. 3, 5.

In response, EPA asserts that the clear language of Section 3008(h) provides authority for corrective action for any release at a facility, and Respondent's site constitutes a facility. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 12-13. The definition of "facility" as provided in the Subpart S Proposed Rules, "means all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA." This definition was upheld in the case, United Technologies Corporation v. U.S. EPA, 821 F.2d 714 (D.C. Cir. 1987).

Once again, it deserves attention that Respondent neither

pressed nor argued this issue after the initial request for a hearing, despite numerous opportunities to do so, and regulatory requirements mandating such action. In all probability, Respondent waived this argument because it was not properly raised and pursued in accordance with applicable regulations. See U.S. EPA v. Environmental Waste Control Inc., 917 F.2d 327, 331 (7th Cir. 1990); and 40 C.F.R. § 24.14(c). Evidently, there is no actual ongoing controversy regarding whether the Sparton Coors Road Plant is a "facility." See Honig v. Doe, 484 U.S. 305, 317 (1988). In addition, Respondent owned and operated the Sparton Coors Road facility in light of credible record evidence. See Administrative Record, pp. 008435-008436, 008437-008442; and Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, Attachment E, p. 1. From Respondent's own admissions cited in the above record evidence, and the definition of facility, there is no doubt in concluding that the Sparton plant is a "facility." Respondent clearly controls the site for which a RCRA Subtitle C permit was sought. As such, Respondent is entitled to no relief regarding this issue.

E. Authorized To Operate Under Section 3005(e)

Respondent disputes the designation, current owner and operator of a hazardous waste management facility or a generator of hazardous waste. According to Respondent it is not currently engaged in such activities. See Respondent's Protective Response

and Request for Hearing, pp. 3, 5. However, Respondent acknowledged that past operations involved the manufacture of electrical components from 1961 until 1994, while a machine shop is currently operated. From 1961 up to 1994, spent chlorinated solvents associated with the manufacture of electric components were accumulated at the Coors Road facility. See Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 3. Spent chlorinated solvents were also released into the environment as explained above.

More specific to the interim status issue, Respondent claims it has no records of hazardous waste being accumulated at the facility for longer than 90 days after November 19, 1980. Based upon that claim, Respondent asserts it did not own and operate a hazardous waste management facility on November 19, 1980, or afterwards.[11] See Memorandum Regarding Sparton's Position on the

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[11] Respondent's written submissions and public hearing testimony, which occurred after its initial request for a hearing, do not brief or press the interim status issue as required by 40 C.F.R. § 24.14(c). As such, it is likely Respondent waived this argument because it was not properly raised and pursued in accordance with applicable regulations. See U.S. EPA v. Environmental Waste Control Inc., 917 F.2d 327, 331 (7th Cir. 1990); and 40 C.F.R. § 24.14(c). Further, Respondent requested that if any Section 3008(h) order is issued here, it should contain facts and conclusions of law which establish corrective action liability. See Respondent's Protective Response and Request for Hearing, p. 13, Attachment E, pp. 1-3. From these circumstances and information contained in Respondent's permit application, I find that Respondent does not seriously dispute the interim status issue. As such, there is no ongoing controversy regarding this issue, See Honig v. Doe, 484 U.S. 305, 317 (1988), and Respondent is not entitled to any relief.

Facts, Law and Relief Sought by EPA, pp. 3, 5.

EPA asserted that in order to qualify for interim status, a facility must have been in existence on November 19, 1980, submitted a notification of hazardous waste activity by August 19, 1980, and a RCRA Part A application by November 19, 1980. Based upon these requirements, EPA contends Respondent operated as an interim status facility. Because credible information in the administrative record supports EPA's position, there is no question that Respondent operated as an interim status facility, despite its contentions. See Administrative Record, pp. 008435-008436, 008437-008442. Credible record evidence shows Respondent submitted interim status information as required by RCRA Section 3005(e). All documents submitted in satisfaction of Section 3005(e) requirements were certified as true by the Respondent's then existing, vice-president and general manager.

F. Corrective Action Or Such Other Response Necessary To Protect Human Health And The Environment

EPA Selected Remedy and Respondent's Preferred Remedy. In order to address the merits concerning actions necessary to remediate the Sparton Coors Road facility, a description of the final remedy selected by EPA is provided below. Likewise, a restatement of the remedy recommended by Respondent is also set forth. Each party's remedy selection process for this action is also discussed.

At one point, as evidenced by the CMS, Respondent

recommended on-site groundwater extraction and soil vapor extraction as its selected remedy. See Administrative Record, pp. 005692-005703. The recommended remedy consists of continued operation of the existing groundwater extraction system to remove contaminants, via an air stripper, from the groundwater at the facility, conversion of an existing monitoring well near the western fence-line of the facility to pump contaminated groundwater to the surface for treatment, natural attenuation, installation of five additional groundwater monitoring wells to confirm plume location and movement, sampling of vapor concentrations in the soil beneath the facility, and installation of a soil vapor extraction system if vapor concentrations are above the appropriate threshold value for volatile organic compounds. See Administrative Record, pp. 005692-005703.

Although the administrative agreement affording Respondent the opportunity to perform the CMS and recommend a remedy for the site was terminated, Respondent submitted a recent recommended remedy. The March 14, 1997, recommended remedy, a modification to Respondent's previous remedy, includes installation of one or more off-site containment wells pumping 200 gallons per minute at the leading edge of the contaminated groundwater plume,[12]

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[12] On one hand, Respondent stated the vertical and horizontal extent of the contaminated groundwater plume has already been defined, while on the other, it admitted uncertainty regarding the vertical extent of contamination. Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 9; and Public Hearing Record, pp. 128, 164-165. As

enhancement of the on-site groundwater extraction system to recover and treat 20 gallons per minute,[13] development and operation of an on-site soil vapor extraction system to reduce soil-sorbed and groundwater dissolved vapor concentrations to 10 parts per million or below, and discharge of the recovered and treated groundwater to the Calabacillas Arroyo. Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 8-9, Attachment E, pp. 4-5; and Additional Information Supporting Sparton's Position on the Facts, Law and Relief Sought by EPA, p. 10.

From the totality of remedy information provided by Respondent, if corrective action is required, the only issue currently in dispute includes the installation of interior wells to aggressively restore the contaminated aquifer. See Public Hearing Record, pp. 165-169. Because there is no actual ongoing controversy regarding implementation of the remaining components of EPA's selected remedy described below, these issues are moot. See Honig v. Doe, 484 U.S. 305, 317 (1988). The Respondent agrees to soil vapor extraction, acknowledges that EPA has not ruled out discharge of treated groundwater into the Calabacillas

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such, Respondent's position regarding definition of the plume is questionable and lacks credibility.

[13] According to data generated up to February 1992, Respondent's groundwater extraction wells flow rate averaged approximately eight gallons per minute. See Administrative Record, pp. 005698-005699.

Arroyo, and both parties agree that one or more off-site containment wells may be necessary. See Public Hearing Record, pp. 165-169.

On June 24, 1996, EPA selected the final remedy for the Sparton Coors Road facility. See Administrative Record, p. 008606. This remedy includes operation of an expanded groundwater extraction system and soil vapor extraction, and requires implementation in a phased approach building upon data collected, to ensure the design of an effective system to address the contamination. It includes the installation of groundwater extraction wells to prevent further migration of the contaminant plume, and restoration of the contaminated aquifer to its beneficial use. In addition, the remedy requires installation of the groundwater extraction wells at the facility, and in off-site areas. Groundwater monitoring wells are also required to be installed in off-site areas. The current cost estimate includes 20 groundwater monitoring wells. Consistent with Proposed 40 C.F.R. § 264.526(d), which provides for implementation of selected remedies in various phases, before a groundwater extraction system can be properly designed, the full extent of the plume must be determined. See Public Hearing Record, pp. 139-141.

After the horizontal and vertical extent on the contaminated groundwater is defined, groundwater extraction wells would be installed to prevent further migration of the off-site plume.

EPA estimated that one to three wells may be sufficient to prevent further migration from the leading edge of the plume, but information obtained during remedy design would provide the basis for selecting the final number of extraction wells. In addition to the existing groundwater extraction system in operation on-site, at least one or more extraction wells are required for installation during the initial phase of remedy implementation. Additional wells will be installed as necessary to restore the contaminated aquifer for use as a drinking water source, and to prevent further off-site migration.

EPA's selected remedy also includes treatment and disposal of the contaminated groundwater. Treatment will include the use of a new or expanded air stripper already in use at the site, due to the increased volume of water processed. Additional treatment may be necessary to remove metals from the contaminated groundwater. The two methods for disposal of treated groundwater identified are reinjection of the treated groundwater through injection wells and surficial reuse. Both options will receive further review upon implementation of the design phase of the remedy. There is precedent which allows EPA to select and plan implementation of either one or two corrective action technologies, or a combination of the two, to address groundwater contamination. See U.S. EPA v. Environmental Waste Control Inc., 710 F.Supp. 1172, 1241, 1255 (N.D. Ind. 1989). Thus, EPA's plan to consider two methods of disposal is both acceptable here, and

within its authority to determine necessary corrective action measures.

Another component of EPA's selected remedy includes installation of a soil vapor extraction system to remove volatile organic contaminants from the vadose zone. A preliminary clean-up target of 10 parts per million for chlorinated organic vapors was set by New Mexico; however, further evaluation of this target will be conducted during the design phase of the remedial action. See Administrative Record, pp. 008647-008652.

Remedy Selection Criteria for Respondent and EPA. Review of the record indicates that Respondent believes its recommended remedy is justified because it is protective of human health and the environment. Respondent also believes there is no threat to human health or the environment because of site contamination, and therefore, no remedy is necessary. See Administrative Record, pp. 005700-005703; Respondent's Protective Response and Request for Hearing, pp. 4, 8, 11; Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 5-8; and Additional Information Supporting Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 2-9.

According to Respondent, the contaminated ground water plume does not present a risk to human health, and will not result in the loss of any reasonable foreseeable use of the contaminated aquifer. Respondent also believes the existing groundwater

extraction system's performance demonstrated the ability to achieve significant reduction in contaminant concentration and can be easily monitored. With respect to the soil vapor extraction system, Respondent considers it a well-established methodology for remediation of volatile organic contamination, and performance was confirmed through implementation in the Albuquerque area with similar hydrogeologic conditions.

Respondent believes its recommended remedy is reliable and lacks implementability concerns. It notes the groundwater extraction system has been in operation more than seven and one-half years without significant difficulty or breakdown, and performance has not decreased. Similarly, Respondent acknowledged that soil vapor extraction technology is reliable, proven and widely implemented. However, Respondent recognized the groundwater extraction component of its recommended remedy would not achieve media clean-up standards within a reasonable time period. As such, Respondent realized that additional corrective measures could be necessary to address potential threats at the site. See Administrative Record, pp. 005700-005703.

Record evidence also includes Respondent's justification for its updated March 14, 1997, recommended remedy, which modified the previous remedy. Respondent states the installation and operation of one containment well at the leading edge of the off-

site plume will cause contaminants of concern in the contaminated aquifer to be at or below media clean-up standards within thirty years, and discharge of treated groundwater to the Calabacillas Arroyo is technically implementable, cost-effective and promotes water conservation. See Additional Information Supporting Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 11-12. Yet, at the public hearing Respondent stated that media clean-up standards at the site will not be achieved "within a reasonable amount of time" or "in anybody in this room's lifetime" because of technical difficulties. See Public Hearing Record, pp. 88-89, 179-180.[14]

EPA responds that there is a potential threat to human health and the environment. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 16-21. Before considering the potential threat to human health, which Respondent strenuously disputes, an analysis of the contaminated groundwater should be provided. As mentioned earlier, the contaminated groundwater at the Sparton facility falls within the definition of environment.

Because the City of Albuquerque and nearby municipalities rely on groundwater as its sole source of drinking water, an extensive groundwater protection plan has been developed. See

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[14] This evidence advanced by Respondent is in conflict with previous evidence set forth by Respondent. As such, Respondent's credibility concerning the attainment of media clean-up standards and technical impracticability is diminished.

Administrative Record, pp. 001895-002000. There is no doubt that this potential drinking water aquifer may be needed for future use. As such, the extensive contamination in this potential drinking water aquifer and location of the contamination, constitute a potential threat to the environment. Clearly, Respondent does not dispute that TCE concentration below the facility, and also located in a drinking water aquifer are as high as 7,600 parts per billion (ppb). In addition, there is no dispute that TCE concentrations near the center of the contaminated groundwater plume are as high as 3,200 ppb. TCE is not only toxic to human beings, but is also a probable human carcinogen. See U.S. EPA v. Environmental Waste Control Inc., 710 F.Supp. 1172, 1227 (N.D. Ind. 1989). The record shows Respondent and EPA both believe the contaminated groundwater plume has not been completely defined, and continues to migrate well beyond the facility's boundary. See Public Hearing Record, pp. 139-140, 164-165; and Respondent's Public Hearing Exhibits 1 and 2.

Based upon the above, there is a potential threat to the environment, and there is no need to determine a potential threat to human health. However, there is no question that contamination in such high levels, renders the affected groundwater unsafe for anyone to drink. See Administrative Record, p. 003554. It is not necessary for a catastrophic event, such as someone drinking contaminated groundwater, to occur

before ordering correction action. See U.S. EPA v. Environmental Waste Control Inc., 710 F.Supp. 1172, 1241 (N.D. Ind. 1989). Accordingly, there is a potential threat to human health presented by this site which requires corrective action.

Upon review of credible record evidence, Respondent's March 14, 1997, recommended remedy does not purport to satisfy minimum standards for remedy selection. As provided earlier, pursuant to Proposed 40 C.F.R. 264.525, it is proper to consider a remedy for implementation only if it satisfies four minimum standards, including: 1) The remedy is protective of human health and the environment; 2) The remedy attains media clean-up standards; 3) The remedy controls the sources of releases to reduce or eliminate further releases; and 4) The remedy complies with standards for management of wastes.

Reliable record evidence demonstrates Respondent failed to propose a remedy that will attain media clean-up standards, one of the four minimum remedy selection standards. Further, Respondent believes protection of human health and the environment can be attained without inclusion of applicable media clean-up standards. See Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 10-12; Public Hearing Record, pp. 106-108. As such, there is no basis to conclude that Respondent's recommended remedy satisfies Proposed 40 C.F.R. § 264.525.

Instead of recommending a remedy which attains media clean-

up standards, Respondent prefers a containment remedy, and provides that an aggressive interior groundwater extraction system is technically impractical. See Public Hearing Record, pp. 83-90, 108-109, 165-169. However, there is no record of Respondent submitting a technical impracticability demonstration in compliance with EPA guidance. See Public Hearing Record, pp. 141-143; Proposed 40 C.F.R. § 264.531; and Administrative Record, pp. 003365-003377, 001605-001638. Once again, Respondent failed to provide credible evidence supportive of a reasoned justification to deviate from Proposed 40 C.F.R. § 264.525, used as Agency guidance in selecting remedies. See In Re Delco Electronics Corporation, 5 EAD 475, 487 (EAB 1994). Because minimum standards for remedy selection have not been satisfied, there is no need to consider other remedy selection factors with respect to Respondent's recommended remedy. See In Re Delco Electronics Corporation, 5 EAD 475, 487 (EAB 1994). Therefore, the remedy proposed by Respondent cannot be implemented at the site.

In contrast to Respondent's proposed remedy, EPA's selected remedy demonstrates the proposed rules for corrective action were considered. See Administrative Record, pp. 008640-008647; Proposed 40 C.F.R. § 264.525; 55 Fed Reg. 30797, 30877-30879 (July 27, 1990); and EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 27-29. Furthermore, in addition to evidence included in the administrative record, EPA

provided sufficiently credible technical testimony consistent with Proposed 40 C.F.R. § 264.525, at the public hearing. See Public Hearing Record, pp. 27-31, 39-50. Because of such corroborating evidence, I find EPA's remedy selection evidence more convincing than Respondent's. Figure 12 of the EPA final decision document which identifies the selected remedy, demonstrates that in order for a remedy to be considered for implementation, it must meet four minimum standards. See Administrative Record, p. 008641.

These standards are overall protection to human health and the environment, attainment of media standards, control of the sources of releases and compliance with standards for management of wastes. After satisfying these standards, the remedy must withstand the five selection criteria. See Administrative Record, p. 008641. The five selection criteria are long-term reliability and effectiveness, reduction of toxicity, mobility, or volume of wastes, short-term effectiveness, implementability and cost. Thereafter, State and community acceptance may bear on the final remedy selection decision. See Administrative Record, p. 008641.

EPA construes its selected remedy as protective of human health and the environment because it will reduce the levels of contamination in the ground water and the soil. See Administrative Record, pp. 008640, 008647. Operation of EPA's selected groundwater monitoring and extraction activities will

restore the contaminated aquifer to its beneficial use, a potential useable drinking water source. According to EPA, applicable media clean-up standards, which include the more stringent of maximum contaminant levels for drinking water established under the Safe Drinking Water Act, 42 U.S.C. § 330f et seq., and maximum allowable contaminant concentrations for groundwater set by the State of New Mexico, will be attained by reducing the quantity of source material available for migration to the surrounding groundwater, and removal of contaminants throughout the contaminated aquifer. Contrary to the uncertainty associated with Respondent's recommended remedy, operation of EPA's selected soil vapor extraction system and groundwater extraction system will not only attain media clean-up standards, but will also control the sources of releases. See Administrative Record, pp. 008642, 008647, 008650.

EPA recognizes its selected remedy must comply with waste management standards. Waste management standards potentially identified include regulatory limits for discharge of contaminants into the atmosphere and disposal of residues. Air emissions from the air stripper utilized as part of the groundwater extraction and treatment system will be discharged into the atmosphere. Likewise, operation of the soil vapor extraction system will result in the discharge of air emissions. Before discharge into the air, these emissions will be treated to remove volatile organic contaminants. Any residue from the soil

and groundwater treatment will be disposed or treated at a permitted off-site facility. EPA's treatment train will be designed to attain discharge requirements for treated groundwater and air emissions. See Administrative Record, pp. 008643, 008650-008652.

After addressing the initial four standards for remedy selection, EPA went on to consider the five selection criteria and modifying circumstances. EPA's selected remedy offers long-term protection to human health and the environment because it includes an active approach to for the entire groundwater contaminant plume, including the source material remaining in the soil beneath the facility. Also, EPA's selected groundwater extraction and treatment system, and soil vapor extraction system result in the greatest reduction in toxicity, mobility, and volume of waste. EPA notes the selected technology serves to remove the maximum amount of contaminants from the groundwater plume and soil beneath the facility. See Administrative Record, pp. 008643-008644, 008649-008651.

Short-term effectiveness and implementability do not pose a problem for EPA's selected remedy. According to EPA, the utilization and operation of existing technology included in the selected remedy presents no exceptional technical obstacles. The design and engineering of off-site structures will account for potential acts of vandalism. See Administrative Record, pp. 008643-008644, 008649-008651. EPA believes that in light of

satisfying the objective of the clean up, restoration of the contaminated groundwater to its beneficial use, the selected remedy provides a solution to address the facility contamination at the lowest present worth costs. See Administrative Record, p. 008645. The State of New Mexico, County of Bernalillo and the City of Albuquerque, all prefer a remedy similar or more comprehensive to EPA's selected remedy. See Administrative Record, p. 008646. The locally affected community prefers a remedy similar to the one selected by EPA. See Administrative Record, pp. 008645-008646. Inclusion of the local government and community in decision making is grounded in the United States Constitution, where it has been widely recognized that certain functions are often best performed at local levels of government. Often, local levels of government have firsthand knowledge of the problems and insight to manageable solutions. See Garcia v. San Antonio Metro. Transit Auth., 469 U.S. 528, 574-576 (1985)(Powell, J., dissenting).

Because the above reliable evidence demonstrates that EPA's selected remedy comports with Proposed 40 C.F.R. § 264.525, the Respondent's remaining arguments concerning the adequacy of the selected remedy are immaterial and unconvincing. Respondent, as discussed previously, has not shown by credible record evidence, the ability to select a remedy in compliance with Proposed 40 C.F.R. § 264.525. However, to the extent Respondent has already performed remediation work required by the Initial Order that

EPA finds acceptable and approvable in accordance with Section 3008(h), Respondent should not be required to unnecessarily duplicate its efforts. See In Re General Motors Corporation, Delco Moraine Division, et al., 4 EAD 334, 340, 344 (EAB 1992). Thus, Respondent's installation of five additional groundwater monitoring wells after EPA selected the final corrective action remedy, should be considered by EPA during design and implementation of the remedy identified in the Initial Order. Ultimately, it is EPA's responsibility to determine if the five new wells are consistent with, and equivalent to requirements found in the Initial Order and standards imposed by HSWA. See In Re General Motors Corporation, Delco Moraine Division, et al., 4 EAD 334, 344 (EAB 1992). As such, this tribunal recommends modification to the Initial Order. In accordance with the recommended modification, Respondent shall submit to EPA the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants which in any way relates to the five additional groundwater monitoring wells installed after selection of EPA's remedy.

Relief Terms and Statutory Authority. Respondent also disputes significant portions of the Initial Order on the grounds they are outside the statutory authority provided to EPA. See Respondent's Protective Response and Request for Hearing, p. 7. For example, portions of the parties bound, work to be performed,

submissions/agency approval/additional work, facility access and record retention, sampling and data/document availability, and reservations of rights sections are disputed by Respondent. Additionally, the project manager, quality assurance, dispute resolution, financial assurance, indemnification of the United States, final agency action, statement of severability, and participation of community relations activities section of the Initial Order are disputed *in toto*. See Respondent's Protective Response and Request for Hearing, p. 7.

EPA replies that the legislative history for Section 3008(h) provides considerable discretion to the Agency in crafting contents of an initial order. Further, EPA notes that Respondent included some of the initially contested relief provisions, in its preferred Section 3008(h) Order. See EPA's Response to Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 37-40. In analyzing the language of Section 3008(h), this tribunal should give the words employed by Congress their ordinary meaning, while also construing them in light of the purposes Congress sought to serve. See Perrin v. United States, 444 U.S. 37, 42 (1979); and Chapman v. Houston Welfare Rights Org., 441 U.S. 600, 608 (1979).

From pertinent language of Section 3008(h), including, "the Administrator may issue an order requiring corrective action or such other response measure as he deems necessary," the grant of

authority is broad. There is no doubt that as long as relief measures are intended to advance the achievement of corrective action goals, they are within the scope of authority provided under Section 3008(h). Remedial statutes such as RCRA enjoy liberal interpretation to effectuate their goals. See U.S. v. Aceto Agr. Chemicals Corp., 872 F.2d 1373, 1383 (8th Cir. 1989). Here, the goal is to protect the groundwater by reducing and controlling contamination in the soil and groundwater.

The legislative history indicates Congress sought to provide EPA with broad authority to require corrective action for releases of hazardous waste or constituents to the environment from facilities seeking a RCRA permit (ie., interim status facilities). See H. Rep. No. 1133, 98th Cong., 2d Sess. 111-112 (1984). Thus, the remedial purpose of Section 3008(h), evidenced by legislative history, and language provided in the statute, demonstrates the relief provisions included in the Initial Order fall within EPA's grant of authority. Because Respondent failed to provide any legislative history or cases to support its allegations, its request for relief must be denied.

G. Specificity Of The Initial Order

Specificity of the EPA Selected Remedy. While Respondent's additional information brief contends the Initial Order does not describe EPA's selected corrective action with reasonable specificity, it did not assert such a claim in its opening

request for a hearing or the initial brief supporting its position on the law and the facts. As a matter of fact, prior to the submission of its additional information brief, Respondent provided detailed argument expressing why it disagreed with the corrective action provided in Initial Order. See Respondent's Protective Response and Request for Hearing, pp. 6-7; Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 8-9; and Additional Information Supporting Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 9-10. Nevertheless, Respondent now contends that EPA's remedy must provide the number of containment wells, the need for and number of recovery wells, the type of water treatment required, the need for and number of monitoring wells, the mechanism for dealing with recovered and treated groundwater, the number of soil vapor extraction wells and the method for dealing with recovered soil vapors. See Additional Information Supporting Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 9-10.

It is puzzling that Respondent attempts to advance this argument in light of applicable regulations. Section 24.05(c) of 40 C.F.R. Part 24 provides, "the response to the initial order shall specify each factual or legal determination, or relief provision in the initial order the respondent disputes and shall briefly indicate the basis upon which it disputes such determination or provision." Section 24.17(a) of 40 C.F.R. Part 24 only requires the recommended decision to address material

issues of fact and law properly raised by the respondent. Review of Respondent's initial request for a hearing exposes Respondent's failure to delineate and briefly indicate the basis of its position. In addition, EPA did not have the opportunity to rebut the "reasonable specificity" issue in its written brief because it was not properly raised by Respondent in either its initial request for a hearing, or the initial brief on the facts and the law as required by 40 C.F.R. § 24.14(c). Hence, in all likelihood, Respondent waived this argument because it was not properly raised and pursued in accordance with applicable regulations. See U.S. EPA v. Environmental Waste Control Inc., 917 F.2d 327, 331 (7th Cir. 1990).

Regardless, RCRA Section 3008(h)(2) supports EPA's selected corrective action to address the contamination found at the site. Section 3008(h)(2) requires the Initial Order in question to "state with reasonable specificity the nature of the required corrective action ... and a time for compliance." With respect to the nature of the corrective action included in the Initial Order, Respondent clearly articulated, "EPA is asking two actions be undertaken -- soil vapor extraction and groundwater extraction." To perform these two actions, Respondent understands that installation of additional monitoring wells, recovery wells and containment wells will be required. Time frames for compliance are also noted by Respondent. See Memorandum Regarding Sparton's Position on the Facts, Law and

Relief Sought by EPA, pp. 8-9.

Clearly, Respondent also understands reinjection may be the selected disposal option for groundwater treated to applicable media clean-up standards. Memorandum Regarding Sparton's Position on the Facts, Law and Relief Sought by EPA, pp. 8-9. Respondent understands that EPA has not ruled out other disposal options, including discharge to the Cabacillas Arroyo. Record evidence also indicates that Respondent disagrees with certain aspects of the remedy, including the installation of interior wells to aggressively restore the contaminated aquifer to media clean-up standards. See Public Hearing Record, pp. 88-89, 166-169. From the above record evidence, not only is EPA's selected corrective action reasonably specific in nature, Respondent understands with reasonable specificity, the nature of the required corrective action. Furthermore, in order to effectuate the remedial goals of RCRA, interpretation of RCRA has been liberal rather than conservative. See U.S. v. Aceto Agr. Chemicals Corp., 872 F.2d 1373, 1383 (8th Cir. 1989). Accordingly, Respondent's requested relief is unsupported by sufficient record evidence, and it's narrow construction of Section 3008(h)(2) is unpersuasive.

As to all other matters raised by Respondent, they were considered and found either immaterial, not properly raised or unpersuasive in light of 40 C.F.R. § 24.17.

CONCLUSION

A. Right To Comment

Both EPA and Respondent continue to possess the ability to influence the outcome of the final decision. This tribunal only recommends a decision to the Regional Administrator, and the parties have the opportunity to file comments on this Recommended Decision within 21 days of service of the recommendation. See 40 C.F.R. § 24.17. Accordingly, the parties are once again informed of their immediate post-hearing rights.

B. Jurisdictional Basis For The Order

The preponderance of evidence demonstrates that Respondent is the owner and operator of a facility which had interim status, and released hazardous waste or hazardous constituents into the environment. The weight of convincing record evidence also shows relief measures selected by EPA and included in the Initial Order, are both reasonably specific and necessary to protect human health and the environment.

RECOMMENDATION

This tribunal reviewed all oral and written information made part of the record, including presentations by each party at the March 27, 1997, public hearing. As a result, the following modifications to the Initial Order are recommended:

1) Modification to Initial Order, Section I (Jurisdiction), Page 1, Paragraph 1. In sentence two, delete "April 16, 1985"

and insert "July 27, 1995."

2) Modification to Initial Order, Section XII (Dispute Resolution), Page 16, Paragraph 3. Delete the last two sentences of the paragraph and insert, "The Regional Administrator will review Respondent's written dispute regarding submissions, including plans or reports, and the Director's written decision concerning the dispute. If the Regional Administrator finds modification of the written decision is necessary, then the Director will make all required changes. The final written decision will be signed by the Regional Administrator. The final written decision will be issued to Respondent within 20 days from the date of the informal conference, and shall be binding on both Parties to this Order. The final written decision will be incorporated by reference into this Order. The Regional Administrator may consult with the Regional Counsel or her/his designee in connection with any dispute involving Respondent."

3) Modification to Initial Order, Section VIII (Submissions/Agency Approval/Additional Work), Page 11, Paragraph 3. After the first sentence of the paragraph insert, "Respondent shall submit to EPA the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants which in any way relates to the five additional

groundwater monitoring wells installed after selection of EPA's remedy."

SO RECOMMENDED, this 9th day of July 1997.

GEORGE MALONE, III
REGIONAL JUDICIAL OFFICER, ACTING

In the Matter of Sparton Technology, Inc., Respondent
Docket No. RCRA VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Lorena S. Vaughn, Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing Recommended Decision dated July 9, 1997, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. Thompson & Knight 1700 Pacific Avenue Suite 3300 Dallas, Texas 75201	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED
Mr. Evan Pearson, Senior Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Date : July 9, 1997

Lorena S. Vaughn
Lorena S. Vaughn
Regional Hearing Clerk

July 9, 1997

Called James B. Harris's secretary from the law firm of Thompson & Knight, to have them send a courier over to the 7th floor to have them pick up the copy of Sparton Technology, Inc. - RCRA VI-001(h)-96-H, I did not send it Certified.

Lorena S. Vaughn
Regional Hearing Clerk

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

July 30, 1997

HAND DELIVERED

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Enclosed are the original and one copy of EPA's Response to Recommended Decision of the Presiding Officer in the above-entitled case. Please file the original and forward the copy to the Acting Regional Administrator, as required by 40 C.F.R. § 24.17(b).

Sincerely,

Evan L. Pearson

Evan L. Pearson
Senior Attorney

Enclosures

cc: Honorable George Malone, III
James B. Harris

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UNITED STATES
ENVIRONMENTAL PROTECTION A
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)	
SPARTON TECHNOLOGY, INC.	)	
9621 COORS ROAD NW ALBUQUERQUE, NM 87114	)	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H
EPA I.D. NO. NMD083212332	)	
RESPONDENT	)	

EPA'S RESPONSE TO THE RECOMMENDED

DECISION OF THE PRESIDING OFFICER

Evan L. Pearson
Senior Attorney
U.S. Environmental Protection Agency
Region 6
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Dallas, Texas 75202-2733
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I. INTRODUCTION

The United States Environmental Protection Agency, Region 6 (EPA), by and through its attorney, Evan Pearson, hereby files its Response to the Recommended Decision of the Presiding Officer dated July 9, 1997. In this Decision, the Presiding Officer found that the ground water contamination caused by the Respondent's operations presented a potential threat to human health and the environment, and that the corrective action or the remedy proposed by EPA was necessary to protect human health and the environment. Recommended Decision at 44 - 46. The Presiding Officer recommended that the Regional Administrator issue a Final Decision upholding EPA's RCRA Section 3008(h) Initial Administrative Order (Order) implementing EPA's selected remedy (which would protect human health and the environment) with only ree modifications to the Order. Recommended Decision at 58 - 60. This Response will describe EPA's proposed remedy, discuss some of the major holdings of the Presiding Officer, discuss EPA's proposed modifications to the Recommended Decision, and address the three proposed modifications to the Initial Administrative Order recommended by the Presiding Officer.

II. DESCRIPTION OF REMEDY

On September 16, 1996, EPA filed an Initial Administrative Order (Order) pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h), and 40 C.F.R. Part 24, seeking an Order requiring the Respondent to implement the remedy previously selected by EPA on June 24, 1996. This Order was issued to protect human health and

restore the aquifer for use as a potential source of drinking water. EPA's Pre-Hearing Brief at 36 - 37.

No final decision as been made as to the method of disposal of the treated ground water. This decision will be made during the design phase of the ground water extraction system. Reinjection into the aquifer, discharge into the Calabacillas Arroyo[2], or any option that is consistent with the criteria for conservation of the valuable ground water resource will be considered. EPA's Pre-Hearing Brief at 43.

The second major component of EPA's remedy involves the installation of a soil vapor extraction (SVE) system. The SVE system removes volatile organic compounds from the vadose zone, or the unsaturated soil above the water table. This will remove the source of contamination, thus protecting human health and the environment by preventing the release of further contamination to the ground water. EPA's Pre-Hearing Brief at 35 - 36.

Based on cost documentation provided by the Respondent, EPA originally calculated the present value of the selected remedy as ranging from $15.046 million - $26.393 million (depending upon the treatment and disposal option actually implemented). Final Decision and Response to Comments (FDRTC) at 28 - 29 [Administrative Record (AR) at 008634 - 35]. Because the Respondent raised cost of the remedy as an issue, EPA recalculated the cost of the selected remedy using its own cost documentation. EPA determined that the Respondent greatly

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[2]An arroyo is a watercourse in an arid region.

overestimated the costs of the ground water extraction and treatment system. Depending upon the treatment and disposal option that is implemented, the present value of the selected remedy now ranges from $5,927,635 - $6,334,441. EPA's Response to the Exhibits Submitted by Respondent at 19 - 21 (April 22, 1997).

III. EPA HAS PROVEN BY A PREPONDERANCE OF THE EVIDENCE THAT IMPLEMENTATION OF ITS PROPOSED REMEDY IS NECESSARY TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT

The Presiding Officer found that EPA proved, by a preponderance of the evidence, all of the statutory criteria necessary to issue a RCRA Section 3008(h) Administrative Order. Recommended Decision at 29 - 51. In particular, the Presiding Officer held that the highly contaminated aquifer was a potential source of drinking water, and thus a potential threat to human health and the environment, thereby requiring corrective action to abate this threat. Recommended Decision at 44 - 46. Furthermore, the Presiding Officer found that EPA's selected remedy is necessary to protect human health and the environment. Recommended Decision at 47 - 51. In addition, the Presiding Officer found that EPA's proposal to determine the method of disposal of the treated ground water during the design phase of the remedy was reasonable. Recommended Decision at 41 - 42.

The Presiding Officer also determined that the Respondent's proposed remedy was not protective of human health and the environment because the threat to human health and the environment would not be abated because the Respondent's remedy

will not restore the aquifer to drinking water standards (media cleanup standards). Recommended Decision at 46 - 47. Finally, the Presiding Officer rejected the Respondent's remaining arguments concerning the alleged inadequacy of the proposed remedy [Recommended Decision at 51], and numerous unsupported allegations related to the Order. However, because EPA anticipates the Respondent will object to many of the Presiding Officer's findings, EPA will address some of the findings with which the Respondent may take these issue.

A. THE CONTAMINATED GROUND WATER PRESENTS A THREAT TO HUMAN HEALTH AND THE ENVIRONMENT

In order to establish that corrective action or other response measures are necessary to protect human health or the environment, EPA must show a present or potential threat posed by the release. Interpretation of Section 3008(h) of the Solid Waste Disposal Act at 13 (December 16, 1985) (emphasis added). The Presiding Officer found that EPA had met its burden of proof, holding that the contaminated ground water presents a potential threat to human health and the environment. Recommended Decision at 44 - 46.

The administrative record in this case shows that trichloroethylene (TCE) contamination resulting from the Respondent's operations ranges from 7,600 parts per billion (ppb) at the facility, 3,200 ppb near the center of the off-site TCE plume, to less than 5 ppb at a distance of at least ½ mile from the facility. The TCE plume is approximately 3300 feet long, 1650 feet wide (covering approximately 90 acres, with the plume

depth ranging from 50 to 125 feet below the top of the water table). The TCE plume has contaminated an aquifer of the Santa Fe Group aquifer system, which the City of Albuquerque and other nearby municipalities rely on as their sole source of drinking water. The TCE plume is also located in an area the City of Albuquerque had intended to use as a future well site. A public drinking water supply well, New Mexico Utilities Well No. 2, is approximately two (2) miles downgradient from the leading edge of the TCE plume. EPA's Pre-Hearing Brief at 3 - 4 and 16 - 17. In addition, the Albuquerque City Council passed a resolution which states in part:

> Whereas, the aquifer impacted and endangered by the Sparton contamination is master planned as the location of the Corrales Trunk Primary Well Field and as such is a critical resource for the City of Albuquerque; and
>
> . . . the Groundwater Protection Policy and Action Plan adopted by the City designates the area impacted and endangered by the Sparton contamination as a critical area for groundwater quality protection;
>
> * * * *

EPA Pre-Hearing Brief at 22 - 23. Therefore, the Presiding Officer was correct in finding that the contaminated aquifer is a potential source of drinking water. Recommended Decision at 44 - 45.

The administrative record shows that the levels of TCE in the ground water exceed the maximum contaminant level (MCLs) for TCE of 5 ppb[3]. EPA's Pre-Hearing Brief, Exhibit 1. MCLs are the maximum allowable concentrations of a specific contaminant in

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[3]40 C.F.R. § 141.61.

water supplied by public water systems. 42 U.S.C. § 300f(3). MCLs are health based standards that EPA has determined are protective of human health. See 55 Fed. Reg. 30798, 30817 (July 27, 1990). For example, the TCE concentration in the off-site ground water (3200 ppb) is over 600 times the corresponding MCL (5 ppb). Therefore, since the contaminant concentrations in the aquifer exceed the limits established by the Safe Drinking Water Act, there is a potential threat to human health. State of New York v. Shore Realty Corporation, 759 F.2d 1032, 1038, fn. 4 (2nd Cir. 1985) (release to ground water posed threat to human health even if drinking water supplies not threatened). As the Presiding Officer concluded, "it is not necessary for a catastrophic event, such as someone drinking contaminated groundwater, to occur before ordering corrective action." Recommended Decision at 45 - 46; U.S. EPA v. Environmental Waste Control, Inc., 710 F.Supp. 1172, 1241 (N.D. Ind. 1989); aff'd 917 F.2d 327 (7th Cir. 1990), cert denied 499 U.S. 975 (1991).

The Presiding Officer also found that there was a potential threat to the environment due to the ground water contamination. Recommended Decision at 44 - 45. In addition to the reasoning cited by the Presiding Officer, the contaminated ground water would also constitute a threat to the environment under New Mexico law. For example, "water pollution" is defined as:

> introducing or permitting the introduction into water[4], either directly or indirectly, of one or more . . .

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[4]The definition of "water" includes ground water. NMSA § 74-6-2.G (1996).

> contaminants in such quantity and in such durations as may with reasonable probability . . . unreasonably interfere with the public welfare or the use of property.

NMSA § 74-6-2.A (1996). By contaminating the drinking water aquifer, the Respondent not only threatened, but interfered with the public welfare and the use of the ground water, thus meeting the definition of "water pollution" under New Mexico law. Furthermore, the State of New Mexico defines "substantial adverse environmental impact" as:

> an act or omission of the violator . . . that amounts to more than ten thousand dollars ($10,000) damage or mitigation costs to . . . ground water.

NMSA § 74-6-2.O.

The TCE plume (which covers approximately 90 acres) is in the Santa Fe Group aquifer system, which the City of Albuquerque and other nearby municipalities rely on as the sole sources of drinking water. The TCE plume is also located in an area the City of Albuquerque had intended to use as a future well site. EPA's Pre-Hearing Brief at 4. Mitigation costs clearly exceed $10,000.[5] Thus, the TCE plume has had a "substantial adverse environmental impact", and that under New Mexico law, the environment has not only been threatened, but actually harmed by the ground water contamination. Therefore, EPA recommends that the Regional Administrator modify the Recommended Decision to find that the ground water contamination meets the definition of

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[5]The cost of the SVE system alone ($150,000) greatly exceeds the $10,000 threshold. Hearing Transcript, Respondent's Exhibit 13.

"water pollution" and that it has caused a "substantial adverse environmental impact" to the aquifer. EPA's proposed language is set forth in Section IV.

Thus, in order to protect human health and the environment, the protection of ground water from threats should be based on its highest beneficial use to which the ground water can presently or potentially be put to use. 55 Fed. Reg. at 30804. The portion of the aquifer contaminated by the Respondent is a potential source of drinking water. The contamination exceeds the MCLs, a health based standard. Therefore, the contamination of a potential drinking water aquifer presents a threat to human health and the environment.

B. EPA'S PROPOSED REMEDY IS NECESSARY TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT

In this proceeding, EPA is seeking to implement the remedy summarized in Section II above and set forth in the Order. The statutory standard for corrective action or remedy selection set forth in Section 3008(h) of RCRA is protection of human health and/or the environment. In this case, EPA established the following corrective action objectives as protective of human health and the environment at the Sparton site:

> (1) prevent further migration of the contaminant plume; (2) restore the contaminated aquifer to the more stringent of Federal or State standards; and (3) reduce the quantity of source material in the soil or ground water, to the extent practicable, to minimize further release of contaminants to the surrounding ground water, and to ensure no further contaminant migration to the ground water above the existing cleanup goals established for ground water.

FDRTC at p. 18 [AR at p. 008624].

These objectives are necessary to protect human health and the environment because: (1) preventing further migration of the contaminant plume prevents contamination of the unaffected areas of the aquifer(s), a potential source of drinking water and a valuable natural resource; (2) restoring the contaminated aquifer to maximum contaminant levels (MCLs) protects human health by returning usable ground water to a safe level for drinking; and (3) reducing the amount of source material protects human health and the environment by preventing further contamination of the aquifer. EPA's Pre-Hearing Brief at 26.

EPA then selected the remedy (summarized in Section II above) based on the criteria set forth in the Guidance on RCRA Corrective Action Decision Documents, Office of Solid Waste and Emergency Response (OSWER) Directive 9902.6 (April 29, 1991)[6]. EPA's Pre-Hearing Brief at 27 - 29. These criteria were developed by EPA to ensure that the selected remedy protects human health and the environment. These criteria protect human health and the environment by providing "goals for cleanup and screening tools for potential remedies" [61 Fed. Reg. at 19449], and ensuring that "an appropriate combination of technical measures and management controls for addressing environmental

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[6]These are the same recommended criteria and approaches set forth in the "Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities", 55 Fed. Reg. at 30877 (which includes the proposed 40 C.F.R. § 264.525) (also known as the Proposed Subpart S Rule), and the Advanced Notice of Proposed Rulemaking for Corrective Action for Releases from Solid Waste Management Units at Hazardous Waste Management Facilities, 61 Fed. Reg. 19432, 19449 (May 1, 1996).

problems" are considered. 55 Fed. Reg. at 30824. EPA's detailed justification for selecting its remedy and why the implementation of the remedy is necessary to protect human health and the environment is set forth in the FDRTC at pages 34 - 46 [AR at 008640 - 008652], and incorporated by reference into this Response.[7]

The Presiding Officer found that "EPA's remedy selection evidence [was] more convincing than Respondent's" [Recommended Decision at 48]. The Presiding Officer also found that EPA's selected remedy will protect human health and the environment by: (1) reducing the levels of contamination in the ground water and soil; (2) seeking to restore the contaminated aquifer to its beneficial use (a potential source of drinking water source), by reducing the quantity of source material available for migration to the ground water, and removal of the contaminants throughout the contaminated aquifer; (3) providing long-term protection to human health and the environment because it includes an active approach for the entire ground water contaminant plume, including the source material remaining in the soil beneath the facility; and (4) resulting in the greatest reduction in toxicity, mobility, and volume of waste. Recommended Decision at 48 - 50. Thus, the Presiding Officer determined that EPA's proposed remedy will abate the threat from the contaminated ground water, and

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[7]EPA's discussion of remedy selection at the hearing is set forth on pages 27 - 31 and 39 - 50 of the Hearing Transcript.

thus is protective of human health and the environment.[8] Therefore, EPA has proven, by a preponderance of the evidence, that its proposed remedy is necessary to protect human health and the environment.

C. THE RESPONDENT'S PROPOSED REMEDY DOES NOT PROTECT HUMAN HEALTH AND THE ENVIRONMENT

When EPA made its remedy selection in June 1996, the Respondent had recommended that no action be taken to address the off-site ground water contamination. [AR at pp. 005693 - 94]. It wasn't until much later that the Respondent formally proposed a one well containment system to EPA. EPA's Pre-Hearing Brief at 32. However, the Presiding Officer determined that the Respondent's latest proposed remedy would not be protective of human health and the environment because it would not meet the MCLs (the media cleanup standard for ground water). Recommended Decision at 46. MCLs are health based standards that EPA has determined that are protective of human health and the environment. See 55 Fed. Reg. at 30817. Thus, human health and the environment would not be protected because as discussed above, the continued presence of the contaminant plume in concentrations above the MCLs in the drinking water aquifer presents a potential threat to human health, and continues to pose a threat to the environment due to the contamination of a

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[8]Proposed language clarifying the use of the statutory criteria for protection of human health or the environment is set forth in Section IV.

valuable natural resource. Therefore, the Respondent's proposed remedy cannot be considered for implementation.

D. RESTORATION OF THE AQUIFER IS A TECHNICALLY FEASIBLE GOAL

EPA believes that restoration of the aquifer to drinking water standards is a feasible goal at the site. There are three general factors that determine whether restoration is feasible: (1) the physical characteristics of the aquifer; (2) the physical characteristics of the contaminants; and (3) the adequacy of the ground water extraction system design. Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, Interim Final, at 1 (OSWER Directive 9234.2-25) [TI Guidance] [AR at 001613].

For this site, the sand and the gravel in the aquifer provide a favorable environment for a ground water extraction system. An analysis of the boring logs from the ground water monitoring wells shows that the vast majority of the sediment in the saturated interval ranges from 90% to 100% sand and gravel. EPA's Response to the Exhibits Submitted by Respondent at 2 - 10 (April 22, 1997). In addition, the relatively low sorption potential of TCE in the aquifer material in the area of the off-site plume also appears to favor a strategy for ground water extraction. EPA's Pre-Hearing Brief, Exhibit 14 at 5. Therefore, the combination of a high sand/gravel content in the aquifer, and the fact that TCE has a relatively low sorption potential in the aquifer material demonstrate that restoration is a feasible goal at this site. The third factor, the adequacy of

the ground water extraction system design, can be addressed by designing and implementing an appropriate system. This factor is discussed in detail in EPA's Pre-Hearing Brief, Section IX, at 53 - 56, and Exhibit 14, at 5 - 7, and incorporated by reference into this Response.

Furthermore, as opposed to the Respondent's one-well containment proposal, EPA's selected remedy utilizes active ground water extraction throughout the contaminant plume. See 55 Fed. Reg. at 30804 and 30830. EPA's remedial option is the most aggressive strategy since it relies on maximizing the removal of contaminant mass through additional wells installed within the contaminant plume. An aggressive strategy will generally result in a significantly shorter restoration timeframe than other remedial options. TI Guidance at 16 [AR at 001634]. A shorter remediation timeframe is desired to reduce the potential for human exposure where there is current or reasonably expected near-term future use of the ground water. TI Guidance at 22 [AR at 001634]. In this case, the City of Albuquerque is dependent upon ground water as a sole source of drinking water and has determined that the impacted aquifer is a significant nature resource requiring remediation. EPA's Pre-Hearing Brief, Exhibit 6. Therefore, restoration of the aquifer to drinking water standards is a feasible goal at this site and is necessary to protect human health and the environment.

EPA expects that the Respondent will again claim that it is not technically practicable to restore the ground water to

drinking water standards. However, the Presiding Officer found that the Respondent failed to submit "a technical impracticability demonstration in compliance with EPA guidance." Recommended Decision at 47. EPA does not agree with the Presiding Officer that the Respondent must follow EPA guidance in submitting a technical impracticability demonstration. Rather, the Respondent need only submit sufficient information which will allow EPA to make this determination. EPA has previously determined that the Respondent's technical impracticability demonstration was insufficient. [AR at 008378 - 008382]. Proposed language addressing this concern is set forth in Section IV.

The Respondent has also claimed that the Respondent's one-well containment system will achieve restoration of the aquifer in the same time as EPA's remedy. However, the Presiding Officer found that the Respondent had given conflicting evidence in regard to the restoration potential of its remedy, and therefore, did not give much weight to the Respondent's arguments. Recommended Decision at 44, footnote 14.

E. THE METHOD OF DISPOSAL OF THE TREATED GROUND WATER SHOULD BE DEFERRED TO THE DESIGN PHASE OF THE REMEDY

As previously stated in Section II, no final decision as been made as to the method of disposal of the treated ground water. This decision will be made during the design phase of the ground water extraction system. Reinjection into the aquifer, discharge into the Calabacillas Arroyo, or any option that is consistent with the criteria for conservation of the valuable

ground water resource will be considered. EPA's Pre-Hearing Brief at 43. The Presiding Officer found that deferring this decision to the design phase of the ground water extraction system was proper. Recommended Decision at 41; see In the Matter of General Electric Company, RCRA Appeal No. 91-7, slip op. at 16 (November 6, 1992) (certain technical decisions should be left to the technical expertise of EPA).

The Respondent has contended that reinjection of the treated ground water is not technically or economically feasible. The Presiding Officer rejected this argument. Recommended Decision at 51 ("Respondent's remaining arguments concerning the adequacy of the selected remedy are immaterial and unconvincing"). However, EPA expects the Respondent to reargue this issue in its Response to the Recommended Decision.

In its Pre-Hearing Brief, EPA presented the Report of Michael C. Raimonde (Treated Groundwater Injection), and Affidavits of Baird Swanson and Dennis McQuillan[9], and a Joint Affidavit of Dennis McQuillan and Baird Swanson, refuting the Respondent's arguments, and demonstrating that reinjection of treated ground water is a technically and economically feasible option. EPA's Pre-Hearing Brief, Exhibits 10 - 13. These Exhibits are incorporated by reference into this Response.

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[9]Mr. Swanson and Mr. McQuillan are with the New Mexico Environment Department (NMED).

The Respondent may also contend that the Order should require that the treated water be discharged into the Calabacillas Arroyo, rather than reinjected into the aquifer. However, discharge into the Calabacillas Arroyo involves the issuance of an NPDES permit, and authorization from the Albuquerque Metro Area Flood Control District (AMAFCA), the City of Albuquerque, and possibly the New Mexico Environment Department (NMED). The Respondent applied for an NPDES permit on January 31, 1997. The NPDES permit process also involves public review and comment period. If the Regional Administrator orders that the water should be discharged into the Calabacillas Arroyo, and the authorizations are not received,[10] no cleanup will take place. Furthermore, requiring discharge into the Arroyo as part of this order would in essence bind EPA into issuing the Respondent an NPDES permit no matter what the outcome of the permit evaluation process and public comment.

In summary, no final decision as to the method of the disposal of the treated ground water has been made. Reinjection, discharge into the Calabacillas Arroyo, or any other option that the Respondent submits that is "consistent with the criteria in the FDRTC document for conservation of the ground water resource" will be considered. This decision should be deferred to the design phase of the ground water extraction system, and left to

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[10]This statement in no way implies that an NPDES permit will or will not be issued. The permit application will be judged on its own merits.

the technical expertise of EPA. In the Matter of General Electric Company, RCRA Appeal No. 91-7, slip op. at 16.

IV. EPA'S PROPOSED MODIFICATIONS TO THE RECOMMENDED DECISION

Pursuant to 40 C.F.R. § 24.18, EPA recommends that the Regional Administrator modify the Recommended Decision as set forth below.

A. THE FINAL DECISION SHOULD CLARIFY THAT EPA'S PROPOSED REMEDY MEETS THE "NECESSARY TO PROTECT HUMAN HEALTH OR ENVIRONMENT" STANDARD OF SECTION 3008(H) OF RCRA

In a decision of this length and complexity, and to facilitate judical review and later defensibility of the Final Decision, the Regional Administrator should clarify that EPA'S proposed remedy clearly meets the "necessary to protect human health or environment" standard of Section 3008(h) of RCRA. Therefore, EPA proposes that the Recommended Decision be modified to include the following language in the Final Decision:

> The corrective action proposed by EPA is necessary to protect human health and the environment because trichloroethylene (TCE) contamination resulting from the Respondent's operations ranges from 7,600 parts per billion (ppb) at the facility, 3,200 ppb near the center of the off-site TCE plume, to less than 5 ppb at a distance of at least ½ mile from the facility. [AR at 008616]. Therefore, the off-site contamination is over 600 times the corresponding MCL of 5 ppb for TCE. The TCE plume is approximately 3300 feet long, 1650 feet wide (covering approximately 90 acres, with the plume depth ranging from 50 to 125 feet below the top of the water table). Memorandum Regarding Sparton Technology, Inc.'s Position on the Facts, the Law, and the Relief Sought by EPA, Exhibit A at 9.
>
> The TCE plume has contaminated an aquifer of the Santa Fe Group aquifer system, which the City of Albuquerque and other nearby municipalities rely on as their sole source of drinking water. A public drinking water supply well, New Mexico Utilities Well No. 2, is approximately two (2) miles downgradient from the leading edge of the TCE plume. [AR at

008623]. The aquifer impacted and endangered by the contamination is master planned as the location of the Corrales Trunk Primary Well Field and is a critical resource for the City of Albuquerque. Furthermore, the Groundwater Protection Policy and Action Plan adopted by the City of the Albuquerque designates the area impacted and endangered by the contamination as a critical area for groundwater quality protection. EPA's Response to the Memorandum Regarding Sparton Technology, Inc.'s Position on the Facts, the Law and the Relief Sought by EPA dated February 25, 1997, Exhibit 2.

The remedy proposed by EPA is necessary to protect human health and the environment because the remedy: (1) prevents further migration of the contaminant plume, which prevents contamination of the unaffected areas of the aquifer(s), a potential source of drinking water and a valuable natural resource; (2) implements the goal of restoring the contaminated aquifer to maximum contaminant levels (MCLs), which protects human health by returning usable ground water to a safe level for drinking; and (3) reduces the amount of source material which protects human health and the environment by preventing further contamination of the aquifer. [AR at 008623 - 008624, 008640 - 008647]. Therefore, the Regional Administrator finds that the remedy proposed by EPA is necessary to protect human health and the environment, as required by Section 3008(h) of RCRA, 42 U.S.C. § 6928(h).

In addition, the Respondent's proposed remedy would not be protective of human health and the environment because it would not meet the MCLs (the media cleanup standard for ground water). Recommended Decision at 46. MCLs are health based standards that EPA has determined that are protective of human health and the environment. See 55 Fed. Reg. at 30817. Thus, human health and the environment would not be protected because the continued presence of the contaminant plume in concentrations above the MCLs in the drinking water aquifer presents a potential threat to human health, and continues to pose a threat to the environment due to the contamination of a valuable natural resource.

B. THE GROUND WATER CONTAMINATION MEETS THE DEFINITION OF "WATER POLLUTION" AND HAS CAUSED A "SUBSTANTIAL ADVERSE ENVIRONMENTAL IMPACT" TO THE AQUIFER

As previously shown in Section III.A above, the contaminated ground water would also constitute a threat to the environment under New Mexico law. Therefore, EPA proposes that the

Recommended Decision be modified to include the following language in the Final Decision:

> The TCE contamination resulting from the Respondent's operations ranges from 7,600 parts per billion (ppb) at the facility, 3,200 ppb near the center of the off-site TCE plume, to less than 5 ppb at a distance of at least ½ mile from the facility. [AR at 008616]. The TCE plume is approximately 3300 feet long, 1650 feet wide (covering approximately 90 acres, with the plume depth ranging from 50 to 125 feet below the top of the water table). Memorandum Regarding Sparton Technology, Inc.'s Position on the Facts, the Law, and the Relief Sought by EPA, Exhibit A at 9. The TCE plume has contaminated an aquifer of the Santa Fe Group aquifer system, which the City of Albuquerque and other nearby municipalities rely on as their sole source of drinking water. [AR at 008623]. The TCE plume is also located in an area the City of Albuquerque had intended to use as a future well site. EPA's Pre-Hearing Brief, Exhibit 6. A public drinking water supply well, New Mexico Utilities Well No. 2, is approximately two (2) miles downgradient from the leading edge of the TCE plume. [AR at 008623]. The present value of mitigating the contamination ranges from $5,927,635 - 6,334,441. EPA's Response to the Exhibits Submitted by Respondent at 19 - 21 (April 22, 1997).
>
> The extensive contamination of the ground water (and a potential source of drinking water) caused by the Respondent unreasonably interfered with the public welfare or the use of the aquifer. NMSA § 74-6-2.A. Furthermore, the acts or omission of the Respondent amounts to more than $10,000 damage or mitigation costs to ground water. NMSA § 74-6-2.O.

C. TECHNICAL IMPRACTICABILITY DEMONSTRATION

As set forth in Section III.D., the Presiding Officer found that the Respondent failed to submit "a technical impracticability demonstration in compliance with EPA guidance." Recommended Decision at 47. EPA does not agree with the Presiding Officer that the Respondent must follow EPA guidance in submitting a technical impracticability demonstration. Rather, the Respondent need only submit sufficient information which will

allow EPA to make this determination. EPA has previously determined that the Respondent's technical impracticability demonstration was insufficient. [AR at 008378 - 008382]. Therefore, EPA proposes that the Recommended Decision be modified to include the following language in the Final Decision:

The following sentence and authority on page 47 of the Recommended Decision should be stricken:

> However, there is no record of Respondent submitting a technical impracticability demonstration in compliance with EPA guidance. See Public Hearing Record, pp. 141-143; Proposed 40 C.F.R. § 264.531; and Administrative Record, pp. 003365-003377, 001605-001638.

The following sentence should be added in its place:

> The Respondent has failed to submit sufficient information demonstrating that it is technically impracticable to restore the ground water to drinking water standards. [AR at 008378 - 008382].

D. DENIAL OF DISCOVERY REQUEST

On Page 19 of the Recommended Decision, the Presiding Officer stated the following:

> Respondent was afforded the opportunity to request permission for EPA to answer questions pursuant to 40 C.F.R. §24.14(d); however, this tribunal found that Respondent's questions were not properly before EPA for the reasons set forth in 40 C.F.R. §24.14(d).

The statement that "Respondent's questions were not properly before EPA" implies that the questions were denied on a procedural basis. However, the Presiding Officer found the Respondent's questions were overbroad, not material, unduly burdensome, and did not address issues of material fact. Order Denying Questions by Respondent dated February 18, 1997. Therefore, this sentence should be revised as follows:

> Respondent was afforded the opportunity to request permission for EPA to answer questions pursuant to 40 C.F.R. §24.14(d); however, this tribunal found that Respondent's questions were overbroad, not material, unduly burdensome, and did not address issues of material fact. Order Denying Questions by Respondent dated February 18, 1997.

V. RESPONSE TO THREE RECOMMENDED MODIFICATIONS TO THE INITIAL ADMINISTRATIVE ORDER

A. DATE OF DELEGATION OF AUTHORITY

The Presiding Officer's first proposed modification recommends that in Section I (Jurisdiction), Page 1, Paragraph 1, "April 16, 1985" be deleted and "July 27, 1995" be inserted. Recommended Decision at p. 58 - 59.

The sentence, as set forth in the Initial Administrative Order (Order) reads as follows:

> The authority to issue this Order has been delegated to the Regional Administrator by EPA Delegation Nos. 8-31 and 8-32, dated April 16, 1985, and further delegated to the Director of the Compliance Assurance and Enforcement Division, Region 6 (Director).[11]

A review of the Administrative Record shows that the correct date of the delegation to the Regional Administrator is May 11, 1994, and the date of the delegation to the Division Director is July 27, 1995. [Administrative Record (AR) at 008429 - 008434]. Therefore, EPA proposes the following modifications to the Order (additions indicated by underlining and deletions indicated by strikeout):

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[11]The question of whether the Division Director has been delegated the authority to issue the Order in this case is a question of law, not a question of fact, contrary to the findings of the Presiding Officer on page 11 of the Recommended Decision.

The authority to issue this Order has been delegated to the Regional Administrator by EPA Delegation Nos. 8-31 and 8-32, dated ~~April 16, 1985~~ May 11, 1994, and further delegated to the Director of the Compliance Assurance and Enforcement Division, Region 6 (Director) by EPA Delegation Nos. R6-8-31 and R6-8-32, dated July 27, 1995.

B. DISPUTE RESOLUTION

The Presiding Officer's second proposed modification recommends that Section XII (Dispute Resolution), page 16, Paragraph 13 be modified as follows:

Delete the last two sentences of the paragraph and insert:

The Regional Administrator will review the Respondent's written dispute regarding submissions, including plans or reports, and the Director's written decision concerning the dispute. If the Regional Administrator finds modification of the written decision is necessary, then the Director shall make all required changes. The final written decision will be signed by the Regional Administrator. The final decision will be issued to the Respondent within 20 days from the date of the informal conference, and shall be binding on both Parties to this Order. The final written decision will be incorporated by reference into this Order. The Regional Administrator may consult with the Regional Counsel or her/his designee in connection with any dispute involving the Respondent.

The Presiding Officer claims that the Regional Administrator must be involved in any dispute resolution, because he is the final decision maker under Part 24, and that as a matter of policy, the decision in General Electric[12] requires that involvement of the Regional Administrator in dispute resolution. Recommended Decision at 26. EPA objects to the proposed modification of the Dispute Resolution section on the grounds

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[12] In the Matter of General Electric Company, RCRA Appeal 91-7 (April 13, 1993).

that the General Electric decision does not require that the Regional Administrator be involved in any dispute resolution.

In General Electric, the EAB held that due process requirements were met when the dispute resolution provision in a permit included, inter alia, the right to meet with the ultimate decision maker (the EAB recommended that, for policy reasons, this person should be the same person who issued the permit). In the General Electric case, this was the Division Director who issued the permit. General Electric, slip op. at 19 - 20. Contrary to the Presiding Officer's assertions, the final decision maker in this case should be the Division Director who issued the Order, not the Regional Administrator who heard the administrative appeal.

This situation is analogous to the RCRA permit process. In the General Electric case, the authority to issue the permit was delegated to the Division Director. General Electric, slip op. at 19. General Electric appealed the permit to the Environmental Appeals Board (EAB) pursuant to 40 C.F.R. § 124.19. Under the Presiding Officer's scenario, the EAB would have to be involved in dispute resolution, because it is the final decision maker that hears the appeal in a Part 124 permit proceeding. Since the EAB is not involved in dispute resolution of permits, likewise the Regional Administrator should not be involved in dispute resolution of corrective action orders. The same policy reasons cited in General Electric, argue in favor of the Division Director as the decision maker in dispute resolution. General

Electric at 19 - 21. Therefore, the Regional Administrator should reject the Presiding Officer's recommendation.

In the event that the Regional Administrator accepts the Presiding Officer's recommendation, the last sentence of the Presiding Officer's recommendation concerning consultation with the Regional Counsel should be deleted. Contacts between the decision maker and the Regional Counsel during the dispute resolution process would be subject to the constraints of impartiality and due process. The appropriateness of such contacts could depend upon a number of factors, including the extent to which the Regional Counsel or his designees were involved in ongoing litigation with the Respondent. Therefore, if the Regional Administrator modifies the Order to arbitrate disputes, the last sentence must be stricken.

C. DATA FROM ADDITIONAL MONITORING WELLS

The Presiding Officer's third proposed modification recommends that the following sentence be added to Section VIII (Submissions/Agency Approval/Additional Work) at page 11, Paragraph 3:

> Respondent shall submit to EPA the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants which in any way relates to the five additional monitoring wells installed after selection of EPA's remedy.

Recommended Decision at p. 59 - 60.

EPA has no objection to the submission of the sampling data from the five monitoring wells, and in fact would have expected the Respondent to submit this information as part of this Order.

However, EPA recommends the Order be modified as follows (deletions to the Presiding Officer's proposed modification indicated by strikeout and additions indicated by underlining):

> Respondent shall also submit to EPA the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants which in any way relates to ~~the five~~ any additional monitoring or extraction wells installed after selection of EPA's remedy. All data generated prior to the effective date of this Order shall be submitted in the first monthly progress report, as specified in Sections VIII.2 and X of this Order.

EPA's proposed modification addresses the possibility that Sparton may have installed additional wells or generated test data since the administrative hearing and before the Order becomes final, and also sets a date for the submission of the data.

VI. CONCLUSION

Based on the entire record of this case, including the Recommended Decision and the Administrative Record, EPA has proven by a preponderance of the evidence that it is entitled to the relief set forth in the Initial Administrative Order. Therefore, the Regional Administrator should issue a Final Decision, upholding the Presiding Officer's Recommended Decision, except as modified in Sections IV and V above.

Dated this 30th day of July, 1997.

Respectfully submitted,

Evan L. Pearson
Senior Attorney
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-8074
FAX - (214) 665-2182

CERTIFICATE OF SERVICE

I hereby certify that on the 30th day of July, 1997, the original and one copy of the foregoing EPA's Response to Recommended Decision were hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that true and correct copies were sent to the following by the methods indicated below:

HAND DELIVERED

Honorable George Malone, III
Acting Regional Judicial Officer
U.S. EPA - Region 6
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July 30, 1997

VIA HAND DELIVERY

Ms. Lorena Vaughn, Clerk
Office of the Regional Hearings Examiner
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202

Re: *In the Matter of Spartan Technology, Inc.*
U.S. EPA Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Enclosed are an original and two copies of the Comments of Spartan Technology, Inc. on the Recommended Decision. Please return to me a file-marked copy by the messenger delivering same.

Yours very truly,

James B. Harris

JBH/eshd
Enclosures

cc: Evan L. Pearson, Esq. -- w/enclosure
40310 00001 LERA 55960

FILED
JUL 30 PM 5:26
REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 COORS ROAD NW	)	U.S. EPA DOCKET NO.
ALBUQUERQUE,NM 87114	)	RCRA-VI-001(H)-96-h
	)	
EPA I.D. NO. NMD083212332	)	
	)	
RESPONDENT	)	

COMMENTS OF SPARTON TECHNOLOGY, INC.
ON THE RECOMMENDED DECISION

Sparton Technology, Inc. ("Sparton") hereby files its comments on the Recommended Decision pursuant to 40 C.F.R. § 24.17.

I.
INTRODUCTION

On September 16, 1996, EPA issued an Initial Administrative Order to Sparton directing that certain corrective actions be taken. Sparton challenged that order on a variety of grounds. On July 9, 1997, the Regional Judicial Officer issued a Recommended Decision that without any meaningful analysis of Sparton's arguments rejected the company's positions and rubber-stamped the Initial Administrative Order.

Under the procedural rules that apply to contested corrective action orders, Sparton has the right, but not the obligation, to submit comments on the Recommended Decision designed to identify "factual and legal errors" in that document. See, 54 Fed. Reg. 12262.

Nevertheless, Sparton will take this opportunity to identify many of the more substantial errors, both of fact and of law, contained in the Recommended Decision, even though they will be summarily rejected. In fact, rather than reading these comments, if the Regional Administrator simply reads in a critical way the previous submissions of Sparton, the errors in the Recommended Decision become obvious.

These comments are divided into three parts. Part II describes what the Regional Judicial Officer was supposed to do in issuing the Recommended Decision. Part III describes some of the situations in which the Regional Judicial Officer failed to do what the regulations require. Part IV describes specific issues cursorily addressed in the Recommended Decision, pointing out both errors in understanding the law and errors in evaluating the facts in deciding those issues.

II.
FOR THE RECOMMENDED DECISION TO BE UPHELD IT MUST SATISFY THE STANDARDS SET FORTH IN 40 C.F.R. § 24.17(A)

The rules establish the Recommended Decision must satisfy the following standards to be valid:

- it *must* address all material issues of fact or law properly raised by respondent;
- it *must* recommend that the order be modified, withdrawn or issued without modification;
- it *must* provide an explanation, with citation to material contained in the record for any decision to modify a term of the order, to issue the order without change or to withdraw the order; and
- it *shall* be based on the administrative record.
- its findings *must* be supported by "a preponderance of the evidence" in the administrative record.

As discussed below, the Recommended Decision does not satisfy these conditions.

III.
THE RECOMMENDED DECISION IS REPLETE WITH LEGAL ERRORS

1. The Recommended Decision incorrectly applies the burden of proof.

a. EPA, not Sparton, bears the burden of proof

Section 556(d) of the Administrative Procedure Act states that unless a statute provides otherwise, "the proponent of a rule or order has the burden of proof." 5 U.S.C. § 556(d). This means that EPA, the proponent of the order, carries both the *burden of coming forward with a prima facie case* and the *burden of persuasion* that the order is validly issued. *Director, OWCP v. Greenwich Colleries*, 114 S.Ct. 2251 (1994). The proponent of the order has to meet its burden by a preponderance of the evidence. *Steadman v. SEC*, 450 U.S. 91 (1981). If EPA does not present a prima facie case or meet its burden of persuasion, or if the evidence is evenly balanced, EPA loses.[1] *Director OWCP*, 114 S. Ct. at 2259. Rule 24.17(a) reflects this same standard of proof: if a provision is contested, EPA has the burden of proving that it is supported in the administrative record by a preponderance of the evidence. If EPA does not meet that burden, the order must be withdrawn or modified. 40 C.F.R. 24.17(a). As set forth in Part IV below, EPA has failed to meet its burden. Thus, the Initial Order should be withdrawn or revised consistent with Sparton's recommended remedy.

b. In the Recommended Decision the burden of proof is inappropriately shifted to Sparton.

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[1] Only after EPA has made a prima facie case supported with credible and credited evidence does the burden shift to Sparton to rebut it. *Director, OWCP*, 114 S.Ct. at 2259.

At numerous points in the Recommended Decision the burden of proof is placed on Sparton to demonstrate the invalidity of the order or of a contested provision. For example, the Recommended Decision states, "a respondent must follow procedures set forth in 40 C.F.R. Part 24, and present sufficient probative evidence from which a reasonable decision maker could find in respondent's favor, by a preponderance of the evidence." Recommended Decision, p. 8. This statement violates the requirements of the APA, EPA's rules, and case law, taints the entire Recommended Decision, and requires that the Recommended Decision be set aside and a new hearing held based on applying the burden of proof correctly.

2. The Recommended Decision is deficient in failing to explain why EPA ignored probative evidence supporting Sparton's claims.

The Regional Judicial Officer cannot ignore the evidence Sparton presented in support of its position. As the Supreme Court explained, "[n]o agency is authorized to stand mute and arbitrarily disbelieve credible evidence." *Director OCWP,* 114 S.Ct. at 2259, *quoting* S.Rep. No. 752, 79th Cong., 1st Sess., 22 (1945). Where evidence is in conflict, the agency must explain why it chose to rely on some probative evidence when it was confronted with conflicting evidence. *Vemco, Inc. v. NLRB*, 79 F.3d 526, 529 (6th Cir. 1996) (vacating agency finding where agency did not explain why it credited unsupported testimony of witness and rejected testimony that was supported by documentary evidence); *Green v. Shalala*, 51 F.3d (7th Cir. 1995) (finding must be vacated and remanded if ALJ failed to mention important evidence that contradicted finding); *Adorno v. Shalala*, 40 F.3d 43 (3rd Cir. 1994) (vacating agency finding where agency did not explain why it rejected probative evidence). Because the Regional Judicial Officer did not discharge this responsibility, the

Recommended Decision must be set aside and the Regional Judicial Officer must be directed to issue a new decision that confronts and discusses Sparton's evidence.[2]

3. The Recommended Decision is erroneously based upon a superseded remedy selection approach.

In evaluating the Initial Order and Sparton's March 1997 recommended remedy, the Recommended Decision cites frequently to EPA's 1990 proposed corrective action rules (55 Fed. Reg. 30798 (July 27, 1990). *See* Recommended Decision, pp. 16, 17, 30, 31, 33, 40, 46, 47, 48, 50, 51. The Recommended Decision pays particular homage to what it terms the "four minimum remedy selection standards" discussed in the 1990 proposal. *Id.* at 46, *citing* 55 Fed. Reg. at 30877 (rule prop. to be codified at 40 C.F.R. 264.525). However, in 1996 EPA effectively voided the 1990 proposed rules, when it issued new proposed rules related to remedy selection. 61 Fed. Reg. 19449 (May 1, 1996). In its 1996 proposal, EPA referred to the four "standards" of the 1990 proposed rule as "threshold criteria," and the agency made clear that it "believes [they - the four "standards,"] remain appropriate as general goals for cleanup and screening tools for potential remedies." 61 Fed. Reg. at 19449. The difference between a "minimum standard" and a "general cleanup goal" is significant and demonstrates a marked change in approach. The fact that the Recommended Decision relies on the "threshold criteria" as "minimum standards" in approving the provisions of the Initial Order and rejecting Sparton's recommended remedy, demonstrates that the Regional Judicial Officer applied the wrong standards in reviewing the validity of the Order.

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[2] Section IV contains numerous examples of the failure of the Regional judicial Officer to address evidence advanced by Sparton that contradicts EPA's position.

Further, it is inherently unfair that EPA required Sparton to use a remedy selection process set forth in the Administrative Order on Consent ("AOC") to prepare the Corrective Measures Study ("CMS"), and then evaluates the CMS on the basis of another (albeit improper) set of standards. *See* Sparton's Protective Response, pp. 4; Sparton's Additional Information, pp. 12-13. For instance, Sparton's draft final Corrective Measures Study, which is part of the administrative record, describes corrective action objectives, approved by EPA, that are not identical with the four standards used by the Regional Judicial Officer in the Recommended Decision. It was error for the Regional Judicial Officer to disregard the objectives EPA approved for this site, in evaluating the corrective action called for in the Initial Order.

Considering that the Recommended Decision applied an improper standard in reviewing the remedy in the Initial Order, the Regional Administrator should set aside the Recommended Decision and direct a new hearing be held applying appropriate selection criteria -- namely those set forth in the EPA approved Draft Final Corrective Measures Study.

4. The Recommended Decision fails to explain why the corrective action provisions of the Initial Order are *necessary* to *protect human health or the environment* a threshold legal requirement of section 3008(h) of RCRA.

Section 3008(h) of RCRA authorizes the administrator to act, only when action is necessary to protect human health or the environment. The Recommended Decision is devoid of any meaningful critical analysis of why action is "necessary" at this site to protect human health or the environment.

An action is "necessary" if it is "essential for some purpose." WEBSTER'S NEW INTERNATIONAL DICTIONARY 1510 (3d ed. 1993). Thus, EPA has the burden to prove that

the corrective actions are "essential" to protect human health or the environment. Justification for the corrective action remedies in the Initial Order are set forth in Section F, pages 37-54 of the Recommended Decision.

The Recommended Decision reports that the Administrative Record in this proceeding consists of approximately 9000 pages. Recommended Decision, p. 12. However, the Recommended Decision supports the necessity of the corrective action provisions of the Initial Order by citing to only 25 pages of reports or other documents prepared by EPA or Sparton[3], 47 pages of two EPA publications[4], and 6 pages of a document prepared by an interested party.[5] Although the preponderance of the evidence is not based on the number of pages submitted, this certainly highlights the paucity of evidence supporting the necessity of the Initial Order and demonstrates that EPA has not met its burden of proof regarding the necessity for the Initial Order and that the Recommended Decision has not met the standards set forth in 40 C.F.R. § 24.17(a).

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[3] The Recommended Decision cites to 11 pages in Sparton's earlier version of the Corrective Measures Study (cites to pages 005692-5703 of the Administrative Records at pages 38, 42 and 43 of the Recommended Decision), 13 pages of EPA's Final Decision and Response to Comments (cites to pages 008640-8652 of the Administrative Record at pages 40, 42, 47-51 of the Recommended Decision), and 1 page of EPA's comments addressing requirements in Tasks VII-X of the Scope of Work for a Corrective Measure Study (cite to page 003554 of the Administrative Record at page 45 of the Recommended Decision).

[4] The Recommended Decision cites to "Considerations in Ground-Water Remediation at Superfund Sites and RCRA Facilities -- Update" and "Transmittal of OSWER Directive 9234.2-25: 'Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration'" at Administrative Record, pp. 003365-3377, 001605-1638). Recommended Decision, p. 47.

[5] The Recommended Decision cites to 6 pages of the "Ground-Water Protection Policy and Action Plan as Adopted by the Board of County Commissioners and the City Council." Recommended Decision, p. 45 (citing to Administrative Record, pp. 001895-2000).

A review of the documents cited in the Recommended Decision is even more revealing. The only site-specific facts cited in support of the necessity to protect human health and the environment are EPA's unsupported statements in its "Final Decision and Response to Comments" that "the aquifer is potentially useable as a source of drinking water" and "that it is currently used outside of the contaminant plume for this purpose." Administrative Record, pp. 008640, 008642. This is insufficient evidence to sustain the Initial Order, especially considering Sparton's extensive unrebutted evidence that the contamination poses no present or potential risk to human health or the environment because there are no exposure pathways or ecological receptors.[6]

a. The mere presence of contaminants in groundwater above drinking water standards is not sufficient to support a finding of present or potential harm to human health or the environment.

The Recommended Decision errs in finding that the remedies in the Initial Order are necessary due to the presence of contaminants in groundwater, without considering exposure pathways and fate and transport of constituents. Recommended Decision, pp. 44-45. The presence of contaminants in soil and groundwater constitute the "release" under section 3008(h). Section 3008 authorizes the administrator to order actions necessary to protect human health or the environment, not actions necessary to remove "releases."

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[6] For example, EPA has presented no evidence to refute that the plume of contamination is not in an aquifer used by the City of Albuquerque or New Mexico Utilities as a public drinking water supply, there are no current plans to use the impacted groundwater as a source of drinking water, that the background water quality in the plume is undesirable for a public water supply with or without the contamination, and that even without containment contaminants will meet media cleanup levels before they reach the well, if they ever do. Sparton's Protective Response, p. 4; Sparton's Memorandum, pp. 7-11.

The Recommended Decision states that elevated concentrations of contaminants in groundwater pose "a potential threat to the environment, and there is no need to determine a potential threat to human health." Recommended Decision, p. 45. However, there is no legal or evidentiary support for the contention that the mere presence of contaminants in groundwater poses any ecological risk nor evidence that the provisions of the Initial Order are necessary to protect ecological receptors.[7] Thus, this finding has no support in the administrative record.

The Recommended Decision also errs in finding a potential threat to human health solely on the presence of contaminants in groundwater at concentrations in excess of drinking water standards.[8] Recommended Decision, p. 45. The evidence in the Administrative Record supports only a finding that there is *no threat* to human health. The Recommended Decision notes that this is a contested finding, but errs in failing to explain why the Regional Judicial Officer rejected Sparton's extensive evidence that the contamination poses no present or potential risk to human health or the environment because there are no exposure pathways. *See* Recommended Decision, pp. 44-45; Memorandum regarding Sparton Technology, Inc.'s Position on the Facts, the Law and the Relief Sought by EPA, pp.4-11 (hereinafter referred to as "Sparton's Memorandum"); Additional Information in Support of Sparton Technology, Inc.'s Position on the Facts, the Law, and the Relief Sought by EPA, pp. 2-10 (hereinafter

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[7] According to EPA guidance, the remedy selected must be protective of human health and the environment. This is accomplished through performing risk assessments related to human receptors and ecological receptors. 61 Fed. Reg. 19450-51.

[8] The statement that drinking contaminated groundwater would be a "catastrophic event" demonstrates the Presiding Officer's lack of understanding of the technical issues as well as the legal standard: Drinking contaminated water could create a risk of harm but not cause harm. *Id.* at 45-46.

referred to as "Sparton's Additional Information"). Because there is inadequate support to find that the actions in the Initial Order are necessary, the Regional Administrator should withdraw the Initial Order or, in the alternative, vacate the Recommended Decision and remand it for a new proceeding.

b. The Recommended Decision fails to explain how EPA's proposed remedy better protects human health or the environment than Sparton's recommended remedy.

Both EPA's and Sparton's remedies include containment and removal of the source to prevent further migration from the site and containment of off-site contamination. Sparton's remedy will commence at least two years sooner than that called for in the Initial Order because it does not include the extensive, unnecessary investigations and reports prior to development and construction of the remedial actions. Thus, Sparton's remedy will stop migration at least two years sooner than actions taken under the Initial Order. Although Sparton's remedy does not include an aggressive restoration program within the plume, the containment of on-site sources and the pump and treat program at the off-site containment well will, given EPA's assumptions of the ability to remediate area groundwater, achieve restoration within a reasonable time. Further, although Sparton's remedy is quite expensive, it is considerably less costly than the Initial Order. The Recommended Decision does not adequately explain why the preponderance of the evidence demonstrates EPA's remedy is better and more cost effective than Sparton's.

5. The Recommended Decision fails to build an accurate and logical bridge between the evidence and the result.

In the Recommended Decision, the Regional Judicial Officer was required to build an accurate and logical bridge between the evidence and the conclusions. *Sarchet v. Chater*, 78 F.3d 305, 307 (7th Cir. 1996) (court cannot uphold an agency decision "if, while there is enough evidence in the record to support the decision, the reasons given by the trier of fact do not build an accurate and logical bridge between the evidence and the result"). Further, the basis for reaching a legal ruling and conclusions must be set forth with such clarity as to be understandable. *Louisiana-Pac. Corp. v. NLRB*, 52 F.3d 255 (9th Cir. 1995).

The attached chart, Exhibit A, describes the arguments and evidence advanced by Sparton and how they were addressed by the Regional Judicial Officer in the Recommended Decision. As that chart establishes many of the most critical of Sparton's arguments were not addressed and others were rejected without any reasoned justification.

The Regional Judicial Officer failure to appropriately explain his conclusions requires that the Recommended Decision be set aside and the Regional Judicial Officer be required to explain in a logical and meaningful way why he decided this matter the way he did.

6. The Recommended Decision is deficient because it fails to modify the Initial Order to include institutional controls.

The Initial Order fails to include institutional controls to prevent the use of contaminated groundwater during the remediation period. Hearing Transcript at 108-09. Sparton has proposed working with the State Engineer's office to achieve institutional controls to prevent exposure during the remediation period. *Id.* EPA has not opposed this measure.

The Recommended Decision should be revised to modify the Initial Order to include institutional controls.

7. The Part 24 procedures as applied in this case violate Sparton's constitutional right to due process.

The Recommended Decision errs in summarily dismissing Sparton's due process claims on the grounds that the Part 24 procedures for disputing the Initial Order "are constitutional." *See* Recommended Decision, pp. 19. The case cited in support of that position was a facial challenge to the Part 24 rules and does not foreclose Sparton's allegations of constitutional violations. *See Chemical Waste Management v. U.S. EPA*, 873 F.2d 1477, 1483-85.

A review of that case and EPA's response to comments during rulemaking of Part 24 demonstrates that the rules as applied in this proceeding will not withstand a challenge. In *Chemical Waste*, the Court of Appeals discussed the vulnerability of the Part 24 rules in a direct challenge:

> the absence of formal safeguards could prove troublesome in a case that involved both high financial stakes to the operator and either substantive issues that would benefit greatly from development through trial-type procedures, or a Regional Judicial Officer with "actual bias." . . . From the face of the Part 24 regulations, neither petitioners nor we have any indication of how the agency will apply them in particular instances. There is no reason to doubt, however, that by being reasonably sensitive to the needs of each case, EPA can avoid the problems posited by petitioners.

Chemical Waste, 873 F.2d at 1485. Unfortunately, in this case, EPA has not shown any sensitivity to avoid Sparton's due process concerns regarding the multi-million dollar price tag for measures that are not *necessary* to *protect* human health or the environment. The

substantive contested issues regarding the *necessity* for further studies that will take years to complete prior to implementing the remediation phase and the efficacy of a comprehensive groundwater pump and treat system would benefit greatly from trial-type procedures.

In response to comments on the Part 24 rules regarding procedural due process issues, EPA supported the rules on the grounds that "lengthy administrative proceedings, which include extensive discovery and cross-examination, are not only unnecessary from a due process standpoint, they are also incompatible with the need to accomplish cleanups quickly before contamination spreads ***or*** adverse health/environmental impacts occur [thus recognizing that migration of contamination does not constitute adverse environmental impacts]. 53 Fed. Reg. at 12257. Here, EPA proposes years of study while contaminants will continue to migrate, before implementing the groundwater containment wells.

One of the elements to be considered in determining if a procedure violates due process is the risk of an erroneous deprivation through the procedures used. *Chemical Waste,* 873 F.2d at 1483. To "provide additional protection against factual error", the Part 24 rules provide the opportunity to submit questions to EPA on factual matters which are in dispute. 52 Fed. Reg. 29999, 29224 (August 6, 1987). The Regional Judicial Officer denied Sparton's request for questions that would have provided evidence regarding (1) whether the Regional Judicial Officer has actual bias, (2) whether the Initial Order was based upon documents and communications that are not included in the Administrative Record, (3) whether EPA personnel who reviewed the "Technical Review Final Corrective Measure Study Report RCRA Corrective Action" and the "Technical Review Report on the Effectiveness of the Groundwater Recovery Well System in the Upper Flow Zone RCRA Corrective Action" are

qualified; (4) whether EPA has evidence that detects arsenic in the plume at concentrations in excess of drinking water standards; (5) EPA's experience with the effectiveness of reinjection of treated groundwater; (6) EPA's policy and experience with the requiring and succeeding in restoring groundwater contaminated with chlorinated solvents; (7) EPA's policy and guidance documents approving remedies at RCRA and CERCLA facilities that will leave hazardous constituents in groundwater in excess of drinking water standards; (8) EPA's experience in determining that the vertical and horizontal extent of groundwater was adequately characterized for purposes of designing a remedy. *See* Request to Submit Written Questions to EPA, pp. 6-12. These material questions of fact and policy bear directly on matters in dispute. The Regional Judicial Officer's denial of Sparton's Request to Submit Written Questions is one more instance in which the agency went out of its way to deny Sparton due process in this proceeding.

Finally, any "lack of evidence" related to Sparton's due process, procedural and jurisdictional challenges is due solely to the Regional Judicial Officer's denial of Sparton's Request to Submit Written Questions, thus adding insult to Sparton's constitutional injury.

The bottom line is that EPA is ordering Sparton to undertake a multi-million dollar action without the right to a full administrative hearing in order to save half the cost of such a hearing through its Part 24 procedures. *See* 53 Fed. Reg. at 12257 (stating that the savings to EPA from use of Part 24 procedures are at least fifty percent of previous totals).

IV.
COMMENTS TO SPECIFIC PROVISIONS

1. Delegation of Authority - Pages 8 and 10. On page 10 the Recommended Decision states, "there is no information indicating that the Director of Compliance Assurance and

enforcement does not possess authority to issue the Initial Order in questions." *Id.*, pp. 10. The correct test is whether EPA has met its burden of demonstrating by a preponderance of the evidence that the Administrator has properly delegated authority to issue Initial Orders to the Director of Compliance Assurance and Enforcement. 40 C.F.R. § 24.17. The Administrative Record does not reflect that authority to issue initial orders has been properly delegated to this officer. Thus, the EPA has not satisfied the burden of proof that the Initial Order is valid and the Regional Administrator should withdraw the Initial Order.

2. **Waiver of Arguments - Pages 12, 35, 36 and 52**. The Recommended Decision states that Sparton probably waived the following arguments on the grounds that they were not properly raised and pursued in accordance with applicable regulations: that the order is not based on the administrative record, that the relief provisions in the order were pre-selected by EPA prior to completion of the CMS and development of the administrative record, that the order was issued in bad faith with an improper motive, that Sparton is not the owner and operator of a hazardous waste management facility, that the plant was not an interim status facility, that Sparton did not own and operate the site as a hazardous waste management facility or store waste for more than ninety days after November 19, 1980, and that the Initial Order did not describe the corrective action with reasonable specificity. *See* Recommended Decision, pp. 12, 35, 36 and 56. The Part 24 Rules do not grant the Regional Judicial Officer authority to argue that disputed issues are waived. *See* 40 C.F.R. Part 24. The case cited in the Decision provides no support for the Regional Judicial Officer raising a waiver argument. *See U.S. EPA v. Environmental Waste Control, Inc.*, 917 F.2d 327, 331 n.7 (7th Cir. 1990). In that case, the Court of Appeals stated that it was likely that the respondent waived an

argument that it did not raise in the district court proceeding below. *Id., citing U.S. EPA v. Environmental Waste Control, Inc.*, 701 F.Supp. 1172, 1245 (N.D. Ill.). Failing to raise an issue in district court is quite different from this situation where Sparton raised all the above issues in its pleadings. Further, EPA did not argue waiver in any of its submittals and the rules do not authorize the Regional Judicial Officer to spontaneously raise this argument. 40 C.F.R. Part 24. Instead, the Recommended Decision must decide each disputed provision based upon a preponderance of the evidence. 40 C.F.R. § 24.17(a). The Regional Administrator should revise the Recommended Decision to delete the waiver arguments.

3. Completeness and Accuracy of the Administrative Record - Page 12. With respect to Sparton's contention that the administrative record is neither complete nor accurate, the Recommended Decision cites to the length of the record and states that Respondent waived this argument. Recommended Decision, pp. 12. Sparton's contention is that the Initial Order was based upon political and not technical factors and was decided upon before the administrative record was developed. *See* Sparton's Protective Response and Request for Hearing, pp. 8 (hereinafter referred to as "Sparton's Protective Response"). Sparton was unable to provide facts to support its contention because it did not have the ability to conduct discovery in this matter under Part 24 procedures and because the Regional Judicial Officer denied Sparton the right to submit questions to the agency that would have provided the necessary facts. *See* Sparton's Request to Submit Written Questions to EPA, pp. 6-8; Order Denying Questions by Respondent.

The Recommended Decision recites circumstances that may warrant additions to an administrative record. Recommended Decision, pp. 14. Of interest, additions may be

warranted when it appears the agency relied on documents or materials not in the administrative record. *Id.* However, the Regional Judicial Officer improperly denied Sparton the opportunity to question the agency with respect to this contested issue, making it impossible for Sparton to develop the record on this material issue.

4. Standards for Remedy Selection - Pages 16-17. As set forth in section III above, the Recommended Decision is not based upon EPA's remedy selection rules, nor corrective action objectives EPA approved for this site. The Recommended Decision states that according to proposed rule 40 C.F.R. 264.525, "it is proper to consider a remedy for implementation only if it satisfies four minimum standards." *See* Recommended Decision, pp. 16-17, *citing* 55 Fed. Reg. at 30877-79. The Recommended Decision errs in relying on section 264.525 as establishing *minimum* remedy selection standards. The EPA clarified its remedy selection process for corrective actions in a 1996 proposal. 61 Fed. Reg. 19448-19453. This guidance supersedes the 1990 proposal. The risk-based remedy selection procedures discussed in the 1996 proposal are much more flexible that those set forth in the 1990 proposal. In the 1996 proposal EPA sets forth its "current remedial expectations", which it states "are not binding requirements; rather they reflect collective experience and guide development of remedial alternative."[9]

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[9] (a) EPA expects to use treatment to address the principal threats posed by a site whenever practicable and cost-effective. ...

(b) EPA expects to use engineering controls, such as containment, for wastes and contaminated media which can be reliably contained, pose relatively low long-terms threats, or for which treatment is impracticable.

(c) EPA expects to use a combination of methods (e.g. treatment, engineering and institutional controls), as appropriate, to achieve

5. Procedures Violate Sparton's Constitutional Right to Due Process - Pages 19. As discussed in section III.7 above, the Part 24 rules as applied in this proceeding violated Sparton's right to due process. The Recommended Decision states that Sparton's constitutional allegations have no basis and are unsupported by law and facts. However, it is the nature of the process itself--no right to discovery, no right to cross examination, and the denial of the opportunity to submit written questions--that created the lack of established facts to support the allegations. The Regional Administrator should vacate the Recommended Decision and remand this proceeding for an adjudicative hearing.

6. Bias of Regional Judicial Officer - Pages 20-21. The Recommended Decision states that persuasive record evidence does not support Sparton's allegations of bias but cites no evidence to support this statement. Further, the Regional Judicial Officer denied Sparton's

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> protection of human health and the environment.
>
> (d) EPA expects to use institutional controls such as water and land use restrictions primarily to supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous wastes and constituents. ....
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> (f) EPA expects to return usable groundwaters to their maximum beneficial uses wherever practicable within a time frame that is reasonable given the particular circumstances of the site. When restoration of groundwater is not practicable, EPA expects to prevent or minimize further migration of the plume, prevent exposure to the contaminated groundwater and evaluate further risk reduction. EPA also expects to eliminate surface and subsurface sources of groundwater contamination.
>
> (g) EPA expects to remediate contaminated soils as necessary to prevent or limit direct exposure of human and environmental receptors and prevent the transfer of unacceptable concentrations of contaminants ... from soils, including subsurface soils, to other media.

61 Fed. Reg. 19448 (1996).

Request to Submit Written Questions to EPA that would have developed a factual basis related to this claim.

7. **Right to a Meaningful Hearing or Judicial Review on Modifications of Reports and Work Plans - Pages 22-23.** The Regional Judicial Officer does not understand Sparton's argument and, therefore, has failed to address it. In essence, the Initial Order directs Sparton to undertake unspecified further testing and then propose remedial activities. EPA can modify those proposals anyway it wants, and Sparton cannot challenge such decision under the Part 24 rules. The Recommended Decision never explains why such subterfuge is proper, because it is not. The Regional Judicial Officer erred in not modifying the order to provide Sparton with the right to invoke Part 24 procedures if it disagrees with any EPA modification to a Sparton submittal.

8. **Definition of Extent of Groundwater Plume - Page 38, n. 12, Pages 40-45.** The Recommended Decision mischaracterizes Sparton's position regarding whether the plume has been adequately defined for purposes of remedy design. Sparton has been consistent in its position that the extent of the groundwater plume is *adequately or sufficiently* defined to proceed with the remedial actions. There is never exact certainty of the extent of the plume due to its migration. If Sparton installs more wells and studies the site for two or more years before implementing the remedial actions, as required in the Initial Order, we would still not know the exact extent of contamination because the plume would have migrated further.

Once again the Regional Judicial Officer is either unwilling or unable to understand what Sparton is saying. The plume may not be defined "exactly," but it can still have sufficient definition to allow a remedy to proceed. Sparton's position is not inconsistent.

Instead, it recognizes there is always some uncertainty about plume limits, the issue is whether so much uncertainty exists that a remedy cannot be designed. The Regional Judicial Officer never addressed this issue, but instead disregarded Sparton's argument because of his lack of understanding about what was in issue.

Proposed Rule 264.526(d) does not require that the full extent of the plume be determined prior to implementation of a remedy. *See* 55 Fed. Reg. 30879. Sparton has submitted extensive evidence that it has adequately determined the horizontal and vertical extent of the plume necessary to install on-site and off-site containment wells, with the exception of the one well Sparton has suggested installing as discussed on pages 163-65 of the Public Hearing Record. *See* Sparton's Memorandum, p. 9; Public Hearing Record, pp. 164-65. The Recommended Decision fails to explain whether or why any other wells would need to be installed to define the plume, and why the Sparton's evidence with respect to this issue was rejected.

9. Remedy Issues In Dispute - page 39. The Recommended Decision is wrong in concluding that there is "no actual ongoing controversy regarding implementation" of components of EPA's selected remedy other than installation of interior wells to aggressively restore groundwater and that these issues are moot. Recommended Decision, pp. 39. It is true that EPA and Sparton agree that the plume should be contained, that on-site groundwater recovery should be enhanced, and a soil vapor program installed. But the parties significantly disagree on what additional testing needs to be done before that work can begin, what should be done with recovered and treated groundwater, and the amount of monitoring required to confirm any implemented remedy is working.

All of these disputed tasks are very costly and will delay significantly the start of any remediation. The Recommended Decision fails to identify the preponderance of the evidence that justifies such work.

10. Restoration of the Contaminated Aquifer to its Beneficial Use - Pages 40, 41, 47. The Recommended Decision provides no evidence to support the feasibility of restoring the contaminated groundwater to its beneficial use. The EPA has the burden of demonstrating that the provisions of the Initial Order are necessary to protect human health and the environment. This burden includes demonstrating that the remedy is achievable. It cannot shift the burden to Sparton to prove that the remedy is not necessary because it is not achievable. Sparton has demonstrated that silts and clays are present in many of the boreholes throughout the contaminated plume that are likely to make restoration impossible or even be counterproductive. Public Hearing Record, pp. 85-90, 174-177, and Exhibits 8, 9 and 10. Sparton has submitted credible evidence rebutting the claim that restoring groundwater to beneficial use within a reasonable time is possible, assuming that this water would ever be used beneficially. *See* Sparton's Additional Information, p. 10-12 and Attachments. Because EPA has failed to demonstrate the feasibility of this remedy, the Initial Order should be modified to delete Task V, Paragraphs 15 and 16, except as applied to the one well discussed in the Public Hearing Record, pp. 164-65, and Paragraphs 17-24 except as applied to the containment well(s).

11. Time to Restore Groundwater to Beneficial Use - Pages 43-44. Sparton has submitted evidence that due to the nature of the constituents, it may take hundreds of years to treat groundwater with a pump and treat system. Administrative Record, pp. 005701;

Sparton's Additional Information, p. 10-12 and Attachments. This is due to the presence of clays and silts in subsurface soils. Public Hearing Record, pp. 85-90, 174-177, and Exhibits 8, 9 and 10. EPA states that the soil is gravel and sand and that treatment will only take 30 years. Sparton has submitted credible evidence regarding the presence of silts and clays in the plume and the difficulty these pose for remediation of chlorinated solvents. *Id.* EPA has presented no evidence to support that the aggressive pump and treat system would restore the aquifer to beneficial use within a "reasonable time." Public Hearing Record p. 134-36, 174-75.

However, if EPA is correct and the aquifer is capable of remediation, then Sparton's recommended remedy, including containment of the on-site source and containment of the off-site plume, would also result in restoration of the groundwater to beneficial use within a reasonable time. Additional Information, p. 11.

The statements on page 44 of the Recommended Decision indicate that the Regional Judicial Officer did not understand Sparton's evidence regarding this issue. *See* Recommended Decision p. 44. Once again the Regional Judicial Officer fails to understand Sparton's argument. Sparton and EPA disagree about the subsurface geology at the site (one of the many disputes critical to deciding whether EPA's order should be upheld that is not addressed). If Sparton is right restoration will not occur. If EPA is right, then Sparton's remedy will achieve restoration as quickly as EPA's proposal. Sparton is not taking inconsistent positions. It is simply making alternative arguments, one based on its view of the facts, the other based on EPA's. Why the Regional Judicial Officer cannot understand Sparton's position, which could not have been made any more clear, is a mystery.

The Regional Judicial Officer also failed to identify how long it would take EPA's remedy to achieve restoration and what will be done in that period to avoid the risks to human health EPA believes exist. Sparton proposed institutional controls. EPA nothing. The Recommended Decision does not address this issue.

12. Sparton's Proposal Will Achieve Media Cleanup Standards - Page 46, 48. The Regional Judicial Officer does not understand EPA's interpretation of media cleanup standards. EPA's 1996 proposal regarding remedy selection for corrective actions discusses the confusion over the threshold criteria that remedies attain "media cleanup standards." Media cleanup standards are site- and media-specific concentrations developed as part of the overall cleanup standards that "reflect the potential risks of the media in question by considering the toxicity of the constituents of concern, **exposure pathways**, and **fate and transport** characteristics. *Id.* Further,

> [a]ttaining media cleanup standards does not necessarily entail removal or treatment of all contaminated material above specific constituent concentrations. Depending on the site-specific circumstances, remedies may attain media cleanup standards through various combinations of removal, treatment, engineering and institutional controls.

Id. The Recommended Decision ignores these proposed rules and Sparton's extensive evidence that supports a finding that Sparton's recommended remedy meets the remedy selection criteria set forth in EPA's 1996 proposal as well as the EPA approved objectives in the CMS. Instead, the Recommended Decision establishes the drinking water standards as the "minimum" media clean-up standard and rejects Sparton's approach on the grounds that it will

not achieve "minimum" media cleanup standards within a reasonable time frame. Recommended Decision at 46-49.[10] *See* Sparton's Additional Information, pp. 10-12.

The Recommended Decision also errs on pages 48 and 49 when it indicates that the Initial Order will reduce the levels of contamination in groundwater and soil and control sources of releases, but Sparton's recommended remedy will not. Recommended Decision pp. 48, 49. The Recommended Decision relies on documents discussing Sparton's previous proposal, not the recommended remedy that includes expanded on-site groundwater treatment and containment, off-site groundwater containment (including treatment of removed water), and soil vapor extraction. *See* Additional Information p. 10.

13. There is no support that the remedy in the Initial Order will restore the aquifer to beneficial use - Page 48. EPA has no support for its position that the Initial Order will restore the aquifer to beneficial use - Recommended Decision p. 48. The preponderance of the evidence demonstrates otherwise. The provisions in Task V requiring extensive investigation and implementation of an aggressive pump and treat program are simply not "necessary" to protect human health and safety. As described above, if EPA is right that the site is a good candidate for groundwater restoration, then Sparton's recommended remedy will also accomplish restoration in a reasonable time frame at considerably lower costs. If EPA is wrong and restoration is impracticable, Sparton has spent millions of dollars unnecessarily with no added protection to human health or the environment.

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[10] The Recommended Decision ignores the fact that Sparton's recommended remedy includes treatment of all groundwater withdrawn from the containment well(s) at the leading edge of the plume and from the on-site containment wells. Sparton's Additional Information, pp. 10-12. If EPA is correct in its assessment of the movement of chlorinated solvents in the aquifer, Sparton's remedy will achieve the same level of treatment as EPA's remedy in a reasonable time frame.

14. "Reasonable Specificity" of the Initial Order - Pages 54-56. The Initial Order only outlines the actions to be taken, but not the nature of those actions.[11] The failure of the order to set forth the number of containment, recovery and monitoring wells, the type of water treatment, the method for recovery of soil vapors, and the management of treated groundwater recovery wells does not meet the standard set forth in RCRA section 3008(h)(2) that the order state with "reasonable specificity the nature of the required corrective action." Sparton's Additional Information, p. 9-10. First and foremost, the nature of the corrective action must set forth with sufficient specificity to justify that the order meets the standards of 3008(h)(1), *i.e.*, the Order must be specific enough to allow EPA to justify that the order is *necessary to protect* human health or the environment. Otherwise, as here, it is impossible for a respondent to challenge the necessity of five or fifty monitoring wells, the necessity of one or ten containment wells, the necessity to reinject or discharge treated wastewater, and other remedies that are not specified in the Initial Order but are left to EPA's discretion at some time in the future. The lack of specificity in the Initial Order is so great it may represent a difference of millions of dollars and years of study and effort--which may not be necessary to protect human health or the environment. The Initial Order specifies only more testing. The specifics of the remedial actions, which must be *necessary to protect human health and the environment,* will be set forth years from now in work plans that are not subject to even a Part 24 hearing or judicial review. Thus, the Initial Order cannot be deemed to meet the

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[11] The absence of specificity is most evident upon review of EPA's Response to Sparton's Memorandum where, EPA replies time and again that these decisions should be left to sole discretion of EPA. EPA's Response to the Memorandum Regarding Sparton Technology, Inc.'s Position on the Facts, the Law and the Relief Sought by EPA, pp. 42, 43, 44, 56.

standards of "reasonable specificity" in RCRA § 3008(h)(1). The Regional Administrator should dismiss the Initial Order for lack of specificity.

15. The Recommended Decision fails to address all material issues of fact or law in violation of rule 24.17(a) - Page 57. The recommended decision fails to meet the requirement set forth in 40 C.F.R. § 24.17(a) that all material issues of fact or law properly raised by Sparton must be addressed. The Recommended Decision summarily states that all other issues raised by Sparton were either immaterial, not properly raised or unpersuasive. Recommended Decision, p. 51. The Recommended Decision errs in failing to address the following material issues:

a. The plume of contaminants in not in an aquifer used by the City of Albuquerque ("City") or New Mexico Utilities ("NMU") as a public drinking water supply because the City is not authorized to use it and it is not at the depth of the aquifer used by NMU. Sparton's Protective Response, p. 4. This is a material issue regarding whether the contaminated plume presents a risk to human health or the environment.

b. A new Health and Safety Plan is not necessary. *Id.* at 6. The Decision does not justify the need for this provision in the Initial Order.

c. Provisions in the Initial Order regarding investigations and reports related to the soil vapor extraction remedy are not necessary. *Id.*

d. Provisions in the Initial Order regarding installation of additional monitor wells and requiring studies and reports related to the groundwater extraction remedy are not necessary. *Id.* at 7.

e. Sparton's challenge to misstatements in Exhibit A of the Order (EPA's Final Decision and Response to Comments) are material issues that rebut the basis for EPA's Final Decision, which the Recommended Decision cites as primary support for EPA's remedy selection. *Id.* at 8-18; *cf.* cites in Recommended Decision at 40, 42, 47, 48, 49, 50, and 51.

f. Justifying a remedy solely on the presence of contaminants in groundwater without performing a risk assessment would effectively re-write RCRA 3008(h) and conflicts with EPA's 1996 corrective action remedy selection process. Sparton's Memorandum, p. 6; Sparton's Additional Information, p. 2-4.

g. EPA has not challenged the finding in the Corrective Measure Study, which is part of the Administrative Record, that the impacted groundwater is not used for drinking water and there is no significant risk to human health presented by the impacted groundwater nor identified the likelihood that the NMU well could ever be affected by the plume. Sparton's Memorandum, p. 7 Sparton's Additional Information, p. 2, 5-8.

h. The impacted groundwater is not a future source of drinking water before it would be remediated. Sparton's Memorandum, p. 10.

16. Conclusion - Page 58, Paragraph B. The EPA has not met it burden that the relief measures in the Initial Order are reasonably specific and necessary to protect human health and the environment. Those provisions unnecessarily require further plume delineation, installation of unneeded monitor wells, studies and reports that will only delay efforts to contain the movement of constituents of concern and increase the cost without providing additional protection, a recovery system that will not achieve its objectives faster than Sparton's recommended remedy at considerable excess cost and no additional protection, and

generation of new waste streams that have a higher likelihood of impacting human health or the environment than current conditions. The Regional Administrator should dismiss the Order or modify it to conform to Sparton's recommended remedy.

V.
CONCLUSION AND REQUEST FOR RELIEF

As Sparton's comments makes clear, it is troubled by the fact that the Recommended Decision represents a "rush to judgment." The document reveals that the Regional Judicial Officer neither understood, analyzed, nor responded to Sparton's arguments. Sparton believes at a minimum it is entitled to have a recommended decision be made by someone who has and can critically analyze the legal and technical arguments advanced by Sparton, is willing and able to understand the technical issues presented, and then reduce to writing in a meaningful way a resolution of the disagreements between the parties, making it clear that those disagreements were understood, and providing a reasoned justification or "logical bridge" between the facts found and the conclusions reached. The Recommended Decision in this case does not do that.

Sparton believes that if the Regional Administrator critically considers Sparton's pleadings and reviews the record, the only choice available is to dismiss the Initial Order. In the alternative, Sparton requests that the Recommended Decision be vacated and this matter be remanded to the Regional Judicial Officer with specific instructions to address the deficiencies set forth in these comments.

Respectfully submitted,

THOMPSON & KNIGHT
A Professional Corporation

By: _____
James B. Harris, Esq.
State Bar No. 09065400

Becky L. Jolin, Esq.
State Bar No. 10856200

1700 Pacific Avenue, Suite 3300
Dallas, Texas 75201
(214) 969-1700 Telephone No.
(214) 969-1751 Fax No.

ATTORNEYS FOR
SPARTON TECHNOLOGY, INC.

CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing Comments of Sparton Technology, Inc. on the Recommended Decision was served on Evan Pearson, Senior Counsel, Environmental Protection Agency, Region 6, 1445 Ross Avenue, Dallas, Texas 75202-2733 via hand-delivery on July 30, 1997.

_____
James B. Harris

DISPOSITION OF CONTESTED ISSUES

Issues Raised by Sparton	Pleading[1] and Page	Resolution	Cite(s) in Decision
Jurisdiction - Impacts do not present a risk to public health or the environment	A-2, B-2	Not meaningfully addressed. No risk assessments to support findings: Extensive contamination in potential drinking water aquifer and location = threat to environment; contamination in ground above drinking water limits = potential threat to human health. Not site specific exploration.	45 42-46
Jurisdiction - Plant was and is not an interim status facility	A-2	Respondent allegedly waived this argument (note 11 at 36), no explanation why. Apparently, no actual ongoing controversy.	35-37
Jurisdiction - Director of the Compliance Assurance and Enforcement Division does not have authority to issue the Initial Order	A-2	Incorrectly shifts burden to Sparton to prove delegation not allowed.	9-11
Jurisdiction - The administrative record does not support the relief EPA is ordering	A-2, A-8	Records consists of 9,000 pages; respondent failed to explain how and why the record was materially inadequate or incomplete; waived this argument because not properly raised and pursued; respondent's speculative concerns do not support determination. No discovery allowed on this issue.	11-14
Jurisdiction - The Order is not based on the administrative record - EPA decided to issue the Order and request the relief based on political and not technical factors, and made the decision before the record was developed	A-2, A-18	Respondent allegedly waived this argument because Respondent didn't provide facts, although discovery to establish such facts not allowed.	11-12
Sparton is not the owner and operator of a hazardous waste management facility	A-3, A-5	Respondent probably waived this argument. No explanation why. Apparently, no actual ongoing controversy.	34-35
Sparton is not a generator of hazardous waste or engaged in management of hazardous waste at the site	A-3	Issue raised but not discussed or resolved.	35
Sparton did not own and operate the site as a hazardous waste management facility after November 19, 1980	A-3, A-5	Respondent allegedly waived this argument (note 11 at 36). No explanation why. Apparently, no actual ongoing controversy.	36-37
Sparton's notice identifying itself as the owner/operator of a hazardous waste management facility is not accurate	A-3	Respondent allegedly waived this argument. No explanation why. Apparently, no actual ongoing controversy.	34-35

EXHIBIT
A

Issues Raised by Sparton	Pleading[1] and Page	Resolution	Cite(s) in Decision
Sparton did not treat, dispose of or accumulate wastes at the plant for more than ninety days after November 19, 1980	A-3, A-5	Respondent allegedly waived this argument (note 11 at 36). No explanation why. Apparently, no actual ongoing controversy.	35-37
No hazardous wastes were detected in groundwater monitoring wells from 1983-1988 - only constituents or no release of hazardous waste - only constituents	A-3, A-4, A-5	Respondent did not offer authority rebutting EPA's position; persuasive record evidence and law support that "hazardous waste" includes "hazardous constituents".	32-33
TCE in groundwater collected in January 1996 is not solely from Sparton's operations - data suggests other contributors	A-3, A-4	Not addressed.	
The plume of contamination from Sparton is not in an aquifer used by the city of Albuquerque ("City") and New Mexico Utilities ("NMU") as a public drinking water supply (City not authorized and not at NMU depth)	A-4	Not addressed.	
EPA's concerns regarding the Corrective Measures Study ("CMS") are not part of the CMS and cannot be used in evaluating an appropriate remedy	A-4	AOC and CMS do not provide a reasoned justification to deviate from proposed 40 CFR 264.525, no explanation for why not.	14-17
The AOC does not authorize EPA to unilaterally select a remedy	A-4	Cites to EPA's response--adoption of EPA's position without explanation.	15
The FDRTC does not identify the selected remedy because it did not adopt the CMS remedy	A-4	Not meaningfully addressed.	14-17
The selected remedy is not necessary to protect human health and the environment because no risk to human health and no interference with existing and reasonably foreseeable use of the environment	A-5, A-6, B-2, B-4-5 B-8	Not specifically or meaningfully addressed.	37-54
Existing on-site groundwater extraction and treatment system does not need to be modified - effective in preventing release from on site and identifying characteristics of impacted water	A-6	Not addressed, except for bald statement that because reliable evidence (EPA Final Decision...) demonstrates that EPA's selected remedy comports with proposed rule, Sparton's remaining arguments concerning the adequacy of the remedy are immaterial and unconvincing (p. 51).	
New Health & Safety plan is not required -- current plan effective and appropriate on and off site	A-6	Not addressed.	

Issues Raised by Sparton	Pleading[1] and Page	Resolution	Cite(s) in Decision
No need to implement SVE as envisioned -- the Order involves steps, studies and reports that are unnecessary with no additional protection	A-6	Not addressed.	
No need to implement groundwater extraction: it requires further delineation that is not necessary, requires installation of additional monitor wells that are unnecessary, requires studies and reports that will delay efforts to contain the plume and unnecessarily increase the cost, envisions a recovery system that will not achieve its objectives materially faster than no action while generating new waste streams, and will result in greater impacts due to movement of constituents during the study period	A-7	Not addressed.	
Certain procedural provisions of the order are unnecessary to protect human health or the environment	A-7	The grant of authority to issue orders is broad. Provisions are within scope of authority if they advance achievement of corrective action goals.	52-54
Certain provisions of the Order deprive Sparton of meaningful hearing and/or judicial review of modifications to the relief provisions	A-7	Not meaningfully addressed; Sparton's argument misstated.	23
Exhibit A to the Order is a final decision without factual or legal determinations - moreover, it is apparently based on numerous misstatements in EPA's Final Decision on issues, including chromium concentrations, capture zones for on-site wells, intervals monitored in ground-water, delineation of horizontal and vertical extent of contamination, corrective action objectives, cost of monitoring wells, biological processes transforming contaminants, enhancement of SVE by decreasing water level.	A-8-18	Not addressed. These are significant as they rebut or create as contested issues the "facts" or record references the Recommended Decision cites as the basis for the corrective action remedy.	37-
Order is unenforceable because procedures for challenging it are unconstitutional	A-18, B-2 B-12	Not meaningfully addressed.	20, 18-20
Order unenforceable because process is biased to extent an ALJ is not handling it	A-18	Applicable law and persuasive record evidence do not support allegations, but no discovery allowed.	20, 10-21

Issues Raised by Sparton	Pleading[1] and Page	Resolution	Cite(s) in Decision
Order unenforceable because EPA failed to adequately describe the factual and legal basis for the relief provisions	A-18	Not addressed.	
Order contains relief provisions inconsistent with CMS in violation of the AOC	A-18, C-12	AOC and CMS do not provide a reasoned justification to deviate from proposed 40 CFR 264.525, no explanation for why not.	14-17
Order must be dismissed because relief provisions were pre-selected by EPA prior to completion of the CMS and development of the administrative record	A-18	Respondent allegedly waived this argument, no explanation why.	11-12
Order issued in bad faith with an improper motive	A-18	Respondent allegedly waived this argument, no explanation why.	11-12
Proceeding should be stayed pending the outcome of Sparton's lawsuit challenging the FDRTC, upon which the Order is based	A-18	Not addressed.	
An impact to groundwater itself is not sufficient to justify a 3008(h) order--this would effectively re-write 3008(h) and 1996 proposal	B-6, C-2-4	Not addressed.	
EPA has not challenged the finding of the CMS that the impacted groundwater is not used for drinking water and there is no significant risk to human health presented by the impacted groundwater; EPA has not identified the likelihood that the NMU well could ever be affected by the plume or that there is an exposure pathway.	B-7, C-2 C-5-8	Not addressed.	
The plume is adequately defined	B-9	Not meaningfully addressed, no explanation for why additional testing required.	40 45
The impacted groundwater not a current source of drinking water and not a future source before it would be remediated	B-10	Not addressed.	

Issues Raised by Sparton	Pleading[1] and Page	Resolution	Cite(s) in Decision
If restoration is possible, Sparton's remedy will achieve it in same time period at lower cost	B-11	Not accepted. Presiding Officer misunderstood Sparton's statements regarding if EPA was right (about difficulty of treating groundwater), both remedies would reach MCLs in about 30 years; if Sparton was right both would achieve MCLs in a very long time, if at all.	43, 49
Reinjection is not appropriate	B-11	Not addressed.	
3008(h) authorizes orders only for actions that involve field activities	B-12	Not addressed.	
1996 Guidance does not require achieving MCLs throughout the plume	C-5	Not accepted. Blind allegiance to 1990 rules and that "respondent failed to propose a remedy that will attain media cleanup standards"--with no reasoned justification to deviate from 1990 rules.	46-47
The Order fails to describe actions with reasonable specificity	C-9	Respondent allegedly waived this argument by failing to raise it in its initial request for hearing or memorandum; Cursory review that respondent's knowledge that SVE and groundwater extraction would be required meant knowledge of related items such as additional monitoring wells, recovery wells and containment wells. Order reasonably specific and Sparton's understanding is reasonably specific. No citation to legal authority to support conclusion.	54-56
EPA failed to establish its remedy is more effective than Sparton's recommended remedy	C-10-12	Not meaningfully addressed, only reference is that Sparton remedy supposedly does not meet 1990 selection criteria, while EPA's does.	47
Sparton's claims regarding denial of due process, failure of the EPA to adhere to the AOC and incompleteness of the record have been foreclosed by decisions of the presiding officer	C-12-13	Constitutional allegations concerning Part 24 and lack of discovery have no basis are unsupported by law and facts.	20, 18-20

1. The Pleadings are referenced as follows:

   A - Protective Response and Request for Hearing

   B - Memorandum Regarding Sparton Technology, Inc.'s Position on the Facts, the Law, and the Relief Sought by EPA

C - Additional Information in Support of Sparton Technology, Inc.'s Position on the Facts, the Law, and the Relief Sought by EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

August 28, 1997

HAND DELIVERED

Ms. Lorena Vaughn
Regional Hearing Clerk
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Ms. Vaughn:

Enclosed are two copies of a corrected page 4 of EPA's Response to the Recommended Decision of the Presiding Officer. This page corrects the present value of EPA's selected remedy. Please file one copy and forward the other copy to the Acting Regional Administrator, as required by 40 C.F.R. § 24.17(b).

Sincerely,

Evan L. Pearson
Senior Attorney

Enclosure

cc: Honorable George Malone, III
James B. Harris

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overestimated the costs of the ground water treatment system. Depending upon the treatment and disposal option that is implemented, the present value of the remedy now ranges from $9,397,486 - $9,804,292. EPA's Response to the Exhibits Submitted by Respondent at 19 - 21 (April 22, 1997).

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III. EPA HAS PROVEN BY A PREPONDERANCE OF THE EVIDENCE THAT IMPLEMENTATION OF ITS PROPOSED REMEDY IS NECESSARY TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT

The Presiding Officer found that EPA proved, by a preponderance of the evidence, all of the statutory criteria necessary to issue a RCRA Section 3008(h) Administrative Order. Recommended Decision at 29 - 51. In particular, the Presiding Officer held that the highly contaminated aquifer was a potential source of drinking water, and thus a potential threat to human health and the environment, thereby requiring corrective action to abate this threat. Recommended Decision at 44 - 46. Furthermore, the Presiding Officer found that EPA's selected remedy is necessary to protect human health and the environment. Recommended Decision at 47 - 51. In addition, the Presiding Officer found that EPA's proposal to determine the method of disposal of the treated ground water during the design phase of the remedy was reasonable. Recommended Decision at 41 - 42.

The Presiding Officer also determined that the Respondent's proposed remedy was not protective of human health and the environment because the threat to human health and the environment would not be abated because the Respondent's remedy

CERTIFICATE OF SERVICE

I hereby certify that on the 28th day of August, 1997, two copies of the foregoing were hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that true and correct copies were sent to the following by the methods indicated below:

HAND DELIVERED

Honorable George Malone, III
Acting Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

FIRST CLASS MAIL

James B. Harris
Thompson & Knight
1700 Pacific Avenue
Suite 3300
Dallas, Texas 75201-4693

Eva L Pen

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REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)	
	)	U.S. EPA DOCKET NO.
SPARTON TECHNOLOGY, INC.	)	RCRA VI-001(h)-96-H
ALBUQUERQUE, NEW MEXICO	)	
	)	
EPA I.D. NO. NMD083212332	)	FINAL DECISION
	)	
RESPONDENT	)	

BACKGROUND

This action commenced with the filing and service of an Initial Administrative Order (Initial Order) on September 16, 1996, by the Environmental Protection Agency (EPA). Sparton Technology, Inc., the Respondent, was the recipient of the Initial Order. The Initial Order requires corrective action pursuant to Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h). EPA seeks to compel Respondent to conduct corrective measures, including soil vapor extraction, groundwater extraction and treatment, and reinjection of treated groundwater or reuse at the surface.

Respondent requested a public hearing regarding the Initial Order on October 18, 1996. The parties completed prehearing, hearing and post-hearing proceedings pursuant to 40 C.F.R. §§ 24.14 - 24.17. The Acting Regional Judicial Officer issued a Recommended Decision on July 9, 1997, pursuant to 40 C.F.R. § 24.17(a). Each party timely filed comments concerning the

Recommended Decision on July 30, 1997, under 40 C.F.R. § 24.17(b). Therefore, this action is ripe for a final decision based upon the administrative record.

FINAL DECISION

Based upon the entire record this tribunal affirms the Recommended Decision, minus modifications included herein. Any provision in the Recommended Decision inconsistent with this Final Decision is hereby modified. First, while the correct date for delegation of authority to the Region 6 Compliance Assurance and Enforcement Division Director (Director), is included in the Recommended Decision, a complete description of pertinent delegations of authority is not. See Recommended Decision, pp. 11, 58-59.

Delegation of authority No. 8-31, dated May 11, 1994, authorized the Regional administrator to make a determination that there is or has been a release to the environment pursuant to Section 3008(h). See Administrative Record, p. 008429. Delegation of authority No. 8-32, dated May 11, 1994, gives the Regional Administrator authority to issue orders requiring corrective action. See Administrative Record, p. 008431. Delegation of authority Nos. R6-8-31 and R6-8-32, dated July 27, 1995, authorized the Director to make a determination that there is or has been a release to the environment, and issue orders requiring corrective action. See Administrative Record, pp.

008430, 008433. Accordingly, the Recommended Decision is modified as necessary to fully incorporate the delegations described above.

Next, Respondent was appropriately afforded additional procedural due process protection. However, this Final Decision does not adopt a portion of the Recommended Decision's reasoning. Specifically, additional procedural safeguards are warranted here in light of conceivable financial stakes, rather than policy concerns expressed in the Recommended Decision. See In Re General Electric, 4 EAD 615, 632-633 (EAB 1993); and Recommended Decision pp. 26-27. The financial assurance terms in the Initial Order indicate the burden to pay for corrective action costs rests with Respondent. See Initial Order, pp. 18-20.

Several possible disputes regarding revisions to plans or reports, may significantly increase corrective action costs. For example, EPA's final decision and response to comments dated June 24, 1996, incorporated into the Initial Order, estimated $15.046 million as the present worth cost of the selected remedy without metals removal.[1] See Administrative Record, pp. 008634-

[1] Although EPA and Respondent both dispute the selected remedy's estimated costs as provided in the final decision and response to comments, this tribunal is not persuaded by either party. See EPA's Response to Sparton's Position on the Facts, Law, and Relief Sought by EPA, pp. 61-62; EPA's Response to the Recommended Decision, pp. 3-4; and Public Hearing Record, pp. 99-102, and Respondent's Exhibit 13. EPA relied on Respondent's approved Corrective Measures Study (CMS) data to estimate costs of the selected remedy. See EPA's Response to Sparton's Position on the Facts, Law, and Relief Sought by EPA, pp. 61-62; and

008635, 008647-008652. However, if the selected remedy includes water treatment with ion exchange for removal of metals, the estimated present worth cost is $26.393 million. See Administrative Record, pp. 008634-008635, 008647-008652. Without question, disputed plans or reports concerning the necessity of removing metals from contaminated groundwater, may involve millions of dollars.[2]

Based upon reliable record evidence and potential disputes identified, revisions to plans or reports in this action may remarkably escalate corrective action costs. Cases such as this one, embellished with a prodigious financial landscape, warrant special treatment and more procedural protection. Consequently, the dispute resolution process in the Recommended Decision affording Respondent additional procedural safety, is perfectly reasonable under the circumstances. See In Re General Electric, 4 EAD 615, 632-633 (EAB 1993).

Administrative Record, pp. 005613-005691. EPA authored the final decision and response to comments, and Respondent conducted the CMS. In light of above circumstances, cost information included in the final decision and response to comments is reliable and controlling here.

[2] In addition, other possible disputes that may result in a significantly higher expenditure of funds, include reinjection of the treated groundwater into the aquifer or reuse at the surface, the number of groundwater containment wells, monitoring wells, recovery wells and soil vapor extraction wells, necessary to implement the selected remedy. See Administrative Record, pp. 005613-005691, 008625-008626, 008634-008635, 008645, 008647-008652.

In the final analysis, reliable record information concerning this 40 C.F.R. Part 24 administrative proceeding, demonstrates Respondent is the owner and operator of a facility that had interim status, and released hazardous waste or hazardous constituents into the environment. In addition, reliable record information shows that relief provisions included in the Initial Order are reasonably specific, consistent with EPA remedy selection procedures, and necessary to protect human health and the environment.

The Initial Order's relief provisions are necessary to protect the groundwater. These provisions will reduce and control contamination in the soil and groundwater. The relief provisions are also necessary in light of potential human contact with the highly contaminated groundwater. The Initial Order's aggressive approach to restoring contaminated groundwater in a timely manner, will reduce the risk of human exposure. Accordingly, the Recommended Decision is affirmed with modification, as expressed in this Final Decision rendered pursuant to 40 C.F.R. § 24.18.

ORDER

In accordance with 40 C.F.R. § 24.19, the Director shall modify the Initial Order to agree with the terms of the Recommended Decision, as revised by this Final Decision. Upon completion of modifications to the Initial Order, the Director

shall file the original Final Administrative Order, and serve Respondent a copy. This Final Decision and subsequent Final Administrative Order constitute final Agency action not appealable to the Administrator.

SO ORDERED, this 3rd day of September 1997.

JERRY CLIFFORD
ACTING REGIONAL ADMINISTRATOR

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PS Form 3800, April 1995

010356

In the Matter of Sparton Technology, Inc., Respondent
Docket No. RCRA VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Lorena S. Vaughn, Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing Final Decision dated September , 1997, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. Thompson & Knight 1700 Pacific Avenue Suite 3300 Dallas, Texas 75201	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED & FACSIMILE TRANSMISSION
Mr. Evan Pearson, Senior Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Date : 9-4-97

Lorena S. Vaughn
Lorena S. Vaughn
Regional Hearing Clerk

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

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REGIONAL HEARING CLERK
EPA REGION VI

JAN 30 1998

HAND DELIVERED

Honorable George Malone, III
Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Mr. Malone:

First, I would like to inform you and counsel for the Respondent that I have replaced Evan Pearson as counsel for EPA in the above-referenced case. Second, this letter notifies you that due to an inadvertent error in the Recommended Decision concerning the modification to the Dispute Resolution provision, EPA is correcting this error in its Final Administrative Order.

The Final Decision filed by the Regional Administrator on September 4, 1997, provided that:

> the dispute resolution process in the Recommended Decision affording Respondent additional procedural safety, is perfectly reasonable under the circumstances. (Final Decision, p.4., September 4, 1997)

In its Recommended Decision dated July 9, 1997, the Presiding Officer's second proposed modification recommended that Section XII (Dispute Resolution), page 16, Paragraph 3, of the Initial Administrative Order be modified to include language concerning the Regional Administrator's role in the dispute resolution process. To effectuate this modification proposed by the Presiding Officer, the last two sentences of Paragraph 3 of Section XII would therefore be deleted. If these proposed modifications were made, it would read as follows (deletions indicated by strikeouts):

> EPA's decision pursuant to paragraph two (2) of this Section shall be binding upon both Parties to this Order, unless within ten (10) days of receipt of such written notice, Respondent notifies EPA in writing of its continued objection(s), and requests the Director, or his designee, to convene

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> an informal conference for the purpose of discussing Respondent's objections and the reasons for EPA's determination. ~~The Director shall issue a written decision within ten (10) days of the informal conference, which shall be binding on both Parties to his Order. The written decision will be incorporated by reference into this Order.~~ The Regional Administrator will review the Respondent's written dispute regarding submissions, including plans or reports, and the Director's written decision concerning the dispute. If the Regional Administrator finds modification of the written decision is necessary, then the Director shall make all required changes. The final written decision will be signed by the Regional Administrator. The final decision will be issued to the Respondent within 20 days from the date of the informal conference, and shall be binding on both Parties to this Order. The final written decision will be incorporated by reference into this Order. The Regional Administrator may consult with the Regional Counsel or her/his designee in connection with any dispute involving the Respondent.

EPA objected to the role of the Regional Administrator in the dispute resolution process, but EPA's objection was overruled by the Regional Administrator in the September 4, 1997, Final Decision.

EPA will be issuing the Final Administrative Order in the very near future. If the above modifications were made as proposed in the Recommended Decision, the Dispute Resolution section would not require the Director to issue a written decision concerning the dispute, but would require the Regional Administrator to review the Director's written decision. Also, the ten (10) day deadline for the Director to issue a written decision would be stricken. Because the inclusion of the Director's responsibilities in the dispute resolution process in accordance with a timeframe is consistent with the intent of the decisions of the Presiding Officer and the Regional Administrator in this action, it is clear that there was an inadvertent error in the Recommended Decision. Thus, the first clause of the second to last sentence of this paragraph will not be stricken in the Final Administrative Order. Therefore, Section XII (Dispute Resolution), Paragraph 3, of the Final Administrative Order will read as follows (language of Recommended Decision not deleted indicated by underlining):

> EPA's decision pursuant to paragraph two (2) of this Section shall be binding upon both Parties to this Order, unless within ten (10) days of receipt

010357B

of such written notice, Respondent notifies EPA in writing of its continued objection(s), and requests the Director, or his designee, to convene an informal conference for the purpose of discussing Respondent's objections and the reasons for EPA's determination. The Director shall issue a written decision within ten (10) days of the informal conference. The Regional Administrator will review the Respondent's written dispute regarding submissions, including plans or reports, and the Director's written decision concerning the dispute. If the Regional Administrator finds modification of the written decision is necessary, then the Director shall make all required changes. The final written decision will be signed by the Regional Administrator. The final decision will be issued to the Respondent within 20 days from the date of the informal conference, and shall be binding on both Parties to this Order. The final written decision will be incorporated by reference into this Order. The Regional Administrator may consult with the Regional Counsel or her/his designee in connection with any dispute involving the Respondent.

This change implements the intent of the Recommended Decision and the Final Decision concerning the role of Director and the Regional Administrator in the dispute resolution process. All of the other modifications to the Initial Administrative Order set forth in the Recommended Decision and the Final Decision will be incorporated into the Final Administrative Order in the manner set forth in the Recommended Decision and the Final Decision.

Sincerely,

Gloria Moran

Gloria Moran
Enforcement Counsel

cc: Jerry Clifford (6RA)
Regional Hearing Clerk (6RC-HO)
James B. Harris

010357C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

98 FEB -4 PM 1:33

REGIONAL HEARING CLERK
EPA REGION VI

HAND DELIVERED

February 4, 1998

Honorable George Malone, III
Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Mr. Malone:

Pursuant to your request by telephone on Monday, February 2, 1998, please set a conference call on Thursday, February 5, 1998 or Friday morning, February 5, 1998, between Complainant's attorney, Gloria Moran. and Respondent's attorney, James B. Harris, to discuss the inadvertent error in the Recommended Decision in the above-referenced action which was raised in my letter to you dated January 30, 1998. Complainant, Director of the Compliance Assurance and Enforcement Division, is interested in issuing the Final Administrative Order to Sparton Technology, Inc., Albuquerque, New Mexico, pursuant to the authority of Section 3008(h) of the Resource Conservation and Recovery Act, 42 U.S.C. § 6928(h), and 40 C.F.R. Part 24 within the next several days. Although Complainant has modified the Final Administrative Order in accordance with the Final Decision filed by the Regional Administrator in this action on September 4, 1997, it is important that the clarification explained in the January 30, 1998 letter be discussed in a conference call as requested before the Final Administrative Order is issued.

Sincerely,

Gloria Moran

Gloria Moran
Enforcement Counsel

cc: James B. Harris, Thompson & Knight (via telecopy)
Regional Hearing Clerk (6RC-HO)
Jerry Clifford (6RA)

010357D

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REGION 6
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DALLAS, TX 75202-2733

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REGIONAL HEARING CLERK
EPA REGION VI

February 9, 1998

HAND DELIVERED

Honorable George Malone, III
Regional Judicial Officer
U.S. EPA - Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Sparton Technology, Inc.
Docket No. RCRA-VI-001(h)-96-H

Dear Mr. Malone:

Complainant in the above-referenced action, Director, Compliance Assurance and Enforcement Division, having received your Order on Additional Information, Clarification and Conference dated February 5, 1998, has completed the modifications to the Initial Administrative Order in accordance with the rulings in the Final Decision filed by the Regional Administrator on September 4, 1998.

Sincerely,

Gloria Moran

Gloria Moran
Enforcement Counsel

cc: Jerry Clifford (6RA) (hand-delivered)
Regional Hearing Clerk (6RC-HO) (hand-delivered)
James B. Harris, Thompson & Knight (via telecopy)

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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF:	)
	) U.S. EPA DOCKET NO.
SPARTON TECHNOLOGY, INC.	) RCRA VI-001(h)-96-H
ALBUQUERQUE, NEW MEXICO	)
	)
EPA I.D. NO. NMD083212332	) ORDER ON ADDITIONAL
	) INFORMATION, CLARIFICATION
RESPONDENT	) AND CONFERENCE

BACKGROUND

This action involves letters dated January 30, 1998, and February 4, 1998, submitted by the Environmental Protection Agency (EPA), which seemingly purport to modify the terms of the September 4, 1997, Final Decision rendered by the Acting Regional Administrator. The Final Decision was rendered after each party submitted comments to the July 9, 1997, Recommended Decision. The Final Decision was the end result of an October 18, 1996, hearing request submitted by the Respondent, Sparton Technology, Inc. Respondent requested a hearing in response to EPA's issuance of a September 16, 1996, initial administrative order under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h).

The public hearing proceedings for initial administrative orders under Section 3008(h) are governed by the EPA regulations at 40 C.F.R. Part 24, the Rules Governing Issuance of and Administrative Hearings on Interim Status Corrective Action

010357F

Orders. Because the September 16, 1996, initial administrative order required specified corrective measures, Subpart C of 40 C.F.R. Part 24, was applied to this adjudicatory action.

More specific to the action before this tribunal, pursuant to 40 C.F.R. § 24.20, final decisions regarding initial orders are both effective upon filing, and not subject to administrative appeals. Before final decisions become effective, the parties are provided the opportunity to influence the final outcome in accordance with 40 C.F.R. § 24.17(b). In this case, both parties submitted detailed explanations pursuant to 40 C.F.R. § 24.17(b).

ADDITIONAL INFORMATION

EPA's January 30, 1998, letter noted previous opposition to involvement of the Regional Administrator in the initial administrative order's dispute resolution process. However, neither the January 30, 1998, nor the February 4, 1998, letters explained EPA's failure to specifically object to the Region 6 Compliance Assurance and Enforcement Division Director's (Division Director's) inability to issue a written decision concerning any dispute elevated to the Director's level. The time-frame afforded by 40 C.F.R. § 24.17(b) to comment on the Division Director's role in the dispute resolution process expired long ago. Moreover, the administrative record upon which the Administrator's Final Decision is based, closed long ago as well. Because the Final Decision is not subject to administrative appeals according to 40 C.F.R. § 24.20, the

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January 30, 1998, and February 4, 1998, letters are not part of the administrative record supporting the Regional Administrator's Final Decision. However, these letters will be included in the Sparton Technology, Inc. file.

CLARIFICATION

This Order will clarify, not change, the Division Director's role in the dispute resolution process, as specified in the Final Decision. The Final Decision adopts pertinent language included on pages 28, 29, and 59 of the Recommended Decision. From applicable language, it is clear that the Regional Administrator will review written disputes elevated to the Division Director's level. The Regional Administrator will review written materials submitted by Respondent, and the written decision drafted, not issued, by the Division Director in response to disputed issues. The Division Director will draft the final written decision under the direction of the Regional Administrator. The final written decision will be signed by the Regional Administrator and issued within 20 days from the date the Division Director, or his designee, and Respondent informally convene.

CONFERENCE

This tribunal is available to hold a February 6, 1998, conference call commencing at 2:00 pm. to discuss the dispute resolution issue. If the parties deem such a call necessary, please advise this tribunal by February 6, 1998, at 10:00 am. Any conference call will be initiated by this tribunal, and will

010357H

only include discussion of the dispute resolution issue.

SO ORDERED this 5TH day of February 1998.

GEORGE MALONE, III
REGIONAL JUDICIAL OFFICER

010357I

In the Matter of Sparton Technology, Inc., Respondent
Docket No. RCRA VI-001(h)-96-H

CERTIFICATE OF SERVICE

I, Lorena Vaughn, Regional Hearing Clerk for the Region 6, U.S. Environmental Protection Agency located in Dallas, Texas, hereby certify that I served true and correct copies of the foregoing Order dated February 5, 1998, on the persons listed below, in the manner and date indicated:

Mr. James B. Harris, Esq. Thompson & Knight 1700 Pacific Avenue Suite 3300 Dallas, Texas 75201	U.S. CERTIFIED MAIL RETURN RECEIPT REQUESTED & FACSIMILE TRANSMISSION
Ms. Gloria Moran, Esq. U.S. EPA - Region 6 1445 Ross Avenue Dallas, Texas 75202-2733	HAND DELIVERY

Date: 2-5-98

Lorena S. Vaughn
Lorena Vaughn
Regional Hearing Clerk

PS Form 3800, March 1993

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010357J

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

97 MAR 19 5:0
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EPA REGION VI

IN THE MATTER OF:	)	
	)	
SPARTON TECHNOLOGY, INC.	)	
	)	
9621 COORS ROAD NW	)	U.S. EPA DOCKET NO.
ALBUQUERQUE, NM 87114	)	RCRA-VI-001(h)-96-H
	)	
EPA I.D. NO. NMD083212332	)	
	)	
RESPONDENT	)	

PROTECTIVE REQUEST FOR RECEIPT OF ADDITIONAL INFORMATION

Pursuant to 40 C.F.R. § 24.13(e), Sparton Technology, Inc. ("Sparton") makes this protective request for receipt of additional information in support of its claims.

This submission is being file subject to and without waiving any of Sparton's claims in the pending lawsuit against the Environmental Protection Agency ("EPA"), challenging the agency's authority to issue the Initial Administrative Order ("Order") that began this proceeding and the agency's decision to select the relief provisions set forth in the Order.

EPA now has in its possession revisions to the final CMS. Evan Pearson has objected to the acceptance of this information, claiming it was untimely. His position is surprising. The revisions to the CMS are consistent with a proposal made to the state of New Mexico in July of 1996, were discussed with representatives of EPA, including Mr. Pearson, at a September 1996, meeting in Santa Fe, and were the bases for proposals made to NMED, the latest of which was received by that agency in December of 1996, and discussed with

representatives of EPA. In short, there is nothing in the revisions to the CMS that EPA has not been aware of for many months.

Sparton is also requesting that a letter and certain figures developed by Pete Balleau also be received as additional information. These figures graphically depict the way in which a containment well would operate in dealing with groundwater impacted by operations at the Coors Road Plant. These figures do not literally represent additional information because they describe, in graphical form, technical information already included in previous submission to the agency. These figures are being contemporaneously faxed by Mr. Balleau to the Hearings Clerk and Evan Pearson.

The Presiding Officer has the discretion to receive this information if it is received by the clerk and petitioner at least five (5) business days before the hearing. That condition is obviously satisfied in this case.

Respectfully submitted,

THOMPSON & KNIGHT
A Professional Corporation

By: _____

James B. Harris
Attorney
State Bar No. 09065400

1700 Pacific Avenue, Suite 3300
Dallas, Texas 75201-4693
(214) 969-1700 Telephone No.
(214) 969-1751 Fax No.

ATTORNEYS FOR SPARTON TECHNOLOGY, INC.

CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing Protective Request for Receipt of Additional Information was served on Evan Pearson, Esq., United States Environmental Protection Agency, Region VI, 1445 Ross Avenue, Dallas, Texas 75202-2733 via hand-delivery on March 19, 1997.

James B. Harris

FILED

98 FEB 10 AM 10:07

REGIONAL HEARING CLERK
EPA REGION VI

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

IN THE MATTER OF: SPARTON TECHNOLOGY, INC. 9621 COORS ROAD NW ALBUQUERQUE, NM 87114 EPA I.D. NO. NMD083212332 RESPONDENT	U.S. EPA DOCKET NO. RCRA-VI-001(h)-96-H

FINAL ADMINISTRATIVE

ORDER UNDER SECTION

3008(H) OF THE RESOURCE

CONSERVATION AND RECOVERY

ACT, AS AMENDED

42 U.S.C. § 6928(H)

010358

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ATTACHMENT 1 - CORRECTIVE ACTION PLAN

EXHIBIT A - FINAL DECISION AND RESPONSE TO COMMENTS (FDRTC)

I. JURISDICTION

1. This Final Administrative Order (Order) is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency (EPA) by Section 3008(h) of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, (RCRA), and further amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. § 6928(h). The authority to issue this Order has been delegated to the Regional Administrator by EPA Delegation Nos. 8-31 and 8-32, dated May 11, 1994, and further delegated to the Director of the Compliance Assurance and Enforcement Division, Region 6 (Director) by EPA Delegation Nos. R6-8-31 and R6-8-32, dated July 27, 1995.

2. This Order is issued to Sparton Technology, Inc. (Respondent), the owner and operator of the facility located at 9621 Coors Road NW, Albuquerque, New Mexico 87114 (Facility). This Order is based on the administrative record complied by EPA and incorporated herein by reference. The administrative record has been filed with the Regional Hearing Clerk, and is available for review by Respondent and the public at EPA's Region 6 office at 1445 Ross Avenue, Dallas, Texas 75202-2733.

II. STATEMENT OF PURPOSE

1. The purpose of this Order is to require Respondent to: (a) identify, investigate, and remediate the releases of hazardous wastes and/or hazardous waste constituents to the environment; (b) implement the corrective measures selected by EPA for the Facility; and (c) perform any other activities necessary to correct or evaluate actual or potential threats to human health and/or the environment resulting from the releases of hazardous waste and/or hazardous waste constituents at or from the Facility.

2. This Order requires Respondent to: (a) operate the existing on-site ground water extraction and treatment system and monitor existing ground water monitoring wells; (b) further characterize the extent of contamination in the ground water and vadose zone; (c) install and operate an on-site soil vapor extraction system; and (d) install and operate additional ground water extraction well(s) and a treatment and disposal system.

III. PARTIES BOUND

1. This Order is issued to Sparton Technology, Inc. (Respondent), the owner and operator of the Facility located at 9621 Coors Road NW, Albuquerque, New Mexico 87114.

2. This Order shall apply to and be binding upon Respondent, its officers, directors, employees, agents, receivers, successors and assigns, heirs, trustees, and all other persons, including, but not limited to, contractors, and consultants acting under or on behalf of Respondent in connection with the implementation of this Order.

3. No change in ownership, corporate, or partnership status relating to the Facility will in any way alter the status or responsibility of Respondent under this Order. Any conveyance of title, easement, or other interest in Respondent's Facility or a portion of Respondent's Facility shall not affect Respondent's obligations under this Order. Respondent shall be responsible for and liable for any failure to carry out all activities required of Respondent by this Order, irrespective of its use of employees, agents, contractors, or consultants to perform any such tasks.

4. Respondent shall provide a copy of this Order to all contractors, subcontractors, laboratories, and consultants retained to conduct or monitor any portion of the work performed pursuant to this Order within seven (7) days of the effective date of this Order or date of such retention of services, and shall condition all such contracts on compliance with the terms of this Order.

5. Any documents transferring ownership and/or operations of the Facility from Respondent to a successor-in-interest shall include written notice of this Order; however, Respondent shall, no less than thirty (30) days prior to transfer of ownership or operation of the Facility, provide written notice of this Order to its successor-in-interest, and written notice of said transfer of ownership and/or operation to EPA and the New Mexico Environment Department (NMED).

IV. FINDINGS OF FACT

1. Sparton Technology, Inc. (Respondent), is a corporation incorporated under the laws of the State of New Mexico.

2. Respondent is the owner and operator of a hazardous waste management facility (Facility) located at 9621 Coors Road NW, Albuquerque, Bernalillo County, New Mexico 87114.

3. Respondent is a generator of hazardous waste, and engaged in the treatment, storage, or disposal of hazardous waste at the Facility subject to the interim status requirements of 40 C.F.R. Part 265, and New Mexico's authorized RCRA program.

4. Respondent owned and operated the Facility as a hazardous waste management facility on or after November 19, 1980, the applicable date which renders facilities subject to the interim status requirements, or the requirement to have a permit, under Sections 3004 and 3005 of RCRA, 42 U.S.C. §§ 6924 and 6925.

5. Pursuant to Section 3010(a) of RCRA, 42 U.S.C. § 6930(a), Sparton Southwest, Inc. (the predecessor corporation to the Respondent) notified EPA of its hazardous waste activity. In its Notification dated August 12, 1980, Sparton Southwest, Inc. identified itself as a generator of hazardous waste, and as an owner and operator of a hazardous waste treatment, storage, or disposal facility located at 9621 Coors Road NW, Albuquerque, New Mexico.

6. In its Notification, Sparton Southwest, Inc. notified EPA that it handled the following hazardous waste:

   a. Characteristic hazardous wastes identified at 40 C.F.R. Part 261, Subpart C: ignitable, corrosive, reactive, and toxic;

   b. Hazardous wastes from non-specific sources identified at 40 C.F.R. § 261.31: F001, F002, F003, F005, F006, F007, F008, and F009; and

   c. Commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products identified at 40 C.F.R. § 261.33(f): P030, P098, U002, U057, U108, U122, U134, U154, U159, U162, U220, U226, U228, U238, and U239.

7. Pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e), on or about November 17, 1980, Sparton Southwest, Inc. submitted its RCRA Part A permit application, and identified itself as a Facility generating and treating, storing, or disposing of the following hazardous wastes:

   a. Hazardous wastes from non-specific sources identified at 40 C.F.R. § 261.31: F001, F002, F003, F005, F006, F007, F008, and F009; and

   b. Commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products identified at 40 C.F.R. § 261.33(f): U002, U122, U134, U159, U226, and U228.

8. On or about June 30, 1987, the Facility's interim status was terminated by the New Mexico Health and Environment Department.

9. From 1983 - 1988, one or more of the following hazardous wastes and/or hazardous waste constituents were detected in ground water monitoring wells at the Facility: trichloroethylene, 1,1,1-trichloroethane, 1,1-dichloroethylene, methylene chloride, tetrachloroethylene, toluene, benzene, and chromium.

10. On October 1, 1988, EPA and Respondent entered into a corrective action Consent Order (RFI/CMS Order), U.S. EPA Docket No. VI-004(h)-87-H, pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h). The RFI/CMS Order required Respondent to conduct interim measures, a RCRA Facility Investigation (RFI), and a Corrective Measures Study (CMS) for the Facility.

11. On or about May 21, 1992, Respondent submitted a Final RFI Report to EPA for approval. EPA approved the Final RFI Report on July 1, 1992.

12. On or about December 8, 1995, EPA issued for public comment, a Statement of Basis which described the various remedial alternatives for the Facility. The Statement of Basis and the administrative record for the Facility were made available to the public for review and comment from December 8, 1995, to February 8, 1996. A public hearing to receive comments on the remedial alternatives was held on February 1, 1996.

13. Based on analyses of ground water samples collected in January 1996, trichloroethylene (TCE) contamination resulting from Facility operations ranges from 7,600 ppb at the Facility, 3,200 ppb near the center of the off-site contaminant plume, to less than 5 ppb at a distance of at least ½ mile from the Facility.

14. The ground water contaminant plume originating from the Facility is in an aquifer utilized by the City of Albuquerque and New Mexico Utilities as a public drinking water supply. A public drinking water supply well, New Mexico Utilities Well No. 2, is approximately two (2) miles downgradient from the leading edge of the ground water contaminant plume.

15. On or about May 13, 1996, Respondent submitted a Final CMS Report to EPA for approval. EPA approved the Final CMS Report with concerns on June 24, 1996.

16. Section IV.A.3 and Task IX of the Corrective Action Plan (CAP) of the RFI/CMS Order provided that EPA would select the remedy for the Facility.

17. On June 24, 1996, EPA issued a Final Decision and Response to Comments (FDRTC) which identified the selected remedy for implementation at the Facility, and provided responses to all significant comments received at the public hearing, and all significant written comments received during the public comment period. The FDRTC (excluding the index to the administrative record) is attached as Exhibit A and incorporated by reference into this Order.

18. In the FDRTC, EPA concluded that due to the release of hazardous waste into the environment, corrective action is necessary to protect human health and the environment. EPA selected Alternative 4 - Expanded Ground Water Extraction and Soil Vapor Extraction, as the remedy for the Facility.

19. On June 24, 1996, EPA terminated the RFI/CMS Order.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

1. Respondent is a "person" as that term is defined at Section 1004(15) of RCRA, 42 U.S.C. § 6903(15), and 40 C.F.R. § 260.10.

2. Respondent is the owner and operator of an "existing hazardous waste management facility" as that term is defined at 40 C.F.R. § 260.10.

3. Respondent was authorized to operate under interim status pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e).

4. Certain wastes and constituents found at the Facility are "hazardous wastes" or "hazardous waste constituents" as those terms are defined or set forth by Section 1004(5) and 3001 of RCRA, 42 U.S.C. §§ 6903(5) and 6921, and 40 C.F.R. Part 261.

5. "Hazardous waste" or "hazardous waste constituents", as those terms are defined or set forth by Sections 1004(5) and 3001 of RCRA, 42 U.S.C. §§ 6903(15) and 6921, and 40 C.F.R. Part 261, were released into the environment from the Facility.

6. Based on the release of hazardous waste and/or hazardous waste constituents into the environment from the Facility, the Director has determined that the actions required by this Order are consistent with RCRA, and the actions ordered below are necessary to protect human health and/or the environment.

7. Based on the foregoing, it is hereby ORDERED that Respondent perform the actions set forth in this Order in the manner and by the dates specified therein.

VI. PROJECT MANAGER

1. Within ten (10) days of the effective date of this Order, EPA and Respondent shall each designate a Project Manager, and notify each other and the New Mexico Environment Department (NMED) in writing of the Project Manager it has selected. Each Project Manager shall be responsible for overseeing the implementation of this Order. The EPA Project Manager will be EPA's designated representative for the Facility. Except as otherwise provided in this Order, all communications between Respondent and EPA, including all documents, reports, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the Project Managers, or counsel.

2. The Parties shall provide written notice within five (5) days after changing Project Managers.

3. The absence of the EPA Project Manager from the Facility shall not be cause for the stoppage or delay of work.

VII. WORK TO BE PERFORMED

Respondent shall undertake, continue to take, and complete each of the following actions to the satisfaction of EPA and in accordance with the terms, procedures, and schedules set forth in Attachment I - Corrective Action Plan (CAP). The CAP is hereby incorporated into this Order by reference as if reproduced in full herein.

TASK I: OPERATION OF EXISTING ON-SITE GROUND WATER EXTRACTION SYSTEM AND TREATMENT SYSTEM AND CONTINUED MONITORING OF EXISTING GROUND WATER MONITORING WELLS

1. Effective upon the date of this Order, Respondent shall operate, and maintain continuous operation of the existing ground water recovery well network and treatment system at the Facility. This ground water recovery well network consists of the following recovery wells: PW-1, MW-18, MW-23, MW-24, MW-25, MW-26, MW-27, and MW-28. Respondent shall perform the reporting and sampling and analyses set forth in the CAP. Treatment and disposal of recovered waters under this provision shall be performed in compliance with all Federal; State, or local laws, regulations, permits, or ordinances. Operation of the existing ground water recovery well network and treatment system shall be incorporated into, and modified as necessary to be

consistent with, the operation of the Ground Water Extraction Measure set forth in Task V of the CAP.

2. Within twenty (20) days of the effective date of this Order, Respondent shall submit a Ground Water Monitoring Plan for the existing on-site and off-site ground water monitoring wells, capable of determining: (a) the concentration of the hazardous waste or hazardous waste constituents in the ground water; and (b) the ground water elevations. EPA will approve or modify the Ground Water Monitoring Plan. The Ground Water Monitoring Plan, as approved or modified by EPA, shall become the Final Ground Water Monitoring Plan for the existing on-site and off-site ground water monitoring wells.

   Effective upon the 10th day of the first full month following EPA approval of the Ground Water Monitoring Plan, and every three months thereafter, Respondent shall conduct quarterly sampling and analyses of the existing on-site and off-site ground water monitoring wells.

3. Concurrent with the submission of the Operations and Maintenance Plan for the Ground Water Extraction Corrective Measure in Task V.B.4 of the CAP, Respondent shall submit a revised Ground Water Monitoring Plan for integration into the Operations and Monitoring Plan for the Ground Water Extraction Corrective Measure. EPA will approve or modify the revised Ground Water Monitoring Plan. The revised Ground Water Monitoring Plan, as approved or modified by EPA, shall become the Final Ground Water Monitoring Plan for the ground water monitoring well system.

TASK II: HEALTH AND SAFETY PLAN

4. Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Health and Safety Plan to EPA for all field activity associated with the Vadose Zone Investigation Workplan and the Ground Water Investigation Workplan. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence.

TASK III: PUBLIC INVOLVEMENT PLAN

5. Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Public Involvement Plan to EPA for review and approval. A schedule for community relations activities shall be included in the Public Involvement Plan. EPA will approve or modify the Public Involvement Plan. The Public Involvement Plan, as approved or modified by EPA, shall become the Final Public Involvement Plan.

TASK IV: SOIL VAPOR EXTRACTION CORRECTIVE MEASURE

6. Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Vadose Zone Investigation Workplan to EPA for review and approval. EPA will approve or modify the Vadose Zone Investigation Workplan. The Vadose Zone Investigation Workplan, as approved or modified by EPA, shall become the Final Vadose Zone Investigation Workplan. Respondent shall implement the Final Vadose Zone Investigation Workplan according to the schedule set forth in the Workplan. The Vadose Zone Investigation Workplan shall, at a minimum, include the following plans: (1) a Project Management Plan; (2) a Data Collection Quality Assurance Plan; and (3) a Data Management Plan.

7. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit a Vadose Zone Investigation Report to EPA for review and approval. EPA will approve or modify the Vadose Zone Investigation Report. The Vadose Zone Investigation Report, as approved or modified by EPA, shall become the Final Vadose Zone Investigation Report.

8. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit the Design Plans and Specifications for the Soil Vapor Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the design package. The design package, as approved or modified by EPA, shall become the Final Design Plans and Specifications.

9. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit a Construction Workplan for the Soil Vapor Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the Construction Workplan. The Construction Workplan, as approved or modified by EPA, shall become the Final Construction Workplan.

10. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit an Operations and Maintenance (O&M) Plan for the Soil Vapor Extraction Project to EPA for review and approval. EPA will approve or modify the O&M Plan. The O&M Plan, as approved or modified by EPA, shall become the Final O&M Plan.

11. Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation

Workplan, Respondent shall submit an updated Health and Safety Plan for the Soil Vapor Extraction Corrective Measure to EPA. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall be developed as a stand alone document.

12. Upon receipt of written notification from EPA, Respondent shall commence the construction process for the Soil Vapor Extraction Corrective Measure and implement the Construction Workplan in accordance with the schedule and provisions contained therein.

13. Within ninety (90) days following completion of the construction of the Soil Vapor Extraction Corrective Measure, Respondent shall submit a Construction Completion Report to EPA for review and approval. EPA will approve or modify the Construction Completion Report. The Construction Completion Report, as approved or modified by EPA, shall become the Final Construction Completion Report.

14. Respondent shall prepare and submit a Corrective Measure Completion Report to EPA for review and approval when the corrective measure completion criteria have been achieved for the Soil Vapor Extraction Corrective Measure. EPA will approve or modify the Corrective Measure Completion Report. The Corrective Measure Completion Report, as approved or modified by EPA, shall become the Final Corrective Measure Completion Report.

TASK V: GROUND WATER EXTRACTION CORRECTIVE MEASURE

15. Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Ground Water Investigation Workplan to EPA for review and approval. EPA will approve or modify the Ground Water Investigation Workplan. The Ground Water Investigation Workplan, as approved or modified by EPA, shall become the Final Ground Water Investigation Workplan. Respondent shall implement the Final Ground Water Investigation Workplan according to the schedule set forth in the Workplan. The Ground Water Investigation Workplan shall, at a minimum, include the following plans: (1) a Project Management Plan; (2) a Data Collection Quality Assurance Plan; and (3) a Data Management Plan.

16. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit a Ground Water Investigation Report to EPA for review and approval. EPA will approve or modify the Ground Water Investigation Report. The Ground Water Investigation Report, as approved

or modified by EPA, shall become the Final Ground Water Investigation Report.

17. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit the Design Plans and Specifications for the Ground Water Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the design package. The design package, as approved or modified by EPA, shall become the Final Design Plans and Specifications.

18. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit a Construction Workplan for the Ground Water Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the Construction Workplan. The Construction Workplan, as approved or modified by EPA, shall become the Final Construction Workplan.

19. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit an Operations and Maintenance (O&M) Plan for the Ground Water Extraction Corrective Measure to EPA for review and approval. EPA will approve or modify the O&M Plan. The O&M Plan, as approved or modified by EPA, shall become the Final O&M Plan.

20. Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit an updated Health and Safety Plan for the Ground Water Extraction Corrective Measure to EPA. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall be developed as a stand alone document.

21. Upon receipt of written notification from EPA, Respondent shall commence the construction process for the Ground Water Extraction Corrective Measure and implement the Construction Workplan in accordance with the schedule and provisions contained therein.

22. Within ninety (90) days following completion of the construction of the Ground Water Extraction Corrective Measure, and/or upon written notice from EPA regarding completion of the construction of one or more components in the Ground Water Extraction Corrective Measure (e.g., containment well system, treatment system, etc.,), Respondent shall submit a Construction Completion Report to

EPA for review and approval. EPA will approve or modify the Construction Completion Report. The Construction Completion Report, as approved or modified by EPA, shall become the Final Construction Completion Report.

23. Within sixty (60) days of receipt of written notification from EPA, Respondent shall submit a Corrective Measure Assessment Report for the Ground Water Extraction Corrective Measure to EPA for review and approval. The Corrective Measure Assessment Report shall thereafter be submitted to EPA for review and approval annually for a period of two (2) years, and every five years thereafter until this Order is terminated pursuant to Section XXVI of this Order. EPA will approve or modify the Corrective Measure Assessment Report. The Corrective Measure Assessment Report, as approved or modified by EPA, shall become the Final Corrective Measure Assessment Report for the time period covered by the Report.

24. Respondent shall prepare and submit a Corrective Measure Completion Report to EPA for review and approval when the corrective measure completion criteria have been achieved for the Ground Water Extraction Corrective Measure. EPA will approve or modify the Corrective Measure Completion Report. The Corrective Measure Completion Report, as approved or modified by EPA, shall become the Final Corrective Measure Completion Report.

VIII. SUBMISSIONS / AGENCY APPROVAL / ADDITIONAL WORK

1. Within five (5) days of receipt of approval or modification by EPA of any Workplan(s), Respondent shall commence work and implement the tasks required by the Workplan(s), in accordance with the standards, specifications, and schedule stated in the Workplan(s), as approved or modified by EPA.

2. Beginning with the month following the effective date of this Order, Respondent shall provide EPA with the progress reports every month, due on the tenth (10th) day of the following month. The progress reports shall conform to requirements in relevant Scopes of Work contained in the CAP.

3. Respondent shall provide EPA with the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants which in any way relates to the Facility and/or off-site contamination, regardless of whether such sampling or testing is required by this Order, in the monthly progress reports, as specified in Sections VIII.2 and X of this Order. Respondent shall submit to EPA the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants

which in any way relates to the five additional groundwater monitoring wells installed after selection of EPA's remedy.

4. EPA will review all reports, workplans, or other submittals required under this Order, and notify Respondent in writing of EPA's approval or modification of the deliverables or any part thereof. Upon EPA approval or modification, the submittal shall be deemed incorporated into and part of this Order.

   Notwithstanding the foregoing, EPA reserves the right to disapprove of, or provide comments on, any deliverable or any part thereof. Within thirty (30) days of receipt of EPA's disapproval or comments on any deliverable, Respondent shall address the deficiencies to EPA's satisfaction and submit a revised submittal. EPA shall approve or modify the revised submittal. Upon EPA approval or modification, the submittal shall be deemed incorporated into and part of this Order.

5. Any noncompliance with such EPA approved plans, reports, specifications, schedules, and attachments shall be construed as a violation(s) of the terms of this Order, and subject to the penalty provisions of Section XVI. Oral advice or approvals given by EPA representatives shall not relieve Respondent of its obligation to obtain any formal, written approvals required by this Order.

6. Four (4) copies of all deliverables shall be sent to the EPA Project Manager. An additional one (1) copy shall be sent to NMED, addressed to the following:

   Ed Kelly, Director
   Water and Waste Management Division
   New Mexico Environment Department
   P.O. Box 26110
   Santa Fe, New Mexico 87502-6110

   Unless otherwise specified in this Order, or otherwise notified in writing by EPA, all notifications to NMED shall be made to the aforementioned person.

7. In all instances which this Order requires written submissions to EPA, each submission must be accompanied by the following certification signed by a "responsible official":

   > I certify that the information contained in or accompanying this submission is true, accurate, and complete. As to those identified portions of this submission for which I cannot personally verify the truth and accuracy, I certify as the

Facility Official having supervisory responsibility for the person(s) who, acting upon my direct instructions, made the verification, that this information is true, accurate, and complete.

For the purpose of this certification, a "responsible official" means person in charge of a principal Facility function, or any other person who performs similar decision-making functions for the Facility.

8. EPA may determine, or Respondent may propose that certain tasks, including investigatory work, engineering evaluation, procedure/methodology modifications, or construction are necessary in addition to or in lieu of the tasks included in any EPA-approved workplan, when such additional work is necessary to meet the purposes set forth in Section II: Statement of Purpose. If EPA determines that Respondent shall perform additional work, EPA will notify Respondent in writing and specify the basis for its determination that the additional work is necessary. Within fifteen (15) days after the receipt of such determination, Respondent shall have the opportunity to meet or confer with EPA to discuss the additional work. If required by EPA, Respondent shall submit for EPA approval, a workplan for the additional work. EPA will specify the contents of such workplan. Such workplan shall be submitted within thirty (30) days of receipt of EPA's determination that additional work is necessary, or according to an alternative schedule established by EPA. Upon approval or modification of a workplan by EPA, Respondent shall implement it in accordance with the schedule and provisions contained therein.

IX. FACILITY ACCESS AND RECORD RETENTION

1. EPA and any EPA authorized-representative(s), are authorized, allowed, and permitted pursuant to Section 3007(a) of RCRA, 42 U.S.C. § 6927(a), to enter and freely move about all property at the Facility, and all other property owned or operated by Respondent which in any way relates to the implementation of the corrective measures, at all reasonable times, for the purposes of enforcing the requirements of RCRA and this Order, including:

   a. interviewing site personnel and contractors, inspecting records, operating logs, and contracts related to the Facility;

   b. reviewing the progress of Respondent in carrying out the terms of this Order;

   c. conducting such tests as EPA deems necessary;

d. using a camera, video camcorder, sound recorder, or other documentary type equipment; and

e. verifying the reports and data submitted to EPA by Respondent.

2. Respondent shall permit EPA to inspect and copy all documents, and other writings, including all sampling and monitoring data, which in any way pertains to work undertaken pursuant to this Order.

3. To the extent that work being performed pursuant to this Order must be done beyond the Facility property boundary, Respondent shall use its best efforts to obtain site access agreements from the present owners to perform work pursuant to this Order no later than thirty (30) days from the date that the need for such access becomes known to Respondent. Best efforts shall include, but not be limited to, requiring Respondent to pay reasonable rental costs and compensation for losses sustained by the owner or occupant of the realty. Access agreements shall provide access to Respondent, its contractor(s), the United States, EPA, the State of New Mexico, NMED, and their representatives, including contractors. Any such access agreements shall be submitted to the Project Manager and incorporated by reference into this Order. In the event that site access agreements are not obtained within thirty (30) days of approval of any workplan for which access is required, or of the date that the need for access became known to Respondent, Respondent shall notify EPA by telephone within twenty-four (24) hours after expiration of the above thirty (30) day period, and shall within seven (7) days of the oral notification, submit a complete report to EPA in writing regarding its efforts to obtain access agreements, including the names, dates, addresses, and phone numbers of the person(s) it contacted in order to obtain access. If EPA is able to obtain access, Respondent shall perform work described in this Order.

4. Nothing in this subsection is intended to limit, affect or otherwise constrain EPA's or NMED's right of access to property pursuant to applicable law.

5. All data, information, and records created or maintained in connection with the implementation of work under this Order, including Respondent's employees and Respondent's contractors, shall be made available to EPA upon request. Respondent shall retain all such data, information, or records for five (5) years after termination of the Order, and provide notification to EPA and NMED sixty (60) days prior to the destruction of any such documents.

X. SAMPLING AND DATA/DOCUMENT AVAILABILITY

1. Respondent shall submit to EPA and NMED the results of all sampling and tests or other data generated by its employees, contractors, and/or consultants which in any way relates to the Facility and/or off-site contamination, regardless of whether such sampling or testing is required by this Order. Data which has not yet undergone QA/QC, shall be submitted with the monthly progress reports stamped "Subject to Revision".

2. Respondent shall submit these results in monthly progress reports as described in Task VI of the CAP, and Section VIII.2 of this Order, or upon request of the Project Manager.

3. Respondent shall specify the name and address of the laboratory to be used for sample analysis. EPA reserves the right to conduct a performance and QA/QC audit of the above specified laboratory. If the audit reveals deficiencies in lab performance or QA/QC, resampling and analysis shall be required.

4. At the request of EPA, Respondent shall allow split or duplicate samples to be collected by EPA, and/or its authorized representatives, of any samples collected by Respondent. Respondent shall notify EPA not less than fourteen (14) days in advance of any field sampling or installation activity.

XI. QUALITY ASSURANCE

Throughout all sample collections and analysis activities, Respondent shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures, which shall be part of proposed and approved plans. In addition, Respondent shall:

1. Follow all EPA guidance for sampling and analysis unless determined by EPA not to be applicable;

2. Ensure that EPA and NMED receive written notification not less than fourteen (14) days in advance of any field sampling or installation activity;

3. Ensure that EPA receives written notification not less than fourteen (14) days in advance which laboratories will be used by Respondent, and use its best efforts to ensure that EPA personnel and EPA authorized representatives have reasonable access to the laboratories and personnel used for analysis;

4. Ensure that laboratories used by Respondent for analyses perform such analyses according to EPA methods (SW-846, 3rd Edition or as superseded) or other methods deemed satisfactory to EPA. If methods other than EPA methods are to be used, Respondent shall submit all protocols to be used for analyses to EPA for approval at least thirty (30) days prior to the commencement of analyses; and

5. Ensure that laboratories used by Respondent for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA. As part of such a program, and upon request by EPA, such laboratories shall perform analysis on known samples provided by EPA to demonstrate the quality of the analytical data.

XII. DISPUTE RESOLUTION

1. The Parties to this Order shall make reasonable efforts to informally resolve disputes at the Project Manager or immediate supervisor level. If resolution can not be achieved informally, the procedures of this section shall be implemented to resolve a dispute. The failure to invoke these Dispute Resolution procedures shall constitute a waiver of the right to contest a specific requirement of this Order.

2. If Respondent disagrees, in whole or in part, with any EPA disapproval, modification of a submittal, decision, or directive made by EPA pursuant to this Order, Respondent shall notify the Chief of the Hazardous Waste Enforcement Branch (Branch Chief) or his successor, in writing of its objections and the basis therefore within ten (10) days of receipt of EPA's disapproval, modification, decision, or directive. Said notice shall set forth the specific points of the dispute, the position Respondent is maintaining should be adopted as consistent with the requirements of this Order, the basis for Respondent's position, and any matters which it considers necessary for EPA's determination. Within ten (10) days of EPA's receipt of such written notice, the Branch Chief shall provide to Respondent his decision on the pending dispute.

3. EPA's decision pursuant to paragraph two (2) of this Section shall be binding upon both Parties to this Order, unless within ten (10) days of receipt of such written notice, Respondent notifies EPA in writing of its continued objection(s), and requests the Director, or his designee, to convene an informal conference for the purpose of discussing Respondent's objections and the reasons for EPA's determination. The Regional Administrator will review the Respondent's written dispute regarding submissions, including plans or reports, and the Director's written

decision concerning the dispute. If the Regional Administrator finds modification of the written decision is necessary, then the Director shall make all required changes. The final written decision will be signed by the Regional Administrator. The final decision will be issued to the Respondent within 20 days from the date of the informal conference, and shall be binding on both Parties to this Order. The final written decision will be incorporated by reference into this Order. The Regional Administrator may consult with the Regional Counsel or her/his designee in connection with any dispute involving the Respondent.

4. In any dispute, Respondent shall have the burden of showing that EPA's position, including without limitation, any interpretation of the terms and conditions of this Order, and of applicable Federal and State law and regulations, was arbitrary and capricious, and not in accordance with the law.

5. The existence of a dispute as defined herein, and EPA's consideration of such matters as placed into dispute, shall not excuse, toll, or suspend any compliance obligation or deadline required pursuant to this Order.

XIII. RESERVATION OF RIGHTS

1. EPA expressly reserves all statutory and regulatory powers, authorities, rights, remedies, both legal and equitable, which may pertain to Respondent's failure to comply with any of the requirements of this Order, including without limitation, the assessment of penalties under Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2). This Order shall not be construed as a waiver or limitation of any rights, remedies, powers and/or authorities, civil or criminal, which EPA has under RCRA, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Safe Drinking Water Act (SDWA), or any other statutory, regulatory, or common law enforcement authority of the United States.

2. EPA reserves the right to perform any portion of the work consented to herein, or any additional site characterization, feasibility study, and remedial work as it deems necessary to protect human health and/or the environment. EPA may exercise its authority under CERCLA to undertake response actions at any time. In any event, the United States reserves its right to seek reimbursement from Respondent for costs incurred by the United States. Notwithstanding compliance with the terms of this Order,

Respondent is not released from liability, if any, for the costs of any response actions taken or authorized by EPA.

3. This Order shall not be construed as a ruling or determination of any issue related to any Federal, State, or local permit whether required in order to implement this Order, or required in order to continue or alter operations of the Facility (including, but not limited to, construction, operation, or closure permits required under RCRA), and Respondent shall remain subject to all such permitting requirements. EPA's approval of any workplan does not constitute a warranty or representation that the workplans will achieve the required cleanup or performance standards. Compliance by Respondent with the terms of this Order shall not relieve Respondent of its obligations to comply with RCRA, or any other applicable Federal, State, or local laws, regulations, permits, and ordinances.

4. Nothing in this Order is intended to release or waive any claim, cause of action, demand, or defense in law or equity, administrative or judicial, that any party to this Order may have against any person(s) or entity not a party to this Order, or that any person or entity not a party to this Order may have against any party to this Order.

5. EPA expressly reserves all rights and defenses that it may have, including the right both to disapprove of work performed by Respondent pursuant to this Order, and to order that Respondent perform additional tasks.

6. In any action brought by EPA for a violation of this Order, Respondent shall bear the burden of proving that EPA's actions were arbitrary and capricious and not in accordance with the law.

7. If EPA determines that activities in compliance or noncompliance with this Order have caused or may cause a release of hazardous waste and/or hazardous waste constituents, or is a threat to human health or the environment, or that Respondent is not capable of undertaking any studies or corrective measure ordered, EPA may order Respondent to discontinue work being conducted pursuant to this Order for such period of time as EPA determines may be needed to abate any such releases or threats, and/or to undertake any action which EPA determines is necessary to abate such releases or threats. Failure to comply with EPA's stop work order may result in a penalty of not to exceed $25,000 per day of continued non-compliance with EPA's stop work order, pursuant to Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2).

8. In the event EPA suspends the work or any other activity at the Facility, EPA may extend affected schedules under this Order for a period of time equal to that of the suspension of the Work or other activities, plus reasonable additional time for resumption of activities. Any extensions in the schedules set out in this Order or its attachments must be made by EPA in writing, and incorporated by reference into this Order.

XIV. FINANCIAL ASSURANCE

1. Within thirty (30) days of the effective date of this Order, Respondent shall submit to EPA for review and approval, an assurance of its financial ability to meet the present worth cost estimate for Alternative 4 - Expanded Ground Water Extraction and Soil Vapor Extraction (Without Ion Exchange for Metals Removal), as described in the Final Decision and Response to Comments document (Exhibit A). Respondent's financial assurance shall be in one or a combination of the following forms: (a) a performance or surety bond; (b) a letter of credit from an FDIC regulated financial institution; (c) a corporate guarantee by a third party; (d) an escrow performance guarantee account; (e) a trust fund; or (f) a financial test which allows EPA to determine that Respondent has sufficient financial assets available to perform the requirements of the Order. Respondent shall utilize 40 C.F.R. Part 265, Subpart H, as guidance in preparing the financial assurance submittal.

2. Concurrent with the submittal of the Construction Workplan for the Ground Water Extraction Corrective Measure (Task V.B.3), Respondent shall submit to EPA for review and approval, an updated assurance of its financial ability to meet the current cost estimate for the Corrective Measures Implementation, including both capital costs and operation and maintenance costs. Respondent's financial assurance shall be in one of the forms set forth in Paragraph 1 of this Section.

3. If Respondent chooses one or a combination of the instruments described in Paragraphs 1(a) through 1(e) of this Section, Respondent shall submit a copy of the instrument(s), and describe the nature and extent to which the instrument(s) is available for access by EPA for the purpose of ensuring the completion of all requirements of this Order. If Respondent chooses the instrument described in Paragraph 1(f) of this Section, Respondent shall submit audited financial reports or other reliable evidence, as deemed appropriate by EPA, of Respondent's financial assets.

4. EPA shall review the submittals described in Paragraphs 1, 2, and 3 of this Section, and shall provide written notice

to Respondent as to the adequacy of the existing financial assurance measures, and shall indicate what additional financial assurances, if any, must be provided by Respondent to ensure compliance with the terms of this Order.

5. Within thirty (30) days of receipt of EPA's notice that Respondent's financial assurance measures are inadequate, Respondent shall establish additional financial assurances according to the terms provided in said notice, and submit the additional financial assurances to EPA for review and approval.

6. Annually, on the anniversary of EPA's approval of the financial assurance required by this Section, Respondent shall submit an updated financial assurance, as described in Paragraphs 2 and 3 of this Section, that accounts for the rate of inflation. EPA will follow the procedures in Paragraphs 4 and 5 of this Section to determine if Respondent's updated financial assurance measures are adequate.

7. In the event that Respondent determines at any time that it is unable, or reasonably expects that it will be unable to maintain the financial assurance provided pursuant to this Section, Respondent shall obtain and submit to EPA for approval, one or a combination of the other forms of financial assurance listed in Paragraph 1 of this Section within thirty (30) days of the earlier of: (a) the event that causes such inability; or (b) receipt of information that gives rise to the reasonable expectation of such inability.

8. Respondent's inability to demonstrate financial ability to complete the Corrective Measures Implementation shall not excuse performance of any activities required under this Order.

9. This Order in no way negates Respondent's obligation to establish and/or maintain financial assurances for closure care, post-closure care, and liability requirements under 40 C.F.R. Part 265, Subpart H.

XV. INDEMNIFICATION OF THE UNITED STATES

Respondent shall indemnify, save, and hold harmless the United States, its agencies, departments, agents, and employees, from any and all claims or causes of action arising from or on account of acts or omissions of Respondent or its officers, directors, employees, agents, receivers, successors and assigns, heirs, trustees, contractors, and consultants in carrying out activities required by this Order. This indemnification shall not be construed in any way as affecting or limiting the rights or

obligations of Respondent or the United States under their various contracts.

XVI. PENALTY PROVISIONS

Failure or refusal to carry out the terms of this Order in a manner deemed satisfactory to EPA may subject Respondent to a civil penalty in an amount not to exceed $25,000 for each day of non-compliance with this Order, in accordance with Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2).

XVII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Order shall be undertaken in accordance with the requirements of all applicable Federal, State, and local laws, regulations, permits, and ordinances. Respondent shall obtain or cause its representatives to obtain all permits and approvals necessary under such laws and regulations. This Order does not relieve Respondent of any duty to obtain any Federal, State, or local permits needed to carry out its terms.

XVIII. REPORTING AND PUBLIC ACCESS TO DOCUMENTS AND SAMPLING DATA

1. Respondent may assert a business confidentiality claim covering all or part of any information submitted to EPA pursuant to this Order. Analytical data generated pursuant to this Order shall not be claimed as confidential. Confidentiality claims shall be submitted to EPA in accordance with the procedures outlined in 40 C.F.R. Part 2 [originally published in the Federal Register at 41 Fed. Reg. 36902 (September 1, 1976)], in particular, 40 C.F.R. § 2.203(b), and shall include a written statement explaining how the information claimed to be confidential meets the substantive criteria for use in confidentiality determinations found in 40 C.F.R. § 2.208, or such claim shall be deemed waived. If EPA approves the claim, EPA will afford the information confidential status, as specified in 40 C.F.R. Part 2, Subpart B. Information determined not to be confidential may be made available to the public without further notice to Respondent. If Respondent makes no claim of confidentiality for information submitted pursuant to this Order, EPA may make the information available without further notice to Respondent.

2. If Respondent asserts a business confidentiality claim, it shall clearly mark each page of each document included in its claim with the term "Confidential", and shall provide a redacted version of the information with all confidential business information deleted.

3. The information requested by EPA by this Order is not subject to the Paperwork Reduction Act of 1980, as amended, 44 U.S.C. § 3501 et seq.

XIX. OTHER CLAIMS

Nothing in this Order shall constitute or be construed as a release from any claim, cause of action, demand, or defense in law or equity, against any person, firm, partnership, or corporation for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous waste constituents, hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or migrating from the Facility. Additionally, this Order does not constitute any decision on preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2).

XX. SUBSEQUENT MODIFICATION OF ORDER

1. This Order may be modified by EPA to ensure protection of human health and/or the environment. Such amendments shall be in writing, and shall be effective and incorporated into this Order thirty (30) days after service of the amendment on Respondent, unless Respondent files an objection to the modification with EPA and the Regional Hearing Clerk. 40 C.F.R. Part 24 shall govern the proceedings under this section, and the hearing shall be limited to the scope of the proposed amendment.

2. This Order may also be modified by mutual agreement of EPA and Respondent. Any agreed modifications shall be in writing, signed by both parties, shall have as their effective date the date on which they are signed by EPA, and shall be incorporated into this Order. Upon request of Respondent, EPA may extend the deadlines set forth in this Order.

XXI. FINAL AGENCY ACTION

Notwithstanding any other provision of this Order, no action or decision by EPA pursuant to this Order, shall constitute final agency action giving rise to any right of judicial review prior to EPA's initiation of a judicial action to enforce this Order, including an action for penalties or an action to compel Respondent's compliance with the terms and conditions of this Order.

XXII. SURVIVABILITY/PERMIT INTEGRATION

Except as otherwise expressly provided in this section, this Order shall survive the issuance or denial of a RCRA permit or

post-closure order for the Facility, and this Order shall continue in full force and effect after either the issuance or denial of such permit or order. Accordingly, Respondent shall continue to be liable for the performance of obligations under this Order notwithstanding the issuance or denial of such permit or order. If the Facility is issued a permit or order, and that permit or order expressly incorporates all or a part of the requirements of this Order, or expressly states that its requirements are intended to replace some or all of the requirements of this Order, Respondent may request a modification of this Order and shall, with EPA approval, be relieved of liability under this Order for those specific obligations.

XXIII. STATEMENT OF SEVERABILITY

If any provision or authority of this Order, or the application of this Order to any party or circumstances, is held by any judicial or administrative authority to be invalid, the application of such provisions to other Parties or circumstances and the remainder of the Order shall not be effected thereby.

XXIV. PARTICIPATION IN COMMUNITY RELATIONS ACTIVITIES

Respondent shall be given notice of, provide support, and shall participate in public meetings, as appropriate, which may be held or sponsored by EPA to explain activities at or concerning the Facility.

XXV. COSTS

Each party shall bear its own costs and attorneys' fees.

XXVI. TERMINATION AND SATISFACTION

1. Respondent may seek termination of this Order by submitting to EPA a written document which indicates Respondent's compliance with all requirements of this Order, and the associated dates of approval correspondence from EPA. The provisions of this Order shall be deemed satisfied upon Respondent's and EPA's execution of an "Acknowledgment of Termination and Agreement for Record Preservation and Reservation of Rights" (Acknowledgment). The Acknowledgment shall specify that Respondent has demonstrated to the satisfaction of EPA that the terms of this Order, including any additional tasks determined by EPA to be required pursuant to this Order, have been satisfactorily completed. Respondent's execution of the Acknowledgment will affirm Respondent's continuing obligation: (1) to preserve all records as required in Section IX - Facility Access and Record Retention; and (2) to recognize EPA's reservation of rights as provided in Section XIII - Reservation of Rights, after all other requirements of the Order are satisfied.

2. This Order may also be terminated upon Respondent's receipt of written notice from EPA that Respondent has demonstrated to the satisfaction of EPA, that the terms of the Order, including any additional tasks determined by EPA to be required pursuant to this Order, have been satisfactorily completed. This notice shall also affirm Respondent's continuing obligation: (1) to preserve all records as required in Section IX - Facility Access and Record Retention; and (2) recognize EPA's reservation of rights as provided in Section XIII - Reservation of Rights.

XXVII. EFFECTIVE DATE

This Order shall become effective upon receipt by the Respondent, as provided by 40 C.F.R. §§ 24.04(e) and 24.19.

IT IS SO ORDERED:

Dated: 9 February 1998

Samuel Coleman, P.E.
Director
Compliance Assurance and Enforcement Division
U.S. Environmental Protection Agency Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

CERTIFICATE OF SERVICE

I hereby certify that on the 10th day of February 1998, the original of the foregoing Final Administrative Order was hand delivered to the Regional Hearing Clerk, U.S. Environmental Protection Agency, Region 6, First Interstate Bank Tower, 1445 Ross Avenue, Dallas, Texas 75202-2733, and that true and correct copies of the Final Administrative Order were sent to the following by the method indicated below:

CERTIFIED MAIL - RETURN RECEIPT REQUESTED P 239 540 886

Richard D. Mico
Vice President and General Manager
Sparton Technology, Inc.
4901 Rockaway Blvd., SE
Rio Rancho, New Mexico 87124

CERTIFIED MAIL - RETURN RECEIPT REQUESTED P 239 540 887

James B. Harris
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1700 Pacific Avenue
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ATTACHMENT I

CORRECTIVE ACTION PLAN

SCOPE OF WORK
CORRECTIVE MEASURES IMPLEMENTATION
SPARTON TECHNOLOGY, INC.

PURPOSE

The purpose of the Corrective Measures Implementation (CMI) Scope of Work (SOW) is to set forth the requirements for the design, construction, operation, maintenance, and monitoring of the Corrective Measures selected by EPA in the RCRA Final Decision and Response to Comments (FDRTC) dated June 24, 1996, for the Sparton Technology, Inc. facility located at 9621 Coors Road NW in Albuquerque, New Mexico (Facility). Respondent shall furnish all personnel, materials, and services necessary to implement the CMI program. EPA may require Respondent to conduct additional tasks beyond what is discussed in the following tasks in order to support the CMI program. Respondent shall furnish all personnel, materials, and services necessary to conduct the additional tasks.

PERFORMANCE STANDARDS

The Performance Standards for the CMI shall include remediation goals, cleanup levels, remedial objectives, and other substantive requirements, criteria, or limitations set forth in the FDRTC for the Facility or in this Order. The selected remedy, as described in the FDRTC, has four distinct components:

1. Continued operation of the existing on-site ground water extraction and treatment system, and continued monitoring of existing ground water monitoring wells;

2. Further characterization of the extent of contamination in the ground water and vadose zone;

3. Installation and operation of an on-site soil vapor extraction and treatment(SVE) system; and

4. Installation and operation of additional ground water extraction well(s) and a treatment and disposal system.

EPA will use the Performance Standards to determine if the Corrective Measures Implementation has been completed.

SCOPE

The Scope of Work (SOW) for each document is specified below. The SOWs are intended to be flexible documents capable of addressing both simple and complex site situations. If Respondent can justify to the satisfaction of EPA, that a plan and/or report or portion(s) thereof is not needed in the given site-specific situation, then EPA may waive that requirement.

The CMI program consists of the following tasks:

Task I: Operation of Existing On-Site Ground Water Extraction and Treatment System and Continued Monitoring of Existing Ground Water Monitoring Wells

Task II: Health and Safety Plan

Task III: Public Involvement Plan

Task IV: Soil Vapor Extraction Corrective Measure

- A. Vadose Zone Investigation Workplan
- B. Soil Vapor Extraction Project
  1. Vadose Zone Investigation Report
  2. Design Plans and Specifications
  3. Construction Workplan
  4. Operation and Maintenance Plan
  5. Health and Safety Plan
  6. Commencement of Construction
- C. Construction Completion Report
- D. Corrective Measure Completion Report

Task V: Ground Water Extraction Corrective Measure

- A. Ground Water Investigation Workplan
- B. Ground Water Extraction and Treatment Project
  1. Ground Water Investigation Report
  2. Design Plans and Specifications
  3. Construction Workplan
  4. Operation and Maintenance Plan
  5. Health and Safety Plan
  6. Commencement of Construction
- C. Construction Completion Report
- D. Corrective Measure Assessment Reports
- E. Corrective Measure Completion Report

Task VI: Progress Reports

TASK I - CONTINUED OPERATION OF THE EXISTING ON-SITE GROUND WATER EXTRACTION AND TREATMENT SYSTEM AND CONTINUED MONITORING OF EXISTING GROUND WATER MONITORING WELLS

A. Operation of the Existing On-Site Ground Water Extraction and Treatment System

Effective upon the date of this Order, Respondent shall operate, and maintain continuous operation of the existing ground water recovery well network and treatment system at the Facility. This ground water recovery well network consists of the following recovery wells: PW-1, MW-18, MW-23, MW-24, MW-25, MW-26, MW-27, and MW-28. Respondent shall report the total monthly volume of recovered ground water from each recovery well in the Monthly Progress Reports.

At a minimum, Respondent shall conduct monthly sampling and analyses of the recovered ground water both prior to treatment, and following treatment, for the following constituents:

- Volatile organic constituents as listed in 40 C.F.R. Part 264, Appendix IX; and
- Hexavalent Chromium.

The efficiency of the treatment system as measured by the percent reduction of hazardous waste constituents will be monitored on a monthly basis. Treatment and disposal of recovered waters under this provision shall be performed in compliance with all Federal, State, or local laws, regulations, permits, or ordinances. Operation of the existing ground water recovery well network and treatment system shall be incorporated into, and modified as necessary to be consistent with, operation of the Ground Water Extraction Corrective Measure set forth in Task V.

B. Ground Water Monitoring Plan

Within twenty (20) days of the effective date of this Order, Respondent shall submit a Ground Water Monitoring Plan for the existing on-site and off-site ground water monitoring wells, capable of determining: 1) the concentration of the hazardous waste or hazardous waste constituents in the ground water; and 2) the ground water elevations. EPA will approve or modify the Ground Water Monitoring Plan. The Ground Water Monitoring Plan, as approved or modified by EPA, shall become the Final Ground Water Monitoring Plan for the existing on-site and off-site ground water monitoring wells.

Effective upon the 10th day of the first full month following EPA approval of the Ground Water Monitoring Plan, and every three months thereafter, Respondent shall conduct quarterly sampling and analyses of the existing on-site and off-site ground water monitoring wells. Respondent shall have the samples analyzed for the following constituents:

- Volatile organic constituents as listed in 40 C.F.R. Part 264, Appendix IX;
- Total metals as listed in 40 C.F.R. Part 264, Appendix IX; and
- Hexavalent Chromium.

The sample analyses results and ground water elevations shall be included in the Monthly Progress Reports (Task VI). Potentiometric surface maps and contaminant concentration contour maps shall be prepared for each of the flow zones in the aquifer (e.g., upper, upper lower, etc.) and included in the Monthly Progress Reports.

C. Concurrent with the submission of the Operation and Maintenance Plan for the Ground Water Extraction Corrective Measure in Task V.B.4, Respondent shall submit a revised Ground Water Monitoring Plan for integration into the Operation and Monitoring Plan for the Ground Water Extraction Corrective Measure. EPA will approve or modify the revised Ground Water Monitoring Plan. The revised Ground Water Monitoring Plan, as approved or modified by EPA, shall become the Final Ground Water Monitoring Plan for the ground water monitoring well system.

TASK II: HEALTH AND SAFETY PLAN

Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Health and Safety Plan to EPA for all field activity associated with the Vadose Zone Investigation Workplan and the Ground Water Investigation Workplan. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall, at a minimum, include the following elements:

A. Objectives: Describe the goals and objectives of the health and safety program (must apply to both on-site and off-site personnel and visitors). The Health and Safety Plan shall be consistent with the OSHA Regulations, NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985), all state and local regulations, and other EPA guidance as provided.

B. Hazard Assessment: List and describe the known hazardous substances that could be encountered by field personnel during construction and/or operation and maintenance activities. Respondent shall, at a minimum, discuss the following:

- Inhalation Hazards
- Dermal Exposure
- Ingestion Hazards
- Physical Hazards
- Overall Hazard Rating

Respondent shall include a table that, at a minimum, lists: known hazardous substances, highest observed concentration, media, and symptoms/effects of acute exposure.

C. Personal Protection/Monitoring Equipment

- Describe personal protection levels and identify all monitoring equipment for each operational task.
- Describe any action levels and corresponding response actions (i.e., when will levels of safety be upgraded).
- Describe decontamination procedures and areas.

D. Site Organization and Emergency Contacts

List and identify all contacts (include phone numbers). Identify the nearest hospital and provide a regional map showing the shortest route from the Facility to the hospital. Describe site emergency procedures and any site safety organizations. Include evacuation procedures for neighbors (where applicable). Include a Facility map showing emergency station locations (first aid, eye wash areas, etc.).

TASK III: PUBLIC INVOLVEMENT PLAN

Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Public Involvement Plan to EPA for review and approval. The purpose of the Public Involvement Plan is to disseminate information to the public regarding the investigation and remedial activities and results. A schedule for community relations activities shall be included in the Public Involvement Plan. EPA will approve or modify the Public Involvement Plan. The Public Involvement Plan, as approved or modified by EPA, shall become the Final Public Involvement Plan.

Respondent shall never appear to represent or speak for the EPA before the public, other government officials, or the media.

Public Involvement activities that may be required of Respondent include the following:

A. Providing written and/or verbal notification to local residents or businesses prior to conducting field investigation or construction activities under this Order. Such notification shall include, but not be limited to, a description and estimated duration of the field investigation or construction activity, and contact person for the Respondent (including phone number).

B. Conducting an open house or informal meeting (i.e., availability session) in a public location where people can talk to Agency officials and Respondent on a one-to-one basis;

C. Preparing fact sheets summarizing current or proposed corrective action activities (all fact sheets shall be reviewed by the EPA prior to public distribution);

D. Communicating effectively with people who have vested interest in the corrective action activities, (e.g., providing written or verbal information in the foreign language of a predominantly non-English-speaking community); and

E. Maintaining an easily accessible repository of information on the facility-specific corrective action program, including this Order, approved workplans, and/or other reports at the Taylor Ranch Branch Library, 5700 Bogart Street, N.W., Albuquerque, New Mexico 87120. EPA may designate another repository as a replacement for the Taylor Ranch Branch library.

TASK IV: SOIL VAPOR EXTRACTION CORRECTIVE MEASURE

Task IV sets forth the plans and schedules for those activities to be undertaken by Respondent in order to develop the final plans, drawings, specifications, general provisions, and special requirements necessary to design, construct, operate, and monitor the performance of the Soil Vapor Extraction Corrective Measure selected in the FDRTC. Information on the design, construction, operation, and performance monitoring of the soil vapor extraction system can be found in the following EPA publications:

U.S. EPA. Guide for Conducting Treatability Studies under CERCLA: Soil Vapor Extraction; EPA/540/2-91/019A.

U.S. EPA. Soil Vapor Extraction Technology: Reference Handbook; EPA/540/2-91/003.

U.S. EPA. Evaluation of Soil Venting Application; Ground Water Issue; EPA/540/S-92/004.

U.S. EPA. Decision-Support Software for Soil Vapor Extraction Technology Application: HyperVentilate; EPA/600/R-93/028.

U.S. EPA. Innovative Site Remediation Technology: Vacuum Vapor Extraction, Volume 8; EPA/542/B-94/002.

U.S. EPA. Review of Mathematical Modeling for Evaluating Soil Vapor Extraction Systems; EPA/540/R-95/513.

A. Vadose Zone Investigation Workplan

Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Vadose Zone Investigation Workplan to EPA for review and approval. The objectives of the Vadose Zone Investigation Workplan are to define the location and extent of the lithologic units which may control the fate and transport of contaminants in the vadose zone, to define the nature and extent, both horizontally and vertically, of contamination in the vadose zone, and to collect the appropriate data required to design, construct, operate, and monitor the performance of the Soil Vapor Extraction Corrective Measure selected in the FDRTC. EPA will approve or modify the Vadose Zone Investigation Workplan. The Vadose Zone Investigation Workplan, as approved or modified by EPA, shall become the Final Vadose Zone Investigation Workplan. Respondent shall implement the Final Vadose Zone Investigation Workplan according to the schedule set forth in the Workplan. The Vadose Zone Investigation Workplan shall, at a minimum, include the following plans:

1. Project Management Plan

Respondent shall prepare a Project Management Plan which shall include a discussion of the technical approach, schedules, budget, and an outline of proposed activities necessary to complete the design of the soil vapor extraction system. The technical approach shall address all the requirements necessary to implement the requirements of this Task.

2. Data Collection Quality Assurance Plan

Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed during the investigation, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. This plan shall, at a minimum, address the following:

a. Data Collection Strategy

The Data Collection Strategy shall, at a minimum, include the following:

(1) Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

(2) Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data; and

(3) Description of the methodology used to assure that the data accurately and precisely represents the characteristics of a population, parameter variations at a sampling point, and process conditions or environmental conditions. Examples of factors which shall be considered and discussed include:

(a) Environmental conditions at the time of sampling;
(b) Number of sampling points;
(c) Representativeness of selected media; and
(d) Representativeness of selected analytical parameters.

b. Sampling

The sampling section shall, at a minimum, discuss the following:

(1) Selecting appropriate sampling locations, depths, etc.;
(2) Determining a statistically sufficient number of sampling sites;
(3) Determining which media are to be sampled (e.g., soil, soil gas, etc.);
(4) Determining which parameters are to be measured and where;
(5) Selecting the frequency of sampling and length of sampling period;
(6) Selecting the types of samples and number of samples to be collected;
(7) Documenting field sampling operations and procedures, including:

    (a) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
    (b) Calibration of field devices;
    (c) Collection of replicate samples;
    (d) Construction materials and techniques associated with soil vapor monitoring probes/wells;
    (e) Field equipment listing and sample containers; and
    (f) Decontamination procedures.

(8) Selecting appropriate sample containers; and
(9) Chain-of-custody, including:

    (a) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and
    (b) Pre-prepared sample labels containing all information necessary for effective sample tracking.

c. Field Measurements

The Field Measurements section shall, at a minimum, discuss the following:

(1) Selecting appropriate field measurement locations, depths, etc.;

(2) Providing a statistically sufficient number of field measurements;
(3) Measuring all necessary ancillary data;
(4) Determining conditions under which field measurement should be conducted;
(5) Determining which media are to be addressed by appropriate field measurements (e.g., soil, soil gas, etc.);
(6) Determining which parameters are to be measured and where;
(7) Selecting the frequency of field measurement and length of field measurements period; and
(8) Documenting field measurement operations and procedures, including:

(a) Procedures and forms for recording raw data, and the exact location, time, and facility-specific considerations associated with the data acquisition;
(b) Calibration of field devices;
(c) Collection of replicate measurements;
(d) Construction materials and techniques associated with soil vapor monitoring wells used to collect field data;
(e) Field equipment listing;
(f) Order in which field measurements were made; and
(g) Decontamination procedures.

d. Contaminated Material Disposal

All contaminated material generated by activities required in the CMI shall be disposed of in accordance with all Federal and State laws and regulations.

e. Sample Analysis

The Sample Analysis section shall, at a minimum, specify the following:

(1) Chain-of-custody procedures, including:

(a) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;

(b) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
(c) Specification of laboratory sample custody procedures for sample handling, storage, and disbursement for analysis.

(2) Sample storage procedures and holding times;
(3) Sample preparation methods;
(4) Analytical procedures, including:

(a) Scope and application of the procedure;
(b) Sample matrix;
(c) Potential interferences;
(d) Precision and accuracy of the methodology;
(e) Method detection limits;
(f) Calibration procedures and frequency;
(g) Data reduction, validation, and reporting;
(h) Internal quality control checks, laboratory performance, and systems audits and frequency, including:

1) Method blank(s);
2) Laboratory control sample(s);
3) Calibration check sample(s);
4) Replicate sample(s);
5) Matrix-spiked sample(s);
6) Blind quality control sample(s);
7) Control charts;
8) Surrogate samples;
9) Zero and span gases; and
10) Reagent quality control checks.

(i) Preventive maintenance procedures and schedules;
(j) Corrective action (for laboratory problems); and
(k) Turnaround time.

3. Data Management Plan

Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and the

conclusions of the investigation. The plan shall, at a minimum, address the following:

a. Data Record

The data record shall, at a minimum, include the following:

(1) Unique sample or field measurement code;
(2) Sampling or field measurement location and sample or measurement type;
(3) Sampling or field measurement raw data;
(4) Laboratory analysis ID number;
(5) Property or component measured; and
(6) Result of analysis (e.g., concentration).

b. Tabular Displays

The following data shall be presented in tabular displays:

(1) Unsorted (raw) data;
(2) Results for each medium, or for each constituent monitored;
(3) Data reduction for statistical analysis;
(4) Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
(5) Summary data.

c. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

(1) Display sampling locations and sampling grids;
(2) Contaminant concentrations at each sampling location;
(3) Display average and maxima contaminant concentrations;
(4) Geographical extent of contamination and illustrate changes in concentration in relation to distance from the source and depth;
(5) Indicate features affecting intramedia transport; and
(6) Illustrate the stratigraphy in the area of the vadose zone contamination.

B. Soil Vapor Extraction Project

1. Vadose Zone Investigation Report

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit a Vadose Zone Investigation Report to EPA for review and approval. EPA will approve or modify the Vadose Zone Investigation Report. The Vadose Zone Investigation Report, as approved or modified by EPA, shall become the Final Vadose Zone Investigation Report. This Report shall, at a minimum, include the following:

a. The location and extent of lithologic units which may control the fate and transport of contaminants in the vadose zone. Based on field data and tests, a representative and accurate description of the subsurface stratigraphy in the vadose zone which is a part of the migration pathways at the Facility, including:

(1) Lithology, grain size, sorting;
(2) Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants; and
(3) Cross sections showing the extent (depth, thickness, lateral extent) of units which may be part of the migration pathways;

b. A description of the nature and extent, both horizontally and vertically, of contamination in the vadose zone. The description shall include maps of the horizontal and vertical extent, including concentration profiles of the contaminants originating from the source area(s) at the Facility in both the soil matrix and soil gas; and

c. The appropriate data for the design and implementation of a soil vapor extraction system. This shall include a field pilot test to provide data to determine design parameters and projected effectiveness of the full-scale soil vapor extraction sytem.

2. Design Plans and Specifications

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit the Design Plans and Specifications for the Soil Vapor

Extraction Corrective Measure to EPA for review and approval. The design package shall consist of the detailed drawings and specifications needed to construct the corrective measure(s). EPA will approve or modify the design package. The design package, as approved or modified by EPA, shall become the Final Design Plans and Specifications. The Design Plans and Specifications shall, at a minimum, include the following documents:

a. General Site Plans;
b. Process Flow Diagrams;
c. Mechanical Drawings;
d. Electrical Drawings;
e. Piping and Instrumentation Diagrams;
f. Structural Drawings;
g. Excavation and Earthwork Drawings;
h. Site Preparation and Field Work Standards;
i. Construction Drawings;
j. Installation Drawings;
k. Equipment Lists; and
l. Specifications for Equipment and Material.

3. Construction Workplan

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit a Construction Workplan for the Soil Vapor Extraction Corrective Measure to EPA for review and approval. The purpose of the Construction Workplan is to document the overall management strategy, construction quality assurance procedures, and schedule for constructing the corrective measure. EPA will approve or modify the Construction Workplan. The Construction Workplan, as approved or modified by EPA, shall become the Final Construction Workplan. The Construction Workplan shall, at a minimum, include the following elements:

a. Project Management: Describe the construction management approach including levels of authority and responsibility (include organization chart).

b. Project Schedule: The project schedule shall specify all significant steps in the process, including the timing for key elements of the bidding process, the timing for initiation and completion of all construction tasks as specified in the Design Plans and Specifications.

c. Waste Management Practices: Describe the wastes generated by the construction of the corrective measure, and how they will be managed.

d. Required Permits: List and describe the permits needed to construct and operate the corrective measure. Indicate on the project schedule when the permit applications will be submitted to the applicable agencies, and an estimate of the permit issuance date.

e. Quality Assurance Project Plan: The purpose of construction quality assurance is to ensure, with a reasonable degree of certainty, that a completed corrective measure will meet or exceed all design criteria, plans, and specifications. Sampling and monitoring activities may also be needed for construction quality assurance/quality control and/or other construction related purposes. To ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented, Respondent shall prepare a Quality Assurance Project Plan (QAPjP) to document all monitoring procedures, sampling, field measurements, and sample analysis performed during these activities. Respondent shall use quality assurance, quality control, and chain-of-custody procedures approved by the EPA. These procedures are described in EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, December 29, 1980, or as superseded by EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5).

f. Construction Contingency Procedures:

(1) Changes to the design and/or specifications may be needed during construction to address unforeseen problems encountered in the field. Procedures to address such circumstances, including notification of EPA, shall be included in the Construction Workplan.

(2) The Construction Workplan shall specify that in the event of a construction emergency (e.g. fire, earthwork failure, etc.), Respondent shall orally notify the EPA within twenty-four (24) hours of the event, and shall notify the EPA in writing within seven (7) days of the event. The written notification shall, at a minimum, specify

what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment; and

(3) Procedures to be implemented if unforeseen events prevent corrective measure construction.

g. Cost Estimate

Respondent shall develop a cost estimate that includes both corrective measure construction and operation and maintenance costs. The purpose of the cost estimate is to assure that Respondent has the financial resources necessary to construct and implement the corrective measure(s).

h. Documentation Requirements

Respondent shall describe how analytical data and results will be evaluated, documented, and managed, consistent with SW-846, 3rd Edition, or as superseded.

i. Appendices, including:

(1) Design Data - Tabulations of significant data used in the design effort;

(2) Equations - List and describe the source of major equations used in the design process;

(3) Sample Calculations - Present and explain at least one example calculation for significant or unique design calculations; and

(4) Laboratory or Field Test Results.

4. Operation and Maintenance Plan

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit an Operation and Maintenance (O&M) Plan for the Soil Vapor Extraction Project to EPA for review and approval. The O&M Plan shall outline the procedures for performing operations, long term maintenance, and monitoring of the corrective measure. EPA will approve or modify the O&M Plan. The O&M Plan, as approved or modified by EPA, shall become the Final O&M Plan. The O&M plan shall, at a minimum, include the following elements:

a. Project Management: Describe the management approach, including levels of authority and responsibility (include organization chart), during the operation and management phases of the remedy implementation.

b. System Description: Describe the soil vapor extraction and treatment system and identify and describe significant equipment.

c. Start-Up Procedures: Describe system start-up procedures including any operational testing.

d. Operation and Maintenance Procedures: Describe normal operation and maintenance procedures, including:

   (1) Description of tasks for operation;

   (2) Description of tasks for maintenance;

   (3) Description of prescribed treatment or operation conditions; and

   (4) Schedule showing frequency of each O&M task.

e. Replacement schedule for equipment and installed components.

f. Waste Management Practices: Describe the wastes generated by operation of the corrective measure and how they will be managed.

g. Quality Assurance Project Plan: Sampling and monitoring activities may be needed for effective operation and maintenance of the corrective measure. To ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented, Respondent shall prepare a Quality Assurance Project Plan (QAPjP) to document all monitoring procedures, sampling, field measurements, and sample analyses performed during these activities. Respondent shall use quality assurance, quality control, and chain-of-custody procedures approved by the EPA. These procedures are described in EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, December 29, 1980, or as superseded by EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5).

h. Corrective Measure Monitoring: Describe the following:

(1) monitoring objectives;
(2) the types of measurements to be made (e.g., vapor pressure, contaminant concentrations, etc.);
(3) measurement locations;
(4) measurement methods, equipment, and procedures;
(5) measurement schedules; and
(6) record-keeping and reporting requirements.

This data and information shall be used to prepare Progress Reports and the Corrective Measure Completion Report.

i. O&M Contingency Procedures:

(1) Procedures to address system breakdowns and operational problems, including a list of redundant and emergency back-up equipment and procedures;

(2) Alternate procedures to be implemented if the corrective measure suffers complete failure. The alternate procedures must be able to prevent release or threatened releases of hazardous wastes and/or hazardous waste constituents which may endanger human health and/or the environment or exceed media cleanup standards;

(3) The O&M Plan shall specify that in the event of a major breakdown and/or complete failure of the corrective measure (includes emergency situations), Respondent shall orally notify the EPA within twenty-four (24) hours of the event, and shall notify the EPA in writing within seven (7) days of the event. Written notification shall, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment; and

(4) Procedures to be implemented in the event that the corrective measure is experiencing major operational problems, is not performing to design specifications, and/or will not achieve the remediation goals, objectives, or cleanup levels in the expected time frame.

j. Data Management and Documentation Requirements: The O&M Plan shall specify that Respondent collect and maintain the following information:

(1) Progress Report Information;

(2) Monitoring and laboratory data;

(3) Records of operating costs; and

(4) Maintenance and inspection records.

This data and information shall be used to prepare Progress Reports and the Corrective Measure Completion Report.

5. Health and Safety Plan

Within two hundred and ten (210) days after receipt of EPA's approval or modification of the Vadose Zone Investigation Workplan, Respondent shall submit an updated Health and Safety Plan for the Soil Vapor Extraction Corrective Measure, as set forth in Task II, to EPA. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall be developed as a stand alone document.

6. Commencement of Construction

Upon receipt of written notification from the EPA, Respondent shall commence the construction process and implement the Construction Workplan in accordance with the schedule and provisions contained therein.

C. Construction Completion Report - Soil Vapor Extraction Project

Within ninety (90) days following completion of the construction of the Soil Vapor Extraction Corrective Measure, Respondent shall submit a Construction Completion Report to EPA for review and approval. The Construction Completion Report shall document how the completed project is consistent with the Final Design Plans and Specifications. EPA will approve or modify the Construction Completion Report. The Construction Completion Report, as approved or modified by EPA, shall become the Final Construction Completion Report. The Construction Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure, design criteria, and certification that the corrective measure was

constructed in accordance with the Final Design Plans and Specifications;

2. Explanation and description of any modifications to the Final Design Plans and Specifications, and why these were necessary for the project;

3. Results of any operational testing and/or monitoring, indicating how initial operation of the corrective measure compares to the design criteria;

4. Summary of significant activities that occurred during construction. Include a discussion of problems encountered and how they were addressed;

5. As built drawings; and

6. Schedule indicating when any treatment systems will begin full scale operations.

D. Corrective Measure Completion Report

Respondent shall prepare and submit a Corrective Measure Completion Report to EPA for review and approval when the Performance Standards have been achieved for the Soil Vapor Extraction Corrective Measure. The purpose of the Corrective Measure Completion Report is to fully document how the Performance Standards have been satisfied, and to justify why the corrective measure and/or monitoring may cease. EPA will approve or modify the Corrective Measure Completion Report. The Corrective Measure Completion Report, as approved or modified by EPA, shall become the Final Corrective Measure Completion Report. The Corrective Measure Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure;

2. Demonstration that the Performance Standards have been met. Include results of testing and/or monitoring, indicating how operation of the corrective measure compares to the completion criteria;

3. Summary of work accomplishments (e.g., performance levels achieved, total hours of treatment operation, total treated and/or excavated volumes, nature and volume of wastes generated, etc.);

4. Summary of significant activities that occurred during operations. Include a discussion of problems encountered and how they were addressed;

5. Summary of inspection findings (include copies of key inspection documents in appendices);

6. Summary of total operation and maintenance costs; and

7. An evaluation of implementing additional source control measures to further reduce the remaining source material in the aquifer and soil beneath the Facility. Such measures could include the implementation of additional measures (e.g., incorporating an air sparging system with the soil vapor extraction system) in the aquifer where possible nonaqueous phase liquid (NAPL) contaminants remain relatively unaffected by ground water extraction.

TASK V: GROUND WATER EXTRACTION CORRECTIVE MEASURE

Task V sets forth the plans and schedules for those activities to be undertaken by Respondent in order to develop the final plans, drawings, specifications, general provisions, and special requirements necessary to design, construct, operate, and monitor the performance of the Ground Water Extraction Corrective Measure selected in the FDRTC. Respondent may draft the Design Plans and Specifications, the Construction Workplan, the Operation and Maintenance Plan, and the accompanying schedules so as to implement the Ground Water Extraction Corrective Measure in a phased approach, as outlined in the FDRTC. Information on the design, construction, operation, and performance monitoring of the ground water extraction system can be found in the following EPA publications:

U.S. EPA. Basics of Pump-and-Treat Ground Water Remediation Technology; EPA/600/8-90/003.

U.S. EPA. Methods for Evaluating the Attainment of Cleanup Standards, Volume 2: Ground Water; EPA/230/R-92/014.

U.S. EPA. Methods for Monitoring Pump-and-Treat Performance; EPA/600/R-94/123.

U.S. EPA. Ground-Water and Leachate Treatment Systems Manual; EPa/625/R-94/005.

A. Ground Water Investigation Workplan

Within forty-five (45) days of the effective date of this Order, Respondent shall submit a Ground Water Investigation Workplan to EPA for review and approval. The objectives of the Ground Water Investigation Workplan are to define the location and extent of the lithologic units which may control the fate and transport of contaminant in the aquifer, define the nature and extent, both horizontally and vertically, of contamination in the aquifer, and to collect the appropriate data required to design, construct, operate, and monitor the performance of the Ground Water Extraction Corrective Measure selected in the FDRTC. EPA will approve or modify the Ground Water Investigation Workplan. The Ground Water Investigation Workplan, as approved or modified by EPA, shall become the Final Ground Water Investigation Workplan. Respondent shall implement the Final Ground Water Investigation Workplan according to the schedule set forth in the Workplan. The Ground Water Investigation Workplan shall, at a minimum, include the following:

1. Project Management Plan

Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and an outline of proposed activities necessary to complete the design of the ground water extraction system. The technical approach shall address all the requirements necessary to implement the requirements of this Task.

2. Data Collection Quality Assurance Plan

Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed during the investigation so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. This plan shall, at a minimum, include the following:

a. Data Collection Strategy

The Data Collection Strategy shall, at a minimum, include the following:

(1) Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

(2) Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data; and

(3) Description of the methodology used to assure that the data accurately and precisely represents the characteristics of a population, parameter variations at a sampling point, and process conditions or environmental conditions. Examples of factors which shall be considered and discussed include:

(a) Environmental conditions at the time of sampling;
(b) Number of sampling points;
(c) Representativeness of selected media; and
(d) Representativeness of selected analytical parameters.

b. Sampling

The sampling section shall, at a minimum, discuss the following:

(1) Selecting appropriate sampling locations, depths, etc.;
(2) Determining a statistically sufficient number of sampling sites;
(3) Determining which media are to be sampled (e.g., ground water, etc.);
(4) Determining which parameters are to be measured and where;
(5) Selecting the frequency of sampling and length of sampling period;
(6) Selecting the types of samples and number of samples;
(7) Documenting field sampling operations and procedures, including;

(a) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);
(b) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
(c) Documentation of specific sample preservation method;
(d) Calibration of field devices;
(e) Collection of replicate samples;
(f) Submission of field blanks, where appropriate;
(g) Construction materials and techniques associated with monitoring wells and piezometers;
(h) Field equipment listing and sample containers;
(i) Sampling order; and
(j) Decontamination procedures.

(8) Selecting appropriate sample containers;
(9) Sample preservation; and
(10) Chain-of-custody, including:

(a) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and

(b) Pre-prepared sample labels containing all information necessary for effective sample tracking.

c. Field Measurements

The Field Measurements section shall, at a minimum, discuss the following:

(1) Selecting appropriate field measurement locations, depths, etc.;
(2) Providing a statistically sufficient number of field measurements;
(3) Measuring all necessary ancillary data;
(4) Determining conditions under which field measurement should be conducted;
(5) Determining which media are to be addressed by appropriate field measurements (e.g., ground water, etc.);
(6) Determining which parameters are to be measured and where;
(7) Selecting the frequency of field measurement and length of field measurements period; and
(8) Documenting field measurement operations and procedures, including:

(a) Procedures and forms for recording raw data, and the exact location, time, and facility-specific considerations associated with the data acquisition;
(b) Calibration of field devices;
(c) Collection of replicate measurements;
(d) Submission of field blanks, where appropriate;
(e) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;
(f) Field equipment listing;
(g) Order in which field measurements were made; and
(h) Decontamination procedures.

d. Contaminated Material Disposal

All contaminated material generated by activities required in the CMI shall be disposed of in accordance with all Federal and State laws and regulations.

e. Sample Analysis

The Sample Analysis section shall, at a minimum, specify the following:

(1) Chain-of-custody procedures, including:

(a) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
(b) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
(c) Specification of laboratory sample custody procedures for sample handling, storage, and disbursement for analysis.

(2) Sample storage procedures and holding times;
(3) Sample preparation methods;
(4) Analytical procedures, including:

(a) Scope and application of the procedure;
(b) Sample matrix;
(c) Potential interferences;
(d) Precision and accuracy of the methodology;
(e) Method detection limits;
(f) Calibration procedures and frequency;
(g) Data reduction, validation, and reporting;
(h) Internal quality control checks, laboratory performance, and systems audits and frequency, including:

1) Method blank(s);
2) Laboratory control sample(s);
3) Calibration check sample(s);
4) Replicate sample(s);
5) Matrix-spiked sample(s);
6) Blind quality control sample(s);
7) Control charts;
8) Surrogate samples;
9) Zero and span gases; and
10) Reagent quality control checks.

(i) Preventive maintenance procedures and schedules;

(j) Corrective action (for laboratory problems); and
(k) Turnaround time.

3. Data Management Plan

Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation. The plan shall, at a minimum, include the following:

a. Data Record

The data record shall, at a minimum, include the following:

(1) Unique sample or field measurement code;
(2) Sampling or field measurement location and sample or measurement type;
(3) Sampling or field measurement raw data;
(4) Laboratory analysis ID number;
(5) Property or component measured; and
(6) Result of analysis (e.g., concentration).

b. Tabular Displays

The following data shall be presented in tabular displays:

(1) Unsorted (raw) data;
(2) Results for each medium, or for each constituent monitored;
(3) Data reduction for statistical analysis;
(4) Sorting of data by potential stratification factors [e.g., location, ground water flow zone (upper, upper lower, etc.)]; and
(5) Summary data.

c. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

(1) Display sampling locations and sampling grids;

(2) Contaminant concentrations at each sampling location;
(3) Display average and maxima contaminant concentrations;
(4) Geographical extent of contamination and illustrate changes in concentration in relation to distance from the source and depth;
(5) Indicate features affecting intramedia transport; and
(6) Illustrate the stratigraphy in the area of the ground water contamination.

B. Ground Water Extraction and Treatment Project

1. Ground Water Investigation Report

Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit a Ground Water Investigation Report to EPA for review and approval. EPA will approve or modify the Ground Water Investigation Report. The Ground Water Investigation Report, as approved or modified by EPA, shall become the Final Ground Water Investigation Report. This Report shall, at a minimum, include the following:

a. A description, including maps, of the horizontal and vertical extent, including concentration profiles, of the contaminants in the ground water originating from the Facility;

b. Based on field data and aquifer tests, a representative and accurate description of the hydrogeologic units which are a part of the migration pathways for the contaminant plume, including:

(1) Hydraulic conductivity;
(2) Lithology, grain size, sorting;
(3) Velocity of ground water;
(4) Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants;
(5) Cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways;
(6) Water-level contour and/or potentiometric maps; and

(7) Hydrologic cross sections showing vertical gradients.

c. Definition of the containment area (two-dimensional) and volume (three-dimensional);

d. Appropriate data and analyses for the design and implementation of a ground water extraction system, treatment system, and disposal system. This shall include the appropriate field pilot test(s), aquifer test(s), etc., to provide data to determine design parameters and projected effectiveness of the full-scale ground water extraction system, treatment system, and disposal system. The ground water extraction system shall be capable of hydraulically containing the contaminant plume, and reducing contaminant concentrations to comply with the cleanup goals by maximizing contaminant mass removal and minimizing cleanup time.

e. The necessary contaminant reductions (e.g., volatile organic compounds, chromium, etc.), in the extracted ground water to comply with Federal, State, and local standards prior to disposal; and

f. The recommended disposal method for the treated ground water which is consistent with the criteria in the FDRTC document for conservation of the ground water resource.

2. Design Plans and Specifications

Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit the Design Plans and Specifications for the Ground Water Extraction Corrective Measure to EPA for review and approval. The design package shall consist of the detailed drawings and specifications needed to construct the corrective measure(s). EPA will approve or modify the design package. The design package, as approved or modified by EPA, shall become the Final Design Plans and Specifications. The Design Plans and Specifications shall, at a minimum, include the following documents:

a. General Site Plans;
b. Process Flow Diagrams;
c. Mechanical Drawings;
d. Electrical Drawings;
e. Piping and Instrumentation Diagrams;

f. Structural Drawings;
g. Excavation and Earthwork Drawings;
h. Site Preparation and Field Work Standards;
i. Construction Drawings;
j. Installation Drawings;
k. Equipment Lists; and
l. Specifications for Equipment and Material.

3. Construction Workplan

Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit a Construction Workplan for the Ground Water Extraction Corrective Measure to EPA for review and approval. The purpose of the Construction Workplan is to document the overall management strategy, construction quality assurance procedures, and schedule for constructing the corrective measure. EPA will approve or modify the Construction Workplan. The Construction Workplan, as approved or modified by EPA, shall become the Final Construction Workplan. The Construction Workplan shall, at a minimum, include the following elements:

a. Project Management: Describe the construction management approach including levels of authority and responsibility (include organization chart).

b. Project Schedule: The project schedule shall specify all significant steps in the process, including the timing for key elements of the bidding process, the timing for initiation and completion of all construction tasks as specified in the Design Plans and Specifications.

c. Waste Management Practices: Describe the wastes generated by the construction of the corrective measure, and how they will be managed.

d. Required Permits: List and describe the permits needed to construct and operate the corrective measure. Indicate on the project schedule when the permit applications will be submitted to the applicable agencies and an estimate of the permit issuance date.

e. Quality Assurance Project Plan: The purpose of construction quality assurance is to ensure, with a reasonable degree of certainty, that a completed corrective measure will meet or exceed all design criteria, plans, and specifications. Sampling and monitoring activities may also be needed for

construction quality assurance/quality control and/or other construction related purposes. To ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented, Respondent shall prepare a Quality Assurance Project Plan (QAPjP) to document all monitoring procedures, sampling, field measurements, and sample analysis performed during these activities. Respondent shall use quality assurance, quality control, and chain-of-custody procedures approved by the EPA. These procedures are described in EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, December 29, 1980, or as superseded by EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5).

f. Construction Contingency Procedures:

(1) Changes to the design and/or specifications may be needed during construction to address unforeseen problems encountered in the field. Procedures to address such circumstances, including notification of EPA, shall be included in the Construction Workplan.

(2) The Construction Workplan shall specify that in the event of a construction emergency (e.g. fire, earthwork failure, etc.), Respondent shall orally notify the EPA within twenty-four (24) hours of the event, and shall notify the EPA in writing within seven (7) days of the event. The written notification shall, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment; and

(3) Procedures to be implemented if unforeseen events prevent corrective measure construction.

g. Cost Estimate

Respondent shall develop a cost estimate that includes both corrective measure construction and operation and maintenance costs. The purpose of the cost estimate is to assure that Respondent has the financial resources necessary to construct and implement the corrective measure(s).

h. Documentation Requirements

Respondent shall describe how analytical data and results will be evaluated, documented, and managed, consistent with SW-846, 3rd Edition, or as superseded.

i. Appendices, including:

(1) Design Data - Tabulations of significant data used in the design effort;

(2) Equations - List and describe the source of major equations used in the design process;

(3) Sample Calculations - Present and explain at least one example calculation for significant or unique design calculations; and

(4) Laboratory or Field Test Results.

4. Operation and Maintenance Plan

Within three hundred and thirty (330) days after receipt of EPA's approval or modification of the Ground Water Investigation Workplan, Respondent shall submit an Operation and Maintenance (O&M) Plan for the Ground Water Extraction Corrective Measure to EPA for review and approval. The O&M Plan shall outline the procedures for performing operations, long term maintenance, and monitoring of the corrective measure. EPA will approve or modify the O&M Plan. The O&M Plan, as approved or modified by EPA, shall become the Final O&M Plan. The O&M plan shall, at a minimum, include the following elements:

a. Project Management: Describe the management approach, including levels of authority and responsibility (include organization chart), during the operation and management phase of the remedy implementation.

b. System Description: Describe the ground water extraction, treatment, and disposal systems, and identify and describe significant equipment (e.g., pumps, controllers, piping, wiring, treatment system parts, alarms, etc.).

c. Start-Up Procedures: Describe system start-up procedures including any operational testing.

d. Operation and Maintenance Procedures: Describe normal operation and maintenance procedures, including:

(1) Description of tasks for operation;

(2) Description of tasks for maintenance;

(3) Description of prescribed treatment or operation conditions; and

(4) Schedule showing frequency of each O&M task.

e. Replacement schedule for equipment and installed components.

f. Waste Management Practices: Describe the wastes generated by operation of the corrective measure and how they will be managed.

g. Quality Assurance Project Plan: Sampling and monitoring activities may be needed for effective operation and maintenance of the corrective measure. To ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented, Respondent shall prepare a Quality Assurance Project Plan (QAPjP) to document all monitoring procedures, sampling, field measurements, and sample analyses performed during these activities. Respondent shall use quality assurance, quality control, and chain-of-custody procedures approved by the EPA. These procedures are described in EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, December 29, 1980, or as superseded by EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5).

h. Corrective Measure Monitoring: Describe the following:

(1) monitoring objectives;
(2) the types of measurements to be made (e.g., pumping rates, hydraulic heads, contaminant concentrations, ground water chemistry, precipitation, etc.);
(3) measurement locations;
(4) measurement methods, equipment, and procedures;
(5) measurement schedules; and
(6) record-keeping and reporting requirements.

This data and information shall be used to prepare Progress Reports and the Corrective Measure Assessment and Completion Reports.

i. O&M Contingency Procedures:

(1) Procedures to address system breakdowns and operational problems, including a list of redundant and emergency back-up equipment and procedures;

(2) Alternate procedures to be implemented if the corrective measure suffers complete failure. The alternate procedures must be able to prevent release or threatened releases of hazardous wastes and/or hazardous waste constituents which may endanger human health and/or the environment or exceed media cleanup standards;

(3) The O&M Plan shall specify that in the event of a major breakdown and/or complete failure of the corrective measure (includes emergency situations), Respondent shall orally notify the EPA within twenty-four (24) hours of the event, and shall notify the EPA in writing within seven (7) days of the event. Written notification shall, at a minimum, specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment; and

(4) Procedures to be implemented in the event that the corrective measure is experiencing major operational problems, is not performing to design specifications, and/or will not achieve the remediation goals, objectives, or cleanup levels, in the expected time frame.

j. Data Management and Documentation Requirements: The O&M Plan shall specify that Respondent collect and maintain the following information:

(1) Progress Report Information;

(2) Monitoring and laboratory data;

(3) Records of operating costs; and

(4) Maintenance and inspection records.

This data and information shall be used to prepare Progress Reports and the Corrective Measure Assessment and Completion Reports.

5. Health and Safety Plan

Within three hundred and thirty (330) days after receipt of EPA's approval and/or modification of the Ground Water Investigation Workplan, Respondent shall submit an updated Health and Safety Plan for the Ground Water Extraction Corrective Measure, as set forth in Task II, to EPA. EPA does not approve or disapprove the Health and Safety Plan, but does review it to assure its existence. The Health and Safety Plan shall be developed as a stand alone document.

6. Commencement of Construction

Upon receipt of written notification from the EPA, Respondent shall commence the construction process and implement the Construction Workplan in accordance with the schedule and provisions contained therein.

C. Construction Completion Report

Within ninety (90) days following completion of the construction of the Ground Water Extraction Corrective Measure, and/or upon written notice from EPA regarding completion of the construction of one or more components in the Ground Water Extraction Corrective Measure (e.g., containment well system, treatment system, etc.,), Respondent shall submit a Construction Completion Report to EPA for review and approval. The Construction Completion Report shall document how the completed project or component is consistent with the Final Design Plans and Specifications. EPA will approve or modify the Construction Completion Report. The Construction Completion Report, as approved or modified by EPA, shall become the Final Construction Completion Report for the project or component. The Construction Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure, design criteria, and certification that the corrective measure was constructed in accordance with the Final Design Plans and Specifications;

2. Explanation and description of any modifications to the Final Design Plans and Specifications and why these were necessary for the project;

3. Results of any operational testing and/or monitoring, indicating how initial operation of the corrective measure compares to the design criteria;

4. Summary of significant activities that occurred during construction. Include a discussion of problems encountered and how they were addressed;

5. As built drawings; and

6. Schedule indicating when any treatment systems will begin full scale operations.

D. Corrective Measure Assessment Reports

Within sixty (60) days of receipt of written notification from EPA, Respondent shall submit a Corrective Measure Assessment Report to EPA for review and approval. The Corrective Measure Assessment Report shall thereafter be submitted to EPA for review and approval annually for a period of two (2) years, and every five years thereafter until this Order is terminated pursuant to Section XXVI of this Order. The Corrective Measure Assessment Report shall contain an evaluation of the past and projected future effectiveness of the corrective measure in attaining the remedial objectives of: (1) contaminant plume containment; and (2) restoration of the contaminated ground water to the media cleanup standards set forth in the FDRTC or in this Order. The evaluation shall follow EPA guidance in evaluating the performance of the ground water extraction system in meeting these two objectives. EPA will approve or modify the Corrective Measure Assessment Report. The Corrective Measure Assessment Report, as approved or modified by EPA, shall become the Final Corrective Measure Assessment Report for the time period covered by the Report. The Corrective Measure Assessment Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure;

2. Describe the progress in attaining the remedial objectives of: (a) contaminant plume containment; and (b) restoration of the contaminated ground water.

3. Summarize data obtained during the preceding time interval of systems operation and evaluate trends in the system operating conditions indicating how operation of the corrective measure compares to the remedial objectives;

4. Summary of work accomplishments (e.g., performance levels achieved, total hours of treatment operation,

total treated and/or excavated volumes, nature and volume of wastes generated, etc.);

5. Summary of significant activities that occurred during operations. Include a discussion of problems encountered and how they were addressed;

6. Summary of inspection findings (include copies of key inspection documents in appendices);

7. Summary of total operation and maintenance costs; and

8. An evaluation of implementing post-construction refinements to the ground water extraction system such as, but not limited to:

   - adjusting the pumping rate in some or all of the ground water extraction wells;

   - installing additional extraction wells to facilitate or accelerate cleanup of the contaminant plume;

   - initiating a pulsed pumping schedule in some or all of the ground water extraction wells to eliminate flow stagnation areas, or otherwise facilitate recovery of contaminants from the aquifer;

   - discontinuing pumping at individual extraction wells where cleanup goals have been attained; monitoring of the aquifer would be continued to ensure that media cleanup goals are maintained; and

   - refining the treatment and disposal components of the system.

9. An evaluation of implementing additional source control measures to further reduce the remaining source material in the aquifer and soil beneath the facility. Such measures could include the implementation of additional measures in the aquifer where possible NAPL contaminants remain relatively unaffected by ground water extraction.

Respondent may at any time request that EPA select an alternative and/or supplemental corrective measure(s) (which may include requiring Respondent to achieve alternative clean up standards in lieu of the media cleanup standards set forth in the FDRTC or in this Order). Respondent may also at any time submit a Technical Impracticability

Demonstration to EPA. In addition to demonstrating technical impracticability, Respondent shall also submit an alternative remedial strategy that is: (1) technically practicable; (2) consistent with the overall objectives of the remedy; (3) controls the source(s) of the contamination; and (4) controls human and environmental exposure. An alternative remedial strategy shall be imposed if a determination of technical impracticability is made by EPA.

E. Corrective Measure Completion Report

Respondent shall prepare and submit a Corrective Measure Completion Report to EPA for review and approval when the Performance Standards have been achieved for the Ground Water Extraction Corrective Measure. The purpose of the Corrective Measure Completion Report is to fully document how the Performance Standards have been satisfied and to justify why the corrective measure and/or monitoring may cease. EPA will approve or modify the revised Corrective Measure Completion Report. The revised Corrective Measure Completion Report, as approved or modified by EPA, shall become the Final Corrective Measure Completion Report. The Corrective Measure Completion Report shall, at a minimum, include the following elements:

1. Synopsis of the corrective measure;

2. Demonstration that the Performance Standards have been met. Include results of testing and/or monitoring, indicating how operation of the corrective measure compares to the completion criteria;

3. Summary of work accomplishments (e.g., performance levels achieved, total hours of treatment operation, total treated and/or excavated volumes, nature and volume of wastes generated, etc.);

4. Summary of significant activities that occurred during operations. Include a discussion of problems encountered and how they were addressed;

5. Summary of inspection findings (include copies of key inspection documents in appendices); and

6. Summary of total operation and maintenance costs.

TASK VI: MONTHLY PROGRESS REPORTS

Respondent shall, at a minimum, provide EPA with signed monthly progress reports during the corrective measures design, construction, operation and maintenance. EPA may adjust the frequency of progress reporting to address site-specific needs. For example, more frequent progress reports may be needed to track critical activities such as corrective measure construction and start-up.

Progress reports shall, at a minimum, include the following elements:

A. A description of significant activities (e.g., sampling events, inspections, etc.) and work completed/work accomplishments (e.g., performance levels achieved, hours of treatment operation, treated and/or excavated volumes, concentration of contaminants in treated and/or excavated volumes, nature and volume of wastes generated, etc.) during the reporting period;

B. Summary of system effectiveness. Provide a comparison of system operation to predicted performance levels (applicable only during operation of the corrective measure);

C. Summaries of all findings (including any inspection results);

D. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period;

E. Summaries of all problems or potential problems encountered during the reporting period;

F. Actions being taken and/or planned to rectify problems;

G. Projected work for the next reporting period; and

H. The results of any sampling tests and/or other data generated during the reporting period.

EXHIBIT A

FINAL DECISION AND RESPONSE TO COMMENTS

DATED JUNE 24, 1996

FINAL DECISION
RCRA CORRECTIVE ACTION

SITE NAME AND LOCATION

Sparton Technology, Inc.
Coors Road Facility
9621 Coors Road, N.W.
Albuquerque, New Mexico 87114

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedy for the Sparton Technology, Inc., Coors Road facility, in Albuquerque, New Mexico, chosen in accordance with the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA). This decision is based on the administrative record for the site.

DESCRIPTION OF REMEDY

The selected remedy consists of an expanded ground water extraction system and soil vapor extraction system. The major components of the selected remedy include:

1. Continued operation of the existing on-site ground water extraction and treatment system;

2. Further characterization of the extent of contamination in the ground water and vadose zone;

3. Installation and operation of additional ground water extraction well(s); and

4. Installation and operation of on-site soil vapor extraction (SVE) system;

STATUTORY DETERMINATIONS

Sparton Technology, Inc., is the owner or operator of a facility which was authorized to operate under interim status pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e). Hazardous waste has been released into the environment from the facility. Corrective action is necessary to protect human health and/or the environment. The selected remedy is protective of human health and the environment.

Samuel Coleman, P.E., Director
Compliance Assurance and
Enforcement Division
U.S. Environmental Protection
Agency - Region 6
Dallas, Texas

June 24, 1996
Date

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FINAL DECISION AND
RESPONSE TO COMMENTS
RCRA CORRECTIVE ACTION

SPARTON TECHNOLOGY, INC.
COORS ROAD FACILITY
ALBUQUERQUE, NEW MEXICO

June 24, 1996

INTRODUCTION

In this Final Decision and Response to Comments (FDRTC), the U.S. Environmental Protection Agency (EPA) describes the selected remedy, as well as the other remedial alternatives evaluated for addressing the ground water and soil contamination at the Sparton Technology Coors Road facility located in Albuquerque, New Mexico. This document also explains EPA's rationale for the remedy selected to address the release of hazardous waste. EPA has also prepared a Response to Comments to provide written responses to comments submitted regarding the EPA Statement of Basis for the Coors Road facility. The Response to Comments is included as Attachment 1. The Final Decision summarizes information that can be found in greater detail in the Administrative Record. The index for the Administrative Record in support of the Final Decision is included as Attachment 2.

FACILITY BACKGROUND

A. Site Description

The Sparton Technology, Inc., Coors Road Plant (Facility), at 9621 Coors Road, NW, consists of a 64,000-square-foot building on a 12-acre parcel of land on the northwest side of Albuquerque, New Mexico (Figure 1). The Facility is located on the edge of a terrace approximately 60 feet above the adjacent Rio Grande floodplain, and approximately 0.5 mile west of the Rio Grande. The Corrales Main Canal, a man-made hydraulic structure used for irrigation, is approximately 300 feet east of the Facility, and contains flowing water eight months out of the year. The Calabacillas Arroyo is located about 1,000 feet north of the site. West of Irving Boulevard, the elevation rises some 250 feet from the terrace to form the surrounding hills.

Currently, land use in the area immediately adjacent to the Facility consists of commercial developments, and undeveloped tracts along the west side of Coors Road. Further south and west of the Facility along Irving Boulevard, residential developments

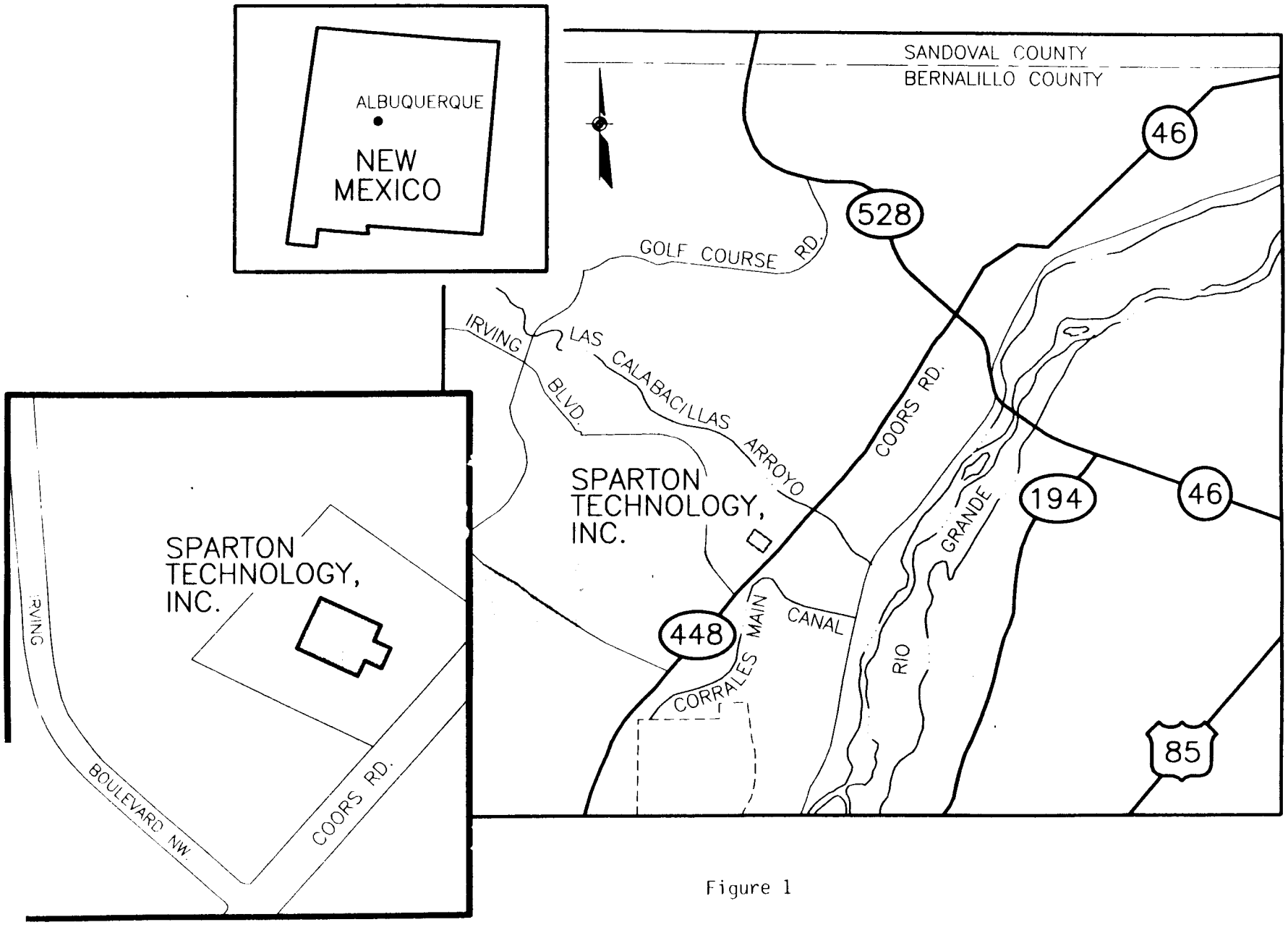

Figure 1

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are present or are being constructed. Residential developments, such as Paradise Hills, are approximately 1/4 - 3/4 mile west of the Facility. Agricultural operations are present east of the Facility and Coors Road.

The subsurface soils across the Facility consist of sandy muds, sands, and gravel. The depth to ground water varies from approximately 65 feet at the Facility to approximately 200 feet in the hills to the west. The depth to ground water can vary as much as two to three feet during the year as a result of recharge from irrigated fields and the Corrales Main Canal. Ground water flow is generally to the southwest across the Facility, changing to the west-northwest between the Facility and Irving Boulevard.

Local ground water supplies both drinking water for the City of Albuquerque as well as process water for industrial purposes. New Mexico Utilities, Inc., operates the nearest downgradient municipal water supply well (well No. 2) approximately 2.6 miles northwest of the Facility (Figure 2). There have been no identified private water supply wells immediately downgradient from the Facility.

B. Facility History

Manufacturing operations began in 1961 with commercial, industrial, and military electronic components, including printed circuit boards. As of 1994, Sparton discontinued manufacturing operations at the Facility and other than routine maintenance activities, the Facility is currently inactive.

The printed circuit board manufacturing process at the Facility generated an aqueous plating waste which was classified as hazardous waste due to heavy metals and a low pH. Waste solvents were generated primarily from cleaning of electronic components. From 1961 to 1975, the plating wastes were stored in an in-ground concrete basin. This basin was replaced by a lined surface impoundment in 1975, termed the "West Pond" and a second lined surface impoundment in 1977 termed the "East Pond" (Figure 3). The "West" and "East" ponds remained in use until 1983, when Sparton ceased discharging to either pond and removed the remaining plating wastes. The ponds are approximately 20 feet by 30 feet in surface dimension and 5 feet deep. The impoundments were constructed of concrete block or cast-walls with a natural sand base and a 30-mil, two-ply hypalon liner.

From 1961 to 1980, waste solvents were accumulated in an on-site sump (Figure 3) and allowed to evaporate. The sump was constructed of concrete blocks and measured approximately 5 feet by 5 feet in surface dimension by 2 feet deep. Sparton ceased discharging to the sump in October 1980 by removing the remaining wastes and filling the sump with sand.

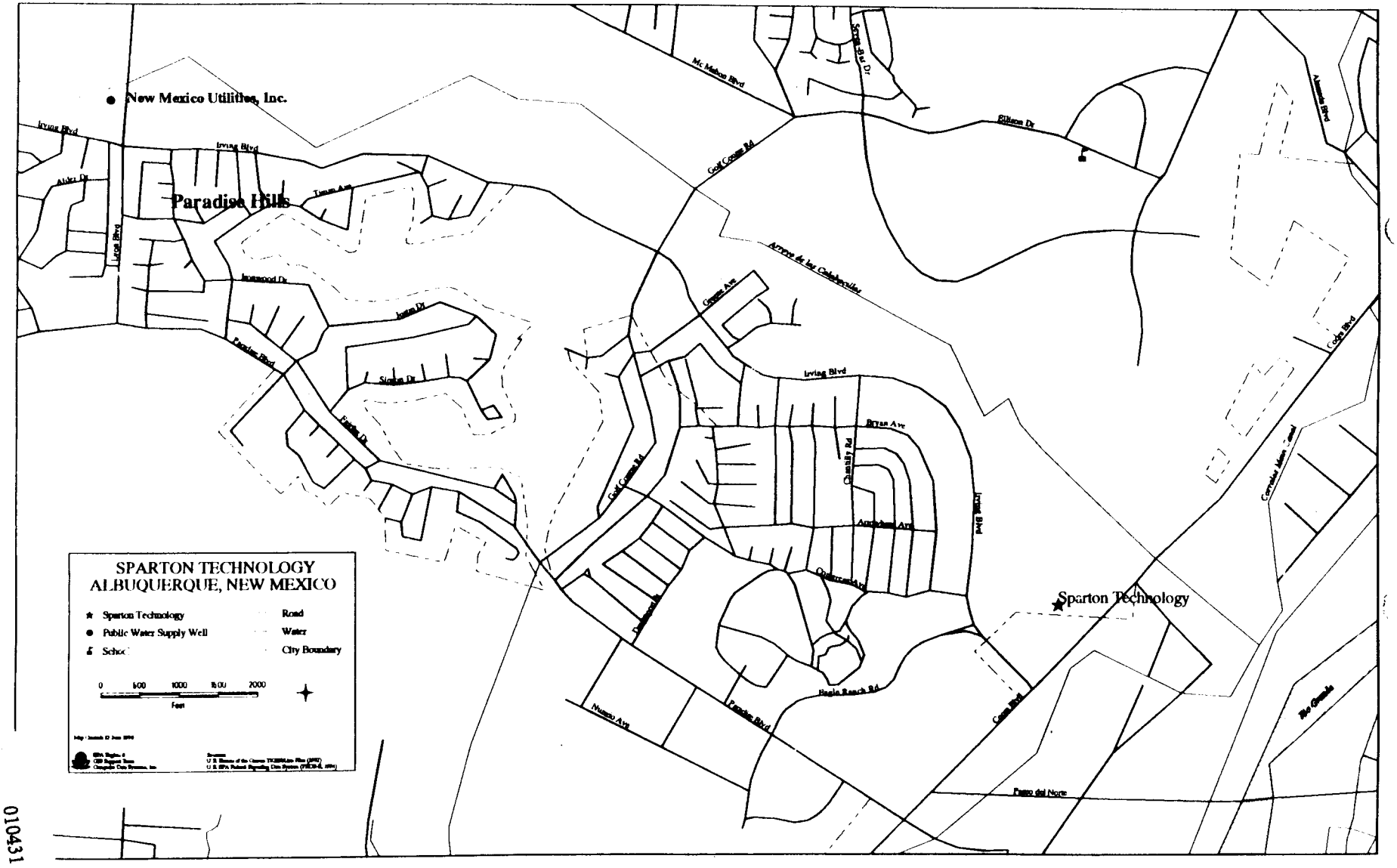

Figure 2

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Drums of hazardous waste were stored on the ground surface prior to May 1981, when a new drum storage area was constructed for storage of all drummed hazardous waste. The new drum storage area consists of a covered concrete pad and a spill collection system.

C. Regulatory History

In response to a Consent Agreement and Final Order signed by Sparton and EPA in 1983, Sparton installed a ground water monitoring system for the RCRA regulated hazardous waste management units at the Facility (East and West ponds). Analyses of the samples collected from the ground water monitoring system revealed that hazardous waste had been released to the ground water as a result of previous and ongoing hazardous waste management practices. During the period from 1983 to 1984, Sparton installed 17 ground water monitoring wells at the Facility. These monitoring wells were screened predominately across the top of the aquifer. Analyses of ground water samples collected from the monitoring wells detected the significant contaminants presented in Table 1.

TABLE 1

Chemical	Concentration (ppb)
Trichloroethylene	27 - 90,900
1,1,1-Trichloroethane	7 - 54,900
Methylene Chloride	11 - 78,400
1,1-Dichloroethylene	18 - 31,600
Tetrachloroethylene	17 - 953
Toluene	5 - 4,720
Benzene	20 - 193
Chromium	22 - 32,100

Sparton ceased discharging to the ponds in 1983, and removed the remaining plating wastes from the ponds for shipment to a permitted off-site disposal facility. On June 16, 1986, the New Mexico Environmental Improvement Division (NMEID), the predecessor agency to the New Mexico Environment Department (NMED), approved the closure plan for the "East" and "West" Ponds and Sump. The ponds and sump were certified closed by Sparton on December 18, 1986, and closure was acknowledged by NMEID on May 18, 1987. Sparton removed the solvent sump and sand backfill, and placed the wastes in the two remaining lined impoundments. The impoundments and sump area were capped by a 6-inch thick

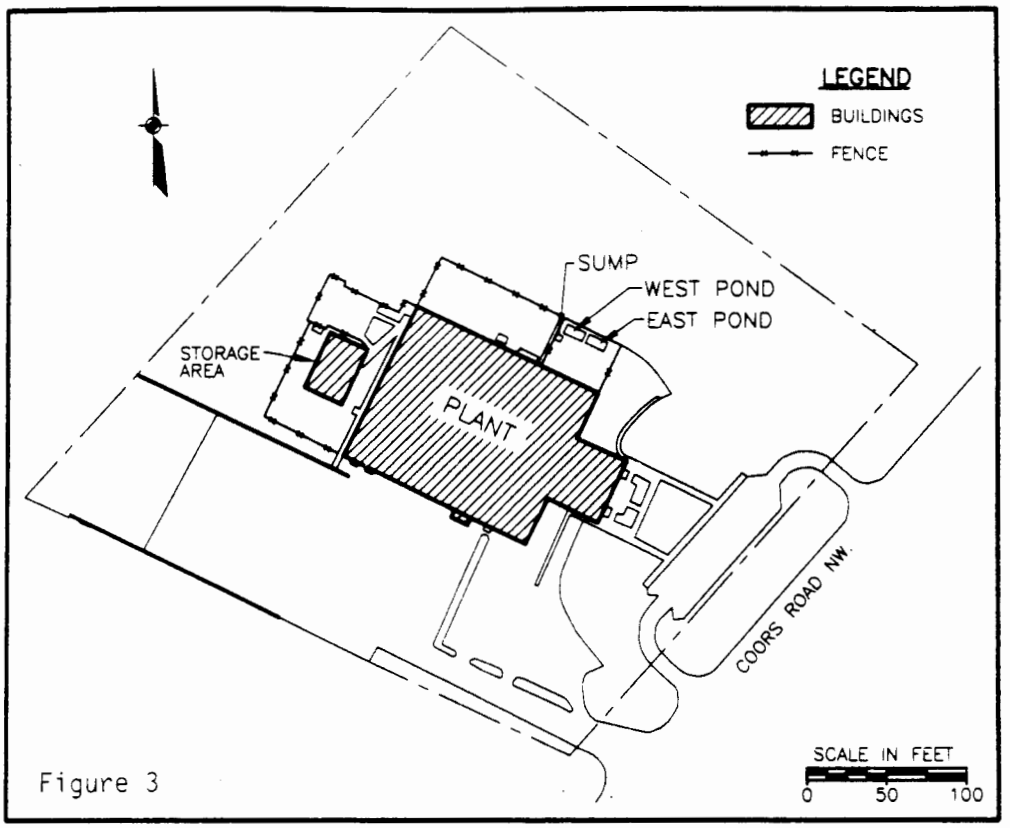


Figure 3

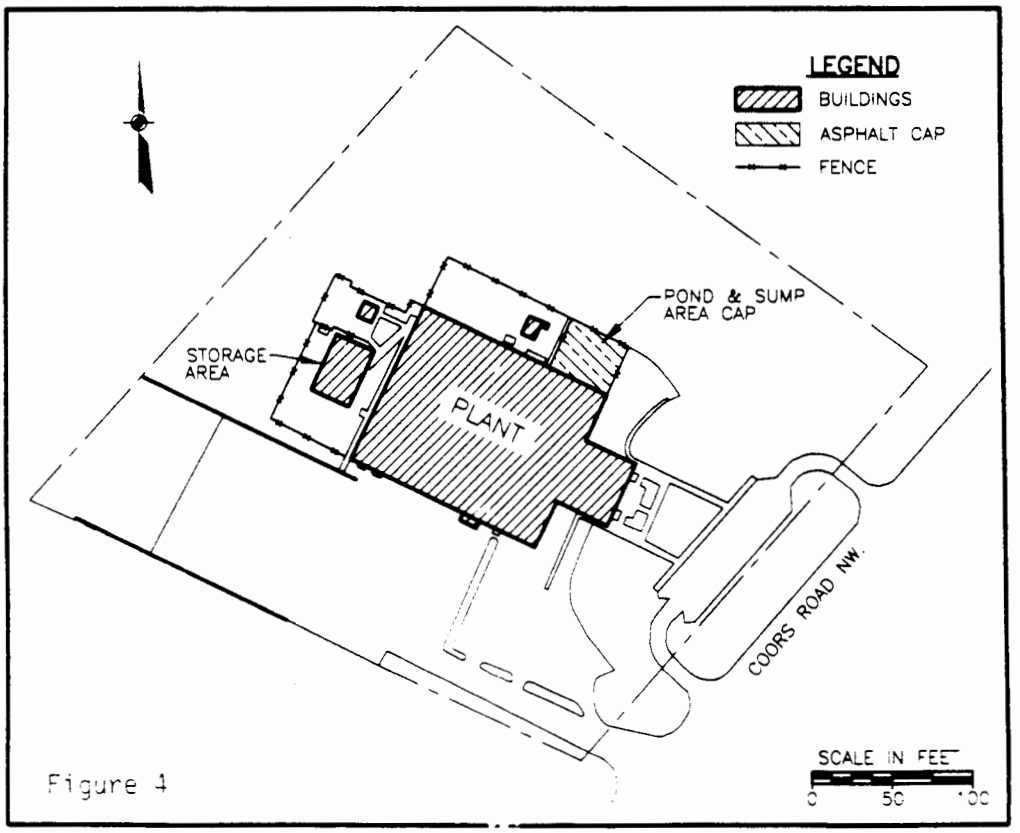


Figure 4

asphaltic base overlain by a 3-inch asphaltic concrete layer (Figure 4). The cap was sloped at 1 percent to promote drainage and reduce the potential for infiltration. The protective cap installed across the former waste management area reduces the potential for direct exposure to the contaminated material, prevents stormwater runoff from transporting contaminants away from the Facility, and reduces further downward migration of hazardous waste to the underlying ground water.

Sparton also performed a soil investigation during 1986 through 1987. Soil borings were used to evaluate the contaminant migration within the unsaturated subsurface soils as a result of past operations at the Facility. Total metals analyses indicated that chromium was the primary inorganic contaminant exceeding 3000 ppm underneath the former pond and sump area. The chromium concentration decreases to approximately 20 ppm outside of the waste management area, but is still above the background levels (2-3 ppm). Field screening conducted for the organic contaminants indicated the presence of volatile chemicals throughout the soil profile. Additional investigations included surface soil gas surveys conducted in 1984 and 1987. Trichloroethylene and trichloroethane were detected in the soil gas across the Facility and the general area of the ground water contamination.

On October 1, 1988, the EPA and Sparton Technology, Inc. (Sparton) entered into an Administrative Order on Consent (Order), Docket No. VI-004(h)-87-H, pursuant to Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6928(h). The Order specified the legal and technical requirements for Sparton to follow in performing corrective action at the Facility.

FACILITY INVESTIGATION

Under the terms of the Order, Sparton was required to complete the following three actions: 1) install and operate a ground water extraction and treatment system at the Coors Road facility as an interim measure; 2) conduct a RCRA Facility Investigation (RFI) to determine the nature and extent of contamination resulting from past Facility operations; and 3) perform a Corrective Measures Study (CMS) to evaluate the various clean-up alternatives. Sparton performed the requirements of the Order with oversight by EPA.

A. Interim Measure

In an effort to begin the recovery of contaminated ground water in 1988, Sparton was required to install and operate a ground water extraction and treatment system at the Facility. The system consists of 8 extraction wells pumping contaminated ground water from the upper 10 feet of the aquifer.

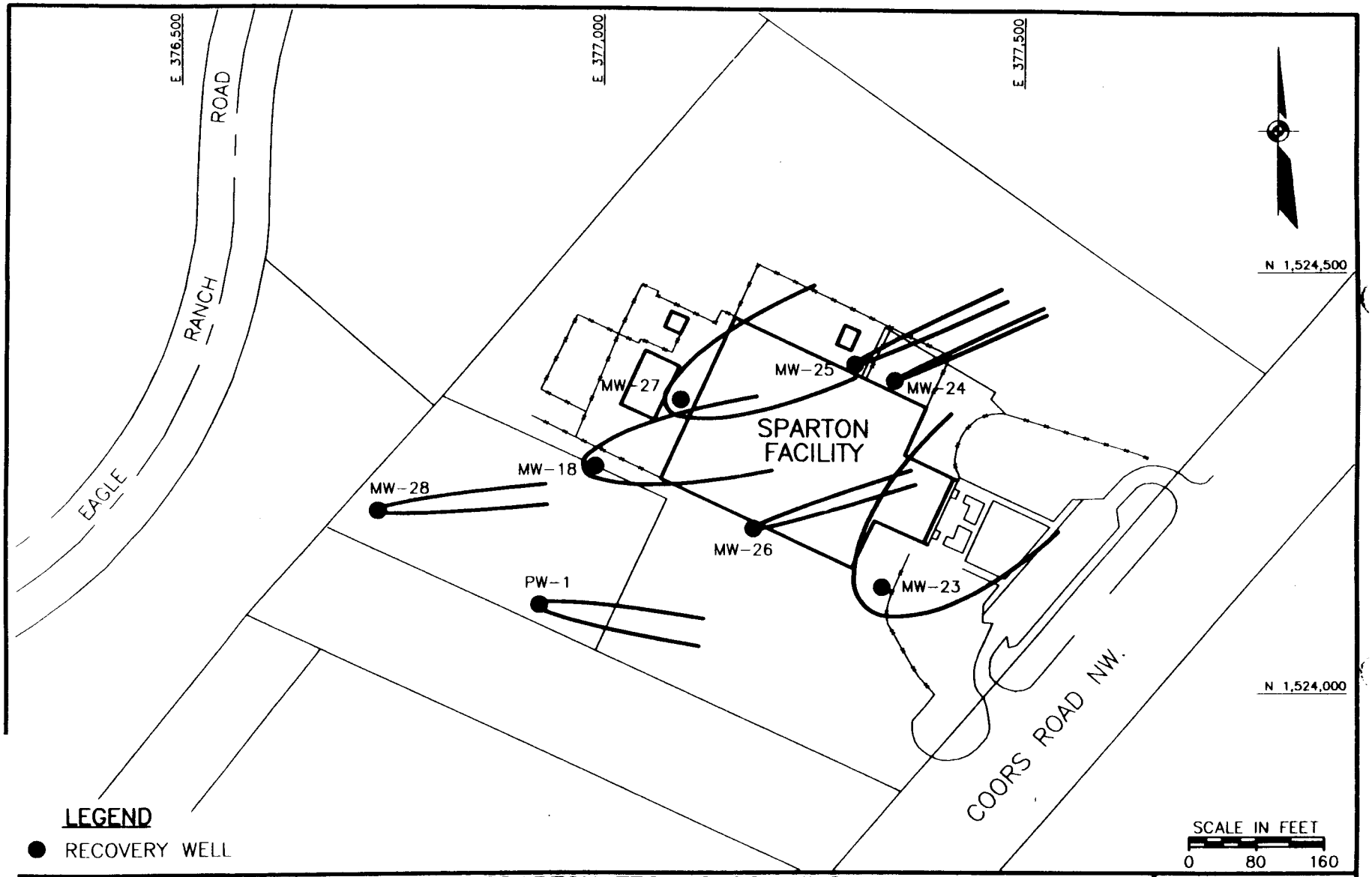
Figure 5 illustrates the well locations and approximate capture zones as estimated by EPA calculations. The total volume of recovered ground water is approximately 1300 gallons per day. The annual ground water withdrawal rate is regulated under the New Mexico State Engineer's office permit No. RG-50161 (expiration date is December 31, 1999). The recovered ground water is piped to a 550-gallon collection tank prior to treatment. The piping system consists of discharge lines encased in secondary piping to provide leak detection and containment. The collection tank is a fiberglass-coated, double wall, steel tank with a leak detection system connected to a visual and audible alarm in the control building.

Water from the collection tank is piped to the top of a 20 gallon per minute (gpm) packed tower air stripper. The air stripper operates by allowing the water to slowly flow downward across plastic balls while forcing air upward through the column to remove volatile organic compounds from the water. Approximately 3.56 million gallons of water have been recovered and treated in the air stripper. The demonstrated efficiency of the system is 99 percent for the contaminant indicators of trichloroethylene, 1,1,1-trichloroethane, methylene chloride, and 1,1-dichloroethylene. Contaminant concentrations in the treated water are in the range of 1 ppb for each contaminant. The volatile organic contaminants which are removed from the ground water in the air stripper are released to the atmosphere. The emissions are permitted by the City of Albuquerque Environmental Health Department (Air Quality Permit Number 187). The average daily air emission from the air stripper is 0.02 pounds, which is below the maximum allowable of 9.1 pounds per day in the permit.

Treated water from the air stripper is discharged to a 15,000-gallon fiberglass-coated, double wall, steel tank for storage. The tank has a leak detection system with a visual and audible alarm in the control building. During previous plant operations, treated water from the storage tank was used in the main plant building as cooling and flushing water, and eventually discharged into the sewer system. Since Facility operations have been discontinued, the treated water is utilized in the sanitary system prior to discharge into the sewer system.

B. RCRA Facility Investigation

Sparton was required to investigate the nature and extent of contaminant releases to the ground water. Monitoring wells installed in the aquifer were used to monitor the concentration and migration of contaminants in the ground water. Of these monitoring wells, 24 are located on-site at the Facility and 23 are installed off-site to a distance of approximately 1/2 mile



Metcalf & Eddy

SPARTON TECHNOLOGY, INC.

APPROXIMATE CAPTURE ZONES FOR THE UPPER FLOW ZONE RECOVERY WELLS

ALBUQUERQUE, NEW MEXICO

Project Number	
165022	
File Name	Figure
SPAR-CAP	5

010436

west-northwest of the Facility. The wells are installed to monitor discrete intervals of the aquifer from 0-10 feet (upper flow zone), 30-40 feet (upper-lower flow zone), 50-60 feet (lower-lower flow zone), and 70-80 feet (third flow zone) below the top of the water table.

Analyses of samples collected from the monitoring wells have shown both organic and inorganic contaminants (Table 1) using EPA approved methods. Trichloroethylene is the major ground water contaminant and has been used to define the extent of the contaminant plume. Concentrations of trichloroethylene in the ground water ranged from 7,600 ppb on-site to less than 5 ppb at a distance of at least 1/2 mile from the facility in 1996. Of the inorganic contaminants, hexavalent chromium has the highest frequency of occurrence with concentrations up to 500 ppb.

Trichloroethylene is a chlorinated organic compound which is denser than water, and if present as a dense, nonaqueous phase liquid (DNAPL), would sink to the bottom of the water column. While a DNAPL has not been identified in the monitoring wells, existing concentrations of trichloroethylene indicate the possible presence of a DNAPL in the upper flow zone of the aquifer on-site at the Facility. Remaining DNAPL in the soil and ground water may produce a zone of contaminant vapors above the water table, and a plume of dissolved contaminants below the water table. Both residual and migrating DNAPLs dissolve slowly, supplying potentially significant concentrations of contaminants to ground water over a long period of time.

Based on available data, the horizontal extent of the ground water contaminant plume is greatest in the upper flow zone. Contaminant concentrations are the highest on-site at the Facility, decreasing off-site to the west-northwest. As of June 1991, the contaminant plume had migrated approximately 1/2 mile west-northwest of the Facility, and the boundary of the plume had shown no significant changes between 1989 and 1991. However, during sampling activities from 1993 through April 1996, analyses of the ground water indicated that the leading edge of the contaminant plume (<5 ppb) has continued to move further northwest along Irving Boulevard. In Figures 6 through 11, the boundary and concentrations of the contaminant plume are approximate, and the maps are intended for illustration purposes only. The plume boundary and relative concentrations may be revised significantly based on additional data. For 1991, the approximate boundary and concentration profiles for trichloroethylene at three separate depths in ground water is illustrated in Figures 6 through 8. For 1996, the approximate boundary and concentration profiles for trichloroethylene at three separate depths in ground water is illustrated in Figures 9 through 11. Figures 6 through 11 were copied from the final CMS Report.

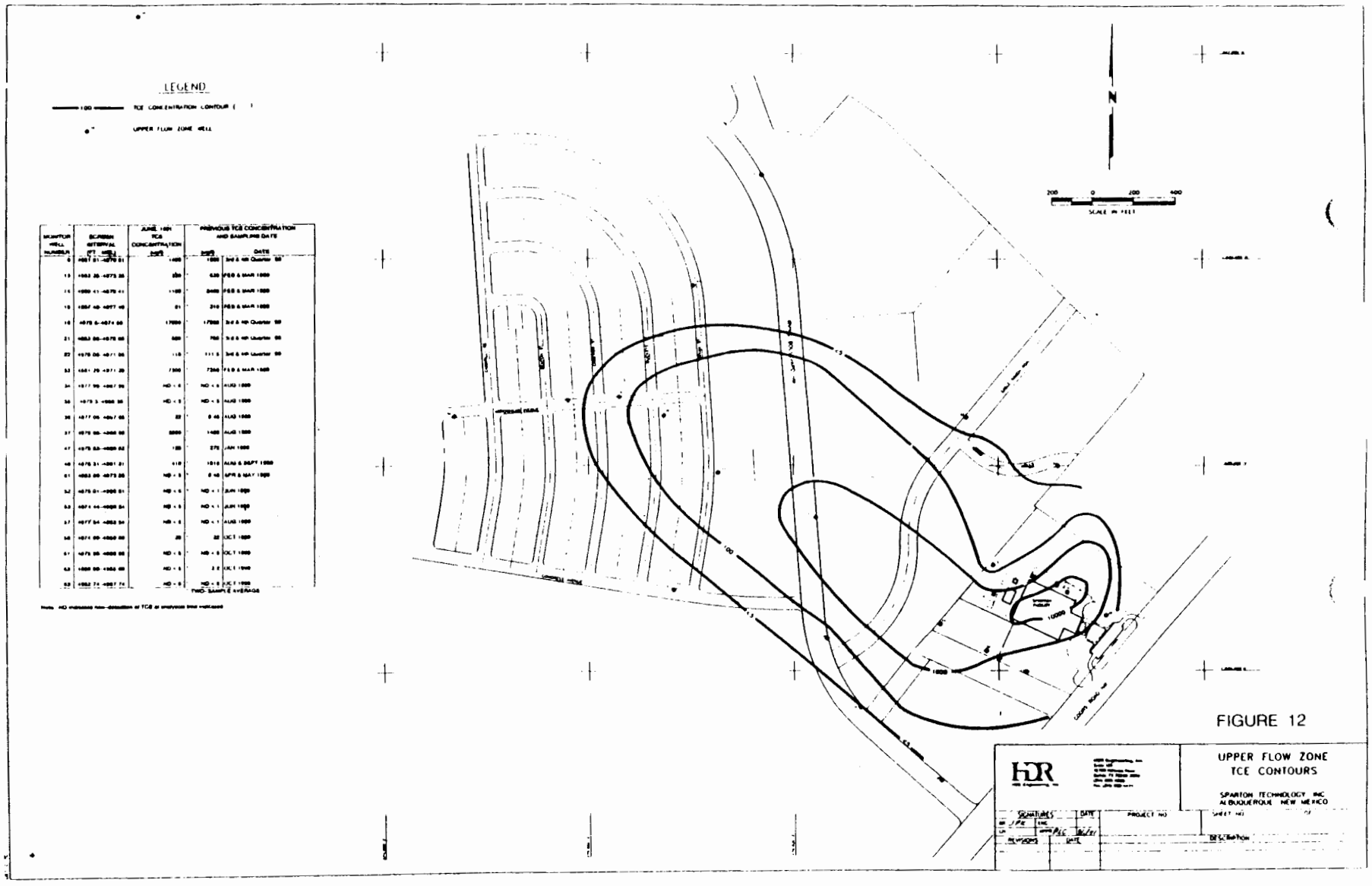

LEGEND
TCE CONCENTRATION CONTOUR
UPPER FLOW ZONE WELL
MONITOR WELL NUMBER
SCREEN INTERVAL (FT. WELL)
JUNE 1991 TCE CONCENTRATION (ug/l)
PREVIOUS TCE CONCENTRATION AND SAMPLING DATE
(ug/l)
DATE
TWO SAMPLE AVERAGE
Note: ND indicates non-detection of TCE at reported limit indicated
N
SCALE IN FEET
200
0
200
400
100
FIGURE 12
HDR
UPPER FLOW ZONE
TCE CONTOURS
SPARTON TECHNOLOGY INC.
ALBUQUERQUE NEW MEXICO
SIGNATURES
DATE
PROJECT NO
SHEET NO
REVISIONS
DATE
DESCRIPTION

Figure 6

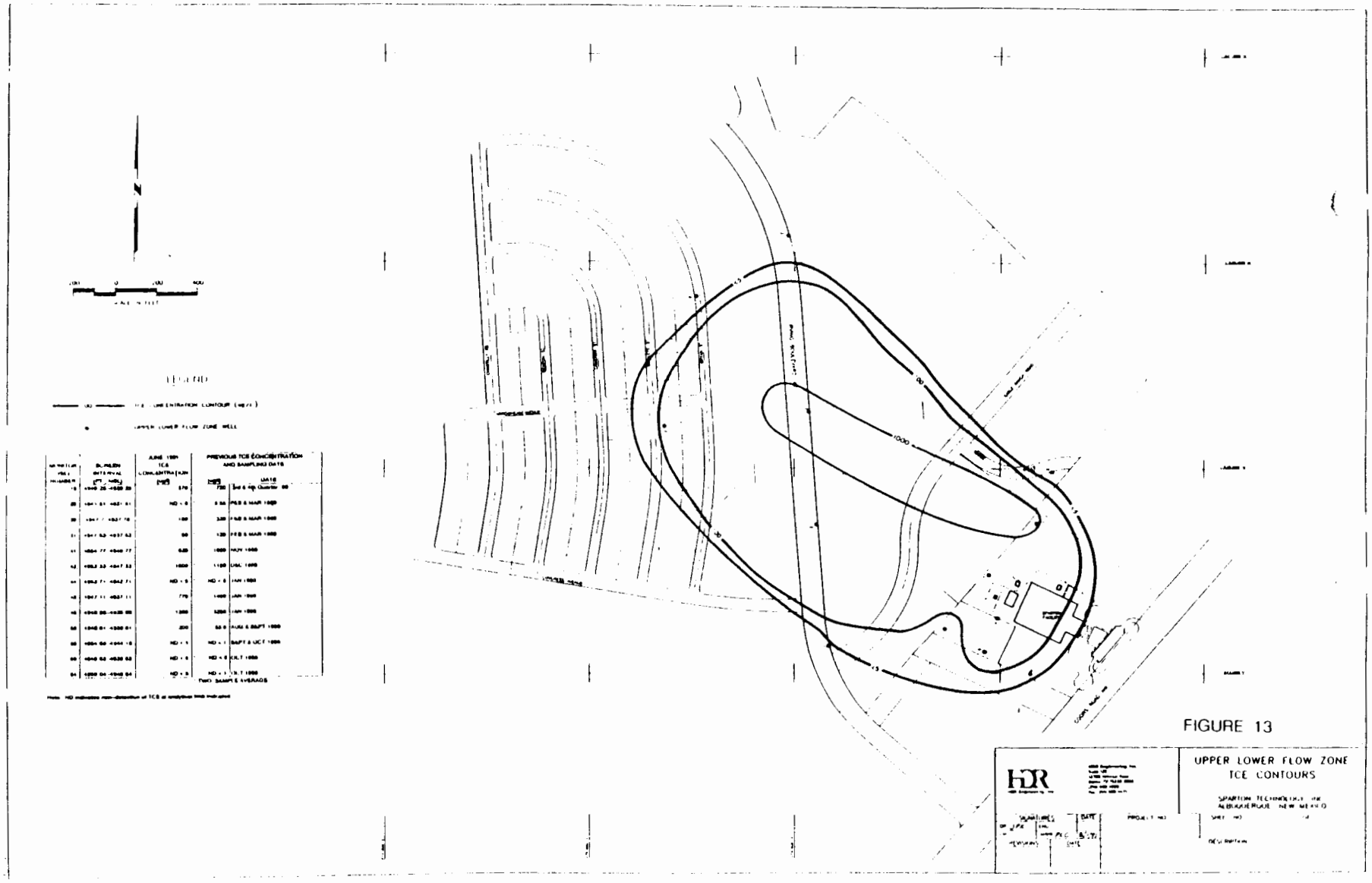


Figure 7

010439

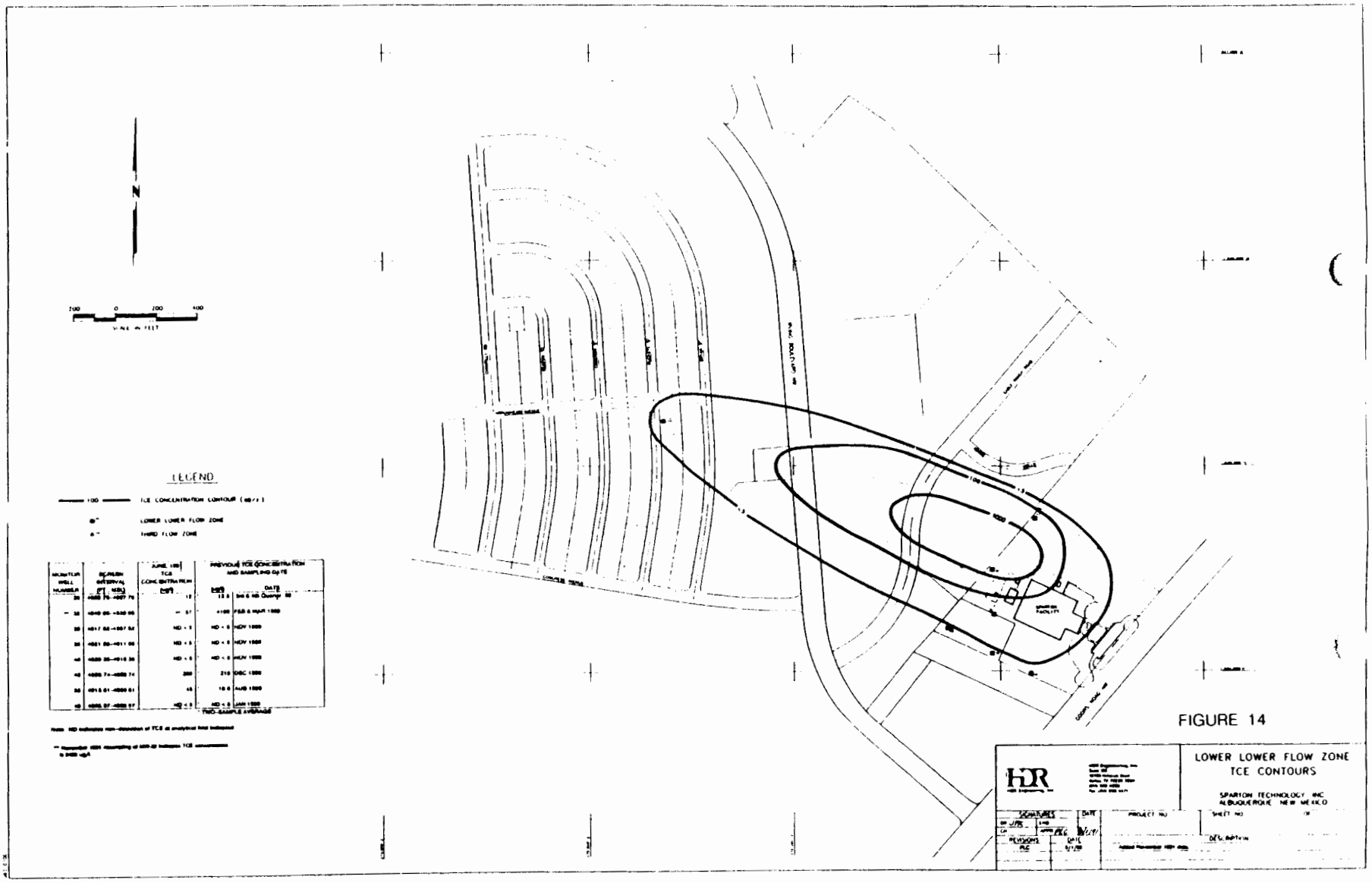


Figure 8

010440

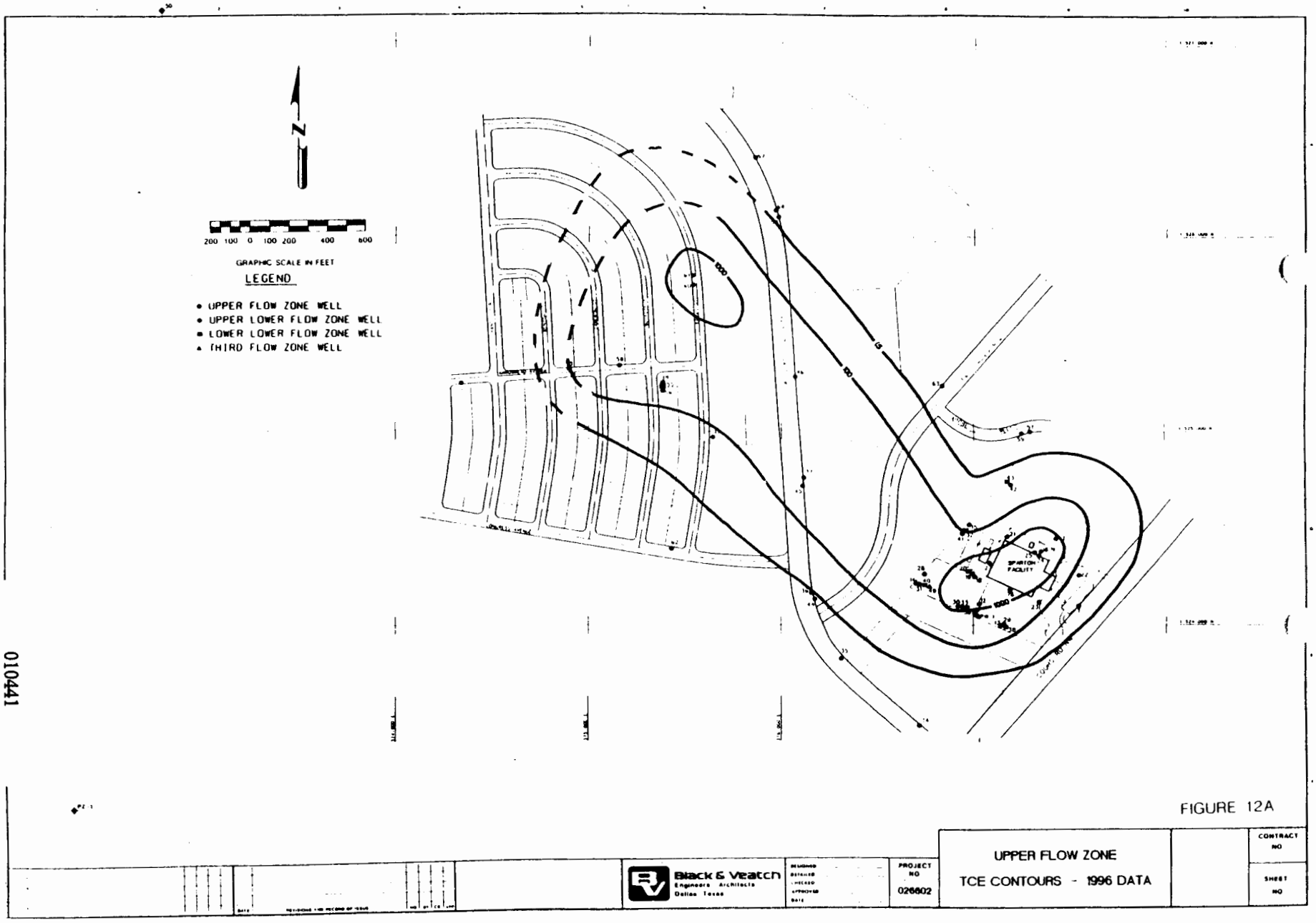


FIGURE 12A

010441

Figure 9

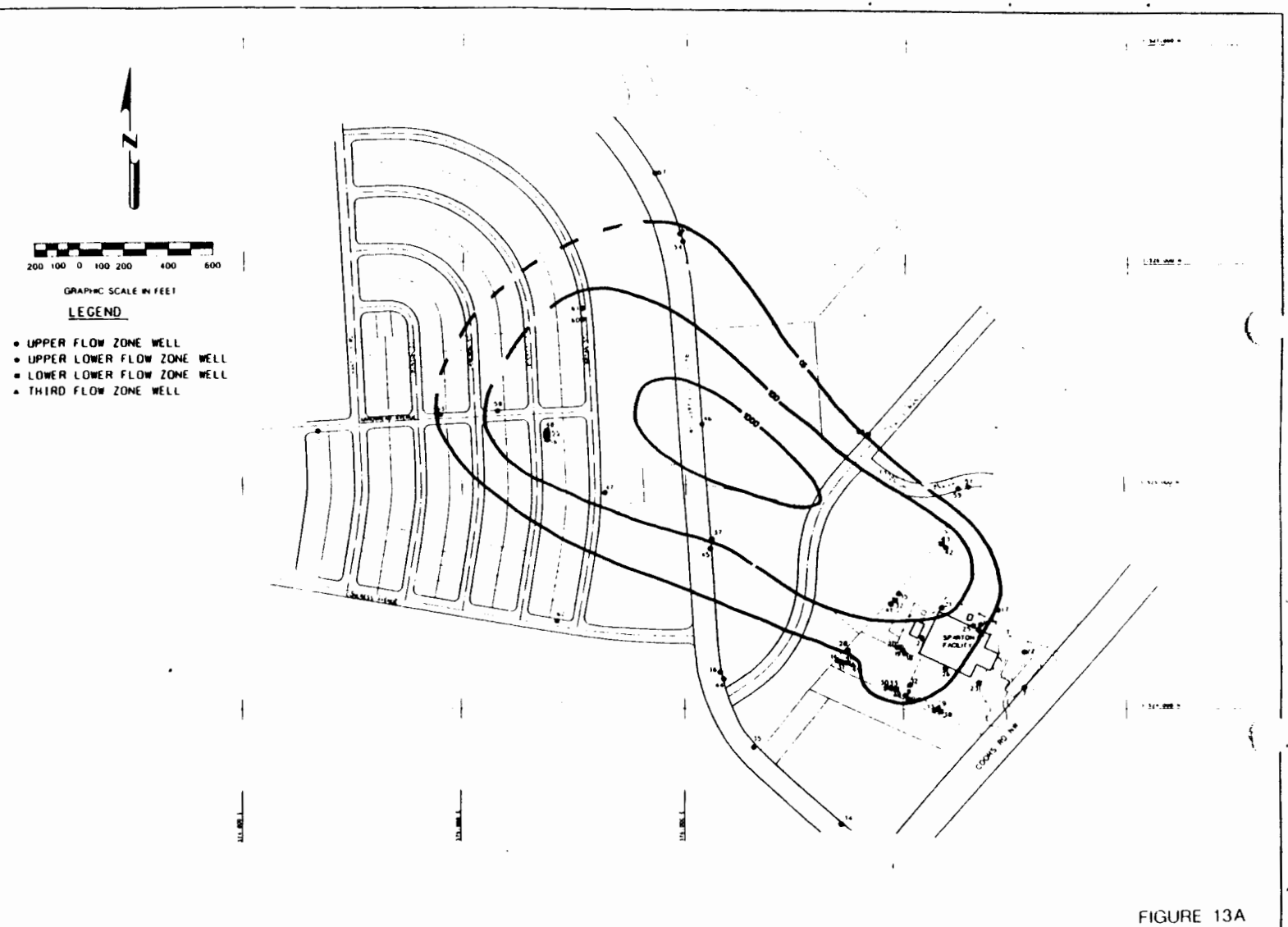


FIGURE 13A

Black & Veatch Engineers Architects Dallas Texas	PROJECT NO 026602	UPPER LOWER FLOW ZONE TCE CONTOURS - 1996 DATA	CONTRACT NO / SHEET NO

Figure 10

010442

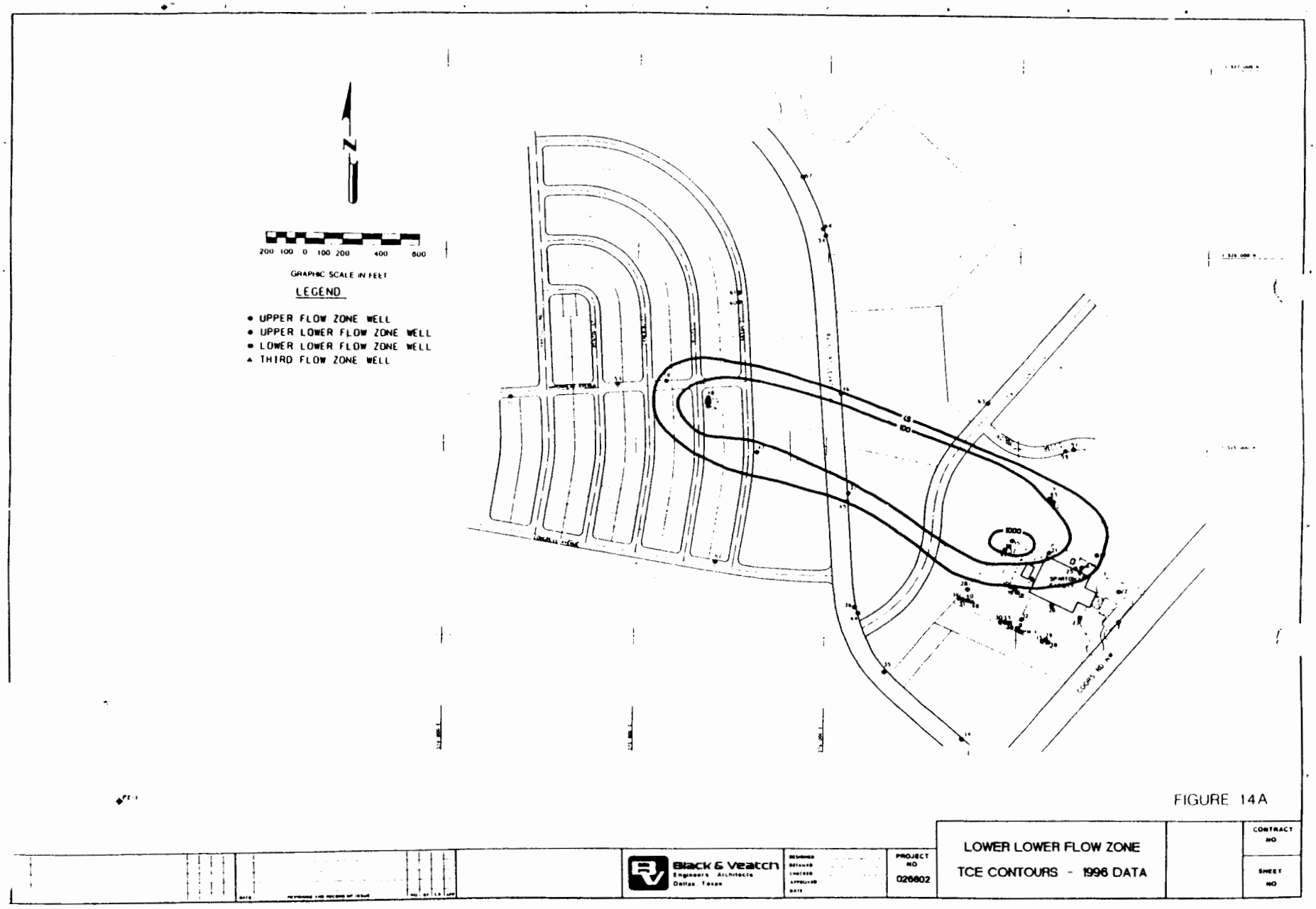


Figure 11

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While the organic contaminant concentrations have decreased with time in the on-site and certain off-site monitoring wells, other off-site monitoring wells have shown an increase in organic concentrations related to the continued migration of the contaminant plume beyond the boundary defined during the RFI. Based on available data, the contamination extends at least 60 feet below the water table. However, the existing monitoring system does not completely define the horizontal and vertical extent of the contamination.

SUMMARY OF SITE RISKS

The New Mexico Environment Department, the New Mexico Office of the Natural Resources Trustee, the New Mexico Attorney General's Office, and the City of Albuquerque have all issued separate notices that an imminent and substantial endangerment to health or the environment may exist at or near the Sparton Technology, Inc., facility at 9621 Coors Road, NW, Albuquerque, New Mexico, pursuant to 42 U.S.C. §6972(a)(1)(B). These findings are the result of past waste management practices at the Sparton facility which have resulted in releases to the ground water and soil. These entities claim that the contamination from the Facility threatens the ability of the City of Albuquerque to use the ground water in this area as a source of drinking water in the future. EPA has not made a determination as of this date as to whether an imminent and substantial endangerment exists pursuant to 42 U.S.C. §6973.

Under Section 3008(h) of RCRA, 42 U.S.C. §6928(h), corrective action is required to protect human health or the environment. Ground water currently supplies the sole source of drinking water for the City of Albuquerque. At this site, the aquifer is potentially useable as a source of drinking water, and is currently used outside of the contaminant plume for this purpose. The New Mexico Utilities Inc., water supply well No. 2 is approximately 2 miles downgradient (northwest) of the leading edge of the contaminant plume. Therefore, a protective goal at this site is the restoration of potentially drinkable ground water to levels safe for drinking throughout the contaminated plume, regardless of whether the water is in fact currently being consumed. Restoration refers to the reduction of contaminant concentrations to the more stringent of either: 1) the Maximum Contaminant Levels (MCLs) for drinking water established under the Safe Drinking Water Act; or 2) the maximum allowable contaminant concentrations in ground water set by the State of New Mexico Water Quality Control Commission (WQCC). MCLs were established to reduce the risk of adverse health effects to users of public water supply systems. Protection of the ground water as a source of drinking water and as a natural resource is protected under 20 NMAC 6.2.3101. Table 2 lists the specific contaminants present in the ground water and the corresponding Federal MCL and State WQCC standard.

Other site risks are directly related to the former sump and the two waste impoundments. During closure of these units, the liquid wastes were removed and a protective cap placed across the former waste management area. The cap reduced the potential for direct exposure to the residual hazardous waste present in the units and in the surrounding soils. The cap also prevents stormwater runoff from transporting contaminants into the surrounding water bodies.

TABLE 2		
Contaminant	MCL (ppb)	WQCC (ppb)
Trichloroethylene	5	100
1,1,1-Trichloroethane	200	60
Methylene Chloride	NA*	100
1,1-Dichloroethylene	7	5
Tetrachloroethylene	5	NA*
Benzene	5	10
Toluene	1000	750
Chromium (total)	100	50

* Not Available

The following corrective action objectives have been established for this site as protective of human health and the environment: 1) prevent further migration of the contaminant plume; 2) restore the contaminated aquifer to the more stringent of Federal or State standards; and 3) reduce the quantity of source material in the soil and ground water, to the extent practicable, to minimize further release of contaminants to the surrounding ground water, and ensure no further contaminant migration to the ground water above the existing cleanup goals established for ground water.

SUMMARY OF ALTERNATIVES

The individual corrective measure alternatives in the final CMS Report have been combined and renumbered to present comprehensive alternatives for addressing the release of contaminants into the ground water and soil. The descriptions and evaluations of the corrective measure alternatives are presented in greater detail in the final CMS Report and Administrative Record. Information gathered during and after the RFI was used to develop several remedial alternatives in the final CMS Report. Sparton also conducted a screening process to eliminate those remedial

alternatives that may prove infeasible to implement, or that rely on technologies unlikely to perform satisfactorily or reliably.

The alternatives for remediation of the contaminated ground water and contaminant source areas are:

- Alternative 1: No Further Action
- Alternative 2: On-Site Ground Water Extraction and Soil Vapor Extraction
- Alternative 3: Expanded Ground Water Extraction
- Alternative 4: Expanded Ground Water Extraction and Soil Vapor Extraction
- Alternative 5: Expanded Ground Water Extraction, Soil Vapor Extraction, and Air Sparging
- Alternative 6: Expanded Ground Water Extraction and Soil Flushing
- Alternative 7: In Situ Bioremediation

Common Elements

Except for the "No Further Action" alternative, all of the alternatives that were considered for the site included a number of common elements. Each of the alternatives include long-term operation and maintenance (O&M) activities for ground water extraction and treatment, with the more conservative time frame for the O&M being 30 years. With all of the alternatives, further investigation of the horizontal and vertical extent of the ground water contamination will be required. An additional 20 or more ground water monitoring wells may be necessary to define the extent of the contaminant plume. The 20 or more wells would be in addition to the existing ground water monitoring well network. The number of additional wells may increase or decrease as the site characterization progresses. Additional monitoring wells may be needed after defining the plume as the contaminant plume continues to migrate, in response to future performance of the selected remedy, or any other changes in site conditions. Due to uncertainties in predicting the number of monitoring wells necessary for the future, no additional costs have been included beyond the initial 20 well estimate. However, Sparton has only recommended five additional wells for further characterization of the contaminant plume, and no additional wells or well costs to monitor the continued plume migration.

Each of the alternatives include a routine quarterly ground water monitoring schedule within and surrounding the contaminant plume to evaluate changes in the extent of the contaminant plume, changes in contaminant concentrations within the plume, and ensure the effectiveness of the remedy. An estimated 20 to 40 monitor wells may be required for the quarterly monitoring schedule. This estimate includes some of the existing monitoring wells installed in the on-site and off-site areas. The total number of wells for the quarterly monitoring schedule may

increase or decrease from this estimate based on the results of the site characterization, continued migration of the contaminant plume, future performance of the selected remedy, and any other changes in site conditions.

The following estimates for monitoring well construction and ground water sampling and analyses are included in Alternatives 2-7.

- Construction of 20 Monitoring Wells: $400,000
- Sampling and Analyses for 40 Monitoring Wells: $160,000/Year

The cost estimates presented for each of the following alternatives include capital costs, operation and maintenance costs, and present worth costs. The costs of several of the alternatives differ from those costs described in the EPA Statement of Basis because Sparton has revised the estimates in the final CMS Report. However, the costs are estimates and may not accurately reflect the final costs for each of the alternatives.

All costs and time required to operate the individual alternatives are estimates. For alternatives 3-7, the ability to achieve cleanup goals throughout the contaminated aquifer cannot be determined until the technologies are implemented, modified as necessary, and the plume response monitored over time. Due to the uncertainty in predicting the time necessary for restoration of the ground water to its beneficial use, all costs were based on a thirty year operational period for comparison purposes. For Alternative 2, it is assumed that the contaminant plume will remain in the ground water beyond the 30-year period. However, costs are only presented for a 30-year period for ease of comparison.

All of the alternatives can create potential impacts to the local community involving construction activities in the public right-of-ways for the off-site monitoring wells, quarterly sampling activities for the monitoring wells, and routine operation and maintenance activities for the monitoring wells.

Description of Alternatives

Alternative 1: No Further Action

Description

The "No Further Action" alternative is often evaluated to establish a baseline for the comparison with other alternatives. Under this alternative, no further remedial actions are performed by Sparton to address the existing ground water and soil contamination. In addition, Sparton's operation of the existing

ground water recovery and treatment system at the Coors Road facility would be discontinued.

Total Cost

Present Worth Cost: $0
Capital Cost: $0
Operation & Maintenance: $0

Time of Implementation

Design/Remedial Action: 0 months
Operation & Maintenance: 0 months

Alternative 2: On-Site Ground Water Extraction System and Soil Vapor Extraction

Description

Sparton has recommended Alternative 2 to address the release of contamination from the Coors Road facility. Alternative 2, as presented in EPA's Statement of Basis, was Sparton's previous recommendation in the draft CMS Report and consisted of the following: 1) continued operation of the existing ground water extraction and treatment system to remove contaminants from the ground water at the Coors Road facility; and 2) natural attenuation of the off-site contaminant plume. As part of the natural attenuation process, Sparton also proposed an annual evaluation of any changes in land use/development to determine the need for further studies as part of the routine ground water monitoring program.

Sparton has now amended Alternative 2 to include the following: 1) convert the existing monitoring well MW-32 into an extraction well; this well is located near the western fence-line of the Facility and would pump ground water from a depth of 35 feet below the water table; 2) sampling of the contaminant vapor concentrations in the soil beneath the facility and installation of a soil vapor extraction system if vapor concentrations are above a threshold value; and 3) installation of five additional ground water monitoring wells to confirm plume location and movement.

The existing ground water extraction system was previously described in the section on Interim Measures. The existing air stripper has sufficient remaining capacity to accommodate additional flow from another recovery well added to the system. Operation of the air stripper unit has confirmed the effectiveness and reliability of this technology for treating ground water contaminated with volatile organic compounds. However, the increased flow from the additional extraction well would also require disposal following treatment. Sparton did not

indicate in the final CMS Report if their proposal included continued disposal in the sanitary sewer system. It is not known at this time if the City of Albuquerque would permit continued disposal in the sewer system from the existing, or an expanded, on-site extraction system.

Since the existing on-site extraction system, or an expanded version of the on-site system, is not capable of containing or removing contaminants from the ground water outside of the facility, naturally occurring physical and biological processes would be relied upon to reduce the contaminant concentrations (natural attenuation). Since there have been no identified biological processes to transform the remaining contaminants, physical processes such as dilution and adsorption would be relied upon. As a result, the contaminant plume will continue to migrate for an indefinite period of time at concentrations exceeding the cleanup goals specified for this site.

In addition to the on-site recovery system, a soil vapor extraction (SVE) system would be installed to enhance the removal of volatile organic contaminants from source areas in the soil and ground water. Further removal of organic contaminants will assist in the attainment of the ground water cleanup goals. The SVE system does not remove inorganic compounds in the soil. SVE wells are installed in the soil above the water table to create a partial vacuum in the soil. This vacuum produces a flow of air which vaporizes the volatile organic compounds from the surrounding soil. The air and vapor mixture is then drawn into the SVE wells and collected at the surface for treatment before venting to the atmosphere. In situ air stripping processes are generally effective in removing volatile organic compounds (e.g. trichloroethylene and trichloroethane) from the soil. Since the SVE system does not result in the physical destruction or transformation of the contaminants, the organic vapors would have to be removed from the air by a granular activated carbon unit to prevent the transfer of contaminants to the atmosphere. The granular activated carbon would then be disposed of off-site or regenerated for future use.

Further sampling of the subsurface soil and contaminant vapor concentrations is necessary prior to installation of a SVE system. This data can then be used to evaluate the design and performance of a soil vapor extraction system. Preliminary remediation goals for contaminant vapors beneath the facility have been set by NMED at 10 ppmV. Further evaluation of this cleanup goal will be performed to determine if a lower cleanup goal is necessary to achieve maximum reductions in ground water contamination.

Since the highest volatile organic concentrations are expected to be associated with the source material in the on-site soil and ground water, the SVE wells would be installed on-site to remove

the maximum amount of contaminants. Performance of the SVE system can be enhanced with the addition of blowers which would force air into the soil in surrounding wells. Further enhancements to the SVE system can be achieved by lowering the water level in the upper few feet of the aquifer at the facility to allow greater volatilization of the organic contaminants in the upper flow zone. An added benefit of the SVE system is the potential for decreasing the time frame for meeting cleanup goals in the ground water by enhancing the volatilization of volatile organic compounds from the water table, thereby further reducing concentrations in the ground water.

Sparton has estimated that a 10 to 20 well SVE system will be necessary to effectively remediate the Coors Road facility. Sparton has also estimated operation of the SVE system would last approximately one to three years. Accordingly, the total O&M cost for cleanup of the site decreases after the third year in operation to reflect the discontinued operation of the SVE system. The ground water extraction system would continue to operate at the Facility and is reflected in the O&M costs for years 4-30. Also, since the five additional monitoring wells proposed by Sparton would be insufficient to monitor the contaminant plume, the capital and O&M costs for an expanded ground water monitoring system are included in the total cost estimate.

Total Cost

Present Worth Cost: $3.48 million
Total Capital Cost: $560,000
Total Operation & Maintenance: $213,000/Years 1-3;
$185,000/Years 4-30

Individual Component Cost

On-Site Ground Water Extraction System

Capital Cost: $10,000
Operation & Maintenance: $25,000/Year

Soil Vapor Extraction System - 20 Wells

Capital Cost: $150,000
Operation & Maintenance: $28,000/Years 1-3

Ground Water Monitoring

Capital Cost: $400,000
Operation & Maintenance: $160,000/Year

Time of Implementation

Design/Remedial Action: 1 year
Operation & Maintenance: 30 years

Alternative 3: Expanded Ground Water Extraction System

Description

Alternative 3 calls for the installation of ground water extraction wells to prevent further migration of the contaminant plume and restore the contaminated aquifer to its beneficial use. This alternative would require the installation of extraction wells at the Facility, and in off-site areas, preferably in existing public right-of-ways. The ground water monitoring wells installed in off-site areas are also installed in existing public right-of-ways.

This alternative can be implemented in several phases. For the contaminant plume extending off-site from the Sparton facility, an initial phase would include further characterization of the ground water contamination to determine the complete horizontal and vertical extent of the contaminant plume. As discussed in the Common Elements Section, the current estimate is that an additional 20 monitoring wells may be needed to monitor the contaminant plume.

After redefining the leading edge of the contaminant plume, ground water extraction wells would be installed near this leading edge to prevent further migration of the plume. Current estimates indicate that one to three extraction wells may be required to accomplish this goal. The appropriate number and location of the extraction wells would be determined during the design phase of the remedy. The construction and operation of two new extraction wells off-site from the Facility have been used for cost purposes. After construction of this phase of the system is completed, the extraction system and surrounding ground water monitoring wells would be carefully monitored on a regular basis to evaluate the performance of the system in meeting the containment goal. Further refinement of the extraction system may be necessary during the monitoring phase to prevent further migration of the contaminant plume. Quarterly sampling and analyses of selected monitoring wells would also continue for evaluation of the contaminant plume.

Along with the efforts to define and control migration of the leading edge of the plume, additional extraction well(s) would be installed on-site at the Coors Road facility to begin further containment and restoration of the contaminated ground water. At least one additional well would be required to achieve this goal. The appropriate number and location of the extraction wells for the on-site area would also be determined during the design phase

of the remedy. The construction and operation of one new extraction well at the Facility has been used for cost purposes. After construction of this phase of the system is completed, the extraction system and surrounding ground water monitoring wells would be carefully monitored on a regular basis to evaluate the performance of the system in meeting the containment and restoration goals. Further refinement of the extraction system may be necessary during the monitoring phase to prevent further migration of the contaminant plume. Quarterly sampling and analyses of selected monitoring wells would also continue for evaluation of the contaminant plume.

In a final phase, additional extraction wells are installed as necessary in off-site areas to restore the aquifer for use as a source of drinking water, in addition to controlling further plume migration. Due to the uncertainty in the number of extraction wells needed for the final phase, no costs have been included in the cost estimate for these wells. However, costs would be similar to costs of the extraction wells set forth above. Restoration is defined as attainment of the media standards (the more stringent of Federal MCLs or State WQCC standards) in the aquifer, over the entire contaminant plume. As additional physical data on the aquifer is collected and performance of the initial phases of the extraction system are monitored, the number of recovery wells for restoration of the contaminated aquifer would be better determined.

The extracted ground water from the off-site recovery wells would have to be transported back to the Facility via underground pipes for treatment. Since the contaminants present in the ground water include both organic and inorganic compounds, the treatment system may require two separate treatment units. For organic compounds, the treatment unit may consist of a larger air stripper to remove volatile organic compounds, and a granular activated carbon unit to reduce air emissions from the air stripper. For the inorganic compounds, the treatment unit may consist of an ion exchange unit for removal of metals from the water. Other treatment options for organic compounds include chemical and/or UV oxidation, and aerobic biological reactors. For the inorganic compounds, other available technologies include chemical precipitation and electrochemical methods. The final sequence of technologies used for the ground water treatment train would be determined during the remedial design. An air stripper and an activated carbon unit (organic compounds) and ion exchange (metals) have been used as treatment options for cost purposes. However, since there exists the possibility that metal concentrations in the recovered ground water may be below levels requiring treatment, the total costs were also presented without the costs for ion exchange. Any treatment train will need to be designed to: 1) attain the chemical-specific discharge requirements; and 2) be easily modified to treat increased flow from an expanded extraction system.

The expanded volume of recovered and treated ground water could no longer be discharged into the sewer system. Options for disposal of the treated ground water may include reinjection back into the aquifer, reuse of the treated ground water as irrigation water, or disposal into the Rio Grande. Reinjection into the aquifer has been used for cost purposes. Any disposal option will have to be consistent with both the State regulations governing ground water usage, and the water management plan presented in the Albuquerque Water Resources Management Strategy - San Juan-Chama Diversion Project Options (July 1995), and the Albuquerque/ Bernalillo County Ground Water Protection Policy and Action Plan (1994).

The ability to achieve the ground water cleanup goals throughout the entire ground water contaminant plume with Alternative 3 cannot be realized within a few years. It is likely that many years of ground water pumping and treatment will be required in order to determine if ground water cleanup goals can be achieved. The presence of high contaminant concentrations and the possible presence of DNAPL in the ground water, as well as the process of chemical and physical desorption of contaminants in both the ground water and soil which lies below the Facility, may delay achieving the cleanup goals throughout the aquifer. A possibility exists that the ground water contaminants may show a rapid initial drop in concentration and then level out to relatively constant, or slowly declining, concentrations. This relatively constant concentration would exist regardless of the length of time ground water extraction was implemented. The equilibrium or steady-state concentration of these organic and inorganic contaminants in the ground water may be greater than the corresponding cleanup goals.

Performance of a ground water extraction system would be carefully monitored on a regular basis and adjusted as warranted by the collected data. Refinement of the system may be required, if EPA determines that such measures will be necessary in order to restore the aquifer in a reasonable time frame, or to significantly reduce the time frame or long-term cost of attaining this objective. Post-construction refinements to the alternative may include any or all of the following:

- adjusting the pumping rate in some or all of the ground water extraction wells;
- installing additional extraction wells to facilitate or accelerate cleanup of the contaminant plume;
- initiating a pulsed pumping schedule in some or all of the ground water extraction wells to eliminate flow stagnation areas, or otherwise facilitate recovery of contaminants from the aquifer;

- discontinuing pumping at individual extraction wells where cleanup goals have been attained; monitoring of the aquifer would be continued to ensure that media cleanup goals are maintained;

- refining the treatment and disposal components of the alternative.

Potential impacts to the local community from implementation of this alternative would involve construction activities in the public right-of-ways for the off-site monitoring wells, recovery wells, and associated piping; quarterly sampling activities; and routine operation and maintenance activities for the monitoring and recovery wells and associated piping. The potential exists for accidents involving breakage or failure of a component in the recovery well system could result in the release of contaminated ground water at the surface.

The following cost estimates are presented for Alternative 3. Since the extracted ground water may or may not require further treatment to remove metals prior to disposal, the present worth cost along with the total capital cost and total O&M cost is presented with both ion exchange and without ion exchange.

Total Cost

Water Treatment Without Ion Exchange for Metals Removal

Present Worth Cost: $14.820 million
Total Capital Cost: $2,125,000
Total Operation & Maintenance: $825,900/Year

Water Treatment Includes Ion Exchange for Metals Removal

Present Worth Cost: $26.167 million
Total Capital Cost: $2,712,500
Total Operation & Maintenance: $1,525,900/Year

Individual Component Cost

Expanded Ground Water Extraction System - 3 Wells

Capital Cost: $306,250
Operation & Maintenance: $54,410/Year

Existing Ground Water Extraction System

Operation & Maintenance: $25,000/Year

Treatment System-Air Stripper and Air Emissions Control

Capital Cost: $181,250
Operation & Maintenance: $76,490/Year

Treatment System-Ion Exchange for Metals

Capital Cost: $587,500
Operation & Maintenance: $700,000/Year

Ground Water Disposal - Injection Wells

Capital Cost: $1,237,500
Operation & Maintenance: $510,000/Year

Ground Water Monitoring

Capital Cost: $400,000
Operation & Maintenance: $160,000/Year

Time of Implementation

Design/Remedial Action: 1-2 Years
Operation & Maintenance: 30 Years

Alternative 4: Expanded Ground Water Extraction and Soil Vapor Extraction

Description

Alternative 4 includes all of the activities outlined in Alternative 3 plus the soil vapor extraction activities outlined in Alternative 2. Alternative 4 combines the implementation of a ground water containment and restoration system designed to address the entire contaminant plume along with an additional technology to enhance further reduction of the remaining source material beneath the Facility.

The following cost estimates are presented for Alternative 4. Since the extracted ground water may or may not require further treatment to remove metals prior to disposal, the present worth cost along with the total capital cost and total O&M cost is presented with both ion exchange and without ion exchange.

Total Cost

Water Treatment Without Ion Exchange for Metals Removal

Present Worth Cost: $15.046 million
Total Capital Cost: $2,275,000
Total Operation & Maintenance: $853,900/Years 1-3;
$825,900/Years 4-30

Water Treatment Includes Ion Exchange for Metals Removal

Present Worth Cost: $26.393 million
Total Capital Cost: $2,862,500
Total Operation & Maintenance: $1,553,900/Years 1-3;
$1,525,900/Years 4-30

Individual Component Cost

Soil Vapor Extraction System - 20 Wells

Capital Cost: $150,000
Operation & Maintenance: $28,000/Years 1-3

Cost Estimate for Alternative 3

Water Treatment Without Ion Exchange for Metals Removal

Total Capital Cost: $2,125,000
Total Operation & Maintenance: $825,900/Year

Water Treatment Includes Ion Exchange for Metals Removal

Total Capital Cost: $2,712,500
Total Operation & Maintenance: $1,525,900/Year

Time of Implementation

Design/Remedial Action: 1-2 Years
Operation & Maintenance: 1-3 Years - Soil Vapor Extraction;
30 Years - Ground Water Recovery

Alternative 5: Expanded Ground Water Recovery System, Air Sparging and Soil Vapor Extraction

Description

Alternative 5 includes all of the activities outlined in Alternative 4. In addition, air sparging wells would be installed in the aquifer to remove additional source material. Air sparging utilizes wells installed in the aquifer to inject clean air directly into the ground water. Dissolved volatile organic compounds are stripped from the ground water by the rising air bubbles around the air injection wells. As the volatile organic compounds rise upward to the overlying soil, the SVE system collects the contaminants for treatment. In addition, the SVE system removes existing soil vapor from the surrounding soil. In situ air stripping/air sparging processes are generally effective in removing volatile organic compounds (e.g. trichloroethylene & trichloroethane) from the soil and ground water.

An added benefit of the combined air sparging/SVE system is the potential for decreasing the time frame for meeting cleanup goals in the ground water by enhancing the volatilization of volatile organic compounds from the water table, thereby further reducing concentrations in the ground water. Site limitations at the Facility may involve the presence of low permeability silt/clay layers which may produce lateral spreading of the volatile organic compounds in the ground water outside of the treatment zone. Performance tests would need to be conducted to determine the radius of influence created by the air injection wells in the aquifer.

Since the air sparging/air stripping technologies do not result in the physical destruction or transformation of the contaminants, the organic vapors would have to be removed from the air by a granular activated carbon unit to prevent the transfer of contaminants to the atmosphere. The granular activated carbon would then be disposed of off-site or regenerated for future use. The air stripping technologies are not useful in removing inorganic compounds in the soil or ground water.

The following cost estimates are presented for Alternative 5. Since the extracted ground water may or may not require further treatment to remove metals prior to disposal, the present worth cost along with the total capital cost and total O&M cost is presented with both ion exchange and without ion exchange.

Total Cost

Water Treatment Without Ion Exchange for Metals Removal

Present Worth Cost: $15.747 million
Total Capital Cost: $2,652,500
Total Operation & Maintenance: $972,650/Years 1-3;
$825,900/Years 4-30

Water Treatment Includes Ion Exchange for Metals Removal

Present Worth Cost: $27.094 million
Total Capital Cost: $3,240,000
Total Operation & Maintenance: $1,672,650/Years 1-3;
$1,525,900/Years 4-30

Individual Component Cost

Air Sparging

Capital Cost: $377,500
Operation & Maintenance: $118,750/Years 1-3

Cost Estimate for Alternative 4

Water Treatment Without Ion Exchange for Metals Removal

Total Capital Cost: $2,275,000
Total Operation & Maintenance: $853,900/Years 1-3
$825,900/Years 4-30

Water Treatment Includes Ion Exchange for Metals Removal

Total Capital Cost: $2,862,500
Total Operation & Maintenance: $1,553,900/Years 1-3
$1,525,900/Years 4-30

Time of Implementation

Design/Remedial Action: 1-2 Years
Operation & Maintenance: 1-3 Years - Air Sparging/SVE;
30 Years - Ground Water Recovery

Alternative 6: Expanded Ground Water Extraction and Soil Flushing

Description

Alternative 6 includes all of the activities outlined in Alternative 3. Instead of implementing a soil vapor extraction system as described in Alternatives 2 and 4, a soil flushing system is used to remove source material (both organic and inorganic contaminants) from the soil overlying the ground water. The process uses a flushing agent such as a solvent or surfactant solution to promote or enhance the mobility of the contaminants in the soil. The flushing process transports the contaminants downward to the ground water for recovery in extraction wells, and the contaminants are then pumped to the surface for treatment. The flushing agent can be applied to the soil by use of sprinkler system. Site limitations involve the presence of low permeability silt/clay layers in the soil above and within the water table which may produce lateral spreading of the flushing agent outside of the treatment zone. Performance tests would need to be conducted to determine the effectiveness of the technology under site conditions.

The following cost estimates are presented for Alternative 6. Since the extracted ground water may or may not require further treatment to remove metals prior to disposal, the present worth cost along with the total capital cost and total O&M cost is presented with both ion exchange and without ion exchange.

Total Cost

Water Treatment Without Ion Exchange for Metals Removal

Present Worth Cost: $16.005 million
Total Capital Cost: $2,875,000
Total Operation & Maintenance: $985,000/Years 1-3;
$825,900/Years 4-30

Water Treatment Includes Ion Exchange for Metals Removal

Present Worth Cost: $27.350 million
Total Capital Cost: $3,462,500
Total Operation & Maintenance: $1,685,000/Years 1-3;
$1,525,900/Years 4-30

Individual Cost Components

Soil Flushing

Capital Cost: $750,000
Operation & Maintenance: $160,000

Cost Estimate for Alternative 3

Water Treatment Without Ion Exchange for Metals Removal

Total Capital Cost: $2,125,000
Total Operation & Maintenance: $825,900/Year

Water Treatment Includes Ion Exchange for Metals Removal

Total Capital Cost: $2,712,500
Total Operation & Maintenance: $1,525,900/Year

Time of Implementation

Design/Remedial Action: 1-2 Years
Operation & Maintenance: 1-3 Years - Soil Flushing
30 Years - Ground Water Recovery

Alternative 7: In Situ Bioremediation

Description

In situ bioremediation is a process in which microorganisms completely or partially decompose organic contaminants, such as trichloroethylene, in the ground water and soil. The decomposition process can occur under either anaerobic (absence of dissolved oxygen) or aerobic (presence of dissolved oxygen) conditions. Limitations include the potential inability to produce a non-toxic degradation product due to incomplete

biodegradation and sensitivity to toxins, and changing environmental conditions resulting in limited bioremediation. The intermediate products produced by biodegradation may be more toxic than the original contaminant.

Within the contaminant plume originating from the Coors Road facility, there has been no data presented which would indicate which of the conditions exist in the plume. However, since there have been no identified by-products from anaerobic degradation, it is possible that aerobic conditions are present.

In order to enhance the bioremediation process under aerobic conditions, additional oxygen and nutrients would have to be injected into the ground water and soil. Sparton has estimated that 50 injection wells centered on a 100 ft. spacing would be required to implement an enhanced bioremediation system for the ground water and another 50 injection wells for the soil. Such a spacing would present difficulties since many of the well locations would be in non-public right-of-ways requiring access agreements in the local neighborhoods. The efficiency of the bioremediation process is limited by the ability to deliver a uniform application of nutrients and oxygen into the soil and ground water. Performance tests would need to be conducted to determine the effectiveness of the technology under site conditions.

The high contaminant concentrations beneath the Coors Road facility would probably restrict the initial application of bioremediation to less contaminated off-site areas. The on-site concentrations would have to be further reduced by continued operation of the existing or an expanded version of the on-site ground water extraction system prior to application. Therefore, all of the activities outlined in Alternative 2 would also be implemented as part of Alternative 7.

Sparton has revised the costs estimates for the bioremediation system. Capital costs have been reduced from $2,500,000 to $1,437,500 and operation and maintenance costs have been reduced from $650,000 to $393,750. Sparton did not present an explanation for the significant change in the cost estimates. Because there is no performance data to suggest the time in which bioremediation could achieve the cleanup goals, all costs were estimated for a 30-year period.

<u>Total Cost</u>

Present Worth Cost: $10.970 million
Total Capital Cost: $1,997,500
Total Operation & Maintenance: $606,750/Years 1-3;
$578,750/Years 4-30

Individual Component Costs

In Situ Bioremediation-Ground Water

Capital Cost: $875,000
Operation & Maintenance: $212,500/Year

In Situ Bioremediation-Soil

Capital Cost: $562,500
Operation & Maintenance: $181,250/Year

Cost Estimate for Alternative 2

Capital Cost: $560,000
Operation & Maintenance: $213,000/Years 1-3; $185,000/Years 4-30

Time of Implementation

Design/Remedial Action: 1 year
Operation & Maintenance: 30 Years

EVALUATION OF ALTERNATIVES

Prior to EPA's decision on a final remedy selection, the performance of all of the alternatives is evaluated against the nine criteria outlined in the Guidance on RCRA Corrective Action Decision Documents, Office of Solid Waste and Emergency Response (OSWER) Directive 9902.6 (Please see Figure 12 which discusses the criteria in more detail). In addition, there are two modifying criterion, State and Community Acceptance, which EPA considers in making its final remedy selection. The following discussion profiles how the performance of each of the alternatives compared against the four general standards, the five remedy decision factors, and the two modifying criterion.

1. **Overall Protection of Human Health and the Environment**

The first decision factor is a general mandate from the RCRA statute. Since the aquifer is potentially useable as a source of drinking water, and is currently used outside of the contaminant plume for this purpose, the final remedy selected for this site will have the goal of protecting the ground water by reducing or controlling the contamination in the soil and ground water. Alternative 1, "No Further Action", will not be considered further as a remedial alternative because it will not provide any protection to human health or the environment. Each of the remaining alternatives provide some degree of protection to human health and the environment by reducing the levels of contamination in the ground water and/or soil.

FIGURE 12

FOUR GENERAL STANDARDS FOR REMEDY SELECTION			
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	ATTAIN MEDIA CLEANUP STANDARDS	CONTROL THE SOURCES OF RELEASES	COMPLY WITH STANDARDS FOR MANAGEMENT OF WASTES
• How alternatives provide human health and environmental protection	• Ability of alternatives to achieve the media cleanup standards. Media cleanup standards are the Federal and State statutory and regulatory requirements that a selected remedy must meet.	• How alternatives reduce or eliminate to the maximum extent possible further releases	• How alternatives assure that management of wastes during corrective measures is conducted in a protective manner

FIVE SELECTION CRITERIA FOR REMEDY SELECTION				
LONG-TERM RELIABILITY AND EFFECTIVENESS	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME OF WASTES	SHORT-TERM EFFECTIVENESS	IMPLEMENTABILITY	COST
• Magnitude of residual risk • Adequacy and reliability of controls	• Treatment process used and materials treated • Amount of hazardous materials destroyed or treated • Degree of expected reductions in toxicity, mobility, or volume • Degree to which treatment is irreversible • Type and quantity of residuals remaining after treatment	• Protection of community during remedial actions • Protection of workers during remedial actions • Environmental impacts • Time until remedial action objectives are achieved	• Ability to construct and operate the technology • Reliability of the technology • Ease of undertaking additional corrective measures, if necessary • Ability to monitor effectiveness of remedy • Coordination with other agencies • Availability of off-site treatment, storage, and disposal services and specialists • Availability of prospective technologies	• Capital costs • Operating and maintenance costs • Present worth cost

MODIFYING CRITERIA	
STATE ACCEPTANCE	COMMUNITY ACCEPTANCE
• The State has an opportunity to review the CMS Report and the Statement of Basis and offer comments to EPA. The State may agree with, oppose, or have no comment on the EPA preferred alternative	• During the public comment period, interested persons or organizations may comment on the alternatives. EPA considers these comments in making its final remedy selection. The comments are addressed in the Final Decision and Response to Comments document.

2. Attainment of Media Cleanup Standards

The final remedy will have the goal of meeting the applicable media cleanup standards. Since the aquifer is potentially useable as a source of drinking water, and is currently used outside of the contaminant plume for this purpose, standards for exposure to the contaminants in the ground water are based upon the more stringent of either: 1) the Maximum Contaminant Levels (MCLs) for drinking water established under the Safe Drinking Water Act; or 2) the maximum allowable contaminant concentrations in ground water set by the State of New Mexico Water Quality Control Commission (WQCC). Protection of the ground water as a source of drinking water and as a natural resource is protected under 20 NMAC 6.2.3101. Table 2 lists some of the contaminants present in the ground water and the corresponding Federal MCL and State WQCC standard.

Alternatives 4-6 would best achieve the media cleanup standards by reducing the quantity of source material available for migration to the surrounding ground water, and removal of contaminants throughout the ground water to restore the ground water to its beneficial use. Alternative 3 has the potential to meet the media cleanup standards for ground water through long-term operation. However, source material would remain in the soil and ground water, providing a long-term source of additional contamination to the surrounding ground water, and potentially limiting the effectiveness of this technology. Alternatives 2 and 7 would be limited or unable to meet the media cleanup standards by continuing to recover contaminants only from beneath the Sparton facility, while the off-site plume would remain at concentrations exceeding the cleanup standards for an indefinite period of time.

3. Controlling the Sources of Releases

Each of the remedial alternatives considered for the final remedy must address the potential for any remaining source material at the Facility. The control of source material to the extent practicable is necessary in eliminating further releases, and for the long-term strategy of addressing the ground water contamination. Unless source control measures are taken, efforts to clean up the ground water may be ineffective or, at best, will involve an essentially perpetual cleanup situation.

Alternatives 2 and 4-7 would provide the most effective source control by including additional technologies along with ground water extraction for removal and treatment of the source material in the on-site soil and ground water. Alternative 3 would rely solely on ground water extraction for source control.

4. **Compliance with Waste Management Standards**

Each of the remedial alternatives considered for the final remedy must comply with the requirements for management of wastes during construction of the remedy and routine operation and maintenance activities. Standards potentially impacting the various alternatives include regulatory limits on the discharge of contaminants into the atmosphere and treated ground water, disposal of residues from the treatment of ground water, and the consumption of ground water.

Alternatives 2 through 7 would comply with all applicable waste management standards. Recovered ground water would be treated through an air stripper to remove the volatile organic contaminants. Air emissions from the air stripper and soil vapor extraction system would be treated through a granular activated carbon unit to remove volatile organic contaminants prior to discharge to the atmosphere. Additional treatment of the recovered ground water may be necessary to remove metals prior to discharge. The granular activated carbon and any residues generated from the treatment process would be disposed or treated off-site at a permitted facility. The treatment train would be designed to attain the chemical-specific discharge requirements for the treated ground water and air emissions.

5. **Long-Term Reliability and Effectiveness**

Each of the remedial alternatives were evaluated on the ability to provide adequate protection of human health and the environment over the long-term. Adequate protection includes source control technologies to ensure that environmental damage from the sources of contamination at the facility will not occur in the future. The magnitude of the residual risk and the adequacy and reliability of preventive controls were also evaluated.

Alternatives 4-6 provide the best long-term approach for protection of human health and the environment. Alternatives 4-6 include an active remedial approach for the entire contaminant plume, as well as the source material remaining in the soil beneath the facility. The combination of technologies would ensure that the maximum amount of contaminants would be recovered. While Alternative 2 includes the removal of contaminants from beneath the Facility, this remedial approach would rely on institutional controls to prevent long-term exposure to the migrating contaminant plume. The active treatment of wastes in Alternatives 4-6 is preferred to the institutional controls in Alternative 2. Alternative 3 would provide a reduction in long-term risk by reducing concentrations throughout the contaminant plume by preventing further migration and recovering contaminants from the off-site contaminant plume. However, contaminants would remain in the soil and provide a

long-term source of additional contamination to the ground water. Due to the uncertainty in whether the in situ bioremediation process would achieve any reduction in contaminant concentrations at this site, Alternative 7 does not provide adequate long-term protection.

6. **Reduction of Toxicity, Mobility, or Volume of Wastes**

Remedial alternatives are favored during the selection process that are capable of permanently reducing the overall degree of risk posed by the contamination in the ground water and soil. This criteria is directly supportive of the goal for achieving long-term reliability. Each of the alternatives were carefully evaluated for the amount of expected reductions in the toxicity, mobility, or volume of wastes, and the type and quantity of the remaining residual waste following implementation of the remedy.

Alternative 7 would involve biological processes that have the potential to permanently reduce or destroy the organic contaminants, and if successful, would achieve the maximum reduction in toxicity, mobility, and volume through treatment. However, the expected success of Alternative 7 is relatively low. Alternatives 4-6 provide the greatest practical reduction in overall toxicity, mobility, and volume of contaminants by permanently removing contaminants from all areas of the ground water contaminant plume, as well as the source material remaining in the soil beneath the facility. The combination of technologies would ensure that the maximum amount of contaminants would be recovered. Alternative 3 would also provide a reduction in volume throughout the contaminant plume, but would not recover contaminants from the remaining source area beneath the Sparton facility. While Alternative 2 includes the removal of contaminants from beneath the Facility, this remedial approach would achieve the least reduction in ground water contamination by addressing only the on-site contaminated ground water.

Since existing technologies cannot ensure a 100% removal efficiency rate, there may be some concentration of contaminants remaining above the media cleanup standards for Alternatives 2 through 7. In addition, the proposed treatment processes in Alternatives 2 through 6 do not result in the permanent destruction of the contaminants, but instead rely on the transfer of contaminants to a permanent off-site disposal site.

7. **Short-Term Effectiveness**

This decision factor directly affects the local community since Alternatives 2-7 require some amount of construction activities in areas being developed for residential and commercial purposes. Protection of the local residents in the community, as well as workers involved in construction of a remedy, must be accounted for when evaluating each of the remedial alternatives. Potential

threats to the community involve exposure to contaminants during construction activities, management of contaminated media, and routine operation and maintenance activities. A potential threat does exist to the community from inadvertent destruction or vandalism of the off-site pipeline and wellheads, resulting in a release of contaminated ground water at the surface. While this possibility will be accounted for in the design and engineering of the off-site structures, the potential threat will remain during the operational period of the preferred remedy.

8. **Implementability**

This decision factor involves the future activities which must be coordinated between the City, County, State, and Federal governments for issuance of any permits at the site. Permits which may be required for the listed alternatives include construction activities in public right-of-ways, recovery and treatment of contaminated ground water, disposal of treated ground water, and management and disposal of hazardous contaminants. The issuance of these permits may affect the time required for implementation of the selected remedy.

Alternatives 2 through 4 utilize existing technology with no exceptional technical obstacles to prevent implementation, operation, performance monitoring and future modifications to the system design. For Alternatives 3 through 7, obstacles exist in the form of permits and/or administrative approvals required for installation of off-site structures in public easements, the discharge of recovered vapors to the atmosphere, the pumping of additional ground water from the aquifer, and the possibility for reinjection of ground water back into the aquifer. An additional obstacle is the requirement for an off-site facility for the regeneration or disposal of the granular activated carbon. Alternatives 5 through 7 would also require the performance of additional testing with varying degrees of uncertainty regarding actual implementation. The success of Alternative 7 is uncertain due to the limited success in aerobic degradation of the organic contaminants.

9. **Cost**

Cost is considered when choosing among the seven alternatives that best meet the objectives at the site. Based on the previous evaluation, Alternatives 4-6 offer a relatively equivalent protection of human health and the environment. Of these, Alternative 4 provides the lowest present worth cost for addressing contamination at the site at $15.046-26.393 million. Alternatives 5 and 6 have a present worth cost of $15.747-27.094 million and $16.005-27.350 million, respectively. Due to the uncertainty in predicting the time necessary for restoration of the ground water to its beneficial use, all costs were based on a thirty year operational period for comparison purposes.

10. **State Acceptance**

State acceptance is a modifying criterion with respect to the evaluation process. The State concerns that were assessed under this criterion include the following: 1) the State's position and key concerns related to the contamination originating from the Sparton Technology site and the corrective measure alternatives; 2) the State's preferred alternative for addressing contamination at this site; and 3) the applicable State and local standards and any waiver of these standards. EPA has and will continue to coordinate actions at this site through the New Mexico Environment Department, the New Mexico Office of the Natural Resources Trustee, the City of Albuquerque Environmental Health Department and the Public Works Department, and the County of Bernallilo.

The New Mexico Environment Department (NMED) preferred remedy is Alternative No. 5, as set forth in a letter from Mr. Ed Kelley, Division Director of NMED, dated February 7, 1996. This letter is included in the Administrative Record for this site.

The New Mexico Office of the Natural Resources Trustee (ONRT) preferred remedy is Alternative No. 5, as set forth in a letter from Mr. Steve Cary, Deputy Director of ONRT, dated February 8, 1996. This letter is included in the Administrative Record for this site.

The City of Albuquerque Public Works Department preferred remedy is Alternative No. 5, as set forth in a letter from Mr. A. Norman Gaume, Manager of the Water Resources Program, dated February 8, 1996. This letter is included in the Administrative Record for this site.

The New Mexico Attorney General's Office preferred remedy is either of the more comprehensive remedies described in Alternatives 3-7, as set forth in a letter from Mr. Charles de Saillan, Assistant Attorney General, dated February 8, 1996.

The County of Bernalillo in a letter from Mr. Richard Brusuelas, Environmental Health Director, dated February 8, 1996, preferred an expedited cleanup to address the ground water contamination, and concurred with the written statement from Mr. Norman Gaume, Manager of the Water Resources Program for the City of Albuquerque.

11. **Community Acceptance**

Community acceptance is a modifying criterion with respect to the evaluation process. EPA recognizes that the local community is the principal beneficiary of all remedial actions undertaken to address contamination originating from the Sparton Technology facility. As such, comments from the community are an important

consideration in the final evaluation of remedial alternatives. EPA also recognizes that it is responsible for informing interested citizens of the nature of the environmental problems and available solutions, and to learn from the community what its preferences are regarding this site.

EPA solicited input from the public on the remedial alternatives proposed to address the contamination originating from the Sparton Technology facility. A public comment period was held from December 8, 1995, to February 8, 1996. A public hearing was held on February 1, 1996, at the Cibola High School in Albuquerque, NM. All comments received from the community favored an expedited plan for restoration of the contaminated ground water. Specific recommendations were made for Alternative Nos. 4 and 5 to address the contamination. One commenter expressed concern over the location of ground water extraction wells and soil vapor extraction wells in the neighborhoods above the ground water contaminant plume. The preference for location of these wells is in the existing public right-of-ways along major streets, and in undeveloped land outside of existing neighborhoods. EPA believes that community concerns regarding the safety of these structures can be addressed through strict controls during the construction activities and the long-term operation and maintenance activities.

SELECTED REMEDY

The goal of this remedial action is to restore the contaminated ground water to its beneficial use. At this site, the aquifer is potentially useable as a source of drinking water, and is currently used outside of the contaminant plume for this purpose. The chemical-specific ground water cleanup goals for this remedial action are specified in Table 2, and are based on the more stringent of Federal MCLs established under the Safe Drinking Water Act, or the ground water standards set by the State of New Mexico under the NMWQCC regulations. Based on information and data concerning the nature and extent of contamination, the analysis of all remedial alternatives, and the information received during the public comment period, EPA believes that Alternative 4 may be able to achieve this goal. Ground water contamination may be especially persistent in the immediate vicinity of the contaminant's source, where concentrations are relatively high. The length of time and ability to achieve cleanup goals at all points throughout the contaminant plume, cannot be determined until the extraction system has been implemented, modified as necessary, and plume response monitored over time.

EPA prefers Alternative 4 to Sparton's recommendation of Alternative 2, because Alternative 4 emphasizes the containment and removal of contaminants from all areas of the ground water, not just the area immediately below the Sparton facility.

Alternative 4 is also more likely to achieve media cleanup standards, whereas under Alternative 2, the off-site plume would remain at concentrations exceeding the cleanup standards for an indefinite period of time. Alternative 4 has an active remedial approach for the entire contaminant plume, whereas Alternative 2 relies on institutional controls to prevent long-term exposure to the migrating contaminant plume. Alternative 2 also achieves the least reduction in ground water contamination by addressing only the on-site contaminated ground water.

EPA also prefers Alternative 4 to the State's recommendation of Alternative 5. While Alternatives 4 and 5 are similar, the potential technical difficulties associated with the implementation and effectiveness of air sparging at this site reduces the preference of Alternative 5. However, EPA concurs that an aggressive approach is necessary to achieve the maximum reduction in source area contamination. Therefore, contingency measures are incorporated in this selected remedy to reevaluate the technologies, including air sparging, if further source area reduction can be achieved following the implementation and performance monitoring of the soil vapor extraction system and the ground water extraction system.

A. Ground Water

Alternative 4 combines the implementation of a ground water containment and restoration system designed to address the entire contaminant plume along with a soil vapor extraction system to enhance further reduction of the remaining source material beneath the facility. The selected remedy will be implemented in a phased approach to build upon data collected at the site so that an efficient and cost-effective system is designed to address the contamination. For the off-site ground water contaminant plume, the initial phase will be to install additional monitoring wells to define the extent of the ground water contaminant plume, in particular the leading edge of the contaminant plume. While the current estimate is for 20 wells, the final number of monitoring wells will be determined during the site characterization. In addition, data on the aquifer characteristics near the leading edge of the contaminant plume will be collected. This data will then be used to design and install a ground water extraction system to prevent further migration of the contaminant plume. While the current estimate is for 1-3 wells, the final location and number of extraction wells will be determined during the remedial design phase. After construction of this ground water extraction system is completed, performance of the system will be carefully monitored on a regular basis. Further refinement of the extraction system may be necessary during the monitoring phase to prevent further migration of the contaminant plume. Quarterly sampling and analyses of selected monitoring wells will be implemented to

evaluate the design and monitor the performance of the extraction system.

For the contaminant plume beneath the Coors Road facility, the initial phase will consist of adding at least one additional ground water extraction well to the existing extraction system. Since the existing ground water extraction system removes contaminants from a limited area beneath the facility, the objectives for the additional well(s) will be to maximize contaminant removal and prevent further migration from the Facility to off-site areas. Additional monitoring wells may be necessary to further define the extent of contamination beneath the Facility and properly locate the extraction well(s). Performance of the system will be carefully monitored on a regular basis. Further refinement of the extraction system may be necessary during the monitoring phase to prevent further migration of the contaminant plume. Quarterly sampling and analyses of selected monitoring wells will be implemented to evaluate the design and monitor the performance of the extraction system.

Following these initial actions, additional extraction wells will be installed as necessary to restore the aquifer for use as a source of drinking water, in addition to controlling further plume migration. Restoration is defined as attainment of the chemical-specific interim ground water cleanup goals in the aquifer, over the entire contaminant plume. Cleanup levels for each ground water contaminant are specified in Table 2. Implementation of this phase of the ground water restoration will be expedited in order to meet the anticipated future demand on the aquifer as a water supply.

Performance of the selected remedy will be carefully monitored on a regular basis, and adjusted as warranted by the collected data. Refinement of the remedy may be required if EPA determines that such measures will be necessary in order to restore the aquifer in a reasonable time frame, or to significantly reduce the time frame or long-term cost of attaining this objective. Post-construction refinements to the proposed remedy may include any or all of the following:

- adjusting the pumping rate in some or all of the ground water extraction wells;
- installing additional extraction wells to facilitate or accelerate cleanup of the contaminant plume;
- initiating a pulsed pumping schedule in some or all of the ground water extraction wells to eliminate flow stagnation areas, or otherwise facilitate recovery of contaminants from the aquifer;

- discontinuing pumping at individual extraction wells where cleanup goals have been attained; monitoring of the aquifer would be continued to ensure that media cleanup goals are maintained; and

- refining the treatment and disposal components of the preferred remedy.

- implementing additional source control measures to further reduce the remaining source material in the aquifer and soil beneath the facility, if determined by EPA to be practicable; such measures could include the implementation of additional measures (e.g. an air sparging system) in the aquifer where possible NAPL contaminants remain relatively unaffected by ground water extraction;

B. Source Control

During the design phase of this remedial action, further soil investigation will be conducted to more fully delineate the nature and extent of contaminants in the vadose zone. This study will determine the depth and concentration of contaminants in the soil which require removal and/or treatment so as to achieve the ground water objective of restoration. At this time, installation of a soil vapor extraction system is expected to enhance the removal of volatile organic contaminants from the soil and ground water to levels which would allow attainment of the chemical-specific ground water cleanup goals. Characterization of the organic contaminants in the soil above the water table will be necessary to evaluate the design and performance of the soil vapor extraction system. A preliminary cleanup target of 10 ppmV for chlorinated organic vapors in the vadose zone has been set by NMED as a level protective of ground water at the Sparton site. Further evaluation of this cleanup goal will be performed to determine if attainment of a lower concentration is necessary to achieve the cleanup goals for the ground water.

C. Treatment and Disposal of Contaminants

Contaminated ground water brought to the surface by the ground water extraction system will require treatment prior to disposal. Treatment of the contaminated ground water will continue to be performed within the property boundary of the Coors Road facility. The existing treatment system at the Coors Road facility utilizes an air stripper to remove organic compounds, such as trichloroethylene, from the water. Since this system has been successful in removing the organic compounds, treatment of the contaminated ground water will continue to utilize an air stripper. However, since the expected volume of ground water from the new extraction system will exceed the capacity of the

existing air stripper, a new or expanded air stripper will be required to handle the increased volume of water.

Since a goal of this remedial action is to remove contaminants from the ground water, not merely transfer them to another media such as air, emissions from the air stripper will require further treatment. Utilization of a carbon adsorption system will remove organic vapors prior to release into the atmosphere. This will ensure that nearby residents and businesses are not affected by this remedial action, and ensure compliance with existing air quality standards. A carbon adsorption system will also be used to remove organic vapors from the soil vapor extraction system to ensure that there is no transfer of contaminants to the air above air quality standards.

Since the air stripper does not remove metals from the water, additional treatment may be necessary to remove metals, such as chromium, prior to disposal of the treated ground water. Since the concentration of metals in the ground water is variable throughout the contaminant plume, further study will be required to determine to what extent these technologies may be necessary. The sequence of technologies used for the ground water treatment train will be determined during the remedial design. The treatment train shall be designed to:

- Attain the chemical-specific discharge requirements; and
- Be easily modified to treat increased flow from an expanded extraction system.

The current method for disposal of the treated ground water is through the City of Albuquerque wastewater treatment system. This is currently accomplished by utilizing the sanitary sewer connections at the Coors Road facility. However, due to the increased pumpage of ground water from the aquifer after implementation of the remedy, this method of disposal is no longer practicable, and would not be permitted by the City of Albuquerque. As a result, other means for disposal of the ground water will have to be evaluated during the design phase of the ground water extraction system. The two options under consideration for the treated ground water will be reinjection back into the aquifer, or reuse at the surface.

Reinjection will require the installation of injection wells to pump the treated ground water back into the aquifer at a total rate equal to the total pumpage from the ground water extraction wells. The number of injection wells needed to accomplish this goal will likely exceed the total number of extractions wells. The number of wells necessary to accomplish this goal would be determined during the design phase of the remedy. The placement of the injection wells can be either on-site at the Coors Road facility or at some off-site location. If the injection wells

are located on-site, then additional cost savings can be achieved by reducing the distance required for additional piping to transmit the water. However, if the wells are located off-site, then a potential benefit is for further containment of the contaminant plume by reversing the flow of ground water near the leading edge of the contaminant plume. This method is currently being employed at the South Valley Superfund site in Albuquerque. Off-site placement of the injection wells would be limited to existing public right-of-ways to minimize the impact to the existing or planned neighborhoods.

For the second option for disposal of the treated ground water, surficial reuse, no potential users have been identified which can receive and utilize the volume of ground water from the expected ground water extraction system. This option will be further explored during the design phase to determine if a suitable use of the treated ground water can be found, and which would present a cost-savings over reinjection of the water. If no such receiver for the water can be identified, then reinjection would proceed as the method for disposal of the water. However, this does not preclude discontinuing the use of injection wells if such a receiver is identified in the future. Both of these options are consistent with the water management plan presented in the Albuquerque Water Resources Management Strategy - San Juan-Chama Diversion Project Options (July 1995) and the Albuquerque/ Bernalillo County Ground Water Protection Policy and Action Plan (1994).