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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

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.

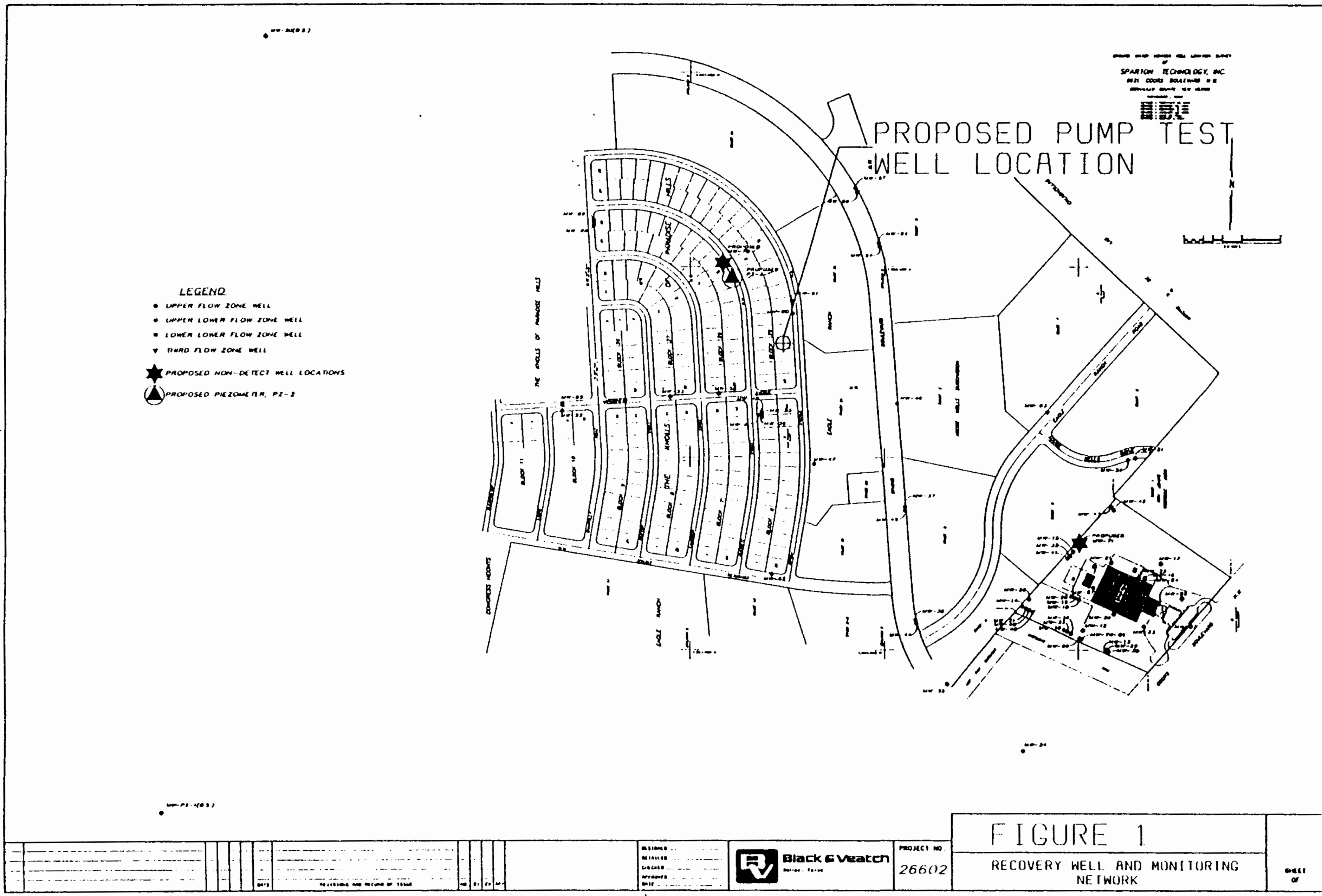


FIGURE 1

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).

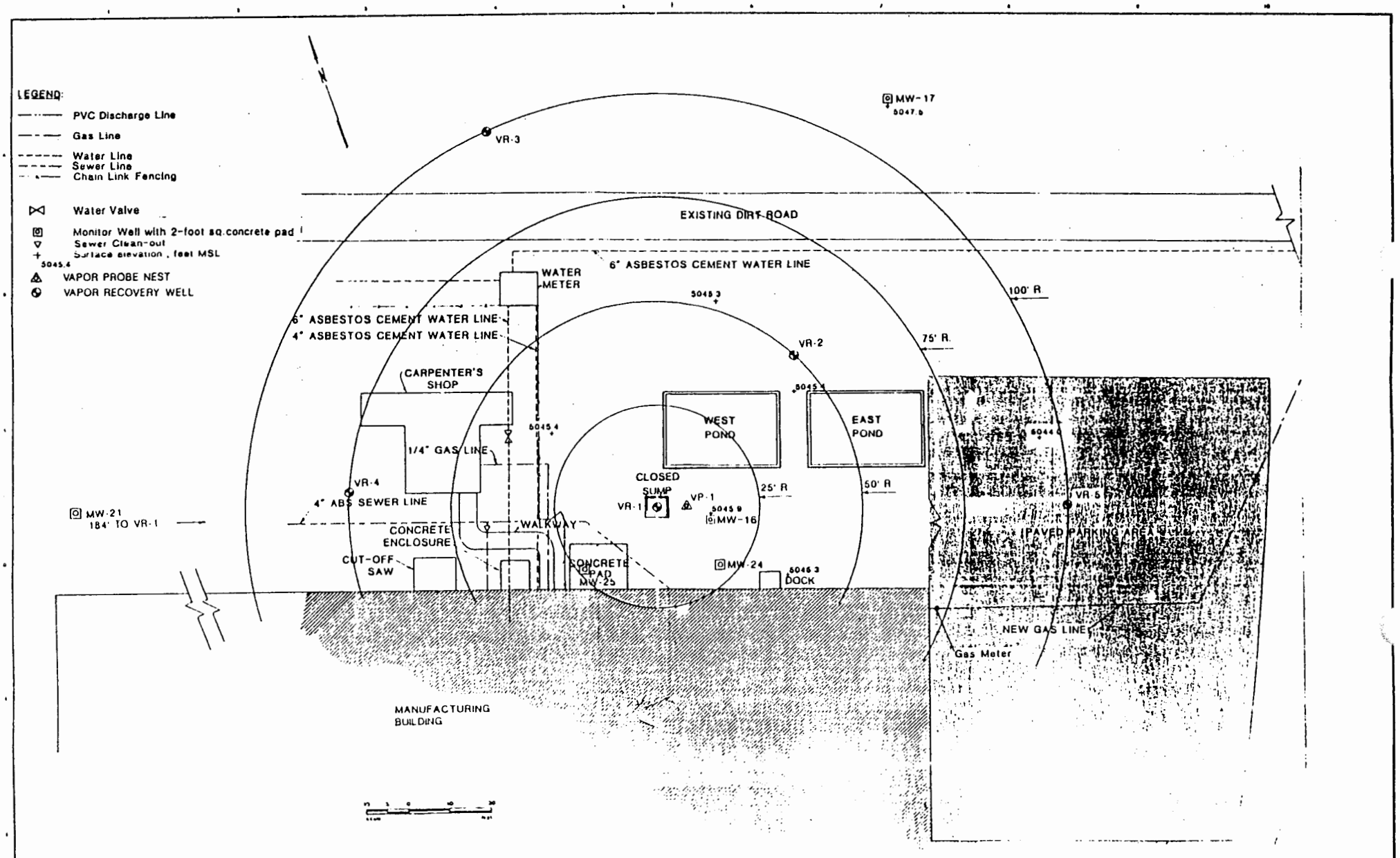
The produced vapor stream (influent) will be analyzed (on a real-time basis) using field screening instruments to determine variation in influent VOC concentration. At selected intervals, influent samples will also be obtained for confirmatory laboratory analyses (EPA Method 8010 and 8020). At least 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.
COORS 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-41, 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.