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October 2, 1984

Project Nos. S732 and S734

Mr. Richard Zambito
U. S. Environmental Protection Agency
Region III
Curtis Building
Sixth and Walnut Streets
Philadelphia, PA 19106

Subject: Transmittal of Work Plan Modification No. 1

Dear Mr. Zambito:

Enclosed is the Work Plan Modification No. 1 requesting an expansion of the Subsurface Investigation/Well Installation Program.

If there are any questions, please call.

Very truly yours,

James C. Colella

James C. Colella
Project Manager

JCC/pal

Enclosure

AR300290

WORK PLAN MODIFICATION NO. 1
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
HARVEY AND KNOTT DRUM SITE
NEW CASTLE COUNTY, DELAWARE
EPA WORK ASSIGNMENT NOS. 18-3L32 AND 18-3M32
NUS PROJECT NOS. 0732 AND 0734

1.0 Description of Modification

The Work Plan modification consists of expanding the subsurface investigation and well installation program at the site into the middle/lower hydrogelogic zone of the Potomac Formation. This modification will determine the geologic profile, the hydraulic gradient between the Upper and Middle/Lower hydrogeologic zones, permeability characteristics, and the degree of contamination. With this information, the Remedial Investigation/Feasibility Study objective, to determine the nature and extent of the problem posed by the contaminants at the site and appropriate remedial action alternatives, can be properly addressed.

2.0 Purpose of Modification

The Middle/Lower Potomac Aquifer is, or may eventually be, contaminated as a result of the hydrogeologic conditions of the site, the contamination in the Columbia and Upper Potomac Aquifer, and the presence of production water wells in the general area. The hydrogeologic conditions near the disposal area on the site have been determined to have a potential for vertical downward groundwater flow from the Columbia and Upper Potomac Aquifer to the Middle/Lower Potomac Aquifer which are separated by a clay formation. The Columbia and Upper Potomac Aquifer, the water table aquifer, has been and/or is being contaminated by the past disposal operations at the site. Furthermore, production water wells in the Middle/Lower Potomac Aquifer, four active and two not currently on line, are located within two miles of the site. Consequently, future pumping requirements of these water wells may influence the quality of the Middle/Lower Potomac Aquifer, if it hasn't presently been affected.

Because the original drilling program only investigated the Columbia and Upper Potomac Formations and Aquifers, the subsurface investigation/well installation program will need to be modified to investigate the Middle/Lower Potomac Formation and Aquifer. The proposed modification consists of drilling additional holes and installing additional wells into the Middle/Lower Potomac Formation to determine the direction of groundwater flow, vertical interconnection between aquifers and degree of contamination or potential future contamination in the aquifer.

3.0 Technical Approach

3.1 Introduction

Work Plan Modification No. 1 is an expansion of Task 16 - Subsurface Investigation - of the approved August 1983 RI/FS Work Plan. For brevity, the approved Work Plan is referenced for information that will not change in this Modification. Only the changes will be presented in the proceeding discussions.

3.2 Task 16 - Subsurface Investigation

3.2.1 General Descriptions of the Phase II Program

We propose four holes be drilled into the Middle/Lower Potomac Aquifer and 4-inch diameter wells be installed to satisfy the objective of this study. In addition, two optional wells, to be located in the Columbia and Upper Potomac Aquifer, would be installed if existing wells are not located near the locations of the new wells. The locations of the new wells will be determined based on the data developed from the Phase I Drilling and are not available now. The schedule of borings and monitoring wells is presented below.

Well No.	Estimated Depth To Screen (Feet)	Estimated Depth Of Hole (Feet)	Remarks
201, 202, 203 & 204	195	200	Wells to Monitor Middle/Lower Potomac Aquifer
205 & 206	35	40	Wells to Monitor Columbia and Upper Potomac Aquifer

3.2.2 Drilling and Sampling

Borings drilled for monitoring well installation will be drilled by mud rotary methods using a bentonite slurry mixture as the drilling fluid. A 15-inch diameter hole will be advanced into the Potomac clay layer, which will be identified by our field representative. At this time, a 10-inch diameter (ID) steel casing will be installed and seated a minimum of two feet into the clay layer to minimize cross-contamination of the water table aquifer and the Middle/Lower Potomac Aquifer. Our representative will monitor the installation of the steel casing. Afterwards, the drilling mud will be flushed from within the casing with drinking water quality water until our field representative has determined sufficient flushing has occurred. New drilling mud will be prepared and an 8-inch diameter hole will be advanced through the clay layer into the Middle/Lower Potomac formation. The hole will be advanced to the first major sand lense which will be identified by our field representative. A well will then be constructed and developed.

If the 2-inch diameter wells are required in the Columbia and Upper Potomac Aquifer, borings will be drilled by mud rotary methods to the desired depths.

All the borings will be logged geophysically by the Delaware Geological Survey. Split barrel samples (Standard Penetration Tests) will be obtained at selected depths to identify soil lenses, the appropriate depth to install the well screen, or to coorelate the geophysical logging information. In addition, undistrubed soil samples (shelby tubes) will be obtained at selected depths for a laboratory testing program (classification, permeability).

3.2.3 Pump Test

A pump test will be performed to determine the characteristics of the Middle/Lower Potomac and the Columbia and Upper Potomac Aquifers. One of the 4-inch diameter wells installed in the Middle/Lower Potomac Aquifer will be used as the pumping well, while the others, both 4 and 2-inch diameter wells, are monitored and water levels recorded.

3.2.4 Water Level Recorders

Continuous monitoring water level recorders will be installed in selected wells to measure normal fluctuations in the aquifers and fluctuations during the pump test.

3.2.5 Sampling and Chemical Analysis

Phase I and II monitoring wells will be sampled at completion of the Phase II program. In addition, selected existing state monitoring and residential drinking wells will be sampled. Phase I and II well samples will be analyzed for the Hazardous Substance List. Samples from the other wells will be analyzed for parameters to be identified after review of the previous analysis.