



Memorandum

Dennis

Date: July 15, 1998

To: Mike A. Hebert, USEPA
Michael Donnellan, USDOJ
Steven Amter, DSI
Dennis McQuillan, NMED
Ana Marie Ortiz, NMED
John Stomp, City of Albuquerque, PWD
Gary A. O'Dea, City of Albuquerque, LD
Charles de Saillan, NMOAG

From: Stavros S. Papadopoulos *SSP*

Subject: **Sparton Technology, Inc., Coors Road Facility, Albuquerque, New Mexico
Work Plan for the Evaluation of the Off-Site Containment System
Performance**



Enclosed please find the original of the subject Work Plan which was faxed to you by Jim Harris of Thompson & Knight earlier today.

Enclosure

cc: R. Jan Appel, Sparton
James B. Harris, T&K
Gary L. Richardson, Metric
Pierce L. Chandler, Jr.

**WORK PLAN FOR THE EVALUATION OF
THE OFF-SITE CONTAINMENT SYSTEM
PERFORMANCE**

Prepared For:

**SPARTON TECHNOLOGY, INC.
Coors Road Facility
Albuquerque, New Mexico**

Prepared By:



**S. S. PAPADOPULOS & ASSOCIATES, INC.
Environmental & Water-Resource Consultants**

July 14, 1998

7944 Wisconsin Avenue, Bethesda, Maryland 20814-3620 • (301) 718-8900

**WORK PLAN FOR THE EVALUATION
OF THE
OFF-SITE CONTAINMENT SYSTEM PERFORMANCE**

1.0 INTRODUCTION

Sparton Technology, Inc. (Sparton) has agreed to install and test an off-site containment well near the leading edge of an off-site plume of solvents thought to be associated with past operations at its Coors Road Facility in Albuquerque, New Mexico. The installation and testing of the well will comply with the terms of the United States Department of Justice "Work Plan for the Installation of Additional Wells and Conducting a Pump Test in the Area of the Leading Edge of the Contaminant Plume Originating from the Sparton Technology, Inc. Coors Road Facility", dated June 10, 1998 (DOJ Work Plan). At the completion of the tests, Sparton will continue operating the well at a rate that will contain the plume and prevent its further migration. The operating pumping rate for this off-site containment well will be determined from the results of the tests to be conducted under the DOJ Work Plan. If the well is not capable of producing the pumping rate required to achieve containment, additional extraction wells may be installed. The containment well, and any additional extraction wells that may be installed to achieve containment, will constitute the off-site containment system for the plume. Discharge from the containment system will be addressed in the Ground Water Discharge Permit recently issued by the State of New Mexico.

The purpose of this Work Plan is to describe the procedures that will be used to evaluate the performance of the off-site containment system, that is, to assess whether hydraulic capture of the

off-site plume has been achieved. This evaluation will be first performed at the completion of the testing program based on data to be collected in compliance with the DOJ Work Plan for the installation and testing of the containment well. Additional evaluations will be performed during the operation of the system based on data collected in compliance with the Ground Water Monitoring Program Plan (Monitoring Plan), to be finalized later this month (July, 1998).

2.0 DATA AND MONITORING REQUIREMENTS

The information needed to select the operating pumping rate for the off-site containment system and to evaluate its performance, that is, to determine whether the system provides the desired hydraulic capture of the plume, are:

1. The transmissivity of the aquifer near the leading edge of the plume;
2. The prevailing natural hydraulic gradient in the off-site area;
3. The extent of the contaminant plume;
4. The pumping rate of the containment well(s); and
5. Water-levels in existing monitoring wells during the operation of the containment system.

The objective of any data collection or monitoring activities associated with the containment system performance evaluation is to provide the above listed information.

The hydrogeologic tests that will be conducted as described in the DOJ Work Plan will include a two to three day constant-rate pumping test and a 30-day containment-feasibility test. These tests will provide data for determining the transmissivity of the aquifer near the leading edge of the plume.

The prevailing natural hydraulic gradient in the off-site area will be determined from water-level data collected from off-site wells during the last several years, as well as additional water-level data that will be collected, in compliance with the DOJ Work Plan and the Monitoring Plan, prior to the 30-day containment-feasibility test.

The extent of the plume will be confirmed from water quality data collected from existing monitoring wells. Data collected during the last several years under the ongoing monitoring program and those to be collected under the DOJ Work Plan and the Monitoring Plan, prior to the containment-feasibility test, will be used for this purpose.

Pumping-rate and water-level data for the first evaluation of the containment system performance will be collected during the conduct of the 30-day containment-feasibility test in accordance with the DOJ Work Plan. Pumping-rate and water-level data for evaluations to be performed after the beginning of the continuous operation of the containment system will be collected in accordance with the Monitoring Plan.

3.0 EVALUATION OF CONTAINMENT SYSTEM PERFORMANCE

. The tasks that will be performed to select the operating pumping rate for the off-site containment system and to evaluate the performance of the system will be:

- Task 1 - Determine transmissivity of the aquifer;
- Task 2 - Determine prevailing off-site hydraulic gradient;
- Task 3 - Confirm extent of the contaminant plume;
- Task 4 - Determine pumping rate needed to achieve containment;

- Task 5- Evaluate capture zone of the containment well using data from the containment-feasibility test;
- Task 5a - Adjust pumping rate, if necessary, and re-evaluate capture zone after six months of operation; prepare report on results of evaluation; and
- Task 6 - Evaluate capture zone after each year of continuous operation using data collected during that year, and present results in Annual Reports.

A brief description of each of these tasks is presented below; a schedule for their performance is given in Figure 1.

3.1 Task 1 - Transmissivity of the Aquifer

The transmissivity of the aquifer near the leading edge of the plume will be determined from the analysis of data from the two- to three-day constant rate pumping test that will be conducted using the containment well. A letter report presenting the results of this analysis will be prepared within two weeks of the end of the test and prior to the beginning of the 30-day containment-feasibility test.

3.2 Task 2 - Off-Site Hydraulic Gradient

Available water-level data from off-site monitoring wells indicate that the prevailing off-site hydraulic gradient is 0.0025 foot per foot to the northwest. Additional evaluations will be made, including data to be collected prior and during the testing program, to determine the range of the magnitude and direction of the hydraulic gradient. Kriging of the water-level data and/or regression analyses will be used for these evaluations. The results of the evaluations will be included in the

letter report that will be prepared prior to the beginning of the containment-feasibility test (see Task 1).

3.3 Task 3 - Extent of the Plume

The depth of the containment well needed to capture this vertical extent of the plume has been determined from water-quality data available from deep monitoring wells including a monitoring well (well MW-71) recently installed by Sparton under the terms of the DOJ Work Plan.

The lateral extent of the plume to be captured by the off-site containment system will be confirmed prior to the containment-feasibility test using the most recent water-quality data available at that time. Concentrations of the contaminants detected in monitoring wells will be used to develop isoconcentration maps for each of the detected contaminants. Kriging of the logarithms of measured concentrations, and information on the rate and direction of ground water flow and on the past history of contamination in the off-site area will be used in developing these maps. The extent of the plume to be captured will be defined by the envelop of the isoconcentration contours corresponding to the maximum allowable contaminant concentrations in ground water set by the State of New Mexico Water Quality Control Commission. The results of this evaluation will also be included in the letter report that will be prepared prior to the beginning of the 30-day containment-feasibility test (see Task 1).

3.4 Task 4 - Required Pumping Rate

The transmissivity determined from the two- to three-day constant rate pumping test (Task 1) will be used in conjunction with the prevailing hydraulic gradient in the off-site areas (Task 2) and

the lateral extent of the plume (Task 3) to calculate the pumping rate that should provide hydraulic containment of the plume. The results of this calculation will be included in the letter report that will be prepared prior to the beginning of the 30-day containment-feasibility test (see Task 1). The 30-day containment-feasibility test will be conducted at the calculated pumping rate. This pumping rate will also be used to operate the containment well on a continuous basis, unless otherwise indicated by the results of the containment-feasibility test, as evaluated in Task 5.

3.5 Task 5 - Capture Zone Evaluation

Confirmation of the performance of the containment well, that is, the determination of whether the well is indeed containing the plume, will be based on water-level data that will be collected from observation and monitoring wells during the conduct of the containment-feasibility test. The first step in this evaluation would be an analysis of the data to determine whether the transmissivity from this longer test is consistent with that determined from the constant rate pumping test; any adjustments to the transmissivity that may result from this analysis will be considered in the evaluation of the system performance.

The next step of the evaluation would be to determine the capture zone of the well. Water-level data collected near or at the end of the feasibility test, that is, after the water levels have stabilized, will be contoured to prepare a water-level map which is consistent with the pumping rate of the well and the transmissivity of the aquifer. This water-level map will then be used to calculate groundwater flow paths and determine the capture zone of the well. A particle-tracking routine, such

as PATH3D¹, or equivalent, will be used for this purpose. The capture zone determined by the approach described above will then be compared to the extent of the plume, as defined in Task 3, to evaluate whether the well provides containment of the plume. If this evaluation indicates that the capture zone is too small or too large in comparison to the extent of the plume, adjustments will be made to the pumping rate of the well to achieve containment or to avoid excessive pumping of uncontaminated water. The results of this evaluation, including any proposed adjustments to the pumping rate and/or the number of extraction wells, will be presented in the report that will be prepared within four weeks after the completion of the containment-feasibility test (see DOJ Work Plan).

3.5.1 Task 5a - Re-evaluation of the Capture Zone

If the evaluation of the capture zone performed in Task 5 indicates that an adjustment to the pumping rate of the containment well is necessary, this adjusted rate will be used for the continuous operation of the well and a re-evaluation of the performance of the containment system will be performed after the first six months of system operation. This re-evaluation will be based on water-level and pumping-rate data collected during these six months and will use the approach described in Task 5. The results of the re-evaluation will be reported in a report to be prepared within one month after the completion of the initial six-month operation period.

¹ Zheng, Chunmiao, 1992, *PATH3D 3.2, A Ground-Water Path and Travel-Time Simulator (Third Revision)*: S. S. Papadopoulos & Associates, Inc., Bethesda, Maryland.

3.6 Task 6 - Annual Performance Evaluations

During the continuous operation of the containment well, annual evaluations of the capture zone will be made using an approach similar to that described in Task 5 and using water-level and pumping rate data collected during each year in compliance with the Monitoring Plan; adjustments to the pumping rate will be made, if necessary. The results of these evaluations will be presented in detailed Annual Reports prepared within four months after the anniversary date of the startup of the continuous system operation. In addition to the data and evaluations related to the performance of the containment system, these Annual Reports will include all site-related water-quality and other data collected during the year, including interpretations and evaluations of these data, and will discuss site operations during the year.

