5.0 SITE CHARACTERIZATION

5.1 BACKGROUND HISTORY

Waste recovery and disposal operations at the facility began in 1958 under the name Don's Oil Service. The site changed ownership and became Ohio Liquid Disposal (OLD) in 1970. Chemical Waste Management, Inc. acquired the site in 1978 and is the present owner and operator.

Over the history of the site, 12 ~~ponds~~ SURFACE IMPOUNDMENTS, 7 injection wells, an oil recovery facility, and several sludge farms have been constructed and operated on the facility. Of these areas, only four injection wells are currently active. All other units used have either been closed or are scheduled to be closed.

Past waste disposal activities have included landfarming of sludges, sedimentation by surface impoundment, oil recovery, aqueous waste treatment and deep-well injection. The following is a brief description of all known information on each of these activities.

5.1.1 Landfarming of Sludges

Sludges from former ~~pond~~ SURFACE IMPOUNDMENT 9 were landfarmed in areas north of former ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12, east of the former Oil ~~Reclamation~~ RECOVERY Facility and around the area where Injection Well No. 3 was located between the years 1975 to 1981. In 1979, a small amount of sludge from former ~~pond~~ SURFACE IMPOUNDMENT 9 was buried in trenches dug north of ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12. The sludges which were buried in the trench were subsequently dug up in 1980, landfarmed, and spread until landfarming was complete in the fall of 1981. The final disposition of the former landfarm area adjacent to decommissioned Injection Well No. 3 is not known. Efforts to determine the disposition of the sludges in this area during a comprehensive monitoring evaluation performed by the USEPA in 1987 included a historical document review of materials collected from USEPA, OEPA, and CWM files and interviews with CWM staff.

THE THREE LANDFARM AREAS WERE TO BE SAMPLED, AS PRESENTED IN THE ENVIRONMENTAL TESTING AND CERTIFICATION CORPORATION'S (ETC) REPORT TITLED "CLOSED CLEAN WATER, INC., CLOSED LAGOONS, SITE 690 PHASE VB,

FINAL REPORT " DATED NOVEMBER 1983 (APPENDIX A), AT ONE OR TWO FOOT INTERVALS DOWN TO A DEPTH OF THREE FEET. THIS PLAN WAS MODIFIED TO INCLUDE ONLY ONE SAMPLE CORE AT EACH OF THE LOCATIONS.

THE LANDFARM AREAS WERE SAMPLED USING A PISTON TUBE SAMPLER AND ONE SECTION OF 1-INCH PIPE, PLUS THE HAMMER SECTION. THE CORE TUBE WAS HAMMERED INTO THE GROUND FROM THE SURFACE, AND THE CORE WAS SHEARED OFF AT THE BOTTOM BY ROTATING THE SHAFT CLOCKWISE WITH A WRENCH. TWO PEOPLE WERE TYPICALLY REQUIRED TO EXTRACT THE FULL TUBE FROM THE GROUND. A NEW CLEAN TUBE WAS USED AT EACH LOCATION. AFTER EXTRACTION, THE SAMPLE LOCATION CODE WAS SCRATCHED ON THE TUBE, AND THE DRIVE HEAD CLEANED WITH HEXANE, METHANOL, AND POTABLE OFFSITE WATER. WHERE WATER COVERED THE SURFACE, A PREPARED TUBE WAS USED.

IN THE EAST AREA LANDFARM, NEXT TO THE OIL RECOVERY FACILITY, THE PISTON TUBE, AT ONE LOCATION, HAD TO BE DUG OUT OF THE GROUND WITH A SHOVEL. ONE ADDITIONAL SOIL SAMPLE WAS ADDED TO THE PROGRAM IN A MARSHY SECTION OF THE NORTH END OF THE EAST AREA. SOIL SAMPLES WERE COLLECTED BOTH ON BERMS AND IN THE LANDFARM ITSELF, SINCE THE BERMS WERE MADE OF MATERIAL FROM THE LANDFARM. TWO LOCATIONS WERE SUBMERGED AT THE TIME OF SAMPLING.

IN THE SOUTH AREA LANDFARM, THREE SOIL SAMPLES WERE COLLECTED AT REPRESENTATIVE LOCATIONS WITHIN THE LANDFARM AREA. ONLY ONE OF THE SAMPLING LOCATIONS WAS SUBMERGED AT THE TIME OF SAMPLING.

IN THE NORTH AREA LANDFARM, THE ENTIRE AREA WAS SUBMERGED UNDER RUNOFF WATER. ALL OF THE SOIL SAMPLES WERE COLLECTED USING THE PISTON TUBE SAMPLER WITH PREPARED SAMPLE TUBES.

THE SAMPLES WERE EXTRUDED FROM THE SAMPLE TUBES USING A HYDRAULIC RAM SPECIFICALLY DESIGNED TO REMOVE THE SAMPLE FROM THE DEVICE. THE CORE WAS EXTRUDED ONTO A FRESH PIECE OF ALUMINUM FOIL. A SPATULA WAS USED TO SHAVE THE OUTSIDE OF THE CORE, LEAVING VIRGIN MATERIAL

UNTOUCHED BY THE PISTON TUBE. BOTH ENDS WERE CUT OFF WITH A SOIL KNIFE, AND THE SAMPLES SPLIT LONGITUDINALLY INTO QUARTERS, FOR A REPLICATE SPLIT. THE SOIL TOOLS WERE CLEANED BETWEEN CORES WITH HEXANE FOLLOWED BY METHANOL AND POTABLE OFFSITE WATER. THE SOIL SAMPLES WERE SENT TO THE LABORATORY FOR ANALYSIS OF PCBS. ADDITIONALLY, TWO SAMPLES FROM THE NORTH AREA LANDFARM WAS ANALYZED FOR EP TOXICITY.

~~THE RESULTS OF THE LABORATORY ANALYSIS ARE PROVIDED IN APPENDIX A.~~ THE RESULTS INDICATED MINIMAL CONTAMINATION IN THE NORTH AREA LANDFARM, AND NO CONTAMINATION IN THE EAST AND SOUTH AREA LANDFARMS. ONE SAMPLE COLLECTED AT THE NORTH LANDFARM INDICATED THE PRESENCE OF AROCHLOR 1254 AT A CONCENTRATION OF 7.7 PPM. NO OTHER WASTE CONSTITUENTS WERE PRESENT ABOVE THE MINIMUM DETECTION LIMIT. THE RESULTS OF THE LABORATORY ANALYSIS ARE PROVIDED IN APPENDIX A.

Under the direction of the OEPA, the former landfarm area east of the former Oil ~~Reclamation~~ RECOVERY Facility was excavated of contaminated soils in August 1984. In September 1984, the excavated area was backfilled with clean soil.

Soil ~~and water~~ samples collected from the former landfarm area north of former ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12 in 1983 indicated that no hazardous wastes were present. In the summer of 1984, the excavated soil from the landfarm area north of ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12 was moved to the temporary waste pile with approval by OEPA, and subsequently placed into the Closure Cell.

5.1.2 Surface Impoundments ~~(Lagoons)~~

The following sections present a brief history of the ~~ponds~~ SURFACE IMPOUNDMENTS that existed at the facility. A more detailed evaluation of the closure, sampling procedures, and the evaluation analytical data of each of the ~~ponds~~ SURFACE IMPOUNDMENTS are located in sections 5.2. and 6.0.

5.1.2.1 Former ~~Ponds~~ SURFACE IMPOUNDMENTS 1 and 2

Former ~~Ponds~~ SURFACE IMPOUNDMENTS 1 and 2 were used for the treatment and recovery of waste oil sludges and inorganic contaminated acids. The ~~ponds~~ SURFACE IMPOUNDMENTS were closed in 1979 or early 1980.

5.1.2.2 Former ~~Pond~~ SURFACE IMPOUNDMENT 3

Former ~~Pond~~ SURFACE IMPOUNDMENT 3 was used for the storage of wastes. The types of wastes which were stored in Former ~~Pond~~ SURFACE IMPOUNDMENT 3 included waste oils, oily sludges and inorganic contaminated spent acids. The ~~pond~~ SURFACE IMPOUNDMENT was closed in 1980.

5.1.2.3 Former ~~Ponds~~ SURFACE IMPOUNDMENTS 4 and 5

Former ~~Ponds~~ SURFACE IMPOUNDMENTS 4 and 5 were used for settlement and treatment of acid wastes. These ~~ponds~~ SURFACE IMPOUNDMENTS were also used to hold sludges from the closure of Former ~~Ponds~~ SURFACE IMPOUNDMENTS 1, 2, 3, 4, 6, 9 and 10. ~~Ponds~~ SURFACE IMPOUNDMENTS 4 and 5 were closed in 1985.

5.1.2.4 Former ~~Pond~~ SURFACE IMPOUNDMENT 6 East

Former ~~Pond~~ SURFACE IMPOUNDMENT 6 East was used for the storage of mixed acid wastes. The ~~pond~~ SURFACE IMPOUNDMENT was closed in 1979.

5.1.2.5 Former ~~Pond~~ SURFACE IMPOUNDMENT 6 West

Former ~~Pond~~ SURFACE IMPOUNDMENT 6 West was used for the storage of sludge from acid neutralization. The ~~pond~~ SURFACE IMPOUNDMENT was closed in 1981.

5.1.2.6 Former ~~Pond~~ SURFACE IMPOUNDMENT 7

Former ~~Pond~~ SURFACE IMPOUNDMENT 7 was used for settlement and treatment of acid wastes. The ~~pond~~ SURFACE IMPOUNDMENT was closed in 1985.

5.1.2.7 Former ~~Pond~~ SURFACE IMPOUNDMENT 8

Former ~~Pond~~ SURFACE IMPOUNDMENT 8 was combined with Former ~~Pond~~ SURFACE IMPOUNDMENT 7 some time between 1979 and 1989.

5.1.2.8 Former ~~Pond~~ SURFACE IMPOUNDMENT 9

Former ~~Pond~~ SURFACE IMPOUNDMENT 9 was used for the storage of organic liquids and inorganic sludges. The ~~pond~~ SURFACE IMPOUNDMENT was closed in 1981.

5.1.2.9 Former ~~Pond~~ SURFACE IMPOUNDMENT 10

Former ~~Pond~~ SURFACE IMPOUNDMENT 10 was used for the storage of aqueous phenolic materials. The ~~pond~~ SURFACE IMPOUNDMENT was closed in 1982.

5.1.2.10 Former ~~Ponds~~ SURFACE IMPOUNDMENTS 11 and 12

Former ~~Ponds~~ SURFACE IMPOUNDMENTS 11 and 12 were used to store organic contaminated liquids, organic and inorganic sludges, and contaminated spent acids. The ~~ponds~~ SURFACE IMPOUNDMENTS were closed in 1992.

5.1.3 Oil ~~Reclamation~~ RECOVERY Facility

This facility was used to reclaim waste oil from various industrial mixtures. The facility was decommissioned and dismantled and was finally closed in 1986.

5.1.4 Injection Wells

Injection Wells 1, 1A, 2, 3, 4, 5, and 6 were/are currently used to inject acid wastes into the Mt. Simon Sandstone, 2,800 feet below the surface. Injection Well 1 was closed in 1980 and replugged in 1986. Injection Well's 1A and 3 were closed in 1987. The remaining four wells are presently active.

5.2 SOLID WASTE MANAGEMENT UNITS (SWMUs)

There were forty-five SWMUs identified within the March 1991, RFA Report by Jacobs Engineering. As part of this updated Description of Current Conditions an additional seven units have been identified. IT SHOULD BE NOTED AT THIS TIME THAT GROUNDWATER MONITORING HAS BEEN REQUIRED, BEFORE ISSUANCE OF THE PART B PERMIT, BY RCRA INTERIM STATUS REGULATIONS AS WELL AS A FEDERAL CONSENT AGREEMENT AND FINAL ORDER (CAFO) (APPENDIX B) IN ACCORDANCE WITH THOSE DOCUMENTS CWM AGREED TO INSTALL A GROUNDWATER MONITORING SYSTEM AROUND THE SURFACE IMPOUNDMENTS AND THE TSCA CLOSURE CELL. THE CURRENT SYSTEM WAS DESIGNED TO SATISFY BOTH INTERIM STATUS REQUIREMENTS, THE CAFO AND THE TSCA REQUIREMENTS AND WAS APPROVED BY THE OHIO EPA AND THE USEPA. GROUNDWATER QUALITY MONITORING REPORTS ARE REQUIRED PURSUANT TO THE CAFO AND ARE SUBMITTED TO THE FOLLOWING AGENCIES:

OHIO EPA - GROUNDWATER DIVISION
P.O. BOX 1049
1800 WATERMARK DRIVE
COLUMBUS, OHIO 43266-0149
ATTENTION: DONALD R. SCHREGARDUS, DIRECTOR
PHONE# 1-800-686-2330 OR 614-644-3020

AND

U.S. EPA, REGION V
77 WEST JACKSON BLVD.
CHICAGO, ILLINOIS 60604
ATTENTION: VALDUS ADAMKUS, ADMINISTRATOR
PHONE# 312-353-2197

GROUNDWATER MONITORING INITIALLY BEGAN AT THIS FACILITY IN 1972 BY THE OEPA. INITIAL MONITORING MADE USE OF TWO ON-SITE WELLS AND TWO NEIGHBORING WELLS.

SINCE GROUNDWATER MONITORING BEGAN AT THE SITE, THE MONITORING SYSTEM HAS UNDERGONE REVISION AND EXPANSION IN 1974, 1975, 1976, 1079, 1981, 1982 THROUGH 1986, 1988 AND 1992. SPECIFIC DETAILS OF WELLS INSTALLED DURING THESE PERIODS CAN BE FOUND IN THE OPERATING RECORD OF THE FACILITY.

IN ACCORDANCE WITH THE CAFO(H)(5-6), PHASE I OF THE CWM - VICKERY MONITORING SYSTEM WAS INITIATED IN THE FALL OF 1985 BY GOLDER. IN ACCORDANCE WITH THE CAFO (H) (7), PHASE II OF THE CWM - VICKERY MONITORING SYSTEM WAS COMPLETED IN JULY-AUGUST, 1992. CONSTRUCTION DETAILS AND INSTALLATION NOTES OF THE WELLS INSTALLED FOR PHASE I AND PHASE II OF THE MONITORING SYSTEM CAN BE FOUND IN THE OPERATING RECORD OF THE FACILITY. IN THE FALL OF 1986, THREE PHASE I MONITORING WELLS WERE RELOCATED DUE TO THEIR PROXIMITY TO THE STATE ROUTE RIGHT-OF-WAY. DOCUMENTATION OF THIS RELOCATION PROGRAM CAN BE FOUND IN THE OPERATING RECORD OF THE FACILITY.

IN ACCORDANCE WITH THE GROUNDWATER FINDINGS AND ORDERS DATED OCTOBER, 1992, A REPLACEMENT WELL FOR L-19, KNOWN AS L19A WAS INSTALLED IN SEPTEMBER, 1992.

IN ACCORDANCE WITH THE CAFO (H)(8) AND UNDER WRITTEN PERMISSION FROM THE USEPA AND OEPA DATED NOVEMBER 1986, THE CWM - VICKERY FACILITY IS NO LONGER REQUIRED TO SAMPLE MONITORING WELLS THAT WERE INSTALLED PRIOR TO INSTALLATION OF THE PHASE I MONITORING SYSTEM.

ADDITIONALLY, IN ACCORDANCE WITH THE CONSENT DECREE OF MAY 22, 1984 BETWEEN CHEMICAL WASTE MANAGEMENT, INC. AND THE STATE OHIO, AN OVERBURDEN GROUNDWATER SAMPLING AND ANALYSIS PROGRAM WAS PERFORMED AT LOCATIONS AROUND THE OPEN SURFACE IMPOUNDMENTS. THIS OVERBURDEN GROUNDWATER TESTING PROGRAM CONSISTED OF A SINGLE SAMPLING EVENT AND ANALYTICAL TESTING OF THOSE SAMPLES OF OVERBURDEN GROUNDWATER FOR SELECTED ORGANIC AND INORGANIC CONSTITUENTS AS LISTED IN THE CONSENT DECREE. THE DETAILS FOR PLACEMENT, INSTALLATION AND SAMPLING OF THE HOLES FOR THE SINGLE

SAMPLE PROGRAM WERE APPROVED BY THE OEPA PRIOR TO COMMENCEMENT OF THE PROGRAM. MODIFICATIONS REQUIRED IN THE FIELD WERE ALSO APPROVED BY THE OEPA PRIOR TO THEIR IMPLEMENTATION. THESE SINGLE SAMPLE HOLES (SS) WERE INSTALLED BETWEEN JUNE 20, AND JULY 13, 1984, AND SAMPLED BETWEEN JUNE 29 AND AUGUST 15, 1984. THE CONCLUSIONS DRAWN FROM THE ANALYTICAL RESULTS OF THE ONE-TIME SAMPLING EVENT INDICATED THAT THE OVERBURDEN GROUNDWATER QUALITY DID NOT REFLECT CONTAMINATION FROM THE SURFACE IMPOUNDMENTS. HOWEVER, THERE WAS AN ISOLATED HOLE NEAR THE OIL RECOVERY SYSTEM. AN INVESTIGATION OF THIS HOLE, SS-10, WAS COMPLETED BY GOLDER. THIS INVESTIGATIONS REPORT IS PRESENTED IN APPENDIX C. THE REPORT CONCLUDED THAT THE RESULTS FROM SOIL AND WATER SAMPLES FROM THE FOUR BORINGS INDICATED THAT VOCS ARE PRESENT IN THE SHALLOW SOIL, EVEN ABOVE THE GROUNDWATER, AND IN GROUNDWATER CONTACT WITH THOSE SOILS, AND THE COMPOUNDS PRESENT IN BOTH SOIL AND WATER DIMINISH IN CONCENTRATION WITH DEPTH.

GOLDER SUMMARIZED THAT THE POTENTIAL FOR THE VOC CONCENTRATIONS IN THE SS-10 AREA TO HAVE ORIGINATED FROM A SOURCE OTHER THAN ACCUMULATED SPILLS/LEAKS ASSOCIATED WITH THE TRUCK/UNLOADING APPEARS TO BE NEGLIGIBLE. THERE ARE NO OTHER POTENTIAL SOURCE AREAS SOUTH (REGIONALLY UPGRADIENT) OF THE SS-10 AREA. THE CLOSEST OTHER POTENTIAL SOURCES WERE THE PREVIOUS OIL RECOVERY SYSTEM TO THE EAST OF THE SS-10 AREA AND PREVIOUSLY USED OIL TRANSFER LINES NORTH OF THE SS-10 AREA. SINCE LATERAL GROUNDWATER MOVEMENT ACROSS THE SITE IN THE LACUSTRINE SOIL IS ON THE ORDER OF 10^{-4} FEET PER YEAR, AND THESE OTHER POTENTIAL SOURCE AREAS ARE ABOUT 50 FEET OR MORE AWAY FROM THE SS-10 AREA, LATERAL MIGRATION OF VOCs WITH GROUNDWATER THROUGH THE LACUSTRINE SOILS FROM THESE POTENTIAL SOURCES IS NOT EXPECTED. FURTHERMORE, THE EVIDENCE OF HIGHER CONCENTRATIONS OF VOCs IN THE SOILS ABOVE THE GROUNDWATER CLEARLY INDICATES THE VOCs ORIGINATED FROM THE SURFACE IN THE SS-10 AREA. HOWEVER, THE TOTAL LATERAL EXTENT OF VOCs FROM ACCUMULATED SPILLS/LEAKS IN THE LOADING/UNLOADING AREA HAS NOT BEEN COMPLETELY DEFINED.

The locations of the SWMUs are presented on Figure 5.1. Table 5-1 presents a list of the SWMUs. The SWMUs are described on the following pages.

SWMU 1 - ~~Pond~~ SURFACE IMPOUNDMENT 1

Regulatory Status:	~~Closed - Pre RCRA~~ INACTIVE; NON-RCRA CLOSED; PRE-RCRA, NO AGENCY CERTIFICATION 1980
UNIT DESCRIPTION:	~~Pond~~ SURFACE IMPOUNDMENT 1 was unlined. It had a natural clay bottom, measuring 430'x100'x11' and had a capacity of 2,300,000 gallons. ~~Pond~~ SURFACE IMPOUNDMENT 1 received waste oils and sludge, and inorganic contaminated spent acids.
STATUS:	~~Pond~~ SURFACE IMPOUNDMENT 1 was closed in 1980 by removing liquid and sludge to ~~Pond~~ SURFACE IMPOUNDMENT 4 and backfilling with ~~Pond~~ SURFACE IMPOUNDMENT 9 sludges, earth and some demolition material, such as rock and concrete. The ~~impoundment~~ SURFACE IMPOUNDMENT was located in the northeast portion of the facility, east of ~~Pond~~ SURFACE IMPOUNDMENT 4. The temporary waste pile was placed over the area where ~~Pond~~ SURFACE IMPOUNDMENT 1 was located. The waste pile was placed into the Closure Cell in 1991. The entire area where the waste pile was located was capped with 2 feet of clay.
PERIOD OF OPERATION:	1964 - 1980
CONSTITUENTS:	Types of waste include; waste oils, oily sludges, inorganic contaminated spent acids. Types of waste constituents include; PCBs, D004-D011 Metals, VOCs, PAHs and unknowns.
RELEASE CONTROLS:	Earthen Dikes
MEDIA OF CONCERN:	Groundwater, SOIL

RELEASE HISTORY:

In January, 1973 the dike walls of ~~Ponds~~ SURFACE IMPOUNDMENTS 1, 4 and 5 failed allowing an unknown amount of liquid to flow onto the soil adjacent to ~~Pond~~ SURFACE IMPOUNDMENT 1.

MIGRATION PATHWAYS:

Soil: The soil remains a migration pathway due to the January 1973 release to the adjacent soils. It remains unknown whether the area was remediated. Due to the fact that the ~~pond~~ SURFACE IMPOUNDMENT was unlined and type of backfill material used to close the ~~pond~~ SURFACE IMPOUNDMENT (i.e., ~~Pond~~ SURFACE IMPOUNDMENT 9 Sludges), it remains a possibility that contaminants have migrated into the underlying clay. Analytical results from samples collected within the clay did not show the presence of PCBs. However, there still remains no analytical data on more mobile contaminants such as halogenated organics.

Groundwater: There remains to be a potential for groundwater to be a migration pathway for the contaminants from the ~~pond~~ SURFACE IMPOUNDMENT, due to the lack of a liner. The natural clay underlying the ~~pond~~ SURFACE IMPOUNDMENT may have acted as a barrier however, the clay may have only slowed the migration through to the underlying ground water. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS

OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: Prior to the closing of the ~~pond~~ SURFACE IMPOUNDMENT and due to the failure of the dike in 1973, the potential for surface water to be a migration pathway existed. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: There is no potential for air to act as a migration pathway from this unit.

Subsurface Gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: Soil and sludge samples were collected by Environmental Testing and Certification in 1983 as part of the Clean Water, Inc., Closed Lagoons, Site 690, Phase VB Final Report. This report describes the purpose, field methodology, and location of the samples ~~(Appendix 1 A)~~. The analytical results indicated that PCBs were present at a concentration of 0-335 ppm. The PCBs were found to be located in the sludges at a depth of 6-10 feet below the top of the dikes. ADDITIONALLY, TWO SOIL SAMPLES WERE COLLECTED FOR EPTOX CONSTITUENTS. THE RESULTS DID NOT INDICATE THE PRESENCE OF THE CONSTITUENTS. THE CLOSED LAGOONS REPORT IS PRESENTED AS APPENDIX A. Additionally, 1,2-Dichloroethane (1,2-DCA) has been detected repeatedly in groundwater monitoring well L-19, which is located southwest of the former location of ~~Pond~~

SURFACE IMPOUNDMENT 1. An investigation of the area of L-19 was conducted by Golder Associates in 1990 and concluded that the hydrogeologic and analytical data for monitoring wells L-19, T-19 and MW-19R and the results of the investigation program suggested a localized condition around monitoring well L-19 to be cause of the presence of 1,2-DCA in this area. The compound did not indicate migration downward, as evidenced by the analytical results from monitoring wells T-19 and MW-19R. Lateral migration of the contaminant is not expected due to the low lateral groundwater flow velocity. Since previous monitoring results from monitoring well L-19 indicated little variation in concentration of 1,2-DCA, Golder suggested that the contamination present in monitoring well L-19 was a localized, static situation (APPENDIX D).

SWMU 2 - ~~Pond~~ SURFACE IMPOUNDMENT 2

Regulatory Status: ~~Closed - Pre RCRA~~
INACTIVE; NON-RCRA CLOSED; PRE-RCRA, NO AGENCY CERTIFICATION; 1979

UNIT DESCRIPTION: ~~Pond~~ SURFACE IMPOUNDMENT 2 was unlined. It had a natural clay bottom, measuring 320'x160'x11' and had a capacity of 3,400,000 gallons. ~~Pond~~ SURFACE IMPOUNDMENT 2 received waste oils and sludge, and inorganic contaminated spent acids.

STATUS: ~~Pond~~ SURFACE IMPOUNDMENT 2 was closed in 1979. During closure, liquids and possibly some sludges were removed to ~~Pond~~ SURFACE IMPOUNDMENT 4. Sludges from ~~Pond~~ SURFACE IMPOUNDMENT 2 were solidified by fixing with foundry sand and lime kiln flue dust. The fixed sludge was left in place and covered with demolition debris. The ~~impoundment~~ SURFACE IMPOUNDMENT was located in the northeast portion of the facility. The temporary waste pile was placed over the area where ~~Pond~~ SURFACE IMPOUNDMENT 2 was located. The waste pile was placed into the Closure Cell in 1991. The entire area where the waste pile was located was capped with 2 feet of clay.

PERIOD OF OPERATION: 1962 - 1977

CONSTITUENTS: Types of waste included; organics, inorganics, PCBs less than 500 ppm and corrosives.
Types of waste constituents include; PCBs, D004-D011 metals, VOCs, PAHs and unknowns.

RELEASE CONTROLS: Earthen Dikes

MEDIA OF CONCERN: Groundwater, SOIL

RELEASE HISTORY: Unknown

MIGRATION PATHWAYS:

Soil: The soil remains a migration pathway due to the fact that the ~~pond~~ SURFACE IMPOUNDMENT did not have a liner. Hazardous contaminants (i.e., PCBs) are in direct contact with the underlying clay soils. No analytical data exists on mobile contaminants such as halogenated organics.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants from ~~Pond~~ SURFACE IMPOUNDMENT 2 due to the lack of a liner. The natural clay underlying the ~~pond~~ SURFACE IMPOUNDMENT may have acted as a barrier however, the clay may have only slowed the migration through to the underlying groundwater. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit, and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: Prior to the closure of the ~~pond~~ SURFACE IMPOUNDMENT, the potential for surface water to be a migration pathway existed. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: Soil and sludge samples were collected by Environmental Testing and Certification in 1983 as part of the Clean Water, Inc., Closed Lagoons, Site 690, Phase VB Final Report. This report describes the purpose, field methodology, and location of the samples (Appendix ~~I~~ A). The analytical results indicated that PCBs were present at a concentration of 0-146 ppm. The PCBs were found at a depth of 3-12 feet below the top of the dikes. SAMPLES WERE NOT COLLECTED FOR METALS ANALYSIS.

SWMU 3 - ~~Pond~~ SURFACE IMPOUNDMENT 3

Regulatory Status:	~~Closed - Pre RCRA~~ INACTIVE; NON-RCRA CLOSED; PRE-RCRA, NO AGENCY CERTIFICATION; 1979
UNIT DESCRIPTION:	~~Pond~~ SURFACE IMPOUNDMENT 3 was unlined. It had a natural clay bottom, measuring 230'x200'x4.5' and had a capacity of 2,600,000 gallons. ~~Pond~~ SURFACE IMPOUNDMENT 3 received waste oil, oily sludges and inorganic contaminated spent acids.
STATUS:	~~Pond~~ SURFACE IMPOUNDMENT 3 was closed in 1979 by landfarming the sludges and backfilling the ~~pond~~ SURFACE IMPOUNDMENT with clean earth. The ~~impoundment~~ SURFACE IMPOUNDMENT was located in the northeast portion of the facility, north of ~~Ponds~~ SURFACE IMPOUNDMENTS 1 and 2. The temporary waste pile was place over the area where ~~Pond~~ SURFACE IMPOUNDMENT 3 was located. The waste pile was placed into the closure cell in 1991. The entire area where the waste pile was located was capped with 2 feet of clay.
PERIOD OF OPERATION:	1967 - 1979
CONSTITUENTS:	Types of waste include; waste oils, caustics, acids, pickle liquors and unknowns. Types of waste constituents include; PCBs, D004-D011 metals, VOCs, PAHs and unknowns.
RELEASE CONTROLS:	Earthen Dikes
MEDIA OF CONCERN:	Groundwater, SOIL
RELEASE HISTORY:	Unknown

MIGRATION PATHWAYS:

Soil: A release of PCBs to the clays underlying ~~Pond~~ SURFACE IMPOUNDMENT 3 has been documented in two reports dating 1983 and 1984. It is also likely that more mobile contaminants, such as halogenated organics, have also been released to the soil and have migrated to a greater extent than the PCBs. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants from the ~~pond~~, SURFACE IMPOUNDMENT due to the lack of a liner. The natural clay underlying the ~~pond~~ SURFACE IMPOUNDMENT may have acted as a barrier, however the clay may have only slowed the migration through to the underlying groundwater. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected.

Surface Water: Prior to the closing of the ~~pond~~ SURFACE IMPOUNDMENT, the potential for surface water to be a migration pathway existed. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: Soil and sludge samples were collected by Environmental Testing and Certification in 1983 as part of the Clean Water, Inc., Closed Lagoons, Site 690, Phase VB Final Report. This report describes the purpose, field methodology, and location of the samples (Appendix ~~1~~ A). The analytical results indicated that PCBs were present at a concentration of 0-156 ppb. The PCBs were found to be located in the sludges 3 - 6 feet below the top of the dikes. Additionally, PCBs were present in the clays beneath the ~~pond~~ SURFACE IMPOUNDMENT at concentrations between 8-32 ppm. SAMPLES WERE NOT COLLECTED FOR METALS ANALYSIS.

SWMU 4 - ~~Pond~~ SURFACE IMPOUNDMENT 4

Regulatory Status:

~~RCRA Regulated Unit - Closed~~
INACTIVE; RCRA CLOSED (OEPA APPROVED CERTIFICATION); 1985

UNIT DESCRIPTION:

~~Pond~~ SURFACE IMPOUNDMENT 4 was unlined. It had a natural clay bottom, measuring 800'x200'x15'' and a capacity of 21,000,000 gallons. ~~Pond~~ SURFACE IMPOUNDMENT 4 received organic contaminated liquids, organics, organic and inorganic sludges and contaminated spent acids. The ~~pond~~ SURFACE IMPOUNDMENT was used for treating waste oils with waste acids. Oil was skimmed off the top of the ~~ponds~~ SURFACE IMPOUNDMENTS using a boom skimmer located between ~~Ponds~~ SURFACE IMPOUNDMENTS 4 and 5. The skimmed oil was stored in two skim oil tanks, one 12,000 gallons and one 18,000 gallons. Sediments would settle to the bottom of the ~~pond~~ SURFACE IMPOUNDMENT and the acidic aqueous wastes would be pumped to ~~Pond~~ SURFACE IMPOUNDMENT 5. During the late 1970's and early 1980's, the southern half of ~~Pond~~ SURFACE IMPOUNDMENT 4 was used for the storage of sludges generated from the closing of several ~~ponds~~ SURFACE IMPOUNDMENTS.

STATUS:

~~Pond~~ SURFACE IMPOUNDMENT 4 was closed in 1985, as required by the CAFO (ATTACHMENT B). Aqueous wastes were pumped to ~~Ponds~~ SURFACE IMPOUNDMENTS 11 and 12. The sludges were fixed by mixing with lime and cement kiln dust. The 149,552 cubic yards of fixed sludges were placed in a temporary waste pile. Excavation to native clay was then completed and approved by the OEPA. The Closure Cell was built over the area where ~~Ponds~~ SURFACE IMPOUNDMENTS 4, 5

and 7 were located. Details of Closure Cell construction can be found in the Closure Cell Design submittals by Golder Associates. The waste pile was placed into the closure cell in 1991. The closure cell was completed in 1992.

PERIOD OF OPERATION: 1963 - 1985

CONSTITUENTS: Types of waste include; waste oils, caustics, acids, pickle liquors, used filters, sludges, phenolic wastes, unknown. Types of waste constituents include; PCBs, D004-D011 metals, VOCs, PAHs, dioxins, unknowns.

RELEASE CONTROLS: Earthen Dikes

MEDIA OF CONCERN: Groundwater

RELEASE HISTORY: In 1973 a breakage in dike walls between ~~Ponds~~ SURFACE IMPOUNDMENTS 5, 4 and 1 allowed an unknown amount of liquid to flow from ~~Pond~~ SURFACE IMPOUNDMENT 5, into ~~Ponds~~ SURFACE IMPOUNDMENTS 4 and 1, and then to the soil adjacent to ~~Pond~~ SURFACE IMPOUNDMENT 1. Additionally, numerous complaints of air releases from the open ~~pond~~ SURFACE IMPOUNDMENT, especially during sludge fixation, are noted in the regulatory record.

MIGRATION PATHWAYS: **Soil**: Releases from this ~~pond~~ SURFACE IMPOUNDMENT to the soil has been documented. VOCs and PCBs have been documented as being present in seeps coming from the east slope of the ~~pond~~ SURFACE IMPOUNDMENT during the initial excavation in 1985. Additional contamination was discovered and removed when the dikes were pushed in. Since the unit has been "Clean" closed and analysis of subsurface soils following residue and sludge stabilization

and removal have been completed, the potential for soil to be a migration pathway now remains low.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants from the ~~pond~~, SURFACE IMPOUNDMENT due to the lack of a liner. The natural clay underlying the ~~pond~~ SURFACE IMPOUNDMENT may have acted as a barrier however, the clay may have only slowed the migration through to the underlying ground water. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: Prior to the closing of the ~~pond~~ SURFACE IMPOUNDMENT, the potential for surface water to be a migration pathway existed. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: There is currently a low potential for air to be a migration pathway since the ~~pond~~ SURFACE IMPOUNDMENT was excavated and the closure cell constructed.

Subsurface gas: There seems to be a moderate potential for releases of subsurface gases to the capillary drain system

beneath the closure cell. However, any releases would be vented through the capillary drainage system.

PREVIOUS SAMPLING DATA: Soil and sludge samples were collected by Environmental Testing and Certification in 1983 as part of the Clean Water, Inc., Closed Lagoons, Site 690, Phase VB Final Report. This report describes the purpose, field methodology, and location of the samples (Attachment ~~1~~ A). The analytical results indicated that both PCBs and dioxin were present in the sludges at a concentration of 0-23 ppm and 18 ppm, respectively. PCBs were also detected at a concentration of 14 ppm from the rip-rap deposits on the dikes of the open portion of the ~~pond~~ SURFACE IMPOUNDMENT. Sludges from the ~~pond~~ SURFACE IMPOUNDMENT also showed high levels of metals and VOCs. Seeps on the east side of the excavated ~~pond~~ SURFACE IMPOUNDMENT revealed PCB and some VOC contamination. Evaluation of the groundwater monitoring well data from monitoring wells around the facility was conducted by Golder Associates in 1988, and demonstrated that many of the results from groundwater sampling were false indicators of potential contamination. The only positive identification of a detection of groundwater contamination exists in monitoring well L-19, located southeast of the ~~pond~~ SURFACE IMPOUNDMENT. The compound 1,2-Dichloroethane (1,2-DCA) has been detected repeatedly in groundwater monitoring well L-19 An investigation of the area of L-19 was conducted by Golder Associates in 1990 and it concluded that the hydrogeologic and analytical data for monitoring wells L-19, T-19 and MW-19R and the results of the investigation program suggested a localized condition around monitoring well L-19 to be the cause of the presence of 1,2-DCA in this area. The compound did not indicate migration downward, as evidence by the analytical results

from monitoring wells T-19 and MW-19R. Potential lateral migration of the contaminants is minimal due to the low lateral groundwater flow velocity. Since previous monitoring results from monitoring well L-19 indicated little variation in concentration of 1,2-DCA, Golder suggested that the contamination present in monitoring well L-19 was a localized, static situation (ATTACHMENT D). ADDITIONAL SAMPLING HAS BEEN COMPLETED AS PART OF THE EXCAVATION AND CLEAN CLOSURE OF SURFACE IMPOUNDMENT 4. THESE RESULTS CAN BE FOUND IN THE CLOSURE CELL DOCUMENTS PREVIOUSLY TRANSMITTED TO THE USEPA. ALL CONTAMINATED SOILS WERE EXCAVATED AND PLACED IN THE WASTE PILE AND SUBSEQUENTLY MOVED TO THE TSCA CLOSURE CELL.

SWMU 5 - ~~Pond~~ SURFACE IMPOUNDMENT 5

Regulatory Status: ~~RCRA Regulated Unit - Closed~~ INACTIVE; RCRA CLOSED (OEPA APPROVED CERTIFICATION); 1985

UNIT DESCRIPTION: ~~Pond~~ SURFACE IMPOUNDMENT 5 was unlined. It had a natural clay bottom, measuring 800'x200'x15'' and had a capacity of 21,000,000 gallons. SURFACE IMPOUNDMENT 5 IS LOCATED ADJACENT TO SURFACE IMPOUNDMENT 4 AND 7 IN THE AREA NOW LOCATED BY THE TSCA CLOSURE CELL. ~~Pond~~ SURFACE IMPOUNDMENT 5 received organic contaminated liquids, organics, organic and inorganic sludges and contaminated spent acids. The ~~pond~~ SURFACE IMPOUNDMENT was used for treating waste oils with waste acids. Oil was skimmed off the top of the ~~pond~~ SURFACE IMPOUNDMENT and processed in the Oil Reclamation Facility. The skimmed oil was stored in two skim oil tanks located between ~~Ponds~~ SURFACE IMPOUNDMENTS 4 and 5. Sediments would settle to the bottom of the ~~pond~~ SURFACE IMPOUNDMENT and the acidic aqueous wastes would be pumped to ~~Pond~~ SURFACE IMPOUNDMENT 7.

STATUS: ~~Pond~~ SURFACE IMPOUNDMENT 5 was closed in 1985, as required by the CAFO (ATTACHMENT B). In 1983, approximately 150,000 gallons of >500 ppm PCB oil was skimmed from ~~Pond~~ SURFACE IMPOUNDMENT 5 and incinerated at the CWM facility in Emele, Alabama. Aqueous wastes were pumped to ~~Ponds~~ SURFACE IMPOUNDMENTS 11 and 12. The sludges were fixed by mixing with lime and cement kiln dust. The 72,434 cubic yards of fixed sludges were then placed in a temporary waste pile. Excavation to native clay was then completed

and the dikes were pushed in. The closure cell has been built over the area where ~~Ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7 were located. The waste pile was placed into the closure cell in 1991. The closure cell was completed in 1992.

PERIOD OF OPERATION: 1968 - 1985

CONSTITUENTS: Types of waste include; waste oils, caustics, acids, pickle liquors, phenolic wastes, unknown.
Types of waste constituents include; PCBs, D004-D011 metals, VOCs, PAHs, dioxins, unknowns.

RELEASE CONTROLS: Earthen Dikes

MEDIA OF CONCERN: Groundwater

RELEASE HISTORY: In 1973 a breakage in dike walls between ~~Ponds~~ SURFACE IMPOUNDMENTS 5, 4 and 1 allowed an unknown amount of liquid to flow from ~~Pond~~ SURFACE IMPOUNDMENT 5, into ~~Ponds~~ SURFACE IMPOUNDMENTS 4 and 1, and then to the soil adjacent to ~~Pond~~ SURFACE IMPOUNDMENT 1. Additionally, numerous complaints of air releases from the open ~~pond~~ SURFACE IMPOUNDMENT, especially during sludge fixation, are noted in the regulatory record.

MIGRATION PATHWAYS: **Soil:** Releases from this ~~pond~~ SURFACE IMPOUNDMENT to the soil has been documented. Seeps appeared at the south end of the ~~pond~~ SURFACE IMPOUNDMENT after the final excavation in 1985. Although, the seeps from ~~Pond~~ SURFACE IMPOUNDMENT 5 were not sampled, data from ~~Ponds~~ SURFACE IMPOUNDMENTS 4 and 7 indicate VOC, phenol, and possibly metal contamination. Additional contamination was discovered and removed when

the dikes were pushed in. Since the unit has been "Clean" closed and analysis of subsurface soils following residue and sludge stabilization and removal have been completed, the potential for soil to be a migration pathway now remains low.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants from the ~~pond~~ SURFACE IMPOUNDMENTS due to the lack of a liner. The natural clay underlying the ~~pond~~ SURFACE IMPOUNDMENTS may have acted as a barrier however, the clay may have only slowed the migration through to the underlying ground water. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: Prior to the closing of the ~~pond~~ SURFACE IMPOUNDMENT, the potential for surface water to be a migration pathway existed. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: There is currently a low potential for air to be a migration pathway since the ~~pond~~ SURFACE IMPOUNDMENT was excavated and the closure cell constructed.

Subsurface gas: There is a moderate potential for releases of subsurface gases to the capillary drain system beneath the closure cell. However, any releases would be vented through the capillary drainage system.

PREVIOUS SAMPLING DATA: Approximately 150,000 gallons of oil removed from the ~~pond~~ SURFACE IMPOUNDMENT in 1983 contained PCBs in excess of 500 ppm and sediment samples contained up to 223 ppm PCBs. Sludges from the ~~pond~~ SURFACE IMPOUNDMENT also showed high levels of metals and VOCs especially halogenated compounds. Evaluation of the groundwater monitoring well data from monitoring wells around the facility was conducted by Golder Associates in 1988, and demonstrated that many of the results from groundwater sampling were false indicators of potential contamination. The only positive identification of a detection of groundwater contamination exists in monitoring well L-19, located southeast of the POND SURFACE IMPOUNDMENT. The compound 1,2-Dichloroethane (1,2-DCA) has been detected repeatedly in groundwater monitoring well L-19 An investigation of the area of L-19 was conducted by Golder Associates in 1990 and it concluded that the hydrogeologic and analytical data for monitoring wells L-19, T-19 and MW-19R and the results of the investigation program suggested a localized condition around monitoring well L-19 to be the cause of the presence of 1,2-DCA in this area. The compound did not indicate migration downward, as evidenced by the analytical results from monitoring wells T-19 and MW-19R. Since previous monitoring results from monitoring well L-19 indicated little variation in concentration of 1,2-DCA, Golder suggested that the contamination present in monitoring well L-19 was a localized, static situation (ATTACHMENT D). Potential lateral migration of the contaminants is minimal due to the low lateral groundwater flow velocity. GROUNDWATER

FLOW VELOCITIES WITHIN THE LACUSTRINE, TILL AND BEDROCK UNITS ARE PRESENTED ON FIGURES 4-9 THOUGH 4-17. A DISCUSSION ON THE HYDRAULIC PROPERTIES OF THESE UNITS ARE PRESENTED IN SECTION 4.4.2 AND 4.4.3. ADDITIONAL SAMPLING HAS BEEN COMPLETED AS PART OF THE EXCAVATION AND CLEAN CLOSURE OF SURFACE IMPOUNDMENT 4. THESE RESULTS CAN BE FOUND IN THE CLOSURE CELL DOCUMENTS PREVIOUSLY TRANSMITTED TO THE USEPA. ALL CONTAMINATED SOILS WERE EXCAVATED AND PLACED IN THE WASTE PILE AND SUBSEQUENTLY MOVED TO THE TSCA CLOSURE CELL.

SWMU 6 - POND SURFACE IMPOUNDMENT 6 East/West

Regulatory Status:

6E ~~Pre-RCRA - Closed~~ INACTIVE; NON-RCRA CLOSED;PRE-RCRA, NO AGENCY CERTIFICATION; 1979

6W ~~RCRA Regulated United - Closed~~ INACTIVE; NON-RCRA CLOSED; CLOSURE PLAN/REPORT SUBMITTED FEBRUARY 1991. ACCEPTED BY OEPA; 1981

UNIT DESCRIPTION:

~~POND~~ SURFACE IMPOUNDMENT 6 was unlined. It had a natural clay bottom, measuring 400'x80'x13' and had a capacity of 2,000,000 gallons. ~~POND~~ SURFACE IMPOUNDMENT 6 received mixed acids, acid sludges, phenolic wastes and other unknown wastes. The ~~POND~~ SURFACE IMPOUNDMENT was divided into an east and west ~~POND~~ SURFACE IMPOUNDMENT by the construction of a dike in 1976.

STATUS:

~~POND~~ SURFACE IMPOUNDMENT 6E was closed in 1979. In 1979, sludges from the east side were removed to ~~POND~~ SURFACE IMPOUNDMENT 4 and the east side was backfilled with clean fill. In 1981, the liquids from ~~POND~~ SURFACE IMPOUNDMENT 6W were pumped to either ~~POND~~ SURFACE IMPOUNDMENT 4 or 5 and most of the sludges clamshelled to ~~POND~~ SURFACE IMPOUNDMENT 10. Some of the sludges may have been landfarmed at the North Landfarm. The west side was backfilled with clean fill and ~~POND~~ SURFACE IMPOUNDMENT 9 sludges which had been fixed with foundry sand, lime and pickle liquors using the Pug Mill. During the construction of a trench around the closure cell, ~~POND~~ SURFACE IMPOUNDMENT 6W sludges were discovered. At this time, it was determined, instead of digging a trench system for use as a drainage ditch system

around the closure cell, the area above ~~POND~~ SURFACE IMPOUNDMENT 6 was constructed using 2 ft. of compacted clay and would be graded for sheet flow off the closure cell.

PERIOD OF OPERATION: 1966 - 1981

CONSTITUENTS: Types of waste include; waste acids, acid sludges, pickle liquors, phenolic wastes, ~~POND~~ SURFACE IMPOUNDMENT 9 sludges, and unknowns.
Types of waste constituents include; PCBs, D004-D011 metals, VOCs, PAHs, pesticides and unknowns.

RELEASE CONTROLS: Earthen Dikes

MEDIA OF CONCERN: Groundwater, SOIL, SURFACE WATER

RELEASE HISTORY: In 1975 an unknown amount of phenolic waste was released into Little Raccoon Creek. It is not known if the creek was remediated. Additionally in 1978, a release of Diazinon, an insecticide, into ~~POND~~ SURFACE IMPOUNDMENT 6 due to an unloading hose blowout, generated fumes.

MIGRATION PATHWAYS: **Soil:** There remains a POTENTIAL FOR SOIL TO BE A migration pathway due to the fact the ~~POND~~ SURFACE IMPOUNDMENT had no liner and hazardous wastes including acids, heavy metals, and phenols have been in direct contact with the underlying clay since 1966. Although this unit was closed and backfilled, the sludges and bottom sediments were not removed nor samples collected or analyzed.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants due to the lack of a liner under the ~~POND~~ SURFACE

IMPOUNDMENT. The ~~POND~~ SURFACE IMPOUNDMENT contained hazardous wastes such as acids, heavy metals, and phenols, which were in direct contact with the underlying clays. The natural clay underlying the ~~POND~~ SURFACE IMPOUNDMENT may have acted as a barrier, however the clay may have only slowed the migration through to the underlying groundwater. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: Prior to the closing of the ~~POND~~ SURFACE IMPOUNDMENT, a release of phenolic wastes to Little Raccoon Creek occurred in 1975. The cause of the release is not known and it is not known if the creek was remediated or if samples were collected and analyzed. DUE TO THIS PRIOR RELEASE, SEDIMENTS WITHIN LITTLE RACCOON CREEK REMAIN A MODERATE CONCERN. Presently, since this ~~POND~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: A release to air has been documented when Diazinon reacted, with acids and generated fumes in 1978. However, since the ~~POND~~ SURFACE IMPOUNDMENT was

excavated and the closure cell constructed, there is currently a low potential for air to be a migration pathway.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: No PCBs, were detected in the ~~POND~~ SURFACE IMPOUNDMENT backfill or clay beneath the ~~POND~~ SURFACE IMPOUNDMENT during sampling conducted in 1983 (~~ATTACHMENT A~~ APPENDIX A). ONE SOIL SAMPLE WAS COLLECTED FOR EP TOXICITY ANALYSIS. THIS SOIL SAMPLE DID NOT ~~DETECT ANY~~ INDICATE THE PRESENCE OF METALS.

SWMU 7 - ~~POND~~ SURFACE IMPOUNDMENT 7

Regulatory Status: ~~RCRA Regulated Unit - Closed~~ INACTIVE; RCRA CLOSED (OEPA APPROVED CERTIFICATION); 1985

UNIT DESCRIPTION: ~~POND~~ SURFACE IMPOUNDMENT 7 was unlined, It had a natural clay bottom, measuring 800'x200'x15'' and had a capacity of 19,200,000 gallons. ~~POND~~ SURFACE IMPOUNDMENT 7 received organic contaminated liquids, organics, organic and inorganic sludges and contaminated spent acids. The ~~POND~~ SURFACE IMPOUNDMENT was used as a settling/treatment ~~POND~~ SURFACE IMPOUNDMENT for waste acids and oils. ~~POND~~ SURFACE IMPOUNDMENT 7 received both raw wastes and liquid wastes pumped from ~~pond~~ SURFACE IMPOUNDMENT 5. These wastes were then be pumped to ~~pond~~ SURFACE IMPOUNDMENT 11.

STATUS: ~~pond~~ SURFACE IMPOUNDMENT 7 was closed in 1985. In 1983, approximately 170,000 gallons with 1000 ppm PCB was skimmed from ~~pond~~ SURFACE IMPOUNDMENT 5 and incinerated at the CWM facility in Emele, Alabama. Aqueous wastes were pumped to ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12. The sludges were fixed by mixing with lime and cement kiln dust. The 46,873 cubic yards of fixed sludges were then placed in a temporary waste pile. Excavation to native clay was then completed and the dikes were pushed in.. The closure cell has been built over the area where ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7 were located. The waste pile was placed into the closure cell in 1991. The closure cell was completed in 1992.

PERIOD OF OPERATION: 1968 - 1985

CONSTITUENTS: Types of waste include; waste oils, acids, pickle liquors, phenolic wastes, unknown.
Types of waste constituents include; PCBs, D004-D011 metals, VOCs, PAHs, dioxins, unknowns.

RELEASE CONTROLS: Earthen Dikes

MEDIA OF CONCERN: Groundwater

RELEASE HISTORY: In 1979, a displaced transfer line from the ~~pond~~ SURFACE IMPOUNDMENT 7 to 11 discharged up to 96,000 gallons of waste acid to the ground outside, the east dike of ~~pond~~ SURFACE IMPOUNDMENT 11. The waste made its way to Meyers Ditch and was reported to have been pumped out. In 1981, a transfer line from ~~pond~~ SURFACE IMPOUNDMENT 7 to 11 failed spilling 1,000 to 1,500 gallons of acid. The acid was removed to the ~~impoundments~~ SURFACE IMPOUNDMENTS and soil was excavated and removed with dike wall and sent off-site for disposal. In 1984, the transfer line from ~~pond~~ SURFACE IMPOUNDMENT 7 to 11 failed due to corrosion of an abandoned drain pipe connected to the transfer line spilling 300 gallons of acid. The recovered acids were removed, and ultimately disposed down the deep wells. The contaminated soils were removed and sent offsite for disposal. In 1985, the transfer pump failed spilling 500 gallons of acid from ~~pond~~ SURFACE IMPOUNDMENT 11. The recovered acids were pumped to ~~pond~~ SURFACE IMPOUNDMENT 11 and the contaminated soils were treated with lime and disposed off-site. Additionally in 1985, an open valve discharged 500 gallons of acid from ~~pond~~ SURFACE IMPOUNDMENT 7 to a drainage ditch adjacent to the pond's dike. The recovered acids were pumped to ~~pond~~ SURFACE IMPOUNDMENT 11 and the contaminated soils were removed and placed on the waste

pile. In 1989, 100 to 1,500 gallons of acid from ~~pond~~ SURFACE IMPOUNDMENT 7 was discharged at the pump house. Air releases from incompatible materials have been known to occur throughout the operating history of the ~~pond~~ SURFACE IMPOUNDMENT. These air releases involved unknown amounts of NO_3 and NO_2 fumes and a uncontrolled release of a cloud of NO_x in 1989 was documented as leaving the site in a southwesterly direction for approximately 2 miles.

MIGRATION PATHWAYS:

Soil: Releases from this ~~pond~~ SURFACE IMPOUNDMENT to the soil has been documented. Up to 100,000 gallons of waste acid has been released from this pond's transfer piping in various incidents during its operation. The clays which underline the ~~pond~~ SURFACE IMPOUNDMENT and seeps emanating from the south slope of the excavated ~~pond~~ SURFACE IMPOUNDMENT have indicated no residual contamination. Since the unit has been closed and analysis of subsurface soils following residue and sludge stabilization and removal have been completed, the potential for soil to be a migration pathway now remains low.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants as evidenced by the widespread soil releases. The water table in the lacustrine zone which was above the base of the ~~pond~~ SURFACE IMPOUNDMENT at one time may suggest some connection to the groundwater. The ~~pond~~ SURFACE IMPOUNDMENT was unlined and contained up to 20 feet of liquid waste during its period of operation. The installation of the capillary drain under the closure cell has reduced the tendency for the migration of contaminants from the ~~pond~~ SURFACE IMPOUNDMENT by lowering the hydraulic head. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample

holes adjacent to the unit, an investigation in May 1983, and analyses of groundwater from the capillary drain have determined that no release to the groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: Prior to the closing of the ~~pond~~ SURFACE IMPOUNDMENT, the potential for surface water to be a migration pathway existed. A release of up to 96,000 gallons of waste acid to Meyers Ditch has been documented. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: The ~~ponds~~ SURFACE IMPOUNDMENTS have released numerous VOCs and inorganic acids to the air, as documented in data collected in 1983. However, since the ~~pond~~ SURFACE IMPOUNDMENT was excavated and the closure cell constructed, there is currently a low potential for air to be a migration pathway.

Subsurface gas: There is a moderate potential for releases of subsurface gases to the capillary drain system beneath the closure cell. However, any releases would be vented through the capillary drainage system.

PREVIOUS SAMPLING DATA: Waste oil from ~~pond~~ SURFACE IMPOUNDMENT 7 contained concentrations of PCBs of approximately 1,000 ppm. The sludge samples collected from the ~~pond~~ SURFACE IMPOUNDMENT contained up to 42 ppm

PCBs. The seeps from the south end of the ~~pond~~ SURFACE IMPOUNDMENT during excavation indicated the presence of phenols. Evaluation of the groundwater monitoring well data from monitoring wells around the facility was conducted by Golder Associates in 1988, and demonstrated that many of the results from groundwater sampling were false indicators of potential contamination. The only positive identification of a detection of groundwater contamination exists in monitoring well L-19, located southeast of the ~~pond~~ SURFACE IMPOUNDMENT. The compound 1,2-Dichloroethane (1,2-DCA) has been detected repeatedly in groundwater monitoring well L-19 An investigation of the area of L-19 was conducted by Golder Associates in 1990 and concluded that the hydrogeologic and analytical data for monitoring wells L-19, T-19 and MW-19R and the results of the investigation program suggested a localized condition around monitoring well L-19 to be the cause of the presence of 1,2-DCA in this area. The compound did not indicate migration downward, as evidenced by the analytical results from monitoring wells T-19 and MW-19R.Since previous monitoring results from monitoring well L-19 indicated little variation in concentration of 1,2-DCA, Golder suggested that the contamination present in monitoring well L-19 was a localized, static situation (ATTACHMENT D). Potential lateral migration of the contaminants is minimal due to the low lateral groundwater flow velocity. GROUNDWATER FLOW VELOCITIES WITHIN THE LACUSTRINE, TILL AND BEDROCK UNITS ARE PRESENTED ON FIGURES 4-9 THOUGH 4-17. A DISCUSSION ON THE HYDRAULIC PROPERTIES OF THESE UNITS ARE PRESENTED IN SECTION 4.4.2 AND 4.4.3. ADDITIONAL SAMPLING HAS BEEN COMPLETED AS PART OF THE EXCAVATION AND CLEAN CLOSURE OF SURFACE IMPOUNDMENT 4. THESE

RESULTS CAN BE FOUND IN THE CLOSURE CELL DOCUMENTS PREVIOUSLY TRANSMITTED TO THE USEPA. ALL CONTAMINATED SOILS WERE EXCAVATED AND PLACED IN THE WASTE PILE AND SUBSEQUENTLY MOVED TO THE TSCA CLOSURE CELL.

SWMU 8 - ~~pond~~ SURFACE IMPOUNDMENT 9 and Wet Well

Regulatory Status: ~~RCRA Regulated Unit - Closed~~
SURFACE IMPOUNDMENT 9-INACTIVE; NON-RCRA CLOSED; 1981
WET WELL - CLEAN CLOSED JULY 1984 AS PILOT FOR CLOSURE OF 4, 5 AND 7, APPROVAL OEPA

UNIT DESCRIPTION: ~~pond~~ SURFACE IMPOUNDMENT 9 was unlined It had a natural clay bottom, measuring 440'x80'x10'' and had a capacity of 1,000,000 gallons. ~~pond~~ SURFACE IMPOUNDMENT 9 received organic liquids, and inorganic sludges. The ~~pond~~ SURFACE IMPOUNDMENT was used to store a variety of sludges and hydroxide slurries from other ~~ponds~~ SURFACE IMPOUNDMENTS. An appendage to ~~pond~~ SURFACE IMPOUNDMENT 9, known as the Wet Well, was located on the southwest corner of the ~~pond~~ SURFACE IMPOUNDMENT. The Wet Well had a dimension of 110'x90' and was actually the first ~~pond~~ SURFACE IMPOUNDMENT developed at the facility to store waste oils, acids and sludges. It is assumed that the sludges from the Wet Well were placed in ~~pond~~ SURFACE IMPOUNDMENT 9 for storage.

STATUS: ~~pond~~ SURFACE IMPOUNDMENT 9 was closed in 1981. Liquids from the ~~pond~~ SURFACE IMPOUNDMENT were pumped to ~~pond~~ SURFACE IMPOUNDMENT 4. In 1978, sludges from the ~~pond~~ SURFACE IMPOUNDMENT were mixed with dirt and backfilled into ~~pond~~ SURFACE IMPOUNDMENT 1. In 1980, the sludges from the ~~pond~~ SURFACE IMPOUNDMENT were ~~be-~~fixed with foundry sand and lime, and pickle liquors using the Pug Mill. In 1981, the ~~pond~~ SURFACE IMPOUNDMENT was backfilled with clean stone and soil. In 1984, the Wet Well was drained to ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5

and 7 and was used as a pilot project in preparation for the closure of ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7. The sludges were solidified with lime and cement kiln dust, excavated and placed on the south end of ~~pond~~ SURFACE IMPOUNDMENT 4 and subsequently placed in the temporary waste pile. The wet well was backfilled with clean~~s~~ soil. The temporary waste pile was placed over the area where ~~pond~~ SURFACE IMPOUNDMENTS 1, 2, 3 and 9 ~~and wet well~~ were located. The waste pile was placed into the closure cell in 1991. The entire area where the waste pile was located was capped with clay.

PERIOD OF OPERATION: ~~pond~~ SURFACE IMPOUNDMENT 9: 1968 - 1981.
Wet Well: 1958? - 1984.

CONSTITUENTS: Types of waste include; waste oils, acids, pickle liquors, sludges, unknowns.
Types of waste constituents include; PCBs, D004-D011 metals, VOCs, PAHs, unknowns.

RELEASE CONTROLS: Earthen Dikes

MEDIA OF CONCERN: Groundwater, SOIL

RELEASE HISTORY: Unknown

IGRATION PATHWAYS: **Soil**: The soil remains a migration pathway due to the fact the ~~pond~~ SURFACE IMPOUNDMENT did not have a liner. Hazardous contaminants (i.e., PCBs) were in direct contact with the underlying clay soils. PCBs were found in the backfilled material of ~~pond~~ SURFACE IMPOUNDMENT 9 and in the clay berms of the Wet Well. It is likely that more mobile contaminants have also migrated through the soils.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants from ~~pond~~ SURFACE IMPOUNDMENT 9 due to the lack of a liner. The natural clay underlying the ~~pond~~ SURFACE IMPOUNDMENT may have acted as a barrier however, the clay may have only slowed the migration through to the underlying groundwater. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit, and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: Prior to the closure of the ~~pond~~ SURFACE IMPOUNDMENT, the potential for surface water to be a migration pathway existed. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: Soil and sludge samples were collected by Environmental Testing and Certification in 1983 as part of the Clean

Water, Inc., Closed Lagoons, Site 690, Phase VB Final Report. This report describes the purpose, field methodology, and location of the samples (Attachment ~~1~~ A). The analytical results indicated that PCBs were present at a concentration of 34 ppm at a depth of 9 feet. The PCBs were detected at 75 and 7 ppm in the clay berm of the Wet Well. NO SOIL SAMPLES COLLECTED FOR METALS ANALYSIS HAS BEEN DOCUMENTED. Monitoring well L-26 located near the Wet Well has detected various organic compounds. However, an evaluation of the groundwater monitoring well data from monitoring wells around the facility was conducted by Golder Associates in 1988 AND DOCUMENTED IN THE REPORT TITLED "MONITORING WELL SYSTEM, ANALYTICAL DATA EVALUATION, VICKERY, OHIO FACILITY. THIS REVIEW OF ANALYTICAL DATA demonstrated that many of the results from groundwater sampling were false indicators of potential contamination. THE RESULTS OF THE TWO INITIAL LIST MONITORING EVENTS AND THE TWO CONTINUING LIST MONITORING EVENTS OF THE WELLS INSTALLED TO DATA INDICATE NO GROUNDWATER CONTAMINATION ASSOCIATED WITH THE VICKERY WASTE DISPOSAL FACILITIES. THE GOLDER REPORT CONTINUES ON TO SAY THAT THERE IS NO DISTINCT, POSITIVE EVIDENCE IN THE DATA TO SUGGEST THE PRESENCE OF OVERALL SITE GROUNDWATER CONTAMINATION OR TO SUGGEST THE PRESENCE OF A CHEMICAL PLUME WITHIN THE GROUNDWATER SYSTEM.

SWMU 9 - ~~pond~~ SURFACE IMPOUNDMENT 10

Regulatory Status: ~~RCRA Regulated Unit - Closed~~
INACTIVE; NON RCRA CLOSED; 1982 - CLOSURE REPORT/PLAN SUBMITTED TO OEPA FEBRUARY 1991.

UNIT DESCRIPTION: ~~pond~~ SURFACE IMPOUNDMENT 10 was unlined. It had a natural clay bottom, measuring 520'x150'x12 and had a capacity of 8,500,000 gallons. ~~pond~~ SURFACE IMPOUNDMENT 10 received phenolic wastes, sludges and fixed ~~pond~~ SURFACE IMPOUNDMENT 9 sludge.

STATUS: ~~pond~~ SURFACE IMPOUNDMENT 10 was closed in 1982. In 1980, liquid wastes were drained from the ~~pond~~ SURFACE IMPOUNDMENT in preparation for backfilling. Pumpable sludges were transferred into ~~pond~~ SURFACE IMPOUNDMENT 4. Non-pumpable sludges were mixed with cement kiln dust and then moved to the south side of ~~pond~~ SURFACE IMPOUNDMENT 4. The ~~pond~~ SURFACE IMPOUNDMENT was backfilled with a mixture of fixed sludge from ~~pond~~ SURFACE IMPOUNDMENT 9 and clean soil, and capped with clay in 1982 to permit drainage and runoff.

PERIOD OF OPERATION: 1971 - 1982

CONSTITUENTS: Types of waste include; aqueous phenolics and sludges. Types of waste constituents include; PCBs, D004-D011 metals, phenols, VOCs, PAHs, dioxins and unknowns.

RELEASE CONTROLS: Earthen Dikes

MEDIA OF CONCERN: Groundwater, SOIL

RELEASE HISTORY: Unknown

MIGRATION PATHWAYS: **Soil:** There remains a migration pathway due to the fact the ~~pond~~ SURFACE IMPOUNDMENT had no liner and phenolic wastes have been in direct contact with the underlying clay since 1971. Underlying soils have been analyzed for PCBs only. There is no data on the more mobile contaminants such as VOCs and SVOCs.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants due to the lack of a liner under the ~~pond~~ SURFACE IMPOUNDMENT. The ~~pond~~ SURFACE IMPOUNDMENT contained hazardous wastes such as phenols, which were in direct contact with the underlying clays. The natural clay underlying the ~~pond~~ SURFACE IMPOUNDMENT may have acted as a barrier, however the clay may have only slowed the migration through to the underlying groundwater. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: There is a low potential that surface water was a migration pathway as the pond's dikes were made of clay. However, no releases have been reported. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the

potential for surface water to be a migration pathway no longer exists.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: No PCBs, were detected in the ~~pond~~ SURFACE IMPOUNDMENT backfill or clay beneath the ~~pond~~ SURFACE IMPOUNDMENT during sampling conducted in 1983. Soil and sludge samples were collected by Environmental Testing and Certification in 1983 as part of the Clean Water, Inc., Closed Lagoons, Site 690, Phase VB Final Report. This report describes the purpose, field methodology, and location of the samples (Attachment ~~1~~ A). However, 0.22 ppb of dioxin was reported at a depth of 3 feet. No data is available on SVOCs OR METALS. Monitoring wells in the area of the ~~pond~~ SURFACE IMPOUNDMENT indicated contamination of TOX and phenols, however, evaluation of the groundwater monitoring well data from monitoring wells around the facility was conducted by Golder Associates in 1988 AND DOCUMENTED IN THE REPORT TITLED "MONITORING WELL SYSTEM, ANALYTICAL DATA EVALUATION, VICKERY, OHIO FACILITY. THIS REVIEW OF ANALYTICAL DATA demonstrated that many of the results from groundwater sampling were false indicators of potential contamination. THE RESULTS OF THE TWO INITIAL LIST MONITORING EVENTS AND THE TWO CONTINUING LIST MONITORING EVENTS OF THE WELLS INSTALLED TO DATA INDICATE NO

GROUNDWATER CONTAMINATION ASSOCIATED WITH THE VICKERY WASTE DISPOSAL FACILITIES. THE GOLDER REPORT CONTINUES ON TO SAY THAT THERE IS NO DISTINCT, POSITIVE EVIDENCE IN THE DATA TO SUGGEST THE PRESENCE OF OVERALL SITE GROUNDWATER CONTAMINATION OR TO SUGGEST THE PRESENCE OF A CHEMICAL PLUME WITHIN THE GROUNDWATER SYSTEM. NEED RESULTS FROM CLOSURE OF 11 AND 12 HERE.

SWMU 10 - ~~pond~~ SURFACE IMPOUNDMENT 11

Regulatory Status: ~~RCRA Regulated Unit - Closed~~
INACTIVE; RCRA CLOSED (OEPA APPROVED CERTIFICATION); 1992

UNIT DESCRIPTION: ~~pond~~ SURFACE IMPOUNDMENT 11 was unlined. It had a natural clay bottom, measuring 900'x450'x29' and had a capacity of approximately 80,000,000 gallons. ~~pond~~ SURFACE IMPOUNDMENT 11 received organic contaminated liquids, organics, organic and inorganic sludges and contaminated spent acids. ~~pond~~ SURFACE IMPOUNDMENT 11 was used as a settling ~~pond~~ SURFACE IMPOUNDMENT for oily and acidic wastes pumped from ~~pond~~ SURFACE IMPOUNDMENT 7.

STATUS: ~~pond~~ SURFACE IMPOUNDMENT 11 was closed in 1992. In 1985, during the closure of ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7, liquid wastes from these ~~ponds~~ SURFACE IMPOUNDMENTS were pumped to ~~pond~~ SURFACE IMPOUNDMENT 11. The ~~pond~~ SURFACE IMPOUNDMENT also received wastes from the Wet Well. The ~~pond~~ SURFACE IMPOUNDMENT was closed by the fixation of sludges which were placed in the closure cell. Additionally, excavated contaminated soils were placed in the closure cell and the unit was "clean closed" following implementation of post-closure grid sampling system.

PERIOD OF OPERATION: 1971 - 1992

CONSTITUENTS: Types of waste include; oily wastes, waste acids, pickle liquors, caustics, phenols and unknown.
Types of waste constituents include; PCBs, D004-D011 metals, phenols, VOCs, PAHs, and unknowns.

RELEASE CONTROLS: Earthen Dikes

MEDIA OF CONCERN: Groundwater

RELEASE HISTORY: In 1979 the transfer line from ~~pond~~ SURFACE IMPOUNDMENT 7 to 11 failed and between 10,500 and 96,000 gallons of acid spilled to the ~~pond~~ SURFACE IMPOUNDMENT 11 dike wall. In 1984, the transfer line on ramp at the north side of the ~~pond~~ SURFACE IMPOUNDMENT was struck by a truck and broke allowing 5,000 gallons of acid to spill. The liquid was removed to the deepwell system and the contaminated soil was removed for off-site disposal. In 1985, on the east side unloading area, general spills associated with truck unloading occurred. Approximately 100 gallons were transferred to ~~pond~~ SURFACE IMPOUNDMENT 11 and contaminated soils were removed and placed in the waste pile. Additionally, in 1985, approximately 1,500 gallons of waste from the ~~pond~~ SURFACE IMPOUNDMENT was discharged into a surface drainage ditch on the east side.

MIGRATION PATHWAYS: **Soil:** The soil was a migration pathway due to the fact the ~~pond~~ SURFACE IMPOUNDMENT had no liner and phenolic wastes were in direct contact with the underlying clay during operation. However, since the ~~pond~~ SURFACE was "clean closed", there is a low potential for contamination to be present in the soil.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants due to the lack of a liner under the ~~pond~~ SURFACE IMPOUNDMENT and that this ~~pond~~ SURFACE IMPOUNDMENT was the only one built on rip-rap. The ~~pond~~ SURFACE IMPOUNDMENT contained hazardous wastes such as PCBs, metals, organics and phenols, which were in direct

contact with the underlying clays. The natural clay underlying the ~~pond~~ SURFACE IMPOUNDMENT may have acted as a barrier, however the clay may have only slowed the migration through to the underlying groundwater. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: There is a low potential that surface water was a migration pathway as the pond's dikes were made of clay and no releases have been reported. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: Black oily sludges from the rip-rap of the ~~pond~~ SURFACE IMPOUNDMENT contained 576 ppm PCBs (ATTACHMENT A). This unit was "clean closed" in 1992

and sampling of the excavated soils which underlined the ~~pond~~ SURFACE IMPOUNDMENT were collected following implementation of post-closure grid sampling system.

~~RESULTS OF CLOSURE OF SAMPLING POND 12.~~

THIRTY SOIL SAMPLES WERE COLLECTED AS PART OF THE SAMPLING PLAN FOR CLEAN CLOSURE OF SURFACE IMPOUNDMENT 11. THE SAMPLES WERE COLLECTED IN SAMPLING ROUNDS. SUBSEQUENT ROUNDS OF SOIL SAMPLES WERE COLLECTED IF THE ANALYSIS INDICATED THE PRESENCE OF CONTAMINANTS IN THE SOILS. ADDITIONAL SOIL WAS EXCAVATED AND ADDITIONAL SOIL SAMPLES WERE COLLECTED IN THE AREAS OF THE ELEVATED LEVELS OF CONTAMINANTS. SOIL SAMPLES WERE ANALYZED FOR VOLATILE ORGANICS, PCBS AND METALS. THE SOIL SAMPLE RESULTS FOR VOLATILE ORGANICS INDICATED THREE "HITS" OUT OF THE THIRTY SAMPLES COLLECTED. ADDITIONAL SOIL WAS EXCAVATED WITHIN THESE AREAS AN ANOTHER ROUND OF SOIL SAMPLES WERE THEN COLLECTED. ONLY ONE SOIL SAMPLE LOCATION INDICATED A "HIT" AT THE END OF ROUND 2 SAMPLING. MORE SOIL WAS EXCAVATED IN THIS AREA AND SOIL SAMPLING WAS AGAIN INITIATED. THIS AREA DID NOT DETECT ANY ADDITIONAL VOLATILE CONTAMINANTS AFTER ROUND 3. THE CONSTITUENTS IDENTIFIED ABOVE DETECTION LIMITS DURING THE THREE ROUNDS OF SOIL SAMPLING WAS CHLOROBENZENE, 4-METHYL-2-PENTANONE, CHLOROFORM, TOTAL XYLENES, TETRACHLOROETHANE, TOLUENE AND

TRICHLOROETHENE. PCB ANALYSIS OF THE SOIL INDICATED FOUR SOIL SAMPLING LOCATIONS EXCEEDING THE DETECTION LIMITS AFTER ROUND 1 SAMPLING. ONLY ONE SOIL SAMPLE EXCEEDED THE DETECTION LIMITS AFTER ROUND 2 SAMPLING. THE PCBs WHICH EXHIBITED ELEVATED LEVELS WERE AROCHLOR 1248 AND 1254. TOTAL METALS ANALYSIS OF THE SOIL INDICATED FIVE SOIL SAMPLE LOCATIONS WHICH INDICATED ELEVATED LEVELS OF METALS ABOVE THE DETECTION LIMITS. ADDITIONAL SOIL WAS REMOVED IN THESE LOCATIONS AND SOIL SAMPLING WAS CONDUCTED AGAIN. AFTER ROUND 2 SOIL SAMPLING TWO LOCATIONS STILL INDICATED ELEVATED LEVELS OF CERTAIN METALS ABOVE THE DETECTION LIMITS. MORE SOIL WAS REMOVED IN THESE AREAS AND THEY WERE SAMPLED AGAIN AND NO DETECTION OF TOTAL METALS WERE INDICATED. TOTAL METALS PRESENT AFTER ROUNDS 1 AND 2 WERE TOTAL ARSENIC, TOTAL CHROMIUM, TOTAL CYANIDE, TOTAL LEAD, TOTAL MERCURY AND TOTAL SELENIUM.

SOIL SAMPLING WAS TERMINATED AT THIS POINT AND CERTIFICATION OF "CLEAN" CLOSURE OF THE SOIL CONDITIONS UNDER SURFACE IMPOUNDMENT 11 WAS ACCEPTED BY THE OEPA.

SWMU 11 - ~~pond~~ SURFACE IMPOUNDMENT 12

Regulatory Status: ~~RCRA Regulated Unit - Closed~~
INACTIVE; RCRA CLOSED (OEPA APPROVED CERTIFICATION); 1992

UNIT DESCRIPTION: ~~pond~~ SURFACE IMPOUNDMENT 12 was unlined. It had a natural clay bottom, measuring 860'x600'x34' and had a capacity of approximately 110,000,000 gallons. ~~pond~~ SURFACE IMPOUNDMENT 12 received organic contaminated liquids, organics, organic and inorganic sludges and contaminated spent acids. ~~pond~~ SURFACE IMPOUNDMENT 12 was used as a settling ~~pond~~ SURFACE IMPOUNDMENT for acidic wastes pumped from ~~pond~~ SURFACE IMPOUNDMENT 11 after the filtering process was completed. The waste from the ~~pond~~ SURFACE IMPOUNDMENT was then passed through a grit filter for ultimate disposal through the deep well system.

STATUS: ~~pond~~ SURFACE IMPOUNDMENT 12 was closed in 1992. The ~~pond~~ SURFACE IMPOUNDMENT was closed by the fixation and stabilization of sludges which were placed in the closure cell. Additionally, excavated contaminated soils were placed in the closure cell and the unit was "clean closed" following implementation of post-closure grid sampling system.

PERIOD OF OPERATION: 1971 - 1992

CONSTITUENTS: Types of waste include; oily wastes, waste acids, pickle liquors, caustics, phenols and unknown.
Types of waste constituents include; D004-D011 metals, phenols, VOCs, and unknowns.

RELEASE CONTROLS: Earthen Dikes, SURFACE WATER

MEDIA OF CONCERN: Groundwater

RELEASE HISTORY: In 1984, a transfer pump for the ~~pond~~ SURFACE IMPOUNDMENT liquids failed spilling 2,000 to 4,000 gallons of liquid on an adjacent dike. The liquids were removed back to the ~~pond~~ SURFACE IMPOUNDMENT and the soil was treated with lime and removed for offsite disposal. In 1988, 12,000 gallons of dilute sulfuric acid was released to the on-site portion of Meyers Ditch.

MIGRATION PATHWAYS: **Soil:** The soil was a migration pathway due to the fact the ~~pond~~ SURFACE IMPOUNDMENT had no liner and phenolic wastes were in direct contact with the underlying clay during operation. However, since the ~~pond~~ SURFACE IMPOUNDMENT was "clean closed",there is a low potential for contamination to be present in the soil.

Groundwater: There remains a potential for groundwater to be a migration pathway for the contaminants due to the lack of a liner under the ~~pond~~ SURFACE IMPOUNDMENT. The ~~pond~~ SURFACE IMPOUNDMENT contained hazardous wastes such as metals, organics and phenols, which were in direct contact with the underlying clays. The natural clay underlying the ~~pond~~ SURFACE IMPOUNDMENT may have acted as a barrier, however the clay may have only slowed the migration through to the underlying groundwater. There is a groundwater monitoring system in place and groundwater monitoring wells, single sample holes adjacent to the unit and a closed unit investigation conducted in 1983 has determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS

INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: There is a release to Meyer's Ditch in the record. DUE TO A PRIOR RELEASE TO MEYER'S DITCH, THE SEDIMENTS OF THIS SURFACE WATER REMAIN A MODERATE CONCERN. Presently, since this ~~pond~~ SURFACE IMPOUNDMENT is closed, the potential for surface water to be a migration pathway no longer exists.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: This unit was "clean closed" in 1992 and sampling of the excavated soils which underlined the ~~pond~~ SURFACE IMPOUNDMENT were collected following implementation of post-closure grid sampling system. FORTY SOIL SAMPLES WERE COLLECTED AS PART OF THE SAMPLING PLAN FOR CLEAN CLOSURE OF SURFACE IMPOUNDMENT 12. THE SAMPLES WERE COLLECTED IN SAMPLING ROUNDS. SUBSEQUENT ROUNDS OF SOIL SAMPLES WERE COLLECTED IF THE ANALYSIS INDICATED THE PRESENCE OF CONTAMINANTS IN THE SOILS. ADDITIONAL SOIL WAS EXCAVATED AND ADDITIONAL SOIL SAMPLES WERE COLLECTED IN THE AREAS OF

THE ELEVATED LEVELS OF CONTAMINANTS. SOIL SAMPLES WERE ANALYZED FOR VOLATILE ORGANICS, PCBS AND METALS. THE SOIL SAMPLE RESULTS FOR VOLATILE ORGANICES DID NOT INDICATED ELEVATED LEVELS ABOVE THE REQUIRED DETECTION LIMIT. PCB ANALYSIS OF THE SOIL INDICATED THREE SOIL SAMPLING LOCATIONS EXCEEDING THE DETECTION LIMITS AFTER ROUND 1 SAMPLING. ONLY ONE SOIL SAMPLE EXCEEDED THE DETECTION LIMITS AFTER ROUND 2 SAMPLING. SOIL SAMPLE RESULTS AFTER ROUND THREE DID NOT INDICATE ANY ADDITIONAL EXCEEDENCES. THE PCB EXHIBITING THE ELEVATED LEVELS WAS AROCHLOR 1248. TOTAL METALS ANALYSIS OF THE SOIL INDICATED SIX SOIL SAMPLE LOCATIONS WHICH INDICATED ELEVATED LEVELS OF METALS ABOVE THE DETECTION LIMITS. ADDITIONAL SOIL WAS REMOVED IN THESE LOCATIONS AND SOIL SAMPLING WAS CONDUCTED AGAIN. AFTER THE ROUND 2 SOIL SAMPLING, ONE LOCATION STILL INDICATED ELEVATED LEVELS OF CERTAIN METALS ABOVE THE DETECTION LIMITS. MORE SOIL WAS REMOVED IN THESE AREAS AND THEY WERE SAMPLED AGAIN AND NO DETECTION OF TOTAL METALS WERE INDICATED. TOTAL METALS PRESENT AFTER ROUNDS 1 AND 2 WERE TOTAL ARSENIC, TOTAL CADMIUM, TOTAL CHROMIUM, AND TOTAL LEAD.

SOIL SAMPLING WAS TERMINATED AT THIS POINT AND CERTIFICATION OF "CLEAN" CLOSURE OF THE SOIL CONDITIONS UNDER SURFACE IMPOUNDMENT 12 WAS ACCEPTED BY THE OEPA.

Monitoring wells in the area of the ~~pond~~ SURFACE IMPOUNDMENT indicated contamination of chromium however, evaluation of the groundwater monitoring well data from monitoring wells around the facility was conducted by Golder Associates in 1988 AND DOCUMENTED IN THE REPORT TITLED "MONITORING WELL SYSTEM, ANALYTICAL DATA EVALUATION, VICKERY, OHIO FACILITY. THIS REVIEW OF ANALYTICAL DATA demonstrated that many of the results from groundwater sampling were false indicators of potential contamination. THE RESULTS OF THE TWO INITIAL LIST MONITORING EVENTS AND THE TWO CONTINUING LIST MONITORING EVENTS OF THE WELLS INSTALLED TO DATA INDICATE NO GROUNDWATER CONTAMINATION ASSOCIATED WITH THE VICKERY WASTE DISPOSAL FACILITIES. THE GOLDER REPORT CONTINUES ON TO SAY THAT THERE IS NO DISTINCT, POSITIVE EVIDENCE IN THE DATA TO SUGGEST THE PRESENCE OF OVERALL SITE GROUNDWATER CONTAMINATION OR TO SUGGEST THE PRESENCE OF A CHEMICAL PLUME WITHIN THE GROUNDWATER SYSTEM.

SWMU 12 - North Landfarm

Regulatory Status: ~~Pre-RCRA - Closed~~
INACTIVE; ~~NON-RCRA CLOSED~~ PLACED OUT OF SERVICE IN 1981,

UNIT DESCRIPTION: The North Landfarm area is approximately 800'x375'. The landfarm was used to treat the sludges from ~~pond~~ SURFACE IMPOUNDMENT 9. Additional material landfarmed came from a trench dug along the north end of ~~pond~~ SURFACE IMPOUNDMENT 11 and 12. Sludge from ~~pond~~ SURFACE IMPOUNDMENT 6 may also have been landfarmed in this area.

STATUS: The North Landfarm was closed in 1981. The landfarm area was removed and placed in the south end of ~~pond~~ SURFACE IMPOUNDMENT 4 as part of the approved surface water management plan. The entire area was graded and capped with clay.

PERIOD OF OPERATION: 1974 - 1976

CONSTITUENTS: Types of waste include; oily sludges, plating sludges, and metal hydroxide sludges.
Types of waste constituents include; PCBs, D004-D011 metals, phenols, PAHs, VOCs, and unknowns.

RELEASE CONTROLS: Unknown

MEDIA OF CONCERN: Groundwater; ~~to a~~ (minimal) ~~extent~~, SOIL

RELEASE HISTORY: In 1984, PCBs were detected at 7 ppm in one SOIL sample collected in the landfarm area.

MIGRATION PATHWAYS:

Soil: The soil was a migration pathway due to the fact that PCBs in the soil have been documented. However, contaminated soil was removed in 1984.

Groundwater: The potential for groundwater to be a migration pathway is ~~minimal~~MODERATE. ~~There is a~~ THE groundwater monitoring system ~~in place and groundwater monitoring wells,~~ FOR THE FACILITY TO MONITOR FOR OFF SITE MOVEMENT OF CONTAMINATION. Single sample holes adjacent to the unit and a closed unit investigation WAS conducted in 1983. ~~has determined that~~ No release to groundwater has been detected, TO THE EXTENT OF THIS LIMITED INVESTIGATION. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: The potential for surface water to be a migration pathway no longer exists since the area has been remediated and regraded.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: PCBs were detected in one soil sample collected in the area at a concentration of 7 ppm (ATTACHMENT A).

SWMU 13 - East Landfarm

Regulatory Status:	~~Pre-RCRA - Closed~~ INACTIVE; ~~NON-RCRA CLOSED;~~ PLACED OUT OF SERVICE IN 1976, UNDER DIRECTION OF OEPA AREA WAS EXCAVATED IN 1984 AND BACKFILLED WITH CLEAN SOIL.
UNIT DESCRIPTION:	The East Landfarm MEASURED APPROXIMATELY 200' x 275' AND was used to farm the sludges from ~~pond~~ SURFACE IMPOUNDMENT 9 between 1975 and 1976.
STATUS:	The East Landfarm was closed in 1976. The East Landfarm area located next to the Oil Reclamation Area was excavated in 1984 placed in the waste pile and backfilled with clean soil.
PERIOD OF OPERATION:	1975 - 1976
CONSTITUENTS:	Types of waste include; oily sludges, plating sludges, and metal hydroxide sludges. Types of waste constituents include; D004-D011 metals, phenols, PAHs, VOCs.
RELEASE CONTROLS:	Unknown
MEDIA OF CONCERN:	Groundwater; ~~to a~~ (minimal) ~~extent~~, SOIL
RELEASE HISTORY:	Nine soil samples collected in the area indicated concentrations of PCBs to be less than 5 ppm.
MIGRATION PATHWAYS:	**Soil:**Soil as a migration pathway is minimal due to the fact that the contaminated soil was removed in 1984.

Groundwater: The potential for groundwater to be a migration pathway is ~~minimal~~ MODERATE. ~~There is a~~ THE groundwater monitoring system ~~in place and groundwater monitoring wells~~ FOR THE FACILITY IS TO MONITOR FOR OFF-SITE MOVEMENT OF CONTAMINATION. Single sample holes adjacent to the unit and a closed unit investigation WAS conducted in 1983. ~~has determined that~~ No release to groundwater has been detected TO THE EXTENT OF THIS LIMITED INVESTIGATION. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: The potential for surface water to be a migration pathway no long exists since the area has been remediated.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: Soil samples collected in the area in 1983 did not indicate the presence of PCBs above a concentration of 5 ppm (ATTACHMENT A).

SWMU 14 - South Landfarm

Regulatory Status:	~~Pre- RCRA - Closed~~ INACTIVE; ~~NON-RCRA CLOSED~~ PLACED OUT OF SERVICE IN 1976, NO AGENCY CERTIFICATION
UNIT DESCRIPTION:	The South Landfarm ~~was~~ MEASURED 250' x 150' AND WAS used to treat the sludges from ~~pond~~ SURFACE IMPOUNDMENT 9 between 1975 and 1976.
STATUS:	The South Landfarm was closed in 1976. The South Landfarm area was where former Injection Well 3 was located. The landfarm was closed by removal of surficial soils, and backfilled.
PERIOD OF OPERATION:	1975 - 1976
CONSTITUENTS:	Types of waste include; oily sludges, plating sludges. Types of waste constituents include; phenols, PAHs, VOCs.
RELEASE CONTROLS:	Unknown
MEDIA OF CONCERN:	Groundwater; ~~to a~~ (minimal) ~~extent~~, SOIL
RELEASE HISTORY:	Three soil samples were collected and all indicated PCB concentrations of less than 5 ppm.
MIGRATION PATHWAYS:	**Soil:**Soil as a migration pathway is minimal due to the fact that the contaminated soil was removed in 1984. **Groundwater:** The potential for groundwater to be a migration pathway is ~~minimal~~ MODERATE. ~~There is a~~ THE groundwater monitoring system in place. ~~and groundwater monitoring wells~~ Single sample holes adjacent

to the unit and a closed unit investigation WAS conducted in 1983. ~~has determined that~~ No release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: The potential for surface water to be a migration pathway no longer exists since the area has been remediated, regraded and revegetated.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: Soil samples collected in the area did not indicate the presence of PCBs above a concentration of 5 ppm. Soil and sludge samples were collected by Environmental Testing and Certification in 1983 as part of the Clean Water, Inc., Closed Lagoons, Site 690, Phase VB Final Report. This report describes the purpose, field methodology, and location of the samples (Attachment A).

SWMU 15 - Oil ~~Reclamation~~ RECOVERY Facility

Regulatory Status: ~~RCRA Regulated Unit - Closed~~
INACTIVE; NON-RCRA CLOSED; 1986, OEPA APPROVAL OF THE REMOVAL OF PCB CONTAMINATED SOILS, PIPING, TANKS AND DEBRIS TO WASTE PILE.

UNIT DESCRIPTION: The Oil ~~Reclamation~~ RECOVERY Facility was composed of six 420,000 gallon-capacity tanks in a diked sump area, four 15,000 gallon-capacity tanks, two reactors, one oil/water separator, a concrete oil pit, and support structures.

STATUS: In 1986, remediation was completed at this facility and included the removal of all PCB-contaminated oils to an off-site disposal facility, and the removal of contaminated soils, piping, tanks and miscellaneous debris to the waste pile.

PERIOD OF OPERATION: 1967 - 1985

CONSTITUENTS: Types of waste include; oily wastes, contaminated oils, oil/water emulsions, unknowns.
Types of waste constituents include; Cyanide, PCBs, PAHs, VOCs. D004-D011 metals, and unknown.

RELEASE CONTROLS: Dikes, unknown

MEDIA OF CONCERN: Groundwater, ~~to a~~ (minimal) ~~extent~~, SOIL

RELEASE HISTORY: In 1980, the cyanide reactor exploded due to incorrect addition of chromic acid to hydrogen peroxide/cyanide, resulting in the release of 5,000 gallons of waste to the air. In 1983, the overflow of PCB-contaminated oil occurred in Reactor 2. Approximately 400 gallons were spilled. A

number of smaller releases have been documented in the operating record.

MIGRATION PATHWAYS:

Soil: Soil remains as a potential migration pathway as releases of PCBs and VOCs have been documented. The grossly contaminated soil was removed to the waste pile, however, some minor residual VOC and PCB contamination may exist beneath the fill area.

Groundwater: The potential for groundwater to be a migration pathway is ~~minimal~~MODERATE. ~~There is a~~ THE groundwater monitoring system in place FOR THE FACILITY IS TO MONITOR OFF-SITE MOVEMENT OF CONTAMINANTS. ~~around the facility and groundwater monitoring wells,~~ Single sample holes adjacent to the unit and a closed unit investigation WAS conducted in 1983. ~~has determined that~~ No release to groundwater has been detected, TO THE EXTENT OF THIS LIMITED INVESTIGATION. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: The potential for surface water to be a migration pathway no longer exists since the area has been remediated, regraded and revegetated.

Air: Past releases to the air have been documented. However, since the Oil Reclamation Area has been dismantled, there is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: Analytical results of soil samples collected after the excavation of the contaminated materials indicate low levels of VOCs still are present. NO SOIL SAMPLES ARE DOCUMENTED TO HAVE BEEN ANALYZED FOR CYANIDE. THE EXTENT OF SUBSURFACE OIL MIGRATION APPEARED TO BE LESS THAN EXPECTED, AS DESCRIBED IN THE DAMES & MOORE REPORT TITLED " INVESTIGATION OF THE OIL RECOVERY AREA " DATED FEBRUARY 1, 1984. A DETAILED DESCRIPTION OF THE RESULTS OF THE INVESTIGATION IS PRESENTED IN APPENDIX E.

SWMU 16 - Waste Pile

Regulatory Status: ~~RCRA Regulated Unit - Closed~~
INACTIVE; RCRA CLOSED (OEPA APPROVED A CONTINGENT CLOSURE); 1991

UNIT DESCRIPTION: The waste pile was created from the closure of ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7, the Oil Reclamation Facility and other miscellaneous contaminated soils and debris from various closures of units on the facility. It was located over the area once occupied by ~~ponds~~ SURFACE IMPOUNDMENTS 1, 2, 3 and 9 and contained approximately 425,000 cubic yards of material.

STATUS: In 1991 the waste pile was placed within the closure cell and the area where the waste pile existed was excavated. Soil samples were collected from this area and "contingent closure" was achieved. The contingent closure consisted of excavating down in depth at three incremental levels within the sampling grid system and collecting samples. If the samples were within two standard deviations from background concentrations, the excavation of soils would cease. A two foot clay cap was placed over the entire area where the waste pile existed and the area was graded to enhance run-off.

PERIOD OF OPERATION: 1985 - 1991

CONSTITUENTS: Types of waste include; fixed ~~pond~~ SURFACE IMPOUNDMENT sludges, oil reclamation facility tanks, structures and soils.
Types of waste constituents include; PCBs, D004-D011 metals, VOCs, PAHs and phenols.

RELEASE CONTROLS: A plastic cover was used to reduce air emissions and was held down by old tires, netting and a cable grid. A perimeter drainage ditch was used direct run-off and leachate to the leachate retention basin located to the northeast of the waste pile.

MEDIA OF CONCERN: Groundwater, Soil

RELEASE HISTORY: In 1987, numerous leachate seeps were observed emanating from the base of the waste pile. The leachate seeps were observed flowing into a perimeter ditch that directs flow into a retention basin. The plastic cover has been documented to have torn and exposed the pile at various times during the unit's operational history. These tears were immediately repaired.

MIGRATION PATHWAYS: **Soil:** Soil remains as a potential migration pathway as the unit could only be "contingent" closed. Sludges and fill beneath the area from former ~~ponds~~ SURFACE IMPOUNDMENTS 1,2, 3 and 9 probably contain various waste constituents.

Groundwater: The potential for groundwater remains as a migration pathway as the unit could only be "contingent" closed. Various wastes in the fill and sludges underlying the area could migrate to the water table. There is a groundwater monitoring system in place around the waste pile area and groundwater monitoring wells, has determined that no release to groundwater has been detected.

Surface Water: Since the Waste Pile has been placed in the closure cell and the area regraded and revegetated, the potential for surface water to be a migration pathway no longer exists. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED

DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Air: Past releases to the air have been documented when the cover was torn. However, since the unit no longer exists, there is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: Analytical results of soil samples collected after the excavation of the contaminated materials indicate low levels of contaminants are still present. This is evident in the "contingent" closure the unit has received.

SWMU 17 - Leachate Retention Pond

Regulatory Status: ~~RCRA Regulated Unit - Closed~~
INACTIVE; RCRA CLOSED (OEPA APPROVED CERTIFICATION); 1991

UNIT DESCRIPTION: The Leachate Retention Pond was created to collect run-off from the waste pile in 1984, pursuant to an Ohio Consent Decree. It was located to the northeast of the waste pile AND MEASURED APPROXIMATELY 125' WIDE x 650' LONG.

STATUS: In 1991 the waste pile was placed within the closure cell and the area where the leachate retention pond existed was over-excavated and the material was placed in the closure cell. Soil samples were collected from this area and "clean" closure was achieved. A two foot clay cap was placed over the entire area and the area was graded to allow free discharge off-site.

PERIOD OF OPERATION: 1985 - 1991

CONSTITUENTS: Types of waste include; leachate, surface run-off from waste pile.
Types of waste constituents include; PCBs, D004-D011 metals, VOCs, PAHs and phenols.

RELEASE CONTROLS: Two feet of freeboard was maintained by pumping the leachate initially to ~~pond~~ SURFACE IMPOUNDMENT 12 and subsequently to the T-Tanks during the operation of the unit. Surface water management gate G-1 was permanently closed during the operation of the unit to prevent flow off-site.

MEDIA OF CONCERN: Groundwater~~, Soil~~

RELEASE HISTORY: In 1986 an incident occurred in which the surface water management gate G-1 was opened, releasing approximately 75,000 gallons of waste from the Leachate Retention Pond SURFACE IMPOUNDMENT to the Turnpike Ditch which flows to Little Raccoon Creek.

MIGRATION PATHWAYS: **Soil:** Soil is a low potential migration pathway due to the fact that the Leachate Retention Pond has been "clean" closed and the area filled in and regraded.

Groundwater: The potential for groundwater to be a potential migration pathway is minimal due to the "clean closure" of the unit. ~~Additionally, there is a groundwater monitoring system in place around the facility and groundwater monitoring wells, have determined that no release to groundwater has been detected.~~ MONITORING WELLS ARE IN PLACE IN THE DIRECTION OF PREDOMINANT GROUNDWATER FLOW. THESE WELLS HAVE DETERMINED THAT NO RELEASE HAS BEEN DETECTED. THE UNIT WAS CLEAN CLOSED AND THEREFORE THE SOURCES, IF ANY, HAS BEEN REMOVED. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: Since the Leachate Retention Pond has been "clean" closed and the area regraded and revegetated, the

potential for surface water to be a migration pathway no longer exists.

Air: Past releases to the air may have occurred during the past operation of the units due to the fact the pond was open to the air. However, since the unit no longer exists, there is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: This entire area has been over-excavated and the area has been "clean" closed. THE CERTIFICATION DOCUMENTS HAVE BEEN SUBMITTED TO BOTH THE OEPA AND USEPA.

SWMU 18 - Old W-Tank Farm

Regulatory Status: ~~RCRA Regulated Unit - Closed~~
INACTIVE; RCRA CLOSED (OEPA APPROVED CERTIFICATION); 1990 - 1991

UNIT DESCRIPTION: The Old W-Tank Farm was comprised of 4 ABOVEGROUND STEEL tanks (W-3, W-4, W-5 and W-7). These tank received wastes for storage prior to treatment. Each tanks were re-constructed in 1972 and was set on a sand bed foundation. The tanks were drained and the sludges removed as the New Tank Farm was constructed. THE CAPACITY OF THE TANKS WERE AS FOLLOWS: W-3 300,000, GALLON; W-4 340,000 GAL., W-5 340,000 GAL. AND W-7 320,000 GAL.

STATUS: In 1990, the cleaning and disposal of the tanks was performed. The surface soil excavation was performed in late 1990 In 1991, the W-Tank area was resampled and additionally contaminated soil was removed for off-site disposal. A second review of the soil sampling data revealed residual PCB contamination. Additional excavation was performed and the area was backfilled and later seeded in 1992. The unit is now "clean" closed.

PERIOD OF OPERATION: 1963 - 1989

CONSTITUENTS: Types of waste include; aqueous wastes, oily wastes, odorous wastes, phenolic wastes and unknowns.
Types of waste constituents include; PCBs, VOCs. D004-D011 metals, phenols and unknown.

RELEASE CONTROLS: W-7 and W-3 had a sensing device attached to the pressure release valve.

MEDIA OF CONCERN: Groundwater~~, to a minimal extent~~

RELEASE HISTORY: In 1984, organic wastewater leaked from W-7 discharging approximately 50 gallons. This was from a defective discharge valve. Additionally in 1984, nitrogen gas was released into the air due to a malfunction in the pressure-release system. Numerous small leaks and releases have occurred.

MIGRATION PATHWAYS: **Soil:** Soil NO LONGER remains as a potential migration pathway as~~ releases have been documented. However, the soil in~~ the area of the tanks have been excavated and the area has been "clean" closed. THE BOWSER-MORNER CERTIFICATION REPORT IS PRESENTED IN APPENDIX B.

Groundwater: The potential for groundwater to be a migration pathway is ~~minimal~~MODERATE-HIGH. However, SINCE THIS UNIT WAS CLEAN CLOSED, ANY SOURCE, IF PRESENT, HAS BEEN REMOVED.~~since the tanks were set on a sand bed foundation, the possibility still exists. There is a groundwater monitoring system in place around the facility and groundwater monitoring wells have determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.~~

Surface Water: Since the area has been remediated, regraded, revegetated and "clean" closed, the potential for surface water to be a migration pathway no longer exists.

Air: Past releases to the air have been documented. However, since the W-Tank area has been dismantled, and "clean" closed, there is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: PCBs and elevated metals contamination were found in the soils beneath the W-tanks. Excavation of soils underneath the W-Tank area have been completed. Soil samples have been collected and after repeated sampling events and additional excavation, the area was "clean" closed. THE CLOSURE CERTIFICATION REPORT IS PROVIDED AS APPENDIX F.

SWMU 19 - Old Drum Storage Pad

Regulatory Status: ~~RCRA Regulated Unit - Closed~~ INACTIVE; ~~NON-RCRA CLOSED;~~ 1983, STATUS ON APPROVAL OR CERTIFICATION UNKNOWN.

UNIT DESCRIPTION: The Old Drum Storage pad was located in the area of ~~pond~~ SURFACE IMPOUNDMENT 6W according to a facility map from 1981. The pad had a approximate dimension of 330'x75'. THE TOTAL CAPACITY OF THE PAD IS UNKNOWN.

STATUS: The unit is no longer in operation. It is believed that the unit was closed in 1983.

PERIOD OF OPERATION: 1981 - 1983

CONSTITUENTS: Types of waste include; unknowns (possibly phenolic and organic wastes).
Types of waste constituents include; unknowns (possibly, VOCs, phenols and PAHs

RELEASE CONTROLS: Unknown

MEDIA OF CONCERN: Soil, Groundwater

RELEASE HISTORY: Unknown

MIGRATION PATHWAYS: **Soil:** The potential for soil as a migration pathway is unknown due to the lack of data.

Groundwater: The potential for groundwater as a migration pathway is unknown due to the lack of data. However there is a groundwater monitoring system in place around the facility and groundwater monitoring wells have determined that no release to groundwater has been detected.

THEREFORE ANY OFF-SITE MIGRATION OF CONTAMINATION WOULD HAVE BEEN DETECTED. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: Since the area has been remediated, regraded, revegetated and closed, the potential for surface water to be a migration pathway no longer exists.

Air: Past releases to the air can not be evaluated due to the lack of data. However, since the area has been closed, there is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 20 - Lab Waste Tank

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: The Lab Waste Tank is a 2,500 gallon-capacity ~~polyurethane~~ POLYETHYLENE underground storage tank which receives Lab Wastes and unused portions of samples taken from tanker trucks. The tank is regularly pumped out for deep well injection. The tank sits in a concrete vault 9'x9'x9' with 8" walls and base. A previous ~~steel tank~~ CONCRETE CISTERN leaked and was replaced by ~~this polyurethane~~ A POLYETHYLENE tank IN A CONTAINMENT VAULT. THE LAB WASTE TANK WAS REPLACED AGAIN IN AUGUST 1994 BY ANOTHER POLYETHYLENE TANK AND THE CONTAINMENT VAULT WAS RELINED WITH A PVC LINER.

STATUS: ~~The Lab Waste Tank was replaced again in August 1994 and the containment vault was relined.~~ THE LAB WASTE TANK IS ACTIVE. A NEW POLYETHYLENE TANK WAS INSTALLED IN A RELINED CONCRETE VAULT

PERIOD OF OPERATION: ?PRE-1983-PRESENT

CONSTITUENTS: Types of waste include; unused tanker samples, lab waste (everything except F-solvents)
Types of waste constituents include; PCBs, VOCs, PAHs, phenols, D004-D011 metals~~ and unknown~~.

RELEASE CONTROLS: Level indicator with an alarm

MEDIA OF CONCERN: ~~Soil,~~ Groundwater

RELEASE HISTORY:

~~The previous steel underground storage tank developed a leak and was removed. Approximately two feet of contaminated soil was removed and disposed of off-site.~~ IN THE PAST THE PREVIOUS LAB WASTE, CONCRETE CISTERN WAS PUMPED OUT ONCE OR TWICE A WEEK. IN 1983 DURING A ROUTINE PUMP OUT, THE OPERATOR NOTICED SPILLAGE NEAR THE TANK DISCHARGE HOSE AND ASSOCIATED SKIM TRUCK. THE QUANTITY RELEASED AT THE TIME WAS NOT REPORTABLE. THE SPILLAGE MOTIVATED CWM VICKERY FACILITY PERSONNEL TO INVESTIGATE A SMALL WET SPOT APPROXIMATELY 4 -5 FEET SOUTH OF THE TANK DISCHARGE HOSE. AN INVESTIGATION OF THE INTEGRITY OF THE CISTERN DETERMINED THAT THE TANK/CISTERN WAS CORRODED AND CRACKED AT THE SEWER LINE CONNECTION. ADJACENT TO THE OPENING, DISCOLORED CLAY SOIL WAS NOTED AND INSIDE OF THE TANK/CISTERN A SLUDGE RESIDUE WAS PRESENT. THE CONCRETE CISTERN WAS REMOVED WITH TWO FEET OF ASSOCIATED CLAY AND A NEW CONCRETE LINED VAULT WAS PLACED IN THE GROUND WITH A POLYETHYLENE TANK INSIDE THE VAULT.

MIGRATION PATHWAYS:

Soil: The potential for soil as a migration pathway is minimal due to the fact the contaminated soil was removed with the concrete cistern. The present POLYETHYLENE tank sits in a LINED concrete vault.

Groundwater: The potential for groundwater to a migration pathway is minimal due to the underlying clay and its concrete vault and liner. Additionally, there is a groundwater monitoring system in place around the facility

and groundwater monitoring wells have determined that no release to groundwater has been detected. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: ~~No data is available.~~ DURING THE REMOVAL OF THE ORIGINAL CONCRETE CISTERN, AN ANALYSIS OF PCBs WAS CONDUCTED ON THE SOIL OUTSIDE THE TANK. THE RESULTS OF THIS ANALYSIS REPORT A CONCENTRATION OF PCBs OF LESS THAN 10 PPM. WHEN THE ORIGINAL CONCRETE CISTERN WAS REMOVED AN ADDITIONAL TWO FEET OR MORE OF SOIL WAS REMOVED WITH IT. SOIL SAMPLES DO NOT APPEAR TO HAVE BEEN SAMPLED FOR ANY OTHER CONSTITUENTS.

SWMU 21 - Truck Unloading and Washing Facility

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: The Truck Unloading and Washing Facility is a 60'x124'x24' steel framed, insulated building set on top of concrete piers with a 4' high concrete block wall. The facility is used for receipt of wastes from tank trucks prior to treatment. The concrete floors are sloped to 18 inch deep waste unloading sumps. Each sump is lined with a corrosion-resistant liner. The sumps lead to one of four grit filters which sit in pre-cast concrete chambers. The grit filters discharge to the V-tanks.

STATUS: The Truck Unloading and Washing Facility is still active. Pump unloading was installed.

PERIOD OF OPERATION: 1984 - Present

CONSTITUENTS: Types of waste include; waste pickle liquor, acids, brines. Types of waste constituents include; Hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids, D004-D011 metals.

RELEASE CONTROLS: Each sump contains spill resistant liners. Also the concrete floor is sloped both longitudinally and transversely. The sumps are in a 2'x2' deep concrete chambers.

MEDIA OF CONCERN: ~~Groundwater~~ NONE

RELEASE HISTORY: No releases are reported.

MIGRATION PATHWAYS: **Soil:** The potential for soil to a migration pathway is minimal due to the fact the facility is underlain by concrete.

Groundwater: The potential for groundwater as a migration pathway is minimal due to the fact that spills and wastewater are directed toward the unloading sumps.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the fact that spillage is directed toward the unloading sumps.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 22 - Grit Filters (aka, Gravity Filters, Sand Interceptors)

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: Unloading pipes from the Truck Unloading and Washing Facility lead to four grit filters. The Grit Filters are 5'x7'x9' and are constructed with 1/4" stainless steel plates. They have fiberglass grating over most of the top which allows removal of gross solids from the incoming flow. The Grit Filters are set below grade in precast concrete chambers (two per chamber). The chambers are each 11'6"x10'x6'. The top of the chambers are 6" above grade and have a fiberglass cover. Each chamber is vented to the caustic scrubber.

STATUS: The Grit Filters are still active.

PERIOD OF OPERATION: 1984 - Present

CONSTITUENTS: Types of waste include: waste pickle liquor, acids, brines. Types of waste constituents include: hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids; D004-D011 metals.

RELEASE CONTROLS: The concrete chambers serve as secondary containment which are 11'6"x10'x6". Each chamber is covered and gasketed. Also, each chamber is vented to the caustic scrubber.

MEDIA OF CONCERN: ~~Groundwater~~ NONE

RELEASE HISTORY: In 1989, a heel of nitric acid which remained in Grit Filter 3 and Tank V-6 reacted with sulfuric acid/pickle liquor unloaded through the same line. The reaction generated NO_x gases which overloaded the air scrubber. To prevent a reoccurrence, HF/HNO_3 acids are now unloaded only

through Grit Filter 2 and Tank V-7. Additional NO_x releases have occurred without adverse impact.

MIGRATION PATHWAYS:

Soil: The potential for soil to act as a migration pathway is minimal due to the fact that wastes are contained within steel and concrete chambers.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the that fact that wastes are contained within steel and concrete chambers.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air. The air in the Grit Filters is vented to the scrubber.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the fact that wastes are contained within steel and concrete chambers.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 23 - V-Tanks

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: The V-Tanks consists of four 5,920 gallon working volume tanks numbered V-4 through V-7. They are set below grade in a 30'x42' reinforced concrete vault. The vault is approximately 13 feet deep with 6 inches protruding above grade. The vault is covered by a wood and steel sheet building. Wastes are received through the Grit Filters and unloading lines. Discharge lines follow the above ground pipe racks to the various storage/treatment tanks. All tanks are vented to the air scrubber. The V-Tank vault is located just east of the truck unloading facility.

STATUS: The V-Tanks are still active.

PERIOD OF OPERATION: 1984 - Present

CONSTITUENTS: Types of waste include: all permitted wastes.
Types of waste constituents include: hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids; D004-D011 metals.

RELEASE CONTROLS: The vault is divided in half by a 5' 10" high concrete wall on its east-west axis. The two halves of the vault floor slope to sumps in the northeast and southeast corners. Pumps sit nearby.

MEDIA OF CONCERN: ~~Groundwater~~ NONE

RELEASE HISTORY: In 1989 approximately 50 gallons of pickle liquor was released to the ground from a transfer line from Tank V-6 to Tank T-1. Also in 1989 NO_x gases were released when pickle liquor mixed with nitric acid in a common transfer line between the V-Tank and the T-Tanks.

MIGRATION PATHWAYS:

Soil: The potential for soil to act as a migration pathway is minimal due to the fact that the tanks are in a concrete vault.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the fact that wastes are contained within a concrete vault.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air. The headspace gases are vented to the scrubber.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the fact that wastes are contained within steel and concrete chambers.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 24 - Waste Head-Gas Scrubber

Regulatory Status: ACTIVE; CAA Regulated Unit

UNIT DESCRIPTION: The caustic scrubber is a 20' x 5' diameter column, packed with plastic telerettes with contra flow gas and caustic liquid. It has a 25'x 16" diameter vertical exhaust stack. The unit and auxiliary equipment are set in a 27'x32'x16" reinforced concrete slab with a 1' x 3' high surrounding wall. Gas to be scrubbed is drawn into the bottom of the scrubber column and travels upward due to one of the two fans. The gas rising in the scrubber column is cleaned by an aqueous caustic spray injected near top. Contaminated scrubber liquid flows by gravity from the bottom of the column to a large ABOVE GRADE horizontal holding tank. THIS HORIZONTAL HOLDING TANK IS CONSTRUCTED OF STEEL, INSULATED AND LINED AND IS LOCATED WITHIN CONCRETE CONTAINMENT. IT HAS A CAPACITY OF 2,500 GAL. Scrubber lines bring gas from various units.

STATUS: Scrubber is operational.

PERIOD OF OPERATION: 1983 - Present

CONSTITUENTS: Types of waste include: gases vented from wastes in Grit Filters and Tanks.
Types of waste constituents include: acids, VOCs

RELEASE CONTROLS: Aqueous caustic spray inlets. THE HORIZONTAL HOLDING TANK HAS A pH METER, HIGH AND HIGH-HIGH LEVEL ALARMS, IN SECONDARY CONTAINMENT AND IS INSPECTED DAILY.

MEDIA OF CONCERN: Air

RELEASE HISTORY: In 1988, significant increases in chloride concentrations were observed which soon turned normal. In 1989, a nitrous oxide release occurred due to incompatible mixture of ferrous iron and nitrous acid. Also in 1989, another air release occurred due to the same cause.

MIGRATION PATHWAYS: **Soil:**The potential for soil to act as a migration pathway is minimal.

Groundwater: The potential for groundwater to act as a migration pathway is minimal. The waste is gaseous.

Surface Water: There is a low potential for releases to surface water. The waste is gaseous.

Air: Releases to the air have been documented. However, changes in the management of certain waste streams have been implemented to prevent further releases.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low. Gaseous waste is managed above the ground.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 25 -New Tank Farm (T-Tanks)

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: The New Tank Farm consists of 6-ABOVE GRADE-STEEL LINED storage tanks. Four tanks have a 200,000 gallon-capacity and two have a 100,000 gallon-capacity. These tanks sit on a 20-inch thick reinforced concrete foundation with dimensions of 143'x140'. All piping is supported above ground within the containment area. The tanks are enclosed within a secondary containment structure with dimensions of 140'x120'x3.5'. Each tank is vented through the packed tower scrubber.

STATUS: The New Tank Farm is still active.

PERIOD OF OPERATION: 1989 - Present

CONSTITUENTS: Types of waste include: aqueous acid wastes and F-solvents. Types of waste constituents include: waste pickle liquors; hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids; D004-D011 metals; and VOCs.

RELEASE CONTROLS: The tanks are located in a secondary containment structure. Each tank is located on a radially grooved raised pad, which conducts any released liquids to three collection sumps located in the northwest, southwest and southeast corners of the containment.

MEDIA OF CONCERN: ~~Groundwater, minimal~~ NONE

RELEASE HISTORY: No known releases

MIGRATION PATHWAYS:

Soil: The potential for soil to act as a migration pathway is minimal due to the fact that the tanks are underlain by a bermed concrete secondary containment area.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the fact that the tanks are underlain by a bermed concrete secondary containment area.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air. The tank head gas is vented to the scrubber and has a nitrogen blanket.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the fact that the tanks are underlain by a bermed concrete secondary containment area.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 26 -T-Tank Pump House

Regulatory Status:	ACTIVE; RCRA Regulated Unit
UNIT DESCRIPTION:	The T-Tank Pump House lies west of the New Tank Farm. It holds numerous pumps which move wastes between tanks, through filters, and circulates waste within tanks. EVENTUALLY PUMPS WASTES TO FATs FOR DEEP WELL INJECTION.
STATUS:	The T-Tank Pump House is still active.
PERIOD OF OPERATION:	1989 - Present
CONSTITUENTS:	Types of waste include: aqueous acid wastes and F-solvents. Types of waste constituents include: waste pickle liquors; hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids; D004-D011 metals; and VOCs.
RELEASE CONTROLS:	All pumps are housed within a building on a bermed concrete pad.
MEDIA OF CONCERN:	~~Groundwater, minimal~~ NONE
RELEASE HISTORY:	No known releases
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is minimal due to the fact that the pumps are located on a bermed concrete pad. **Groundwater:** The potential for groundwater to act as a migration pathway is minimal due to the fact that the pumps are located on a bermed concrete pad.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the fact that the pumps are located on a bermed concrete pad.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 27 - Filter Building 1

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: Filter Building 1 is a one-story steel framed building set on a reinforced slab on-grade that presently houses two pressure leaf filters. The building contains a concrete curb around an inside wall, designed to contain spills or leaks. The floor is sloped to convex liquid to a sump in the floor. In the event of an accumulation, a pump is used to pump liquid into FAT-A. The pressure leaf filters are horizontal vessels constructed of carbon steel and lined. The liquid to be filtered is pumped by a pump located in the southeast corner of the building. The southwest corner of the building contains the admix and precoat tanks used for mixing and applying the diatomaceous earth filter medium.

STATUS: Filter Building 1 is still active.

PERIOD OF OPERATION: 1975 - Present

CONSTITUENTS: Types of waste include: aqueous acid wastes.
Types of waste constituents include: waste pickle liquors; hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids; D004-D011 metals; and VOCs.

RELEASE CONTROLS: A concrete curb has been installed around the inside of the building in 1985. Also, an 8-foot high polyurethane coating sheet provides spill protection of walls. Various check valves provide additional release control.

MEDIA OF CONCERN: ~~Groundwater, minimal~~ NONE

RELEASE HISTORY: In 1985, overflow of the pre-coat tank resulted in a release of 50 gallons of acid waste to the floor which has been

documented to have flowed through ~~holes~~ DRAINS in the floor TO THE SLUICE PIT AND SUBSEQUENTLY PUMPED TO SURFACE IMPOUNDMENTS. Also, many 10- and 30-gallon spills have been documented.

MIGRATION PATHWAYS:

Soil: The potential for soil to act as a migration pathway was moderate before the drains were plugged and the concrete pad bermed. Currently the potential for soil contamination is low.

Groundwater: The potential for groundwater to act as a migration pathway was minimal due to the fact that the concrete floor is bermed

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the fact that the concrete floor is bermed and spills are contained and directed to a sump .

PREVIOUS SAMPLING DATA: No data is available.

SWMU 28 - Sluice Pit

Regulatory Status:	INACTIVE; RCRA Regulated Unit ~~- Inactive~~
UNIT DESCRIPTION:	The Sluice Pit was used as a BELOW GROUND holding tank for waste liquid during back-flushing of the leaf filters. The pit is a concrete box with a dimension of 10'x10' and it is located in a building between Filter Buildings 1 and 2.
STATUS:	The Sluice Pit is inactive but not closed.
PERIOD OF OPERATION:	1975 - 1986
CONSTITUENTS:	Types of waste include: acid waste backflush. Types of waste constituents include: waste pickle liquors; hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids; D004-D011 metals; and unknowns
RELEASE CONTROLS:	The Sluice Pit is a concrete pit located within a small shed with a steel berm.
MEDIA OF CONCERN:	Groundwater, SOIL
RELEASE HISTORY:	Unknown
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is high because the steel berm shows evidence of corrosion and soil staining was observed outside the berm. **Groundwater:** The potential for groundwater to act as a migration pathway is moderate if the concrete pit has cracked with age. **Surface Water:** There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 29 - Filter Building 2

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: Filter Building 2 contains a large, recessed plate filter press and four polishing filters. Prior to 1989, the building was Pump House 1 serving Injection Wells 1 and 1A. The building is a steel framed building resting on a reinforced concrete slab. The concrete slab has a perimeter containment curb. The control panels for the filter press are also located in this building. These pumps located in Filter Building 1 draw from FAT-A which is fed from the T-Tanks. The plate filter press is a 70 cubic feet filter unit. Waste is fed into the center and exits through a drain pipe and back to the T-Tanks or to FAT-B.

STATUS: Filter Building 2 is still active.

PERIOD OF OPERATION: 1975 - Present

CONSTITUENTS: Types of waste include: all accepted waste codes.
Types of waste constituents include: hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids; D004-D011 metals; and VOCs.

RELEASE CONTROLS: The building contains a perimeter containment curb and all equipment is corrosion resistant.

MEDIA OF CONCERN: ~~Groundwater, minimal~~ NONE

RELEASE HISTORY: Liquid waste occasionally spilled on the floor. A drain was used that flowed through underground pipes which drained to the Sluice Pit. These pipes were found to be extensively corroded when the floor was replaced. All contaminated soils were reported to be excavated.

MIGRATION PATHWAYS:

Soil: The potential for soil to act as a migration pathway is minimal due to the fact that a bermed concrete pad underlies the building.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the fact that a bermed concrete pad underlies the building.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air. The waste is within a closed piping system.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the fact that a bermed concrete pad underlies the building.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 30 -Filtered Acid Tanks: FAT - A, FAT - B, FAT - C

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: FAT-A and FAT-B are fiberglass reinforced plastic vertical cylindrical tanks, which temporarily hold treated acids. FAT- A contains acidic wastes prior to filtration. FAT-B contained the filtered wastes prior to distribution to outlying FATs and injection wells. FAT-C has stored filtered acidic wastes in the past but currently is used for storage of non-hazardous brine.

STATUS: The FATs are still active. THE WASTE VOLUME OF FAT-A AND FAT-B IS 18,313 GALLONS AND 10,575 GALLONS FOR FAT-C

PERIOD OF OPERATION: 1981 - Present

CONSTITUENTS: Types of waste include: acidic wastes.
Types of waste constituents include: waste pickle liquors; hydrochloric, sulfuric, nitric, hydrofluoric, and chromic acids; and D004-D011 metals.

RELEASE CONTROLS: The three FATs lie in a reinforced concrete secondary containment system. This containment consists of a 3.5 foot high perimeter wall set on a concrete slab joined and/or sealed to the tanks.

MEDIA OF CONCERN: ~~Groundwater, minimal~~ SOIL

RELEASE HISTORY: In 1989, 50 gallons of acidic wastes were spilled on the ground outside the southwest corner of FAT-A's concrete containment.

MIGRATION PATHWAYS:

Soil: The potential for soil to act as a migration pathway is minimal due to the secondary containment. However, one spill to the soil is documented in operating records.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the secondary containment.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air. The FATs are completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the secondary containment.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 31 -Filtered Acid Tank: FAT-3

Regulatory Status: ACTIVE RCRA Regulated Unit

UNIT DESCRIPTION: FAT-3 is a fiberglass reinforced plastic vertical cylindrical tank, which temporarily holds treated acids. FAT-3 temporarily stores filtered acid prior to deep well injection. The acidic wastes from FAT-3 are distributed to Injection Well -2, FAT-1 and FAT-5.

STATUS: FAT-3 is still active. FAT-3 HAS A CAPACITY OF 20,804 GALLONS.

PERIOD OF OPERATION: 1981 - Present

CONSTITUENTS: Types of waste include: Filtered acids.
Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs ~~and unknowns~~.

RELEASE CONTROLS: FAT-3 has a reinforced concrete secondary containment system installed in 1984. This containment consists of a 3.5 foot high perimeter wall set on a concrete slab joined and/or sealed to the tanks.

MEDIA OF CONCERN: ~~Groundwater, minimal~~ SOIL

RELEASE HISTORY: In 1984, prior to the construction of the containment wall, approximately 2,000 gallons of acid were released due to the failure of an elbow on the tank. The liquids were collected and ultimately deep well injected.

MIGRATION PATHWAYS: **Soil:**The potential for soil to act as a migration pathway is minimal due to the secondary containment. However, one spill to the soil is documented in operating records.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the secondary containment.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air. The FATs are completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the secondary containment.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 32 -Pump House 3

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: Pump House 3 is a~~n~~ STEEL-FRAMED enclosed building with STEEL PANEL SIDING AND ROOFING SET ATOP a bermed REINFORCED concrete pad. THE SURFACES OF THE CONCRETE SLAB, CURB AND PADS ARE ALL COATED WITH A CORROSION-RESISTANT MATERIAL. The pump house contains two 5-micron polish filters, a satellite drum storage area for used filters, and a piston pump to pump wastes down Injection Well 2.

STATUS: Pump House 3 is still active.

PERIOD OF OPERATION: 1977 - Present

CONSTITUENTS: Types of waste include: acidic wastes.
Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs~~-and unknowns~~.

RELEASE CONTROLS: The pump house has a bermed concrete floor. The high pressure transfer line to Injection Well 2 is a pipe within a pipe system with detection pots.

MEDIA OF CONCERN: Groundwater, minimal, SOIL

RELEASE HISTORY: 400 gallons of filtered waste acid was released during a pump failure (unknown year). The waste flowed out of the building and onto the adjacent ground. The liquid was collected for deep well injection and the visibly contaminated soil was removed. In another incident in an unknown year, 500 gallons of filtered acid waste was released to the ground from the Pump House 3/Injection Well 2 transfer line. Lime was applied to the ground. In

1985, 2,000 - 3,000 gallons of waste acid was released to the ground from the same transfer pipe. The liquid was pumped to ~~pond~~ SURFACE IMPOUNDMENT 11 and lime was applied to the ground.

MIGRATION PATHWAYS:

Soil: The potential for soil to act as a migration pathway is minimal due to the outer containment sleeve with detection pots. However, large spill releases to the soil are documented in operating records.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the outer containment sleeve with detection pots. However, large spill releases to the soil are documented in operating records.

Surface Water: Presently there is a low potential for releases to surface water due to the outer containment sleeve with detection pots.

Air: There is a low potential for releases to the air. The Pump House is completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the outer containment sleeve with detection pots.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 33 -Filtered Acid Tank: FAT-1 (aka FAT-6)

Regulatory Status: ACTIVE; RCRA Regulated Unit ~~- Inactive but not closed~~

UNIT DESCRIPTION: FAT-1 is a fiberglass reinforced plastic vertical cylindrical tank, which temporarily holds treated acids. FAT-1 temporarily stores filtered acid prior to deep well injection. The acidic wastes from FAT-1 are distributed to Injection Well 6. Currently FAT-1 is not used and piping to injection well 6 runs directly from FAT-3.

STATUS: FAT-1 is still active. FAT-1 HAS A CAPACITY OF 13,736 GALLONS.

PERIOD OF OPERATION: 1977-~~1992~~ PRESENT

CONSTITUENTS: Types of waste include: Filtered acids
Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs~~-and unknowns~~.

RELEASE CONTROLS: FAT-1 has a reinforced concrete secondary containment system installed in 1985. This containment consists of a 3.5 foot high perimeter wall set on a concrete slab joined and/or sealed to the tanks.

MEDIA OF CONCERN: ~~Groundwater, minimal~~ NONE

RELEASE HISTORY: No known releases.

MIGRATION PATHWAYS: **Soil:**The potential for soil to act as a migration pathway is minimal due to the secondary containment.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the secondary containment.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air. The FATs are completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the secondary containment.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 34 -Pump House 1 (aka Pump House 6)

Regulatory Status:	ACTIVE; RCRA Regulated Unit
UNIT DESCRIPTION:	Pump House 1 is a~~n~~ STEEL-FRAMED enclosed building with STEEL PANEL SIDING AND ROOFING SET ATOP a bermed REINFORCED concrete pad. THE SURFACES OF THE CONCRETE SLAB, CURB AND PADS ARE ALL COATED WITH A CORROSION-RESISTANT MATERIAL. The pump house contains one 5-micron gravel filter, a satellite drum storage area for used filters, and a piston pump to pump wastes down Injection Well 6.
STATUS:	Pump House 1 is still active.
PERIOD OF OPERATION:	1981 - Present
CONSTITUENTS:	Types of waste include: acidic wastes. Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs~~-and unknowns~~.
RELEASE CONTROLS:	The pump house has a bermed concrete floor. The high pressure transfer line to Injection Well 6 is a pipe within a pipe system with detection pots.
MEDIA OF CONCERN:	~~Groundwater, minimal~~ NONE
RELEASE HISTORY:	No known releases
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is minimal due to the outer containment sleeve with detection pots and a bermed concrete floor.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the outer containment sleeve with detection pots and a bermed concrete floor.

Surface Water: There is a low potential for releases to surface water due to the outer containment sleeve with detection pots and a bermed concrete floor.

Air: There is a low potential for releases to the air. The Pump House is completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the outer containment sleeve with detection pots and a bermed concrete floor.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 35 -Filtered Acid Tank: FAT-5

Regulatory Status:	ACTIVE; RCRA Regulated Unit
UNIT DESCRIPTION:	FAT-5 is a fiberglass reinforced plastic vertical cylindrical tank, which temporarily holds treated acids. FAT-5 temporarily stores filtered acid prior to deep well injection. The acidic wastes from FAT-5 are distributed to Injection Well 5.
STATUS:	FAT-5 is still active. FAT-5 HAS A CAPACITY OF 10,575 GALLONS.
PERIOD OF OPERATION:	1985 - Present
CONSTITUENTS:	Types of waste include: Filtered acids. Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs~~ and unknowns~~.
RELEASE CONTROLS:	FAT-5 has a reinforced concrete secondary containment system installed in 1985. This containment consists of a 3.5 foot high perimeter wall set on a concrete slab joined and/or sealed to the tanks.
MEDIA OF CONCERN:	~~Groundwater, minimal~~ NONE
RELEASE HISTORY:	No known releases.
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is minimal due to the secondary containment and a level alarm. **Groundwater:** The potential for groundwater to act as a migration pathway is minimal due to the secondary containment and a level alarm.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air. The FATs are completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the secondary containment.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 36 -Pump House 5

Regulatory Status: ACTIVE; RCRA Regulated Unit

UNIT DESCRIPTION: Pump House 5 is ~~an~~ STEEL-FRAMED enclosed building with STEEL PANEL SIDING AND ROOFING SET ATOP a bermed REINFORCED concrete pad. THE SURFACES OF THE CONCRETE SLAB, CURB AND PADS ARE ALL COATED WITH A CORROSION-RESISTANT MATERIAL. The pump house contains two 5-micron polish filters, a satellite drum storage area for used filters, and a piston pump to pump wastes down Injection Well 5.

STATUS: Pump House 5 is still active.

PERIOD OF OPERATION: 1981 - Present

CONSTITUENTS: Types of waste include: acidic wastes.
Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs ~~and unknowns~~.

RELEASE CONTROLS: The pump house has a bermed concrete floor. The high pressure transfer line to Injection Well 5 is a pipe within a pipe system with detection pots.

MEDIA OF CONCERN: ~~Groundwater, minimal~~ NONE

RELEASE HISTORY: No known releases

MIGRATION PATHWAYS: **Soil:**The potential for soil to act as a migration pathway is minimal due to the outer containment sleeve with detection pots and a bermed concrete floor.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the outer containment sleeve with detection pots and a bermed concrete floor.

Surface Water: There is a low potential for releases to surface water due to the outer containment sleeve with detection pots and a bermed concrete floor.

Air: There is a low potential for releases to the air. The Pump House is completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the outer containment sleeve with detection pots and a bermed concrete floor.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 37 -Filtered Acid Tank: FAT-2

Regulatory Status: ACTIVE; RCRA Regulated Unit ~~- Inactive but not closed~~

UNIT DESCRIPTION: FAT-2 is a fiberglass reinforced plastic vertical cylindrical tank which temporarily stores filtered acid prior to deep well injection. The acidic waste from FAT-2 is distributed to Injection Well 4. FAT-2 was moved from Pump House 2 to Pump House 4 around 1990.

STATUS: FAT-2 is still active. FAT-2 HAS A CAPACITY OF 13,736 GALLONS.

PERIOD OF OPERATION: 1977 - ~~1990~~ PRESENT

CONSTITUENTS: Types of waste include: Filtered acids.
Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs~~-and unknowns~~.

RELEASE CONTROLS: FAT-2 has a reinforced concrete secondary containment system installed in 1985. This containment consists of a 3.5 foot high perimeter wall set on a concrete slab joined and/or sealed to the tanks.

MEDIA OF CONCERN: ~~Groundwater, minimal~~ NONE

RELEASE HISTORY: No known releases.

MIGRATION PATHWAYS: **Soil:**The potential for soil to act as a migration pathway is minimal due to the secondary containment and a level alarm.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the secondary containment.

Surface Water: There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air. The FATs are completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the secondary containment.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 38 -Pump House 4 (aka New Pump House 2)

Regulatory Status:	ACTIVE; RCRA Regulated Unit
UNIT DESCRIPTION:	Pump House 4 is a~~n~~ STEEL FRAMED enclosed building with STEEL PANEL SIDING AND ROOFING SET ATOP a bermed REINFORCED concrete pad. THE SURFACES OF THE CONCRETE SLAB, CURB AND PADS ARE ALL COATED WITH A CORROSION-RESISTENT MATERIAL. The pump house contains two 4-micron polish filters, a satellite drum storage area for used filters, and a piston pump to pump wastes down Injection Well 4.
STATUS:	Pump House 4 is still active.
PERIOD OF OPERATION:	1986 - Present
CONSTITUENTS:	Types of waste include: acidic wastes. Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs~~ and unknowns~~.
RELEASE CONTROLS:	The pump house has a bermed concrete floor.
MEDIA OF CONCERN:	~~Groundwater, minimal~~ NONE
RELEASE HISTORY:	No known releases
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is minimal due to the bermed concrete floor. **Groundwater:** The potential for groundwater to act as a migration pathway is minimal due to the bermed concrete floor.

Surface Water: There is a low potential for releases to surface water due to the bermed concrete floor.

Air: There is a low potential for releases to the air. The Pump House is completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the bermed concrete floor.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 39 -Old FAT-2 Containment

Regulatory Status:	INACTIVE; RCRA Regulated Unit; 1989~~- Inactive but not closed.~~
UNIT DESCRIPTION:	Secondary Containment for FAT-TANK NO. 2. ~~-which-~~ FAT-TANK NO. 2 was moved to A CONTAINMENT AREA NEXT TO Pump House 4 in 1990. THE OLD SECONDARY CONTAINMENT FOR FAT TANK NO. 2 REMAINS VACANT.
STATUS:	The old FAT-2 containment area is inactive.
PERIOD OF OPERATION:	1977 - 1989
CONSTITUENTS:	Types of waste include: Filtered acids. Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs~~-and unknowns~~.
RELEASE CONTROLS:	A 3.5 foot high perimeter wall set on a concrete slab
MEDIA OF CONCERN:	~~Groundwater, minimal~~ NONE
RELEASE HISTORY:	No known releases.
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is minimal due to the secondary containment. **Groundwater:** The potential for groundwater to act as a migration pathway is minimal due to the secondary containment. **Surface Water:** There is a low potential for releases to surface water.

Air: There is a low potential for releases to the air.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the secondary containment.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 40 -Pump House 2

Regulatory Status: INACTIVE -RCRA Regulated Unit; 1989 ~~- Inactive but not closed~~

UNIT DESCRIPTION: Pump House 2 is ~~an~~ STEEL-FRAMED enclosed building with STEEL PANEL SIDING AND ROOFING SET ATOP a bermed REINFORCED concrete pad. THE SURFACES OF THE CONCRETE SLAB, CURB AND PADS ARE COATED WITH CORROSION-RESISTANT MATERIAL.

STATUS: Pump House 2 is inactive.

PERIOD OF OPERATION: 1977-1989

CONSTITUENTS: Types of waste include: acidic wastes.
Types of waste constituents include: acids, D004-D011 metals, phenols, VOCs ~~and unknowns~~.

RELEASE CONTROLS: The pump house has a bermed concrete floor.

MEDIA OF CONCERN: ~~Groundwater, minimal~~ NONE

RELEASE HISTORY: No known releases

MIGRATION PATHWAYS: **Soil:**The potential for soil to act as a migration pathway is minimal due to the bermed concrete floor.

Groundwater: The potential for groundwater to act as a migration pathway is minimal due to the bermed concrete floor.

Surface Water: There is a low potential for releases to surface water due to the bermed concrete floor.

Air: There is a low potential for releases to the air. The Pump House is completely enclosed.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the bermed concrete floor.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 41 - Drum Storage Pad (90 day)

Regulatory Status:	ACTIVE; RCRA Regulated Unit
UNIT DESCRIPTION:	The Drum Storage pad was is a bermed concrete pad north of the truck unloading facility. The pad has approximate dimensions of 28'x50' and is used as a 90-day storage area for hazardous wastes needing shipment off-site.
STATUS:	The Drum Storage Pad is still active.
PERIOD OF OPERATION:	1989 - Present
CONSTITUENTS:	Types of waste include: filters and filtered materials, solids. Types of waste constituents include: D004-D011 metals, acids, phenols and VOCs
RELEASE CONTROLS:	The Drum Storage Pad has a bermed concrete pad with a sump which is pumped out when necessary.
MEDIA OF CONCERN:	Soil, Groundwater
RELEASE HISTORY:	No known releases
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is low due to the bermed concrete pad which appears adequate to contain minor spillage. **Groundwater:** The potential for groundwater to act as a migration pathway is low due to the bermed concrete pad which appears adequate to contain minor spillage. **Surface Water:** The potential for surface water to be a migration pathway is low due to the bermed concrete pad which appears adequate to contain minor spillage.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 42 - Waste Lube Oil Tank

Regulatory Status: ~~Non-regulated Unit - Closed~~
INACTIVE; NON-RCRA CLOSED; 1992, CERTIFICATION AGENCY UNKNOWN.

UNIT DESCRIPTION: The Waste Lube Oil Tank received waste lube oil from the facility's maintenance building. The 1,000 gallon above ground tank is surrounded by a gravel berm.

STATUS: Closed, and removed

PERIOD OF OPERATION: 1989 - 1992

CONSTITUENTS: Types of waste include: waste oils.
Types of waste constituents include: VOCs, SVOCs, TPHs

RELEASE CONTROLS: Gravel berm

MEDIA OF CONCERN: Soil, Groundwater

RELEASE HISTORY: No known releases

MIGRATION PATHWAYS: **Soil:** The potential for migration to soils is high due to a possibility of spillage associated with the use of the tank.

Groundwater: The potential for groundwater to be a migration pathway is high due to a possibility of spillage associated with the use of the tank. LABORATORY ANALYTICAL RESULTS FROM THE GROUNDWATER DATA COLLECTED DURING PREVIOUS INVESTIGATIONS WILL BE REVIEWED USING EPA REGION 5 GUIDELINES, AS OUTLINED IN THE RFI WORKPLAN, TO DETERMINE IF THE DATA IS OF

SUFFICIENT QUALITY TO MEET THE REQUIREMENTS OF THE RFI QAPjP.

Surface Water: The potential for surface water to be a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low due to the clay soils, which would limit the mobility of any subsurface gases which may exist.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 43 - Wastewater Treatment Plant

Regulatory Status:	ACTIVE; NPDES Regulated Unit
UNIT DESCRIPTION:	The Sanitary Wastewater Treatment Plant treats sanitary wastes pumped out of the cesspits at the maintenance building, the truck unloading facility. The treatment plant is a small unit consisting of seven underground concrete vaults. Two of the vaults hold raw waste, one is for aeration, three are for filtration, and one is for chlorination. Treated water is injected through the deep wells, and sludges are shipped off-site.
STATUS:	Active
PERIOD OF OPERATION:	1984 - Present
CONSTITUENTS:	Types of waste include: sanitary wastewater. Types of waste constituents include: sanitary wastes
RELEASE CONTROLS:	In ground concrete vaults without secondary containment.
MEDIA OF CONCERN:	~~Groundwater~~ NONE
RELEASE HISTORY:	No known releases
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is low. **Groundwater:** The potential for groundwater to act as a migration pathway is low. **Surface Water:** The potential for surface water to act as a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 44 - Truck Unloading Facility Cesspit

Regulatory Status:	ACTIVE; NPDES Regulated Unit
UNIT DESCRIPTION:	The Truck Unloading Facility Cesspit is an underground storage tank used to hold sanitary wastewater for treatment at the Sanitary Wastewater Treatment Plant.
STATUS:	Active
PERIOD OF OPERATION:	1984 - Present
CONSTITUENTS:	Types of waste include: sanitary wastewater. Types of waste constituents include: sanitary wastes
RELEASE CONTROLS:	Underground storage tank
MEDIA OF CONCERN:	Groundwater, SOIL
RELEASE HISTORY:	No known releases
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is low. **Groundwater:** The potential for groundwater to act as a migration pathway is low. HOWEVER THE INTEGRITY OF THE CESSPIT IS NOT DOCUMENTED. **Surface Water:** The potential for surface water to act as a migration pathway is low. HOWEVER THE INTEGRITY OF THE CESSPIT IS NOT DOCUMENTED. **Air:** There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 45 - Maintenance Building Cesspit

Regulatory Status:	ACTIVE; NPDES Regulated Unit
UNIT DESCRIPTION:	The Maintenance Building Cesspit is an underground storage tank used to hold sanitary wastewater for treatment at the Sanitary Wastewater Treatment Plant.
STATUS:	Active
PERIOD OF OPERATION:	1984 - Present
CONSTITUENTS:	Types of waste include: sanitary wastewater. Types of waste constituents include: sanitary wastes
RELEASE CONTROLS:	Underground storage tank.
MEDIA OF CONCERN:	Groundwater, SOIL
RELEASE HISTORY:	No known releases
MIGRATION PATHWAYS:	**Soil:**The potential for soil to act as a migration pathway is low. HOWEVER THE INTEGRITY OF THE CESSPIT IS NOT DOCUMENTED. **Groundwater:** The potential for groundwater to act as a migration pathway is low. HOWEVER THE INTEGRITY OF THE CESSPIT IS NOT DOCUMENTED. **Surface Water:** The potential for surface water to act as a migration pathway is low. **Air:** There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 46 - Injection Well 2

Regulatory Status: ACTIVE; UIC Regulated Unit

~~FAX FROM SANDY?~~

UNIT DESCRIPTION

Injection Well 2 is used to inject waste into the Mt. Simon Sandstone underneath the site. The Mt. Simon Sandstone is approximately 2,800 feet below the surface and is separated from the uppermost aquifer by a least seven confining layers. The injection wells are permitted through the USEPA and each has a UIC Permit. THE INJECTION WELL'S ARE CONSTRUCTED BY "TELESCOPING" DIFFERENT DIAMETER INTERVALS OF DRILLING TO THE REQUIRED DEPTH. THE TOTAL DEPTH OF INJECTION WELL NO. 2 IS 2,961 FT BELOW GROUND SURFACE. THE INITIAL DIAMETER OF THE BOREHOLE IS 14 3/4". AN 18" DIAMETER K-55 CONDUCTOR PIPE IS DRIVEN WITHIN THE BOREHOLE TO A DEPTH OF 40 FT. A K-55 SURFACE CASING MEASURING 10 3/4" IN DIAMETER IS INSTALLED WITHIN THE BOREHOLE FROM THE SURFACE TO A DEPTH OF 629 FT. THE BOREHOLE IS TELESCOPED DOWNWARD TO A DIAMETER OF 9 3/4" TO THE FINAL DEPTH. ANOTHER 7" DIAMETER J-55 STC CARBON STEEL CASING IS SET WITHIN THE BOREHOLES FROM THE SURFACE TO A DEPTH OF 2,660 FT. ANOTHER 7" DIAMETER CASING IS MILLED OUT FROM 2,660 FT TO 2,805 FT. A MWL LINDSEY MODEL "EC" LINER HANGER WITH A DIAMETER OF 5" IS SET AT A DEPTH OF 1,465 FT. INSIDE THE LINER HANGER A 5 ½" LINER IS CEMENTED INTO THE CASING USING 33 BARRELS OF EPSEAL MIXED AT 13.6 LBS/GAL. THE DIFFERENT SIZE DIAMETER CASINGS ARE ALL SEALED IN PLACE USING VARIOUS BLENDS OF SEALING MATERIALS. THE 7" DIAMETER CASING IS SEALED IN TWO STAGES. THE

FIRST STAGE IS SEALED USING 22 BARRELS OF 13.7 LB/GAL EPSEAL. THE SECOND STAGE IS A 50:50:2 RATIO OF POZMIX PLUS WITH GILSONITE. FROM 2,660 FT THE BOREHOLE IS UNDERREAMED AT DIFFERENT DIAMETERS. FROM 2,660 FT TO 2,690 FT THE DIAMETER OF THE BOREHOLE IS 9 7/8". FROM 2,690 FT TO 2,708 FT THE DIAMETER OF THE BOREHOLE IS 12". FROM 2,708 FT TO 2,767 FT THE DIAMETER IS AGAIN 9 7/8". FROM 2,767 FT TO 2,791 FT THE BOREHOLE IS UNDERREAMED AGAIN TO 12". FINALLY, FROM A DEPTH OF 2,791 FT TO 2,821 FT THE BOREHOLE'S DIAMETER IS 9 7/8". INSIDE THE 7" DIAMETER CASING, AND THE ACTUAL TUBING WASTE IS INJECTED THROUGH, IS A 2 7/8" FIBERGLASS VINYL ESTER TUBING WITH A WALL THICKNESS OF 0.350". THIS IS HELD IN PLACE WITH A 2 7/8" TAM VINYL ESTER SEAL ASSEMBLY SET TO A DEPTH OF 2,793 FT. WITH 3 SETS OF 3.9" TEFLON, AFLEAS, HASTELLOY SEAL STACKS. THE END OF THE TUBING IS AT A DEPTH OF 2,813 FT. For more information on the injection wells see the UIC Permit Application.

STATUS: Active

PERIOD OF OPERATION: 1977 - Present

CONSTITUENTS: Types of waste include: aqueous acidic wastes and brines. Types of waste constituents include: acids, D004-D011 metals, VOCs.

RELEASE CONTROLS: The well house floor is dish shaped which allows spilled liquids to remain inside the building. Additionally, the pressure at the well head is monitored at the control room.

Any sudden reduction of pressure at the well head will cause pump shut down.

MEDIA OF CONCERN: Groundwater, Soil

RELEASE HISTORY: In 1985, the high pressure injection line failed resulting in a release 2,000 - 3,000 gallons of waste acid to the ground surface. The liquid was pumped to ~~pond~~ SURFACE IMPOUNDMENT 11. The soil was treated with lime and the contaminated soils were excavated and removed for off-site disposal.

MIGRATION PATHWAYS: **Soil:** The potential for soil to be a migration pathway is moderate due to the history of a spill occurring around the unit. However, since the well house floor is dish shaped and the pressure at the well head is monitored with an automatic pump shut down, the potential for soil to act as a migration pathway is minimal.

Groundwater: The potential for groundwater to act as a migration pathway is moderate due to the history of a spill occurring around the unit. However, since the well house floor is dish shaped and the pressure at the well head is monitored with an automatic pump shut down, the potential for groundwater to act as a migration pathway is minimal.

Surface Water: The potential for surface water to act as a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 47 - Injection Well 4

Regulatory Status: ACTIVE; UIC Regulated Unit

FAX FROM SAND?

UNIT DESCRIPTION

Injection Well 4 is used to inject waste into the Mt. Simon Sandstone underneath the site. The Mt. Simon Sandstone is approximately 2,800 feet below the surface and is separated from the uppermost aquifer by a least seven confining layers. The injection wells are permitted through the USEPA and each has a UIC Permit. THE INJECTION WELL'S ARE CONSTRUCTED BY "TELESCOPING" DIFFERENT DIAMETER INTERVALS OF DRILLING TO THE REQUIRED DEPTH. THE TOTAL DEPTH OF INJECTION WELL NO. 4 IS 2,907 FT BELOW GROUND SURFACE. THE INITIAL DIAMETER OF THE BOREHOLE IS 14 3/4". AN 18" DIAMETER K-55 CONDUCTOR PIPE IS DRIVEN WITHIN THE BOREHOLE TO A DEPTH OF 40 FT. A K-55 SURFACE CASING MEASURING 10 3/4" IN DIAMETER IS INSTALLED WITHIN THE BOREHOLE FROM THE SURFACE TO A DEPTH OF 646 FT. THE BOREHOLE IS TELESCOPED DOWNWARD TO A DIAMETER OF 9 ½" TO THE FINAL DEPTH. ANOTHER 7" DIAMETER K-55 INTERMEDIATE CASING IS SET WITHIN THE BOREHOLES FROM THE SURFACE TO A DEPTH OF 2,384 FT. A 5" DIAMETER LINER (PROTECTIVE CASING) IS INSTALLED FROM THE SURFACE TO A DEPTH OF 2,813.2 FT AND MADE OF N-80. THIS 5" DIAMETER CASING IS CEMENTED WITH LIGHTWEIGHT GILSONITE. THE DIFFERENT SIZE DIAMETER CASINGS ARE ALL SEALED IN PLACE USING EPSEAL CEMENT. INSIDE THE 5" DIAMETER CASING, AND THE ACTUAL TUBING WASTE IS INJECTED THROUGH, IS A 2 7/8" FIBERGLASS VINYL ESTER TUBING WITH A WALL THICKNESS OF 0.350".

THIS IS HELD IN PLACE WITH A 2 7/8" TAM VINYL ESTER SEAL ASSEMBLY SET TO A DEPTH OF 2,793 FT. WITH 2 SETS OF 3.9" TEFLON, AFLEAS, HASTELLOY SEAL STACKS. THE END OF THE TUBING IS AT A DEPTH OF 2,772 FT. THE BOREHOLE IS UNDERREAMED TO A DIAMETER OF 11 3/4" FROM A DEPTH OF 2,704 FT TO 2,903 FT. For more information on the injection wells see the UIC Permit Application.

STATUS: Active

PERIOD OF OPERATION: 1977 - Present

CONSTITUENTS: Types of waste include: aqueous acidic wastes and brines. Types of waste constituents include: acids, D004-D011 metals, VOCs.

RELEASE CONTROLS: The well house floor is dish shaped which allows spilled liquids to remain inside the building. Additionally, the pressure at the well head is monitored at the control room. Any sudden reduction of pressure at the well head will cause pump shut down.

MEDIA OF CONCERN: ~~Groundwater, Soil~~ NONE

RELEASE HISTORY: No known releases

MIGRATION PATHWAYS: **Soil:** The well house floor is dish shaped and the pressure at the well head is monitored with an automatic pump shut down. Therefore, the potential for soil to act as a migration pathway is minimal.

Groundwater: The well house floor is dish shaped and the pressure at the well head is monitored with an automatic

pump shut down. Therefore the potential for groundwater to act as a migration pathway is minimal.

Surface Water: The potential for surface water to act as a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 48 - Injection Well 5

Regulatory Status: ACTIVE; UIC Regulated Unit

FAX FROM SANDY?

UNIT DESCRIPTION

Injection Well 5 is used to inject waste into the Mt. Simon Sandstone underneath the site. The Mt. Simon Sandstone is approximately 2,800 feet below the surface and is separated from the uppermost aquifer by a least seven confining layers. The injection wells are permitted through the USEPA and each has a UIC Permit. THE INJECTION WELL'S ARE CONSTRUCTED BY "TELESCOPING" DIFFERENT DIAMETER INTERVALS OF DRILLING TO THE REQUIRED DEPTH. THE TOTAL DEPTH OF INJECTION WELL NO.5 IS 2,945 FT BELOW GROUND SURFACE. THE INITIAL DIAMETER OF THE BOREHOLE IS 14 3/4". AN 16" DIAMETER K-55 CONDUCTOR PIPE IS DRIVEN WITHIN THE BOREHOLE TO A DEPTH OF 56 FT. A K-55 SURFACE CASING MEASURING 10 3/4" IN DIAMETER IS INSTALLED WITHIN THE BOREHOLE FROM THE SURFACE TO A DEPTH OF 654 FT. THE BOREHOLE IS TELESCOPED DOWNWARD TO A DIAMETER OF 9 3/4" TO THE FINAL DEPTH. ANOTHER 7" DIAMETER J-55 ST&C 8rd CARBON STEEL PROTECTION CASING IS SET WITHIN THE BOREHOLES FROM THE SURFACE TO A DEPTH OF 2,717 FT. THE DIFFERENT SIZE DIAMETER CASINGS ARE ALL SEALED IN PLACE USING EPSEAL CEMENT. INSIDE THE 7" DIAMETER CASING, AND THE ACTUAL TUBING WASTE IS INJECTED THROUGH, IS A 2 7/8" FIBERGLASS VINYL ESTER TUBING WITH A WALL THICKNESS OF 0.350". THIS IS HELD IN PLACE WITH A 2 7/8" TAM VINYL ESTER SEAL ASSEMBLY SET TO A DEPTH OF 2,767.60 FT. WITH 2 SETS OF 3.9" TEFLON, AFLEAS, HASTELLOY SEAL STACKS. THE END OF THE

TUBING IS AT A DEPTH OF 2,772 FT. THE BOREHOLE IS UNDERREAMED TO A DIAMETER OF 12" FROM A DEPTH OF 2,775 FT TO 2,925 FT. For more information on the injection wells see the UIC Permit Application.

STATUS: Active

PERIOD OF OPERATION: 1981 - Present

CONSTITUENTS: Types of waste include: aqueous acidic wastes and brines. Types of waste constituents include: acids, D004-D011 metals, VOCs.

RELEASE CONTROLS: The well house floor is dish shaped which allows spilled liquids to remain inside the building. Additionally, the pressure at the well head is monitored at the control room. Any sudden reduction of pressure at the well head will cause pump shut down.

MEDIA OF CONCERN: Groundwater, Soil

RELEASE HISTORY: In 1985, a release of between 700 - 1,000 gallons occurred due to the failure of a blind flange. This resulted in waste acid passing through the open face gasket and corroding block from the flange. The gasket was replaced and contaminated soils were removed for off-site disposal.

MIGRATION PATHWAYS: **Soil:**The potential for soil to act as a migration pathway is moderate due to the history of a spill occurring around the unit. However, since the well house floor is dish shaped and the pressure at the well head is monitored with an automatic pump shut down, the potential for soil to act as a migration pathway is minimal.

Groundwater: The potential for groundwater to act as a migration pathway is moderate TO HIGH due to the history of a spill occurring around the unit. However, RELEASE CONTROLS SUCH AS THE ~~since the well house floor is~~ dish shaped WELL HOUSE FLOOR and the pressure MONITORS WITH AN AUTOMATIC PUMP SHUT DOWN at the well head ~~is monitored with an automatic pump shut down,~~ the potential for groundwater to act as a migration pathway is minimal, AT PRESENT.

Surface Water: The potential for surface water to act as a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 49 - Injection Well 6

Regulatory Status: ACTIVE; UIC Regulated Unit

UNIT DESCRIPTION

Injection Well 6 is used to inject waste into the Mt. Simon Sandstone underneath the site. The Mt. Simon Sandstone is approximately 2,800 feet below the surface and is separated from the uppermost aquifer by a least seven confining layers. The injection wells are permitted through the USEPA and each has a UIC Permit. THE INJECTION WELL'S ARE CONSTRUCTED BY "TELESCOPING" DIFFERENT DIAMETER INTERVALS OF DRILLING TO THE REQUIRED DEPTH. THE TOTAL DEPTH OF INJECTION WELL NO. 6 IS 2,931 FT BELOW GROUND SURFACE. INJECTION WELL NO. 6 IS DRILLED IN CONSTRUCTED IN A DIFFERENT MANNER THAN THE OTHER INJECTION WELLS. INJECTION WELL NO. 6 IS DRILLED ON AN ANGLE FROM A DEPTH OF 675 FT TO A DEPTH OF APPROXIMATELY 1,600 FT. THIS BOREHOLE IS SET ALONG SIDE AN ORIGINAL BOREHOLE DRILLED APPROXIMATELY 12.8 FT APART. THE INITIAL BOREHOLE IS SEALED WITH LIGHT CEMENT WITH GILSONITE PLUS EPSEAL CEMENT. THE TOTAL DEPTH OF THE INITIAL WELL BORE IS 2,955 FT. THE INITIAL DIAMETER OF THE BOREHOLE IS 14 3/4". A 16" DIAMETER K-55 CONDUCTOR PIPE IS DRIVEN WITHIN THE BOREHOLE TO A DEPTH OF 51 FT. THIS CONDUCTOR PIPE IS SEALED IN PLACE USING 100 SACKS OF CEMENT. A K-55 SURFACE CASING MEASURING 10 3/4" IN DIAMETER IS INSTALLED WITHIN THE BOREHOLE FROM THE SURFACE TO A DEPTH OF 651 FT. THIS SURFACE CASING IS SEALED USING 600 SACKS OF CLASS "A" CEMENT. AND INTERMEDIATE CASING MEASURING 7" IN DIAMETER IS INSTALLED

WITHIN THE 10 3/4" CASING FROM A DEPTH OF 336.5 FT TO A DEPTH OF 675 FT. AND IS CEMENTED USING POZMIX. THE PROTECTIVE CASING IS INSTALLED WITHIN THE OTHER CASINGS AND MEASURES 5" IN DIAMETER. THIS PROTECTIVE CASING IS CONSTRUCTED OF N-80 LT&C AND IS INSTALLED FROM THE SURFACE TO A DEPTH OF 2,750 FT. THE PROTECTION CEMENT AROUND THE 5" CASING AND THE BOREHOLE IS A LIGHT CEMENT WITH GILSONITE PLUS AND 34 BARRELS OF EPSEAL CEMENT ON THE BOTTOM. THE INJECTION TUBING MEASURES 2 7/8" IN DIAMETER AND IS SET WITHIN THE CASING FROM THE SURFACE TO A DEPTH OF 1,592 FT. THIS INJECTION TUBING IS CONSTRUCTED OF FRP TUBING. FROM A DEPTH OF 1,592 FT TO A DEPTH OF 2,733 FT THE TUBING IS OF 2 3/8" DIAMETER. A HASTELLOY SEAL ASSEMBLY IS PLACED WITHIN THE INJECTION STEM FROM A DEPTH OF 2,733 FT TO A DEPTH OF 2,744 FT. BELOW THE HASTELLOY SEAL ASSEMBLY IS A 2 3/8" DIAMETER TAILPIPE TO A DEPTH OF 2,764 FT. THE PROTECTION LINER IS INSTALLED WITHIN THE CASING FROM A DEPTH OF 1,667 FT TO A DEPTH OF 2,736 FT AND IS CONSTRUCTED OF 3 ½" DIAMETER FRP CASING. A 3" SCHEDULE 80 HASTELLOY SEAL IS INSTALLED AT A DEPTH OF 2,736 FT TO A DEPTH OF 2,777 FT. AT 2,777 FT A 2 3/8" FT HASTELLOY TAMCAP PACKER IS INSTALLED TO A DEPTH OF 2,785 FT. THE LINER CEMENT IS MADE OF EPSEAL CEMENT. THE BOREHOLE IS UNDERREAMED FROM 2,120 FT TO 2,770 FT AT A 8 ½" DIAMETER. THE FINAL DIAMETER OF THE BOREHOLE IS 12" FROM A DEPTH OF 2,770 FT TO A DEPTH OF 2,925 For more information on the injection wells see the UIC Permit Application.

STATUS: Active

PERIOD OF OPERATION: 1981 - Present

CONSTITUENTS: Types of waste include: aqueous acidic wastes and brines. Types of waste constituents include: acids, D004-D011 metals, VOCs.

RELEASE CONTROLS: The well house floor is dish shaped which allows spilled liquids to remain inside the building. Additionally, the pressure at the well head is monitored at the control room. Any sudden reduction of pressure at the well head will cause pump shut down.

MEDIA OF CONCERN: Groundwater, Soil

RELEASE HISTORY: In 1985, a release of between 5,000 - 8,000 gallons occurred due to an employee error. Installation of a back-up seal and ball valves was completed to prevent this type of incident in the future. Contaminated soils were removed for off-site disposal.

MIGRATION PATHWAYS: **Soil:** The potential for soil to act as a migration pathway is moderate due to the history of a spill occurring around the unit. However, since the well house floor is dish shaped and the pressure at the well head is monitored with an automatic pump shut down, the potential for soil to act as a migration pathway is minimal.

Groundwater: The potential for groundwater to act as migration pathway is moderate due to the history of a spill occurring around the unit. However, since the well house floor is dish shaped and the pressure at the well head is

monitored with an automatic pump shut down, the potential for groundwater to act as a migration pathway is minimal.

Surface Water: The potential for surface water to act as a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 50 - Injection Well 1

Regulatory Status:	INACTIVE; ~~RCRA~~ UIC Regulated Unit; Closed; 1986
UNIT DESCRIPTION	Injection Well 1 was used to inject waste into the Mt. Simon Sandstone underneath the site. The Mt. Simon Sandstone is approximately 2,800 feet below the surface and is separated from the uppermost aquifer by at least seven confining layers. Injection Well 1 was taken out of service and plugged in 1980 due to casing failure. It was replugged in 1986.
STATUS:	Closed (Abandoned)
PERIOD OF OPERATION:	1976 - 1980
CONSTITUENTS:	Types of waste include aqueous acidic wastes and brines. Types of waste constituents include; acids, D004-D011 metals, VOCs
RELEASE CONTROLS:	Not applicable
MEDIA OF CONCERN:	Groundwater, Soil
RELEASE HISTORY:	The injection well was plugged due to casing failures which were anticipated to cause potential leaks.
MIGRATION PATHWAYS:	**Soil:**The potential for the soil to be a migration pathway is low. MODERATE DUE TO THE POTENTIAL FOR DIESEL FLUID WITHIN THE CASING MAY HAVE LEAKED INTO THE SURROUNDING SOILS. **Groundwater:** The potential for groundwater to be a migration pathway is low ~~MODERATE DUE TO THE POTENTIAL FOR DIESEL FLUID WITHIN THE~~

~~CASING MAY HAVE LEAKED INTO THE SURROUNDING SOILS AND INTO THE GROUNDWATER.~~ THE CASING FAILURE OCCURED AT A DEPTH OF APPROXIMATELY 2,000 FEET. THE LOSS OF DIESEL WAS INTO EITHER THE WASTE OF THE IMMEDIATE SURROUNDING OF THE CASING.

Surface Water: The potential for surface water to be a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 51 - Injection Well 1A

Regulatory Status:	INACTIVE; UIC Regulated Unit; Closed; 1986
UNIT DESCRIPTION	Injection Well 1A was used to inject waste into the Mt. Simon Sandstone underneath the site. The Mt. Simon Sandstone is approximately 2,800 feet below the surface and is separated from the uppermost aquifer by at least seven confining layers. Injection Well 1A was taken out of service and plugged in 1987 due to casing failure.
STATUS:	Closed (Abandoned)
PERIOD OF OPERATION:	1980 - 1987
CONSTITUENTS:	Types of waste include aqueous acidic wastes and brines. Types of waste constituents include; acids, D004-D011 metals, VOCs
RELEASE CONTROLS:	Not applicable
MEDIA OF CONCERN:	Groundwater, Soil
RELEASE HISTORY:	The injection well was plugged due to casing failures which were anticipated to cause potential leaks.
MIGRATION PATHWAYS:	**Soil:**The potential for the soil to be a migration pathway is ~~low~~ MODERATE DUE TO THE POTENTIAL FOR DIESEL FLUID WITHIN THE CASING MAY HAVE LEAKED INTO THE SURROUNDING SOILS. **Groundwater:** The potential for groundwater to be a migration pathway is low. MODERATE DUE TO THE POTENTIAL FOR DIESEL FLUID WITHIN THE CASING MAY HAVE LEAKED INTO THE

SURROUNDING SOILS AND POTENTIALLY IN THE UNDERLYING GROUNDWATER.

Surface Water: The potential for surface water to be a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 52 - Injection Well 3

Regulatory Status: INACTIVE; UIC Regulated Unit; Closed; 1987

UNIT DESCRIPTION: Injection Well 3 was used to inject waste into the Mt. Simon Sandstone underneath the site. The Mt. Simon Sandstone is approximately 2,800 feet below the surface and is separated from the uppermost aquifer by at least seven confining layers. Injection Well 3 was taken out of service and plugged in 1987 due to casing failure.

STATUS: Closed (Abandoned)

PERIOD OF OPERATION: 1977 - 1987

CONSTITUENTS: Types of waste include aqueous acidic wastes and brines. Types of waste constituents include; acids, D004-D011 metals, VOCs

RELEASE CONTROLS: Not applicable

MEDIA OF CONCERN: Groundwater, Soil

RELEASE HISTORY: The injection well was plugged due to casing failures which were anticipated to cause potential leaks. THESE CASING FAILURES MAY HAVE CAUSED THE LEAKING OF DIESEL OUT OF THE ANNULUS OF THE CASING INTO THE SOIL AND GROUND AROUND THE WELL.

MIGRATION PATHWAYS: **Soil:**~~The potential for the soil to be a migration pathway is low.~~ THE POTENTIAL FOR THE SOIL TO BE A MIGRATION PATHWAY IS MODERATE TO HIGH DUE TO THE RECORDED CASING FAILURES. DIESEL FLUID USED IN THE ANULUS MAY HAVE

LEAKED FROM THE CASING INTO THE SURROUNDING SOIL.

Groundwater: ~~The potential for groundwater to be a migration pathway is low.~~ THE POTENTIAL FOR GROUNDWATER TO BE A MIGRATION PATHWAY IS MODERATE DUE TO THE CASING FAILURES POSSIBLY CAUSING LEAKS OF DIESEL INTO THE SOIL AND POSSIBLY CONTAMINATE GROUNDWATER.

Surface Water: The potential for surface water to be a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

SWMU 53 - CLOSURE CELL

REGULATORY STATUS: CLOSURE CELL - TSCA REGULATED UNIT

UNIT DESCRIPTION: THE CLOSURE CELL IS LOCATED OVER THE AREA PREVIOUSLY COVERED BY SURFACE IMPOUNDMENTS 4, 5 & 7. THE CLOSURE CELL HAS BEEN DESIGNED IN ACCORDANCE WITH THE APRIL 1987 DRAFT US EPA DOCUMENT " MINIMUM TECHNOLOGY GUIDANCE ON DOUBLE LINER SYSTEMS FOR LANDFILLS AND SURFACE IMPOUNDMENTS - DESIGN, CONSTRUCTION AND OPERATIONS". THE PRIMARY LINER (TOP LINER) OF THE DOUBLE LINER SYSTEM IS CONSTRUCTED WITH A 60 MIL THICK, HPDE GEOMEMBRANE LINER. THE LINER PREVENTS MIGRATION OF ANY HAZARDOUS CONSTITUENT INTO THE SECONDARY LEACHATE COLLECTION SYSTEM DURING THE OPERATION OF THE CLOSURE CELL. THE PRIMARY LINER IS UNDERLAIN BY A 1/4 INCH THICK LAYER OF BENTONITE CLAY MATTING. THE PRIMARY LINER AND BENTONITE MATTING FORMS A COMPOSITE PRIMARY LINER SYSTEM AND WILL BE SEPARATED FROM THE SECONDARY LEACHATE COLLECTION SYSTEM BY A 40 MIL HDPE LINER. THE SECONDARY LINER (BOTTOM LINER CONSISTS OF TWO COMPONENTS WHICH FUNCTION AS A COMPOSITE LINER SYSTEM. THE UPPER COMPONENT OF THE SECONDARY LINER IS CONSTRUCTED OF THE SAME HDPE GEOMEMBRANE MATERIAL AND WILL HAVE THE SAME THICKNESS AS THE PRIMARY LINER. THE LOWER COMPONENT OF THE SECONDARY LINER

WILL BE A CLAY SOIL WHICH IS AT LEAST THREE FEET THICK AND HAS A COMPACTED PERMEABILITY OF LESS THAN 1 X 10-7.

THE PRIMARY LEACHATE COLLECTION SYSTEM ABOVE THE PRIMARY LINER IS CAPABLE OF MAINTAINING LESS THAN ONE FOOT OF LEACHATE DEPTH ABOVE THE PRIMARY GEOMEMBRANE LINER. THE LEACHATE COLLECTION SYSTEM ON THE BOTTOM OF THE CELL IS 12 INCHES THICK AND CONSTRUCTED OF CLEAN STONE. THE CLEAN STONE IS UNDERLAIN BY A GEOTEXTILE FABRIC AND A GEONET DRAINAGE LAYER. THE COMBINED STONE AND GEONET HAS A COMBINED PERMEABILITY OF 1 X 10-2 CM/SEC. LEACHATE IS PUMPED OUT OF THE CELL FROM SUMPS WHICH ARE USED TO MAINTAIN LESS THAN ONE FOOT OF LEACHATE DEPTH ABOVE THE LOWEST POINT OF THE PRIMARY LINER AT THE EDGE OR LIP OF THE SUMP.

THE LEACHATE COLLECTION SYSTEM IS CONSTRUCTED USING A GEONET WHICH WILL HAVE A TRANSMISSIVITY EQUIVALENT TO A 12 INCH THICK LAYER OF A GRANULAR MATERIAL WITH A HYDRAULIC CONDUCTIVITY OF AT LEAST 1 X 10-2 CM/SEC.

THE CLOSURE CELL IS CONSTRUCTED WITH A TWO FEET DEEP CAPILLARY BARRIER/DRAIN BELOW THE SECONDARY COMPOSITE LINER SO THAT THE BOTTOM OF THE CLOSURE CELL, INCLUDING LINERS AND LEACHATE COLLECTION SYSTEMS, WILL BE ABOVE THE GROUNDWATER TABLE. THIS GROUNDWATER SEPARATION WAS REQUIRED BY TSCA REGULATIONS.

STATUS:	THE CLOSURE CELLWAS COMPLETED IN 1992. IT IS A TSCA REGULATED UNIT.
POST-CLOSURE PERIOD:	1992- PRESENT
CONSTITUENTS:	TYPES OF WASTE INCLUDE: CONTAMINATED SOILS, PIPING AND ANCILLARY EQUIPMENT FROM THE CLOSED SURFACE IMPOUNDMENTS, THE OIL RECOVERY FACILITY AND MISCELLANEOUS FACILITIES SPECIFIED IN THE 1984 CONSENT DECREE. TYPES OF WASTE CONSTITUENTS INCLUDE: PCBs; D004-D011 METALS, VOCs, PAHs, DIOXINS.
RELEASE CONTROLS:	PRIMARY AND SECONDARY LINERS, FINAL COVER. PRIMARY AND SECONDARY LEACHATE COLLECTION SYSTEM. RUN-ON AND RUN-OFF CONTROLS.
MEDIA OF CONCERN:	GROUNDWATER
RELEASE HISTORY:	NO RELEASES ARE REPORTED
MIGRATION PATHWAYS:	**SOIL:** THERE IS NO POTENTIAL FOR SOIL TO BE A MIGRATION PATHWAY. ALL WASTE IS ENCLOSED WITHIN THE CLOSURE CELL CONSTRUCTED WITHIN A LINER SYSTEM. **GROUNDWATER:** THE POTENTIAL FOR GROUNDWATER AS A MIGRATION PATHWAY IS MINIMAL DUE TO THE DOUBLE LINER SYSTEM

WHICH WAS CONSTRUCTED WITH THE CLOSURE CELL. HOWEVER, TSCA REGULATIONS PROVIDE FOR GROUNDWATER MONITORING AND THIS SYSTEM IS IN PLACE SURROUNDING THE CLOSURE CELL. NO RELEASES HAVE BEEN DETECTED WITHIN THESE MONITORING WELLS.

SURFACE WATER: THERE IS NO POTENTIAL FOR SURFACE WATER TO BE A MIGRATION PATHWAY. ALL WASTE IS ENCLOSED WITHIN THE CLOSURE CELL CONSTRUCTED WITHIN A LINER SYSTEM.

AIR: THERE IS NO POTENTIAL FOR AIR RELEASES. THE CLOSURE CELL HAS A FINAL COVER.

SUBSURFACE GAS: THE POTENTIAL FOR SUBSURFACE GAS TO ACT AS A MIGRATION PATHWAY IS MINIMAL DUE TO THE TYPES OF WASTES CONTAINED WITHIN THE CLOSURE CELL.

PREVIOUS SAMPLING DATA: NO DATA IS AVAILABLE.

5.3 AREAS OF CONCERN (AOCs)

There were five AOCs identified within the March 1991, RFA Report by Jacobs Engineering. As part of this updated Description of Current Conditions an additional three units have been identified. The location of the AOCs are presented on Figure 5-2. A list of the AOCs is provided in Table 5-2. The AOCs are described on the following pages.

AOC "A" - Maintenance Tanks

Regulatory Status:	Area Of Concern
UNIT DESCRIPTION	Approximately two dozen empty emergency tanks are found along the above ground transfer piping throughout the facility. These tanks are of 500 - 1,000 gallons in capacity and in some places they are housed in concrete vaults. The tanks are used when transfer pipes need to be drained for repairs.
PERIOD OF OPERATION:	1980s - Present
CONSTITUENTS:	Types of waste include filtered acid Types of waste constituents include; acids, D004-D011 metals, VOCs
RELEASE CONTROLS:	Some of the tanks are in concrete vaults.
MEDIA OF CONCERN:	~~Groundwater,~~ Soil
RELEASE HISTORY:	Unknown
MIGRATION PATHWAYS:	**Soil:**The potential for the soil to be a migration pathway is low DUE TO THE LACK OF USE OF THESE TANKS. However, a containment vault should be built around the tanks which do not have them. **Groundwater:** The potential for groundwater to be a migration pathway is low. **Surface Water:** The potential for surface water to be a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

AOC "B" - North Parking Lot - Truck Unloading Facility

Regulatory Status:	Area Of Concern
UNIT DESCRIPTION	This AOC has been identified based on the Visual Site Investigation (VSI) performed by Jacobs Engineering which identified seven rolloff boxes located on the soil south of the Drum Storage Pad (90-day). In addition to this approximately 100 small drums were found on the pavement at the northwest corner of the parking lot. During the W-Tank demolition, debris was being temporarily accumulated in these areas.
PERIOD OF OPERATION:	1990 - Present
CONSTITUENTS:	Types of waste include W-Tank demolition debris/soil. Types of waste constituents include; acids, D004-D011 metals, VOCs, PCBs and phenols
RELEASE CONTROLS:	No release controls under the rolloff boxes and unbermed pavement under the drums.
MEDIA OF CONCERN:	~~Groundwater,~~ Soil
RELEASE HISTORY:	Unknown
MIGRATION PATHWAYS:	**Soil:**The potential for the soil to be a migration pathway is low. The wastes were containerized and stored for a short time and no evidence of releases were observed. HOWEVER, NO DATA IS AVAILABLE WHICH CHARACTERIZES SOIL CONDITIONS AROUND THE AOC.

Groundwater: The potential for groundwater to be a migration pathway is low. The wastes were containerized and stored for a short time .

Surface Water: The potential for surface water to be a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

AOC "C" - Pug Mill Staging Area (Hay Mill)

Regulatory Status:	Area Of Concern
UNIT DESCRIPTION	The Hay Mill consists of concrete foundations to farm house and silos, west of Injection Well 5. The decontaminated Pug Mill or sludge fixing equipment is stored here.
PERIOD OF OPERATION:	1980s - Present
CONSTITUENTS:	Types of waste include equipment stored which has been used for solidification/fixation. Types of waste constituents include; unknowns
RELEASE CONTROLS:	Concrete pads (Silo Foundations)
MEDIA OF CONCERN:	~~Groundwater,~~ Soil
RELEASE HISTORY:	Unknown
MIGRATION PATHWAYS:	**Soil:**The potential for the soil to be a migration pathway is low. The equipment has been used to stabilize materials removed from ~~ponds~~ SURFACE IMPOUNDMENTS 1, 4 and 9. NO DOCUMENTATION EXISTS DESCRIBING THE SOIL CONDITIONS AROUND THIS AOC. **Groundwater:** The potential for groundwater to be a migration pathway is low. The equipment was decontaminated. **Surface Water:** The potential for surface water to be a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

AOC "D" - Borrow Pit 1

Regulatory Status: Area Of Concern

UNIT DESCRIPTION

Borrow Pit 1 was a 120'x200' depression located to the west of ~~pond~~ SURFACE IMPOUNDMENT 12. It was created in 1982 when clay was excavated to increase the heights of dikes for ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12. Additional clay was removed in 1984 and 1985 to repair the dikes. Some demolition debris was staged at the north side of the pit. This area has since been backfilled as part of the "clean" closure of ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12.

PERIOD OF OPERATION: 1977 - 1985

CONSTITUENTS:

Types of waste include demolition debris, unknowns
Types of waste constituents include; unknowns

RELEASE CONTROLS: None

MEDIA OF CONCERN: Soil

RELEASE HISTORY: No known releases

MIGRATION PATHWAYS:

Soil: The potential for the soil to be a migration pathway is moderate as waste acid from Injection Well 2 , acidic waste from ~~pond~~ SURFACE IMPOUNDMENT 12 and potential PCBs from demolition debris may have released contaminants to the soil.

Groundwater: The potential for groundwater to be a migration pathway is low. The Borrow Pit was used to excavate clay. THE PIT WAS ONLY EXCAVATED TO A DEPTH OF APPROXIMATELY 6-8 FEET BELOW THE

GROUND SURFACE and any releases OF CONTAMINANTS WOULD BE INHIBITED BY A SUFFICIENT AMOUNT OF clay LEFT IN THE EXCAVATED BORROW AREA. ~~would inhibit migration.~~

Surface Water: The potential for surface water to be a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

AOC "E" - Borrow Pit 2

Regulatory Status: Area Of Concern

UNIT DESCRIPTION

Borrow Pit 2 was initially excavated to provide clay and fill material for the closure of ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7 in 1985. The pit was used for the closure of several areas as the need for fill continued across the site. The pit was enlarged further when clay was used for the capping of the closure cell. The pit is now filled with water and used as a wildlife habitat.

PERIOD OF OPERATION: 1984 - Present

CONSTITUENTS:

Types of waste include; None
Types of waste constituents include; None

RELEASE CONTROLS: None

MEDIA OF CONCERN: ~~Groundwater, Soil~~ NONE

RELEASE HISTORY: No known releases

MIGRATION PATHWAYS:

Soil: There is a low potential for soil to be a migration pathway. No evidences of releases have been observed.

Groundwater: The potential for groundwater to be a migration pathway is low. The Borrow Pit was used to excavate clay and any releases to the clay would inhibit migration. THE MAXIMUM DEPTH OF THE EXCAVATION WAS ABOUT 15 FEET BELOW GROUND SURFACE. THERE IS STILL AN ABUNDANT AMOUNT OF CLAY LEFT IN THE BORROW PIT TO INHIBIT ANY MIGRATION OF CONTAMINANTS.

Surface Water: The potential for surface water to be a migration pathway is low. The borrow pit may overflow during heavy and extended rain events.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

AOC "F" - Truck Sampling Area and Inspection Bay Collection Tank

Regulatory Status:	Area Of Concern
UNIT DESCRIPTION	The area of concern consists of the truck sampling area, the scale, receiving trailer, and underground storage tank which is used to collect rain and snowmelt from under the former truck sampling area. This area is used to sample incoming tank trucks.
PERIOD OF OPERATION:	1987 - Present
CONSTITUENTS:	Types of waste include tanker truck receipts Types of waste constituents include; D004-D011 metals, acids, phenols and VOCs, unknowns
RELEASE CONTROLS:	Berms and all runoff to surface drainage ditch system. The inspection bay tank is located in a concrete vault.
MEDIA OF CONCERN:	~~Groundwater,~~ Soil
RELEASE HISTORY:	No known releases
MIGRATION PATHWAYS:	**Soil:** There is a low potential for soil to be a migration pathway. No evidences of releases have been observed. HOWEVER NO DOCUMENTATION EXISTS WHICH DESCRIBE THE SOIL CONDITIONS IN THE ARE SURROUNDING THE INSPECTION BAY COLLECTION TANK. **Groundwater:** The potential for groundwater to be a migration pathway is low. The inspection bay tank is located in a concrete vault.

Surface Water: The potential for surface water to be a migration pathway is low. All runoff is directed to the surface drainage ditch system.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

AOC "G" - Rolloff Staging Pad

Regulatory Status:	Area Of Concern
UNIT DESCRIPTION	The area of concern consists the rolloff staging area. Rolloffs are stored in this area which contain the sludge from the filter buildings. These rolloffs are removed for off-site disposal.
PERIOD OF OPERATION:	1991 - Present
CONSTITUENTS:	Types of waste include waste sludge Types of waste constituents include; D004-D011 metals, acids, phenols and VOCs, unknowns
RELEASE CONTROLS:	Concrete berms surround the rolloff staging pad.
MEDIA OF CONCERN:	Groundwater, Soil
RELEASE HISTORY:	No known releases
MIGRATION PATHWAYS:	**Soil:** There is a low potential for soil to be a migration pathway. No evidences of releases have been observed. NO DOCUMENTATION EXISTS IN THE AREA TO DESCRIBE SOIL CONDITIONS ASSOCIATED WITH THIS AOC. **Groundwater:** The potential for groundwater to be a migration pathway is low due to the concrete berms around the area **Surface Water:** The potential for surface water to be a migration pathway is low.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

AOC "H" - Facility Aboveground Transfer Piping

Regulatory Status:	Area Of Concern
UNIT DESCRIPTION	Aboveground transfer piping exists across the entire facility. This piping transfers wastes from the T-Tanks to each of the Injection Wells, through each of the FATs.
PERIOD OF OPERATION:	1984 - Present
CONSTITUENTS:	Types of waste include acid wastes Types of waste constituents include; D004-D011 metals, acids, phenols and VOCs
RELEASE CONTROLS:	None
MEDIA OF CONCERN:	Groundwater, Soil, SURFACE WATER
RELEASE HISTORY:	A number of document releases from the transfer pipelines have occurred in the operating record.
MIGRATION PATHWAYS:	**Soil:** There is a moderate potential for soil to be a migration pathway. A number of releases have been documented within the operating record. These releases were reported to be pumped up and any contaminated soils were removed for off-site disposal. **Groundwater:** The potential for groundwater to be a migration pathway is moderate due to the fact that various releases have occurred in the operating record. **Surface Water:** The potential for surface water to be a migration pathway is high. A release in April 1993 made its way to Little Raccoon Creek contaminating the creek and disturbing the biota. WASTE ACID FROM THE

TRANSFER PIPELINE TO INJECTION WELL 4 LEAKED. THIS WASTE ACID FOUND ITS WAY TO THE CREEK. STUDY'S WERE COMPLETED ON THE CREEK AT THE TIME OF THE RELEASE AND ALSO SIX MONTHS LATER TO DETERMINE THE EFFECTS OF THE RELEASE ON THE BIOTA. THE RESULTS OF THE STUDY FOUND NO LONG TERM EFFECTS OF THE RELEASE ON THE BIOTA OF LITTLE RACCOON CREEK. ALL REPORTS WERE SENT TO BOTH THE OEPA AND USEPA.

Air: There is no potential migration pathway to the air from this unit.

Subsurface gas: The potential for subsurface gas to act as a migration pathway is low.

PREVIOUS SAMPLING DATA: No data is available.

AOC "I" - Remaining Underground Piping

Regulatory Status: Area Of Concern

UNIT DESCRIPTION

The area of concern consists of any remaining underground piping which may exist. The underground transfer piping was used during the past operation at the facility to move waste to/from the ~~ponds~~ SURFACE IMPOUNDMENTS and other treatment facilities which existed at the facility (Oil Reclamation Facility, W-Tanks). Most of the buried lines associated with the Oil Reclamation Facility were removed during the closure of that unit. DAMES & MOORE PREPARED A REPORT TITLED "INVESTIGATION OF OIL RECOVERY AREA" DATED 1984 (ATTACHMENT E). THE OBJECTIVES OF THIS INVESTIGATION WAS TO CHARACTERIZE THE SUBSURFACE CONDITIONS, PHYSICALLY AND CHEMICALLY, IN THE OIL RECOVERY AREA AND TO LOCATE POTENTIAL SEEPAGE PATHS, PRIMARILY ALONG ACTIVE OR ABANDONED PIPELINES BETWEEN THE OIL RECOVERY AREA AND OPEN OR CLOSED SURFACE IMPOUNDMENTS. DAMES & MOORE CONCLUDED THAT THE EXTENT OF SUBSURFACE OIL MIGRATION APPEARS TO BE LESS THAN EXPECTED. ALTHOUGH SOME OF THE TRENCHES COMPLETED AS PART OF THE INVESTIGATION EXPOSED SOME OILY RESIDUE, IT DID NOT APPEAR TO BE THE RESULT OF SEEPAGE ALONG BURIED PIPELINES. ADDITIONALLY, THE INVESTIGATION DISCOVERED THAT AT NO POINT DID ANY POTENTIALLY CONTAMINATED MATERIAL PENETRATE THE UNDERLYING CLAY, SO ANY REMEDIAL EFFORTS INVOLVING REMOVAL OF CONTAMINATED MATERIAL WOULD BE LIMITED TO THE FILL ZONE.

PERIOD OF OPERATION:	1968 - Present
CONSTITUENTS:	Types of waste include unknowns Types of waste constituents include; PCBs, D004-D011 metals, acids, phenols and VOCs, unknowns
RELEASE CONTROLS:	None
MEDIA OF CONCERN:	Groundwater, Soil
RELEASE HISTORY:	Unknown
MIGRATION PATHWAYS:	**Soil:** There is a high potential for soil to be a migration pathway. Any piping which remains in the ground would be very old and most likely corroded. **Groundwater:** The potential for groundwater to be a migration pathway is high. Any piping which remains in the ground would be very old and most likely corroded. **Surface Water:** The potential for surface water to be a migration pathway is low. **Air:** There is no potential migration pathway to the air from this unit. **Subsurface gas:** The potential for subsurface gas to act as a migration pathway is low.
PREVIOUS SAMPLING DATA:	No data is available.

TABLES

TABLE 5-1

DESCRIPTION OF SWMUs

Unit Number	Solid Waste Management Unit	Release	Recent Release-RFA to Present
1	SURFACE IMPOUNDMENT ~~Pond~~ 1	Yes	No
2	SURFACE IMPOUNDMENT Pond 2	Yes	No
3	SURFACE IMPOUNDMENT ~~Pond~~ 3	Yes	No
4	SURFACE IMPOUNDMENT ~~Pond~~ 4	Yes	No
5	SURFACE IMPOUNDMENT ~~Pond~~ 5	Yes	No
6	SURFACE IMPOUNDMENT ~~Pond~~ 6	Yes	No
7	SURFACE IMPOUNDMENT ~~Pond~~ 7 (Includes SURFACE IMPOUNDMENT ~~Pond~~ 8)	Yes	No
8	SURFACE IMPOUNDMENT ~~Pond~~ 9 and Wet Well	Yes	No
9	SURFACE IMPOUNDMENT ~~Pond~~ 10	Yes	No
10	SURFACE IMPOUNDMENT ~~Pond~~ 11	Yes	No
11	SURFACE IMPOUNDMENT ~~Pond~~ 12	Yes	No
12	North Landfarm	Yes	No
13	East Landfarm	Suspected	No
14	South Landfarm	Suspected	No
15	Oil Reclamation Facility	Yes	No
16	Waste Pile	Unknown	No
17	Leachate Retention Pond	Yes	No
18	Old Tank Farm	Yes	No
19	Old Drum Storage Pad	Unknown	No
20	Lab Waste Tank	Yes	No
21	Truck Unloading and Washing Facility	Unknown	No
22	Grit Filters (aka Gravity Filters, Sand Interceptors)	Unknown	No
23	Waste Receiving Tanks (V-Tanks)	Unknown	No
24	Waste Head-Gas Scrubber	Yes	No
25	New Tank Farm	Unknown	No
26	T-Tank Pump House	Unknown	No
27	Filter Building No.1	Yes	Yes
28	Sluice Pit	Suspected	No
29	Filter Building No.2	Yes	No
30	Filtered Acid Tank: FAT-A, FAT-B, FAT-C	Yes	No

TABLE 5-1

DESCRIPTION OF SWMUs

Unit Number	Solid Waste Management Unit	Release	Recent Release-RFA to Present
31	Filtered Acid Tank, FAT-3	Yes	No
32	Pump House 3	Yes	Yes
33	Filtered Acid Tank, FAT-1	Unknown	No
	(aka FAT-6)		No
34	Pump House 1	Unknown	No
	(aka Pump House 6)		
35	Filtered Acid Tank, FAT-5	Unknown	No
36	Pump House 5	Unknown	No
37	Filtered Acid Tank, FAT-2	Unknown	No
38	Pump House 4	Unknown	No
	(aka New Pump House 2)		
39	Old FAT-2 Containment	Unknown	No
40	Pump House 2	Unknown	No
41	Drum Storage Pad (90-day)	Unknown	No
42	Waste Lube Oil Tank	Unknown	No
43	Sanitary Wastewater	Unknown	No
	Treatment Plant		
44	Truck Unloading Facility Cesspit	Unknown	No
45	Maintenance Building Cesspit	Unknown	No
46	IW #2	Yes	No
47	IW #4	No	No
48	IW #5	Yes	No
49	IW #6	No	No
50	IW #1	Unknown	No
51	IW #1A	Unknown	No
52	IW #3	Unknown	No
53	CLOSURE CELL	NO	NO

TABLE 5-2

DESCRIPTION OF AOCs

Unit Number	Area of Concern	Release	Recent Release-RFA to Present
A	Maintenance Tanks	Unknown	No
B	North Parking Lot - Truck Unloading Facility	Unknown	No
C	Pug Mill Staging Area (Hay Mill)	Unknown	No
D	Borrow Pit #1	Unknown	No
E	Borrow Pit #2	Unknown	No
F	Former Truck Sampling Area	Unknown	No
G	Rolloff Staging Pad	NA (1)	No
H	Facility Aboveground Piping	NA (1)	Yes
I	Remaining Underground Piping	NA (1)	No

Note:

(1) Area of concern identified as part of this report

FIGURES

6.0 INTERIM CORRECTIVE MEASURES

6.1 BACKGROUND

Many Interim Corrective Measures (ICMs) have been completed at the site since 1980. Numerous ~~pond~~ SURFACE IMPOUNDMENT closures, injection well abandonments, facility closures, underground piping removals and excavation of contaminated soils have been completed. These ICMs have significantly altered and improved the conditions of the site. The most prevalent change has been the movement of the waste pile into the closure cell, the closure of ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12, and the final capping and seeding of the closure cell.

The following sections describe ICM activity performed at the site. Figure 6-1 presents the location of ICMs on the site. All facilities which are closed at the facility are presented are Figure 6-2.

6.2 CLOSURE CELL CONSTRUCTION (CLOSURE OF ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5, AND 7)

The most noted ICM at the facility was the construction of the closure cell above where ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7 were located. The landfill was designed to meet the stringent TSCA PCB landfill requirements. CWM placed the following materials inside the landfill: fixed sludges from ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5, 7, 11 and 12, and other remedial material derived from closure across the facility (i.e., Oil ~~Reclamation~~ RECOVERY Area, and miscellaneous facilities detailed within the Consent Decree). Details of the closure of these ~~ponds~~ SURFACE IMPOUNDMENTS and the construction of the closure cell can be found in the closure certification documents completed by SEC Donohue in 1992.

The detailed nine-step plan for closure of SURFACE impoundments 4, 5, and 7, in two phases, is contained in separate documents:

> Phase I of Closure Plan for Ponds 4, 5, and 7; Vickery, Ohio Facility; Volume I (September 10, 1984);
>
> Phase II of Closure Plan for Ponds 4, 5, and 7; Vickery, Ohio Facility; Volume II (September 10, 1984, and revised May 8, 1985, and September 24, 1987);

Modifications to Design of Closure Cell; Impoundments 4, 5, and 7; Vickery, Ohio Facility (April 21, 1988); and

Responses to US EPA Closure Plan Approval Conditions; Closure of Impoundments 4, 5, and 7; CWM Vickery, Ohio Facility (July 26, 1988).

The first phase of ~~impoundment~~ SURFACE IMPOUNDMENT closure was approved by the OEPA on December 28, 1984 and was completed as of the end of December 1985, consisted of five steps:

(1) Preparation of a closure area, including a stockpile area and associated run-off retention basin;

(2) Removal of liquids from ~~ponds~~ SURFACE IMPOUNDMENT 4, 5, and 7 to SURFACE impoundment 11;

(3) In-place chemical fixation of sludges in SURFACE impoundments 4, 5, and 7; and removal and placement of the fixed sludges, together with solid materials and debris from the southern (closed) portion of ~~impoundment~~ SURFACE IMPOUNDMENT 4, in a stockpile;

(4) Removal and placement of ~~impoundment~~ SURFACE IMPOUNDMENT soils in the same stockpile; and

(5) Backfilling of the ~~impoundments~~ SURFACE IMPOUNDMENTS with clean soil from an on-site borrow area to an elevation of 602 ft above mean sea level.

Steps comprising Phase II of the closure of ~~impoundments~~ SURFACE IMPOUNDMENTS 4, 5, and 7 involved the construction and use of a Closure Cell to receive materials stockpiled during the first phase of closure (and, subsequently, materials from the closure of ~~impoundments~~ SURFACE IMPOUNDMENTS 11 and 12). Specifically, these steps included:

(1) Management of run-off from the Stockpile Area in ~~impoundments~~ SURFACE IMPOUNDMENTS 11 and 12;

(2) Construction of the Closure Cell, including its containment berm, double liner and leachate collection system, and underlying capillary barrier/drain, above the backfilled ~~impoundments~~ SURFACE IMPOUNDMENTS 4, 5, and 7. On March 30, 1988, U.S. EPA conditionally approved Phase II of the Closure of ~~impoundments~~ SURFACE IMPOUNDMENTS 4, 5, and 7 (OEPA approval was received on March 20, 1987). In the summer of 1987, CWM Vickery began construction of the Closure Cell liner;

(3) Construction of an interim cover over the liners placed in the Closure Cell to provide freeze protection for clay components;

(4) Placement in the Closure Cell of materials stockpiled during the first phase of closure, including miscellaneous items from the decontamination and dismantling of the Oil Reclamation Facility along with residual materials from closure of ~~ponds~~ SURFACE IMPOUNDMENTS 11 & 12; and,

(5) Completion of closure activities including capping, final grading and engineering certification.

6.3 CLOSURE OF ~~ponds~~ SURFACE IMPOUNDMENTS 11 AND 12

~~impoundments~~ SURFACE IMPOUNDMENTS 11 and 12 were closed pursuant to Paragraph I of the Federal Consent Agreement and Final Order which is presented in the document Closure Plan for ponds 11 and 12; Vickery, Ohio Facility (July 3, 1985). The closure process consisted of:

(1) Maintaining of waste inventory in both ~~impoundments~~ SURFACE IMPOUNDMENTS at less than 50 million gallons;

(2) Removal of the remaining liquids from ~~impoundment~~ SURFACE IMPOUNDMENT 11 to ~~impoundment~~ SURFACE IMPOUNDMENT 12;

(3) Management of runoff during closure in ~~impoundment~~ SURFACE IMPOUNDMENT 12;

(4) In-place chemical fixation of sludges in ~~impoundment~~ SURFACE IMPOUNDMENT 11;

(5) Removal of liquids from ~~impoundment~~ SURFACE IMPOUNDMENT 12 by deepwell injection;

(6) In-place chemical fixation of sludges in ~~impoundment~~ SURFACE IMPOUNDMENT 12;

(7) Placement of the fixed material, contaminated soils, and riprap from ~~impoundments~~ SURFACE IMPOUNDMENTS 11 and 12 into the Closure Cell above the differential cover separating materials placed from ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 & 7;

(8) Placement of final cover on the Closure Cell; and

(9) Backfilling and regrading of the ~~impoundment~~ SURFACE IMPOUNDMENT 11 and 12 area.

The Closure Certification document for the closure cell was submitted on December 7 ,1992.

6.4 CLOSURE OF W-TANKS

The W-Tanks, W-3, W-4, W-5 and W-7 were storage and treatment tanks used in conjunction with filtration and deep well injection of liquid wastes. The tanks and associated piping were closed under interim status regulations. The four tanks were located directly adjacent to the newer T-Tanks. Tanks W-3 and W-4 were located to the east of the T-Tanks, W-5 was located to the northeast of the T-Tanks and W-7 was located to the north of the T-Tanks. Each W tank was vertical steel construction on a soil foundation.

On February 1, 1988, CWM submitted to OEPA a closure plan for the W-Tanks and revised the plan on June 2, 1988. OEPA approved the plan, with conditions, on July 19, 1988. CWM

prepared a revised closure plan on April 7, 1989 and received approval to implement it from OEPA on September 29, 1989. On March 16, 1990, CWM notified OEPA of minor revisions to the approved plan to comply with the recently enacted land ban regulations.

Closure of the W-Tanks was initiated in March 1990. Cleaning and disposal of the tanks and associated equipment was performed through mid-May 1990. Initial soil excavation was performed during April and May 1990. After performing initial soil sampling following removal of the tanks in 1990, and after discussion with OEPA, CWM submitted a revised soil sampling plan to OEPA and received conditional approval on March 5, 1991. Additional soil excavation at the locations where residual contamination was detected was performed in June and July 1990.

After negotiations with OEPA and approval of a revised sampling plan, each tank area was resampled in April 1991 in accordance with the revised sampling plan. These results indicated the need for additional excavation and explanation that was performed in July 1991. The contaminated soil was transported from CWM to the CWM-Model City for disposal as TSCA Regulated Waste. The area was backfilled and graded in September and October 1991 and reseeded on October 9, 1991. A second review of the soil sampling data indicated that some F coded and PCB data was missing in the area of W-5. CWM notified OEPA and began additional excavation and testing in December 1991. This additional excavation and testing was completed in January 1992. The area was backfilled with clay soil on January 29, 1992 and seeded later in the spring. The excavated soil was again transported to CWM-Model City for disposal.

The general plan for closure of the W-Tanks consisted of the following:

(1) Removal of the residual tank contents, solidification and disposal of the contents at TWI, Sauget, Illinois.

(2) The interior of each tank was pressure washed. The rinsate from the tanks was transported and disposed at CWM-Newark, NJ. Rinseate samples were collected and analyzed in accordance with the closure plan.

(3) The tanks were dismantled, cut into pieces with a hydraulic shear and disposed at the Evergreen Landfill, Northwood, Ohio as solid waste.

(4) Fiberglass pipe insulation materials were removed from the piping during closure. The insulation was inspected for indications of visual contamination and disposed at the Evergreen Landfill. Pumps and PVC pipes were dismantled and cut into short pieces. The pieces were triple-rinsed in a basic solution and a clean water rinse. This solid material was disposed at the Adams Center Landfill, Fort Wayne, Indiana. The rinse solutions were disposed with the tank rinse water at CWM-NJ Newark.

(5) The soil was excavated and disposed at the CWM-Model City Landfill as TSCA Regulated Waste.

(6) The area was backfilled and graded to promote drainage to the on-site drainage ditch and seeded.

The W-Tanks were certified "clean closed" in 1992. THE BOWSER-MORNER CLOSURE REPORT IS PROVIDED AS APPENDIX F.

6.5 CLOSURE OF THE WASTE PILE AREA (INCLUDING THE LEACHATE RETENTION POND)

The waste pile area was created from excavated sludges and soils from the closure of ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7, the Oil Reclamation Facility, and other miscellaneous contaminated areas specified in the consent decree. In 1991 the material from the waste pile was placed into the closure cell. Once this task was complete, soil sampling was conducted on the soils beneath the waste pile. A grid sampling system was created and sampling commenced. "Clean" closure of this area could not be achieved as the soils were excavated down to depths approaching the original ~~ponds~~ SURFACE IMPOUNDMENTS (i.e., 1,2, 3 and 9). It was then decided to "contingent" close the waste pile area based on the sampling data, because all soils analyzed were not below the set criteria. The entire area was then capped with a minimum two feet of compacted clay and graded to allow run-off from the closure cell.

The leachate retention ~~pond~~ SURFACE IMPOUNDMENT was created in 1984 to collect run-off from the waste pile. In 1991, when the waste pile was placed in the closure cell, this area was "clean" closed by over-excavating any surface soil and placing that material in the closure cell. Soil samples taken beneath the excavated ~~retential~~ ~~pond~~ SURFACE IMPOUNDMENT yielded

results within the background criteria. A two foot clay cap was placed over this and the area was graded to allow discharge to the drainage swale.

6.6 CLOSURE OF ~~ponds~~ SURFACE IMPOUNDMENTS 1, 2, 3, 6E, 6W , 9 & 10

Specific dates for closure[1] of some of the ~~ponds~~ SURFACE IMPOUNDMENTS are unknown. The general timeframe in which the various closures occurred has not been determined. It is believed that ~~ponds~~ SURFACE IMPOUNDMENTS 2, 3, and 6-East were closed in 1979 followed by ~~pond~~ SURFACE IMPOUNDMENT 1 in 1980. ~~ponds~~ SURFACE IMPOUNDMENTS 6-West and 9 were closed in 1981 and ~~pond~~ SURFACE IMPOUNDMENT 10 was closed in 1982. The method of closure of each ~~pond~~ SURFACE IMPOUNDMENT included transferring liquids, removing sludges and backfilling with clean soil or clay or construction debris. Formal documentation on these closure activities is minimal Recollections of employees and a review of records indicated that some sludges were not removed before the ~~ponds~~ SURFACE IMPOUNDMENTS were closed. More information regarding the closure of these ~~ponds~~ SURFACE IMPOUNDMENTS is contained below.

- In 1979 the liquids contained in ~~pond~~ SURFACE IMPOUNDMENT 2 were pumped into ~~pond~~ SURFACE IMPOUNDMENT 4. The sludges were then pushed with a dozer to one end where they were transferred into ~~pond~~ SURFACE IMPOUNDMENT 1. ~~pond~~ SURFACE IMPOUNDMENT 2 was then backfilled with debris and clean soil was obtained from an off-site source.

- Oil was skimmed from ~~pond~~ SURFACE IMPOUNDMENT 3 and transferred to the Oil Reclamation Facility. The remaining sludges were fixed and transferred to ~~pond~~ SURFACE IMPOUNDMENT 9. ~~pond~~ SURFACE IMPOUNDMENT 3 was backfilled with clean soil from an off-site source.

- The liquid in ~~pond~~ SURFACE IMPOUNDMENT 6-East was pumped into ~~pond~~ SURFACE IMPOUNDMENT 4 or ~~pond~~ SURFACE IMPOUNDMENT 5. The sludges were transferred to ~~pond~~ SURFACE IMPOUNDMENT 10. ~~pond~~ SURFACE IMPOUNDMENT 6-East was backfilled with clean clay.

[1] For this report, "closure" does not mean clean closure under the regulatory sense, but removed from service by CWM.

- The liquids in ~~pond~~ SURFACE IMPOUNDMENT 1 were pumped to ~~pond~~ SURFACE IMPOUNDMENT 4. The sludges were also transferred into ~~pond~~ SURFACE IMPOUNDMENT 4. ~~pond~~ SURFACE IMPOUNDMENT 1 was then backfilled with debris from an off-site county demolition project and capped with clean soil from an off-site source.

- ~~pond~~ SURFACE IMPOUNDMENT 6-West was closed in a similar manner to ~~pond~~ SURFACE IMPOUNDMENT 6-East. However, some of the sludges were landfarmed and ~~pond~~ SURFACE IMPOUNDMENT 6-West was backfilled with stabilized material from ~~pond~~ SURFACE IMPOUNDMENT 9 and some clean soil. ~~pond~~ SURFACE IMPOUNDMENT 6-West was capped with two feet of compacted clay.

- The liquids in ~~pond~~ SURFACE IMPOUNDMENT 9 were transferred into ~~pond~~ SURFACE IMPOUNDMENT 4 and the sludge was fixed with foundry sand, dolomite lime, and pickle liquor by mixing in a pug mill. Most of the stabilized material was placed into ~~pond~~ SURFACE IMPOUNDMENT 6-West and ~~pond~~ SURFACE IMPOUNDMENT 10. Some of the stabilized material was placed into the south end of ~~pond~~ SURFACE IMPOUNDMENT 4. ~~pond~~ SURFACE IMPOUNDMENT 9 was backfilled with clean stone and soil.

- The liquids in ~~pond~~ SURFACE IMPOUNDMENT 10 were pumped to ~~pond~~ SURFACE IMPOUNDMENT 5 or ~~pond~~ SURFACE IMPOUNDMENT 7. Some sludges (pumpable) were transferred to ~~pond~~ SURFACE IMPOUNDMENT 4 while the remaining sludges were pushed to the west side of ~~pond~~ SURFACE IMPOUNDMENT 10. This sludge was mixed with cement kiln dust and transferred to ~~pond~~ SURFACE IMPOUNDMENT 4. Cleaned areas of the ~~pond~~ SURFACE IMPOUNDMENT were backfilled with stabilized material from ~~pond~~ SURFACE IMPOUNDMENT 9 and clean soil from an off-site source. The ~~pond~~ SURFACE IMPOUNDMENT was capped with clean clay.

6.7 CLOSURE OF LANDFARM AREAS

There were four landfarm areas at CWM. These areas known as Landfarm Area 1 (located north of ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12), Landfarm Area 2 (located east of ~~ponds~~ SURFACE IMPOUNDMENTS 11 and 12), Landfarm Area 3 (located east of the Oil ~~Reclamation~~

RECOVERY Facility), and Landfarm Area 4 (located east of ~~pond~~ SURFACE IMPOUNDMENT 9) received sludges from ~~ponds~~ SURFACE IMPOUNDMENTS 6-East, 6-West and 9 and perhaps from other ~~ponds~~ SURFACE IMPOUNDMENTS. The spreading of sludges in Landfarm Area 1 was discontinued in 1981. Landfarm Areas 2 and 3 were used from 1975 to 1976. The period of operation for Landfarm Area 4 is not known. Areas 2 and 3 were closed by removing the soils and backfilling with clean soils from and off-site source and capped with clay in 1976. Area 1 was closed in 1981 in a similar manner. Area 4 was closed n 1985. Soil sampling was collected by ETC in 1983 as part of the Clean Water, Inc., Closed Lagoons, Site 690, Phase VB Final Report. Sampling location, methodology and analytical results were documented in this report and are provided as Appendix ~~B~~A.

6.8 CLOSURE OF THE OIL ~~RECLAMATION~~ RECOVERY FACILITY

In 1977 a new Oil ~~Reclamation~~ RECOVERY Facility was constructed to replace an older facility and to replace the storage of waste oil in ~~ponds~~ SURFACE IMPOUNDMENTS with storage in tanks. The Oil ~~Reclamation~~ RECOVERY Facility is presented in Figure 6-3. Oil-bearing wastewaters and light oil sludges were mixed and sent to an oil/water separator. The recovered oil was stored in the tanks. The wastewater was transferred to a pretreatment system prior to disposal in the injection wells.

Decommissioning of the Oil ~~Reclamation~~ RECOVERY Facility was completed in 1985. The dismantled oil reclamation tanks were temporarily stored with the sludges from ~~impoundments~~ SURFACE IMPOUNDMENTS 4, 5, and 7 in the Waste Pile Area. The liquids in the tanks were shipped to an off-site incinerator. The sludges were stabilized and placed in the waste pile. The tanks and pipes were dismantled and also placed in the waste pile. The wet well closed as a pilot project for the closure of ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7 and was closed in the exact fashion and method used for ~~ponds~~ SURFACE IMPOUNDMENTS 4, 5 and 7 including backfilling with clean clay (ATTACHMENT E).

The wet well's contents were determined to have PCBs at concentrations of up to 228 ppm. Subsequent sampling and analysis of the soils adjacent to the wet well and throughout the Oil Reclamation Area determined that virtually no migration of the PCBs had occurred. The location of trenches completed as part of an investigation are located in Figure 6-4. As illustrated on the map, sample points ORT-7-clay and ORT-8-clay had 75 ppm and 7.17 ppm of PCBs respectively.

Analyses of additional soils in this area taken in October 1983 indicated no other contamination was detected in the overlying gravel or underlying clay.

The area of the former tanks was excavated and the excavated soil was placed in the waste pile and subsequently moved into the closure cell.

6.9 CLOSURE OF INJECTION WELLS 1, 1A AND 3.

Injection Wells 1, 1A and 3 were closed by CWM. The general procedures for closure of these wells are described below.

(1) Approximately 100 barrels (4,200 gallons) of a 10 pound per gallon NaCl brine was pumped was pumped into the well at a rate of 2 barrels per minute or 700 psi whichever was lower.

(2) A blowout preventer was mounted.

(3) A return line was connected from the annulus space to a tank and remove the diesel fuel from the annulus by pumping brine (10 lb/gallon NaCl) down the tubing.

(4) The annulus pressure was allowed to equalize.

(5) The well was cleaned to total depth using an 3-3/4" bit and a 2-7/8" workstring.

(6) The hole was open ended to total depth with 8 joints of 2-7/8" fiberglass tail pipe on the bottom of the workstring.

(7) Clean brine was circulated for 15 minutes with clean brine.

(8) The hole was cemented by pumping 2 barrels of weighted diesel and 800 gallons of Epseal (13.6 pounds per gallon) and inserted a wiper plug. This was displaced with brine.

(9) The blowout preventer and tubing were closed. The annulus was pressurized to 500 psi.

(10) The Epseal was allowed to cure for 24 hours.

(11) The fiberglass was severed tubing above the wiper plug.

(12) The remaining fiberglass tubing was removed.

(13) The Epseal plug was pressure tested to 500 psi for one hour.

(14) The well was entered open ended to the top of the Epseal plug and balanced with Class A neat cement from the top of the Epseal plug to the surface in three stages. Clean brine was circulated at the end of each stage.

(15) The well head was cut off three feet below ground level and welded a plate on top of the casing with the following information:

Chemical Waste Management
Hazardous Waste Disposal Well
Ohio EPA UIC _____
Plugged: ____(DATE)__

(16) Covered with earth and erected a proper monument.

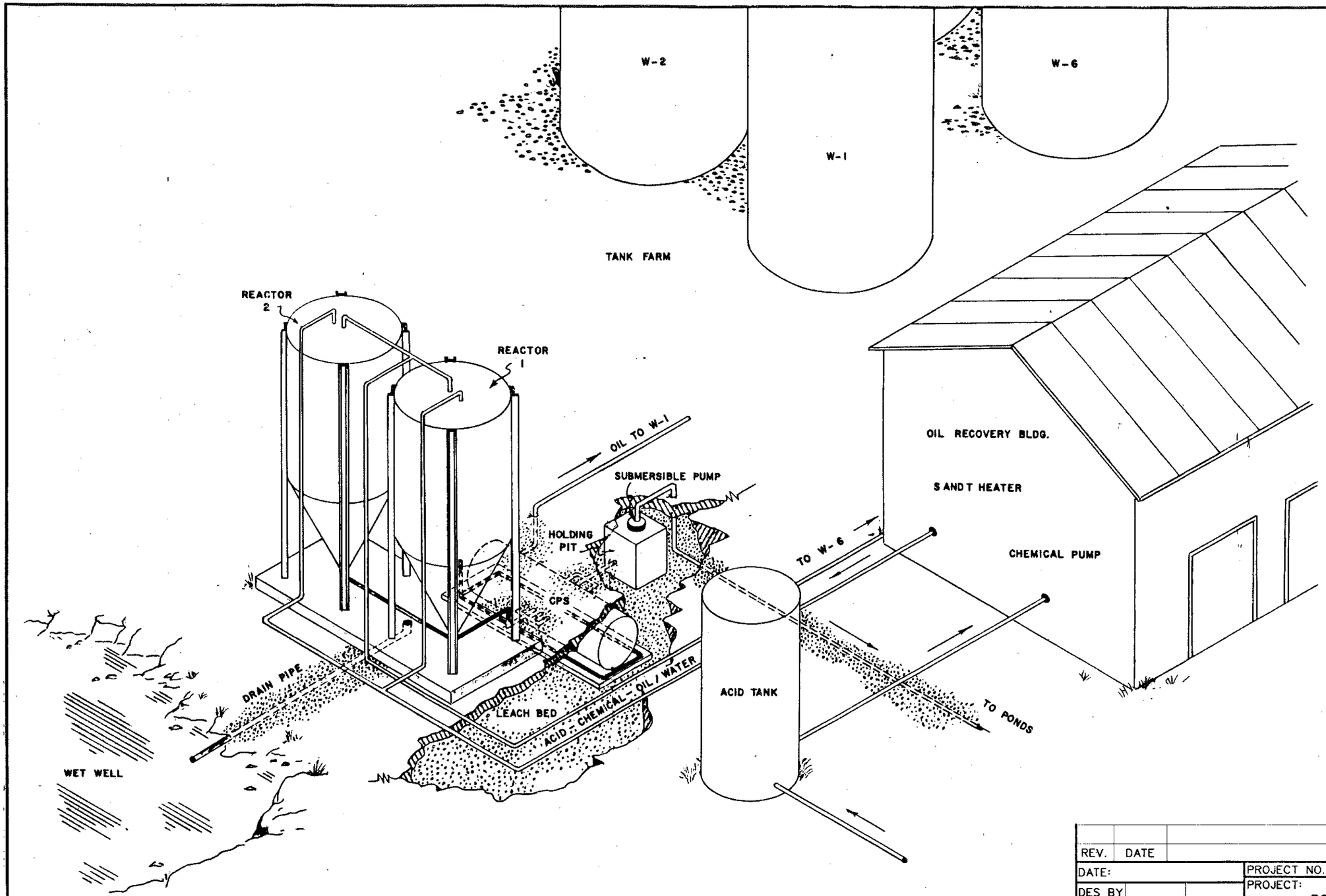
6.10 ADDITIONAL INTERIM REMEDIAL ACTIVITIES

Additional interim remedial activities have taken place on-site. A transfer line from ~~pond~~ SURFACE IMPOUNDMENT 7 to Filter Building 2 failed causing wastes to spill. The liquid was pumped back to ~~pond~~ SURFACE IMPOUNDMENT 7 and the visually contaminated soils were excavated and sent off-site for disposal. The soil underlying the spill area were analyzed and additional excavation was performed three times until soils were to background levels.

Other spills which have occurred on-site have been cleaned up in the following fashion. All liquids were recovered and disposed through the deep well system. All soils were neutralized using lime and sent off-site for disposal. A large spill occurred in April 1993 in which waste was released to Meyer's Ditch and subsequently made its way to Little Raccoon Creek. All liquids

and soils were cleaned up in the same manner as described above. Two bio-studies were conducted in Little Raccoon Creek, in April and August. These studies showed no residual contamination and confirmed that the fish population had been restored with no environmental damage. A report was sent to the OEPA.

FIGURES



REV.	DATE		DRN BY	APP BY

DATE:	PROJECT NO. 38627	SCALE: NOT TO SCALE
DES BY	PROJECT: RCRA FACILITY INVESTIGATION	
DRN BY JAT		
CHK BY RZ	SHEET TITLE: OIL RECOVERY FACILITY	
REV BY		
APP BY		

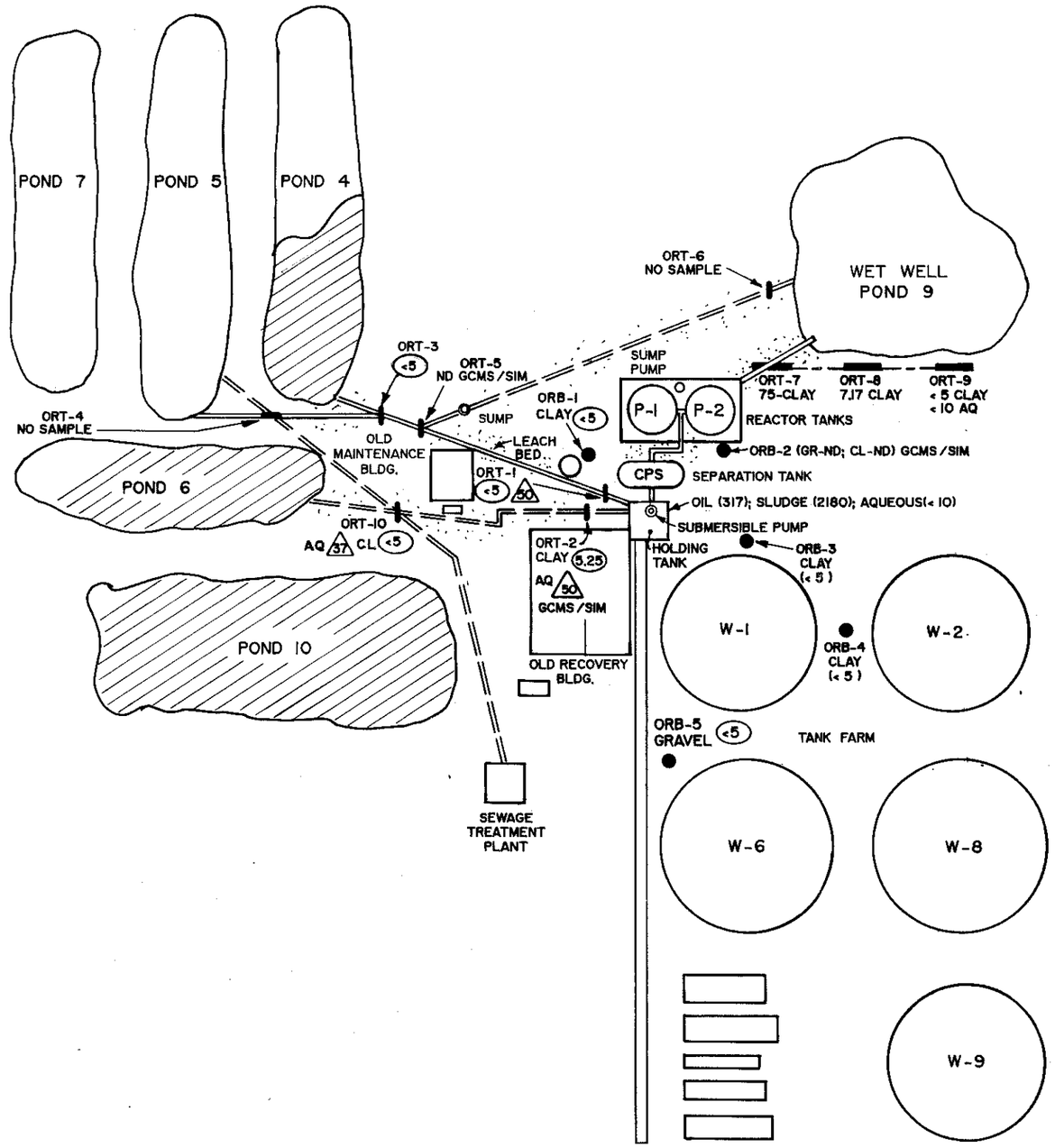
RUST ENVIRONMENT & INFRASTRUCTURE

CWM-Vickery
Vickery, Ohio

SHEET ____ OF ____

DRAWING NO.

FIGURE 6-3



OIL RECOVERY FACILITY

LEGEND

- PCB GRAVEL OR CLAY PPM
- PCB AQ. PPM
- BORING LOCATION
- TRENCH LOCATION
- ABANDONED PIPELINE
- ACTIVE PIPELINE

REV.	DATE		DRN BY	APP BY

DATE: SEPTEMBER, 1993	PROJECT NO. 38627	SCALE: NOT TO SCALE
DES BY	PROJECT: RCRA FACILITY INVESTIGATION	
DRN BY JAT		
CHK BY RZ	SHEET TITLE: **OIL RECOVERY AREA SAMPLING LOCATIONS**	
REV BY		
APP BY		

RUST ENVIRONMENT & INFRASTRUCTURE

CWM-Vickery
Vickery, Ohio

SHEET ____ OF ____

DRAWING NO.

FIGURE 6-4

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FIGURES

APPENDIX ~~1~~ A

CLEAN WATER, INC.

CLOSED LAGOONS
SITE 690

PHASE VB
FINAL REPORT

CLEAN WATER, INC.

CLOSED LAGOONS
SITE 690

PHASE VB
FINAL REPORT

NOVEMBER 1983

Environmental Testing and Certification Corporation
284 Raritan Center Parkway
Edison, New Jersey 08837

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ATTACHMENT 2 -- Chain-of-Custody and Field Forms
ATTACHMENT 3 -- Methodology
ATTACHMENT 4 -- Analytical Results

1.0 PURPOSE

The purpose of the phase 5b project was to determine if PCB's were present in the area of the closed lagoons at Site 690. Included in these objectives were determinations of PCB levels at three foot depth intervals in the fill material and one sample of the underlying clay.

As part of this project, the U. S. Environmental Protection Agency (USEPA) and the Ohio Environmental Protection Agency (OEPA) were invited to take split samples. It was the intent of the USEPA to analyze certain samples for EP Toxicity and/or dioxin. ETC's objectives included analyzing the split samples for these parameters.

2.0 FIELD METHODOLOGY

Sampling was conducted by ETC and its subcontractor, Dames & Moore (D&M) from May 9, 1983 through May 18, 1983. Samples were collected from closed lagoons 1, 2, 3, 4, 6, 9, 10; the Abandoned Sludge Farm; and areas east of the facility (East Area) and south of the facility (South Area). A backhoe was used to open test pits at the closed lagoons, and samples were collected at three foot depth intervals from the backhoe bucket. Samples of the underlying clay were taken with a thin wall piston tube. Soil samples at the other three areas were taken using the Piston Tube Sampler.

2.1 Sample Point Locations

Approximately two to three sample locations per acre were designated for each closed lagoon. A site map is presented in Figure 1 denoting these sample points. Samples were collected from each location at a minimum of three foot depth intervals. Samples were taken of different layers of the fill material. Occasionally this required taking samples at a greater frequency than one per three feet.

The coding convention for these samples, agreed to by CWI, USEPA, and ETC, was as follows:

CL	-	10	-	3	-	9
(Closed Lagoon)	-	(Lagoon #)	-	(Sector #)	-	(Depth in Feet)

Samples were collected from the Abandoned Sludge Farm, East Area and South Area at the sample points designated on the site map (Figure 1). The coding convention for these samples was as follows:

Abandoned Sludge Farm:	ASF
East Area:	EA
South Area:	SA

ASF	-	2	-	0
(Site Code)	-	(Sample Point #)	-	(Depth)

2.2 Sample Collection

Samples from the closed lagoons were collected by excavating the fill material and opening a test pit. Samples were collected from the backhoe bucket. The bucket was steam cleaned between each test pit and all samples were collected from the center of the bucket to avoid possible contamination from the bucket itself. A new piston tube was used to collect a sample of the underlying clay.

Samples from the Abandoned Sludge Farm, East Area, and South Area were also collected using a piston tube. Detailed procedures and a description of the apparatus is provided in Attachment 1.

2.3 Field Data Records

ETC Chain-of-Custody forms (CC1 and CC2) were used to document sampling events. Field information recorded included the sample point ID code, date, time person who had custody of sample, person who physically collected sample, sample depth (inches), depth to bottom, sampling method, weather and general sample description.

Completed copies of these field records (CC1 and CC2) are presented in the analytical reports for each sample. The CC1 data is also maintained on magnetic tape as part of the data file.

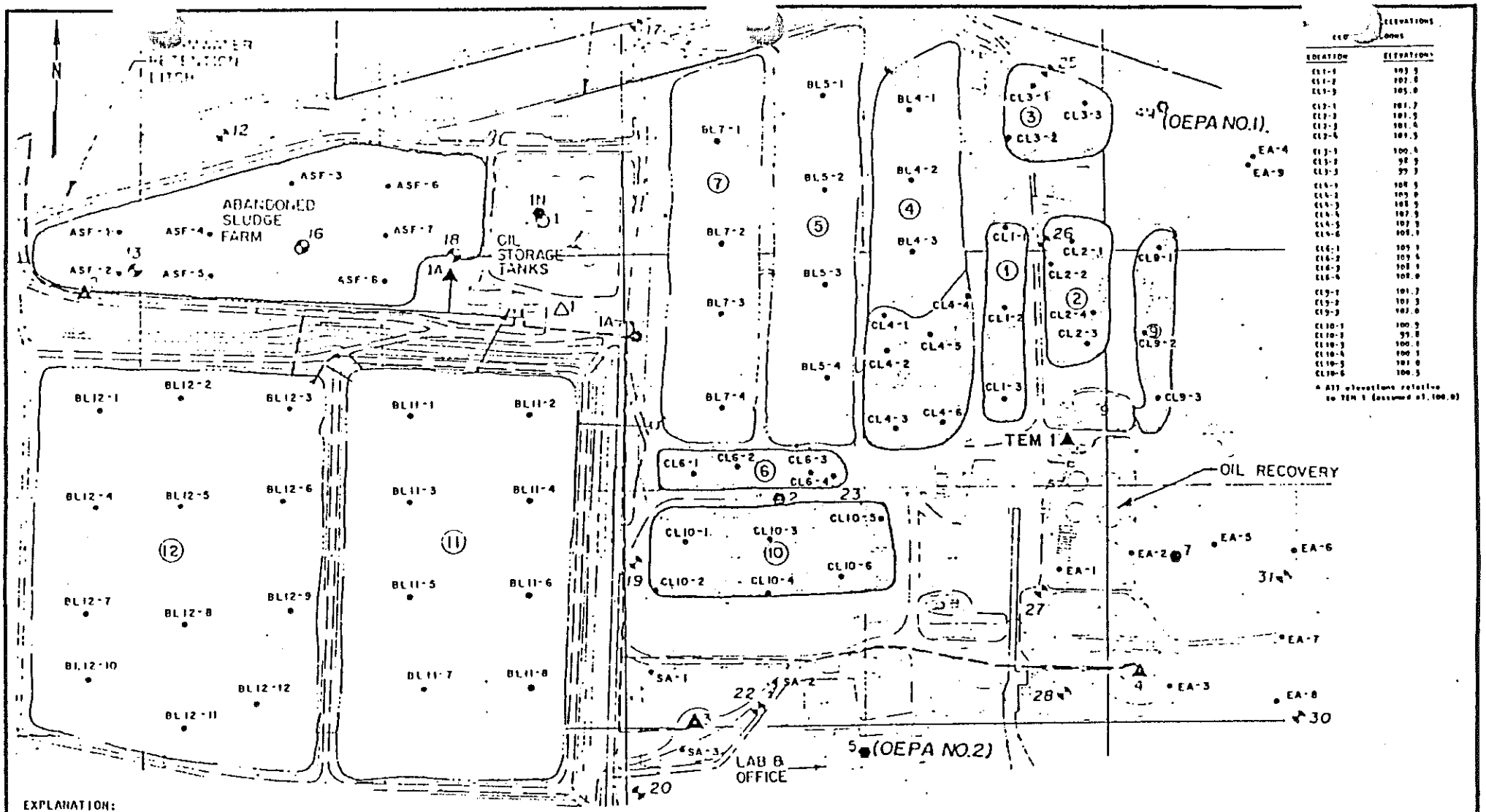
3.0 CHAIN-OF-CUSTODY DOCUMENTATION

Chain-of-Custody and the associated documentation was maintained for each sample. Blank copies of the chain-of-custody form (CC1) and field information form (CC2) are presented as attachments. ETC Sample Shuttles were used to maintain custody from the time the containers left the ETC laboratory in Edison, New Jersey until they were returned to the same location. Shuttles were sealed at the laboratory with a numbered ETC seal and the seal was broken at the Vickery site prior to sample collection. Use of this seal guarantees the integrity of the Shuttle contents during shipment.

Once a person had the sample or sample bottles under custody, they were at all times

- in his/her actual possession; or
- in his/her view, after being in actual possession; or
- in his/her actual possession and then placed in a locked or otherwise secure place to which any access by others was fully recorded.

Before leaving the site, the Shuttles were sealed with a numbered ETC seal and the seal number recorded on the chain-of-custody form. These seals were broken upon receipt at ETC, the seal number verified, and internal chain-of-custody maintained. All chain-of-custody records are presented in the data reports for each sample.



ELEVATIONS	
LOCATION	ELEVATIONS*
CL1-1	103.5
CL1-2	102.8
CL1-3	105.0
CL2-1	101.7
CL2-2	101.5
CL2-3	101.6
CL2-4	101.5
CL3-1	100.6
CL3-2	98.5
CL3-3	99.3
CL4-1	108.5
CL4-2	105.9
CL4-3	103.5
CL4-4	107.5
CL4-5	107.3
CL4-6	105.1
CL6-1	105.3
CL6-2	107.4
CL6-3	108.3
CL6-4	108.0
CL9-1	101.7
CL9-2	101.3
CL9-3	101.0
CL10-1	100.5
CL10-2	99.8
CL10-3	100.1
CL10-4	100.1
CL10-5	101.0
CL10-6	100.3

* All elevations relative to TEM 1 (assumed at 100.0)

EXPLANATION:

▲ CWMI benchmark (assigned elevation 100.00)

● Sampling location

ACTUAL SAMPLING LOCATIONS

REFERENCE: Base map taken from Facility Location Plan, Project No. 33767, 2/16/83

DAMES & MOORE

FIGURE

TABLE 1
SAMPLE POINT SUMMARY

PHASE VB - CLOSED LAGOONS (CL)

SAMPLE POINT CODE	PARAMETERS
CL1-1-0	PCB
CL1-1-3	PCB
CL1-1-6	PCB
CL1-1-9	PCB
CL1-1-12	PCB, EP TOX
CL1-1-12.5C (clay)	PCB, EP TOX
CL1-2-0	PCB
CL1-2-3	PCB
CL1-2-6	PCB
CL1-2-10	PCB, EP TOX
CL1-2-11C (clay)	PCB
CL1-3-3	PCB
CL1-3-6.5	PCB
CL1-3-9	PCB, DIOXIN
CL1-3-11C (clay)	PCB
CL2-1-0	PCB
CL2-1-3	PCB
CL2-1-6	PCB
CL2-1-9	PCB
CL2-1-12	PCB
CL2-1-12C (clay)	PCB
CL2-2-0	PCB
CL2-2-3.5	PCB
CL2-2-6	PCB
CL2-2-9	PCB
CL2-2-12	PCB, EP TOX
CL2-2-12C (clay)	PCB
CL2-3-0	PCB
CL2-3-3	PCB
CL2-3-4	PCB, EP TOX
CL2-3-6	PCB, EP TOX, DIOXIN
CL2-3-10	PCB, EP TOX
CL2-3-11	PCB
CL2-3-11C (clay)	PCB

CL2-4-0	PCB
CL2-4-3	PCB
CL2-4-7	PCB
CL2-4-10	PCB
CL2-4-12	PCB, EP TOX
CL2-4-12C (clay)	PCB, EP TOX
CL3-1-0	PCB
CL3-1-3	PCB, Dioxin
CL3-1-4C (clay)	PCB
CL3-2-0	PCB
CL3-2-3	PCB
CL3-3-0	PCB
CL3-3-3	PCB, EP TOX
CL3-3-3.5 (clay)	PCB
CL3-3-6C (clay)	PCB
CL4-1-0	PCB
CL4-1-3	PCB
CL4-1-6	PCB, EP TOX
CL4-1-10	PCB
CL4-1-12	PCB
(no clay)	
CL4-2-0	PCB
CL4-2-3	PCB
CL4-2-6	PCB, DIOXIN
CL4-2-9	PCB
CL4-2-13	PCB
CL4-2-16	PCB, EP TOX
CL4-2-17C (clay)	PCB
CL4-3-3	PCB
CL4-3-6	PCB
CL4-3-9	PCB
CL4-3-13C (clay)	PCB
CL4-3-15C	PCB
CL4-4-1	PCB
CL4-4-3	PCB
CL4-4-6	PCB
CL4-4-9	PCB
CL4-4-12C (clay)	PCB
CL4-5-0	PCB
CL4-5-3	PCB
CL4-5-6	PCB

CL4-5-10	PCB
CL4-5-12	PCB
CL4-5-16	PCB
(no clay)	
CL4-6-3	PCB
CL4-6-4	PCB
CL4-6-6	PCB
CL4-6-9	PCB
CL4-6-12	PCB
CL4-6-15C (clay)	PCB
CL6-1-4	PCB
CL6-1-6	PCB
CL6-1-9	PCB
CL6-1-12	PCB
CL6-1-13	PCB
CL6-1-13C (clay)	PCB
CL6-2-3.5	PCB
CL6-2-6.5	PCB
CL6-2-9.5	PCB
CL6-2-12	PCB
CL6-2-14.5	PCB
CL6-2-15C (clay)	PCB
CL6-3-4	PCB
CL6-3-6	PCB
CL6-3-9	PCB, EP TOX
CL6-3-12C (clay)	PCB
CL6-4-3	PCB
CL6-4-6	PCB
CL6-4-9	PCB
CL6-4-11.5	PCB
CL6-4-12C (clay)	PCB, DIOXIN
CL9-1-0	PCB
CL9-1-2	PCB
CL9-1-3	PCB
CL9-1-4	PCB
CL9-1-6	PCB, DIOXIN
CL9-1-8	PCB, EP TOX
CL9-1-10C (clay)	PCB
CL9-2-0	PCB
CL9-2-3	PCB
CL9-2-7	PCB

CL9-2-9	PCB
CL9-2-9 (aqueous)	PCB
CL9-3-0	PCB
CL9-3-3	PCB
CL9-3-6	PCB
CL9-3-9	PCB, EP TOX
CL9-3-11C (clay)	PCB
CL10-1-0	PCB
CL10-1-3	PCB
CL10-1-5	PCB
CL10-1-6	PCB
(no clay)	
CL10-2-0	PCB
CL10-2-3	PCB
CL10-2-6	PCB
CL10-2-9	PCB
CL10-2-12	PCB
CL10-2-12.5C (clay)	PCB
CL10-3-0	PCB
CL10-3-3	PCB
CL10-3-6	PCB
CL10-3-8.5	PCB, EP TOX
CL10-3-11	PCB
(no clay)	
CL10-4-0	PCB
CL10-4-3	PCB
CL10-4-6	PCB
CL10-4-6.5C (clay)	PCB
CL10-5-0	PCB
CL10-5-3	PCB, DIOXIN
CL10-5-5.5	PCB
CL10-5-7.5	PCB
CL10-5-11C (clay)	PCB
CL10-6-0	PCB
CL10-6-3	PCB
CL10-6-6	PCB
CL10-6-10	PCB
CL10-6-11C	PCB
ASF1-0	PCB
ASF2-0	PCB, EP TOX
ASF3-0	PCB

ASF4-0	PCB
ASF5-0	PCB
ASF6-0	PCB, EP TOX
ASF7-0	PCB
ASF8-0	PCB
EA1-0	PCB
EA2-0	PCB
EA3-0	PCB
EA4-0	PCB
EA5-0	PCB
EA6-0	PCB
EA7-0	PCB
EA8-0	PCB
EA9-0	PCB
RIP-4	PCB
RIP-5	PCB
RIP-7	PCB
RIP-11	PCB
SA1-0	PCB
SA2-0	PCB
SA3-0	PCB

Attachment 1

Dames & Moore Field Procedures

CLOSED LAGOONS: GENERAL SAMPLING PROCEDURES

Dames & Moore was retained by Environmental Testing and Certification (ETC) to perform on site sampling of sludge from the open lagoons at the Chemical Waste Management Incorporation (CWMI) Vickery, Ohio disposal facility. The scope of work was expanded to include subsurface characterization of the closed waste lagoons and landfarm areas, according to the sampling plan outlined in our letter of April 13, 1983. The purpose of the characterization was to establish any spatial distribution of PCBs in materials used to close several waste lagoons.

The sampling plan was formulated on the basis of obtaining samples from at least two locations per acre in the closed lagoon areas, and at least one location per acre in the landfarm areas. It was assumed that for the closed lagoons a backhoe could be used to recover samples down to just below the lagoon bottoms. Samples were to be taken at 3-foot intervals and at significant changes in stratigraphy. A sample of the native bottom clays was also to be taken at each location. Samples in the landfarm area were to be taken at 1- or 2-foot intervals to a depth of approximately 3 feet.

Each of closed lagoons 1, 2, 3, and 9 were broken up into three relatively equal sectors, with one sampling location in each, as shown in Figure 1. Lagoon 6 was actually split in half by a low dike, and was therefore divided into four sectors, two on each side of the middle dike. Lagoons 4 and 10 were each divided into six sectors. Figure 1 illustrates the planned locations of the sampling locations, however, some alterations in location became necessary due to the logistics of moving in excavation equipment,

and in view of the fill material anticipated. Discussions with CWMI employees identified potential problem areas where large boulders or concrete slabs had been buried. The sampling locations were adjusted to maximize the chances of extending the trench down to native clay.

Sampling Equipment

Sampling was performed by a backhoe or a deep trenching hoe having a deeper reach than the backhoe. The backhoe was used to dig the trenches in closed lagoons 1, 2, 3, and 9. The deep trenching hoe was used for closed lagoons 4 and 6 since the bottom of the lagoon was beyond the reach of the backhoe. It was also used for lagoon 10 as a matter of convenience.

The samples were taken from the middle of the hoe bucket with a steel trowel. Material was sampled which had not contacted the bucket itself, and placed in a stainless bowl. Care was taken not to cross-contaminate the sample by handling with unwashed tools or gloves. The bottles were filled from the bowl utilizing the same trowel and a funnel.

Piston tube cores were taken of the native clays beneath the bottom level of the lagoon. The piston tube sampler is illustrated in Figure 2. In cases where groundwater filled the trench, a prepared brass piston tube was used to preclude the possibility of contamination of the clay core by the groundwater. The prepared tube was made by pouring molten parafin into a plastic end cap, inserting the bit end of the tube and taping the cap to the tube with electrical tape. The drive head is fitted with an O-ring which keeps water from contaminating the inside of

the tube. All pipe threads were sealed with teflon tape when a prepared tube was used.

General Procedure

Sampling locations for each closed lagoon were staked out using a site location map provided by CWMI. First, the lagoon boundaries were staked out by scaling from prominant landmarks on the map. These boundaries were located from the landmarks using a surveying wheel to measure horizontal distances and small orange flags to mark the corners. Once the lagoon boundaries were located, the sector lines were established and sampling locations marked. The boundary marks were subsequently removed to avoid confusion. Once the locations were established according to the plan illustrated in Figure 1, the locations were reviewed in the field with CWMI employees to identify potential problems reaching the bottom of the fill material. Shifts in location were made accordingly.

The backhoe bucket was initially prepared by steam cleaning, using a steam jenny and municipal water from the Town of Clyde, trucked onto the site in a 500-gallon tank mounted on a pick-up truck. Employees of CWMI operated and cleaned the backhoe bucket between each sampling location.

To start each sampling location, typically the hoe was used to scrape the top of the ground surface, and a grab sample was taken directly with a steel trowel, and transferred to a stainless steel bowl. In locations where the surface was comprised of coarse gravel, no sample was taken. The sample was mixed and split between ETC and USEPA, using the trowel and a funnel to

fill the sample jars. Between each sample the trowel, bowl, and funnel were scraped clean and final rinsed with hexane followed by methanol and finally offsite potable rinse water, so as to prevent cross contamination of the samples.

As the digging progressed, the trench was logged descriptively by a Dames & Moore engineer. The logs included detailed descriptions and depths of each sample taken, general observations of the trench, and depth and recovery of the clay core taken in the native clays. Any problems incurred during the sampling were also noted.

Samples were taken at 3-foot intervals or at significant changes in stratigraphy as directed by a Dames & Moore engineer. The samples were taken from the backhoe bucket with the trowel, using care to take portions of material which had not contacted the bucket. The sample was collected on the stainless steel bowl so that digging could proceed while the sample jars were being filled. All samples were taken and handled by Dames & Moore personnel only.

The excavation continued until native clay materials were encountered. A piston tube core was taken using the piston tube sampler shown in Figure 2. At locations where groundwater was seeping into the trench, a prepared tube was used. The cores were taken while standing at the side or back of the trench when the sidewalls were stable. In locations where there was danger of caving, a long aluminum grate was placed across the trench using the backhoe. The sampler was lowered into the trench attached to sections of 1-inch pipe which were preassembled. A drive hammer sliding on a section of pipe was attached and the

tube was driven 12 to 18 inches into the clay. The core was sheared off at the base by twisting the pipe clockwise with a pipe wrench. Two persons using pipe wrenches to grab the pipe were required to withdraw the clay core where the sidewall conditions were stable. In most unstable situations, a pipe wrench was wedged against the backhoe bucket which was used to withdraw clay core. The tube was removed from the drive head, and 1/4 inch of clay was shaved off the lower end to remove any material which may have been contaminated by groundwater, and to allow room for a wax seal. Molten parafin was poured into both ends, and allowed to harden. The location identification and core depth were scratched into the tube with a knife, and the core tube stored in Dames & Moore custody until extrusion.

Upon completing the hole, the backhoe bucket was thoroughly cleaned with a steam jenny, soap, and water. Each trench was immediately backfilled by CWMI employees using a small dozer or a front end loader.

Problems/Deviations from General Procedure

The closed lagoons were samples in the following order: CL2, CL9, CL3, CL1, CL6, CL10, and CL4. The alterations from the general procedure, and problems encountered are highlighted for each lagoon in numerical order below. Sampling chain of custody records were maintained by Mr. John Snodgrass of ETC for closed lagoons 1, 2, 3, and 9. A Dames & Moore technician assumed responsibility for maintaining sample records for the remaining lagoons. A summary of the sample data is shown in Table 1. Several gaps in the data remain which could not be reconstructed with records provided by ETC.

- Closed Lagoon 1: This closed lagoon was flooded in the central eastern part, with water. This water was pumped out in anticipation of sampling, however, the sample locations were slightly altered to enable the backhoe to work on stable ground. No surface sample was taken at CL1-3 due to the presence of coarse limestone gravel.

- Closed Lagoon 2: The piston tube sampler was pushed into the clay with the backhoe bucket and withdrawn with the bucket at locations CL-1 and CL-2. One of the pipe sections buckled and broke under the pressure of the backhoe bucket during sampling with the piston tube sampler. All other clay cores were taken using the hammer. Groundwater was encountered at locations CL2-2, CL2-3, and CL2-4. The hole at CL2-3 constantly caved in from the sides, therefore, no attempt was made to obtain a clay core. Mr. John Snodgrass of ETC requested that an additional location be sampled, designated CL2-4.

- Closed Lagoon 3: This lagoon proved to be very shallow with only samples taken at the surface and 3 feet. At location CL3-3 two clay cores were taken, the first just beneath the sludge line at 3.5 feet. The second core was taken at 5.5 feet at the request of Mr. Lester Franks of CWMI to insure native clays were sampled.

- Closed Lagoon 4: Location CL4-1 was dug in a very loose sludge clay matrix which constantly flowed back into the hole. Due to the instability of the trench, native clay was not reached before the excavation was terminated. Groundwater was encountered at locations CL4-2, CL4-3, CL4-5, and CL4-6. Groundwater at

location CL4-6 left a yellow stain, and contained black oil globules. A dike was built around the borrow pit using the front end loader to contain groundwater carried along in the bucket. The dammed water was siphoned off into a CWMI tank truck. A water sample was taken at location CL4-6 using a bottle to take water from the center of the hoe bucket. Caving became a problem. Caving at location CL4-5 prevented successful recovery of a native clay core.

- Closed Lagoon 6: This lagoon was originally split in two by a berm, whereby two excavations in each half were made. No surface samples were taken since the top foot consisted of coarse angular limestone gravel. Groundwater was encountered at locations CL6-1, CL6-2, and CL6-3. Construction debris and gravel were encountered at location 2, causing caving of the sidewalls. The hole was too big to use the grating for taking the clay core, consequently the clay core was attempted by a Dames & Moore engineer and a CWMI employee suspended above the hole in the hoe bucket. A cave-in midway through obtaining the core broke off the pipe down in the hole. A Dames & Moore engineer was lowered into the hole and retrieved the pipe and clay core by wedging a pipe wrench with the pipe against the bucket, thus allowing the bucket to withdraw the tube.

- Closed Lagoon 9: In this lagoon we encountered extensive construction debris, reportedly the remains of a local county courthouse. At location CL9-1, further penetration was impossible after the first 3 feet. The hole was relocated approximately 25 feet to the east, and sampling resumed at 3 feet. Groundwater seepage was abundant from around huge concrete slabs, carrying with it oil and a purple fluid. The clay core

was taken using a prepared piston tube. Groundwater was also encountered in locations CL9-2 and CL9-3. Caving and the presence of concrete slabs too large to move prevented obtaining a clay core from location 2.

- Closed Lagoon 10: Closed lagoon 10 was a shallow lagoon but sampled with the deep trenching backhoe as a matter of convenience. At location CL10-1, a clay core was attempted with no recovery. The sidewalls became increasingly unstable, threatening the machine, therefore, no further attempts at obtaining a core were made. A 3-foot sludge layer was encountered at location CL10-3 at 8.5 feet. This layer became very unstable and the hoe began to sink into the pit. The hole was abandoned without reaching native clay. Three attempts were made in obtaining a clay sample at location CL10-6 before a successful core was withdrawn.

Abandoned Sludge Farm and Landfarm Areas

Three landfarm areas were to be sampled at 1 or 2 foot intervals down to a depth of 3 feet in locations shown in Figure 3. This plan was modified in the course of conversations with an ETC representative to only include one sample core at each location.

The landfarm areas were sampled using the piston tube sampler and one section of 1-inch pipe, plus the hammer section. The core tube was hammered into the ground from the surface, and the core sheared off at the bottom by rotating the pipe shaft clockwise with a wrench. Two people were typically required to extract the full tube from the ground. A new clean tube was used at each location. After extraction, the sample location code was

scratched on the tube, and the drive head cleaned with hexane, methanol, and potable offsite water. Where water covered the surface, a prepared tube was used.

- East Area Landfarm: At location EA-1, the piston tube had to be dug out of the ground with a shovel. One additional sample (EA-9) was added by the Dames & Moore engineer in a marshy section of the north end of the east area. Samples were taken both on the berms and in the landfarm itself, since the berms were made of material gleaned from the landfarm itself. Locations EA-5 and EA-9 were submerged.

- South Area Landfarm: Three samples were taken at representative locations within the landfarm area. Location SA-1 was submerged.

- Abandoned Sludge Farm: The entire abandoned sludge farm was submerged under runoff water. In the area of ASF-6 (see Figure 3), the water was as much as 3 to 4 feet deep. This landfarm was sampled using the piston tube sampler and prepared tubes. The prepared tubes and all tools were placed in a fiberglass boat. Two Dames & Moore engineers in hip waders performed the sampling as described above, pulling the boat along with them. Coordinate flags were set out on the berms by a Dames & Moore technician and USEPA representatives. A sampling location was obtained by lining up at the intersection of imaginary lines drawn between the flags. The actual locations of the samples are shown in Figure 3.

Horizontal and Vertical Control

Following the excavation at each location, the excavation site was located using a tape or surveying wheel to measure horizontal distances from nearby landmarks. The actual locations of each excavation are plotted in Figure 3. Vertical control was run using a contractors level provided by CWMI. Each elevation circuit was closed, such that the error of each closure could be evaluated. An arbitrary datum was assigned to the northwest corner of the concrete tank slab shown in Figure 3. The resulting elevations of each sampling location of the closed lagoons are listed in Figure 3. Only horizontal control was measured for the landfarm areas.

Clay Core and Landfarm Sample Extrusion

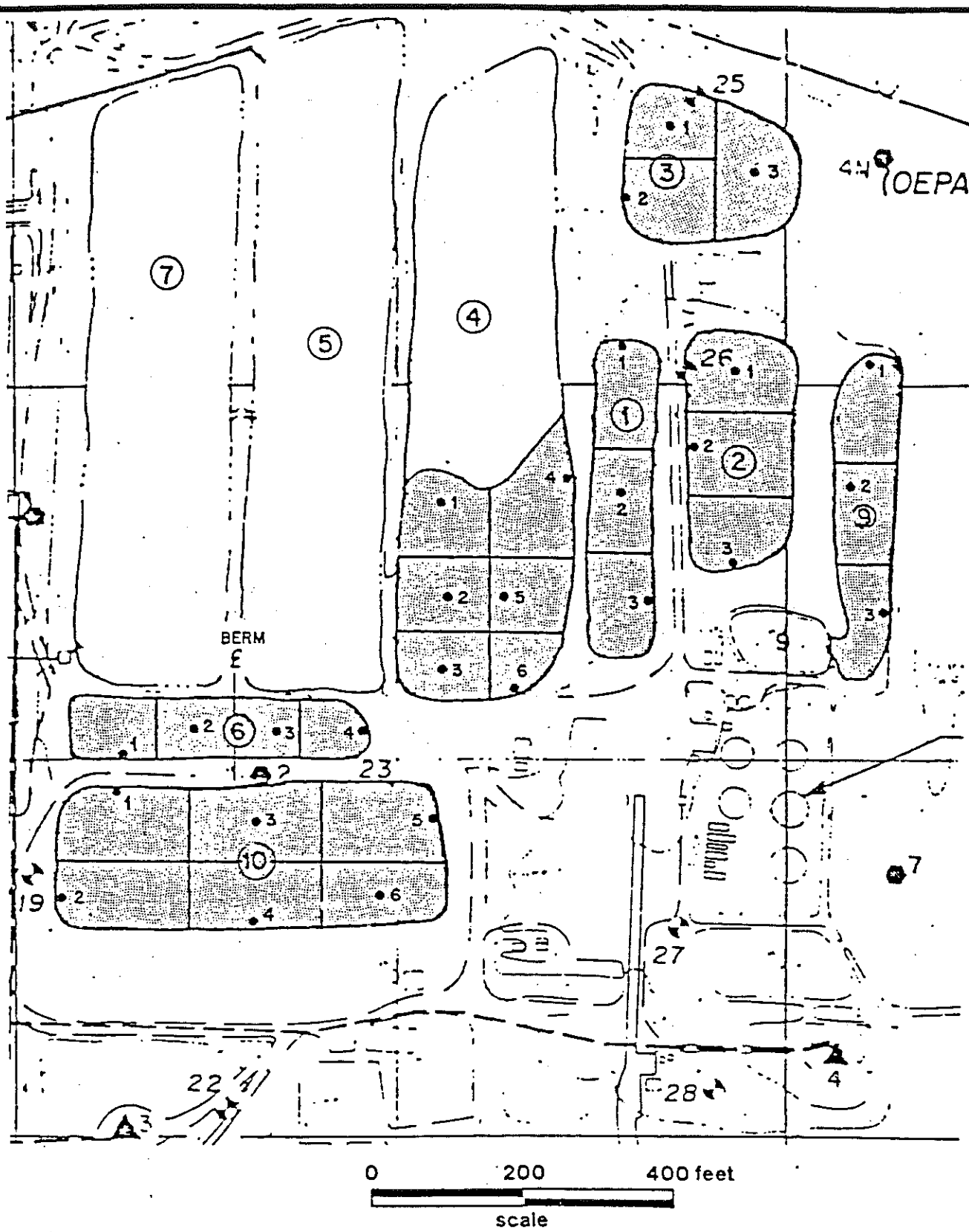
Each clay core from the closed lagoon was sealed with parafin in both ends, and were stored in a trailer on site until they were extruded. The landfarm samples were locked in the same trailer overnight before being extruded. The landfarm samples were not sealed with wax.

The clay cores and landfarm samples were all extruded utilizing a hydraulic ram specifically designed for extruding samples from the Dames & Moore sampling equipment. The core was extruded onto a fresh piece of aluminum foil. A spatula was used to shave the outside of the core, leaving virgin material untouched by the piston tube. Both ends were cut off with a soil knife, and the samples split longitudinally into quarters. Two quarters went to ETC and two quarters went to USEPA, for a replicate split. The soil tools were cleaned between cores with hexane followed by

methanol and potable water. Even the gloves of the engineer handling the cores were cleaned between cores to minimize the chance for cross contamination. All records for ETC were maintained by a Dames & Moore technician.

TABLE 1
CLOSED LAGOON SAMPLING DATA

LOCATION CODE	TOTAL EXCAVATION DEPTH	# SAMPLES (NOT CLAY)	CLAY CORES TAKEN	CLAY CORES DEPTH	CLAY CORES ETC ID #	SAMPLES: ETC ID # (DEPTH)	COMMENTS
CL-1-1	12.5	5	Yes	12.5	700	619(0'); 621(3'); 620(6'); 622(9'); 741(12')	741 - EP TOX
CL-1-2	11.0	4	Yes	11.0	791	(0'); (3'); (6'); (10')	(10') - EP TOX
CL-1-3	11.0	3	Yes	11.0		(3'); (6'); (10')	(10') - Dioxin
CL-2-1	12.0	5	Yes	12.0	709	750(0'); 759(3'); 760(6'); 761(9'); 762(12')	
CL-2-2	12.0	5	Yes	12.0	1023	755(0'); 756(3'); 757(6'); 753(9'); 754(12')	754 - EP TOX
CL-2-3	11.0	5	Yes	11.0	790	750(0'); 751(3'); 748(4'); 749(6'); 752(10')	752 - EP TOX 749-Dioxin; 751-Water sample
CL-2-4	12.0	5	Yes	12.0	1025	774(0'); 773(3'); 777(7'); 775(10'); 776(12')	776 - EP TOX
CL-3-1	3.5	2	Yes	3.5	1024	794(0'); 796(3')	
CL-3-2	6.5	2	Yes	6.5		793(0'); 795(3')	
CL-3-3	5.5	2	Yes	3.5		797(0'); 618(3')	618 - EP TOX
			Yes	5.5			
CL-4-1	11.5	5	No	-	-	1051(0'); 1052(3'); 1053(6'); 1054(10'); 1055(12')	1053 - EP TOX
CL-4-2	17.0	6	Yes	17.0	645	1006(0'); 1007(3'); 1008(6'); 1009(9'); 1010(13'); 1001(16')	1010,1001 - EP TOX 1000 - Dioxin
CL-4-3	15.0	4	Yes	15.0	646	1020(3'); 1019(6'); 1018(9'); 644(13')	644 - EP TOX
CL-4-4	12.0	4	Yes	12.0	647	1031(1'); 1032(3'); 1033(6'); 1034(9')	
CL-4-5	17.0	6	No	-	-	1002(0'); 1003(3'); 1004(6'); 1005(10'); 1016(12'); 1017(16')	
CL-4-6	15.0	5	Yes	15.0	643	1026(3'); 1027(4'); 1028(6'); 1029(9'); 1030(12')	1027-Water sample
CL-6-1	13.0	5	Yes	13.0	1015	778(4'); 642(6'); 641(9'); 640(12'); 639(13')	
CL-6-1	15.0	5	Yes	15.0	1014	630(3'); 617(6'); 616(9'); 615(12'); 614(14')	
CL-6-3	12.0	3	Yes	12.0	1013	613(4'); 607(6'); 606(9')	606 - EP TOX
CL-6-4	12.0	4	Yes	12.0	1012	605(3'); 604(6'); 603(9'); 612(11')	612 - Dioxin
CL-9-1	10.0	6	Yes	10.0	1022	772(0'); 771(2'); 770(3'); 769(4'); 768(6'); 766(8')	766 - EP TOX; 768 - Dioxin; 771, 769-Water sample
CL-9-2	9.0	5	No	-	-	764(0'); 767(3'); 765(7'); 763(9'); 782(9')	782-Water sample
CL-9-3	11.0	4	Yes	11.0	1021	674(0'); 673(3'); 675(6'); 676(9')	676 - EP TOX
CL-10-1	6.0	4	No	-	-	636(0'); 635(3'); 634(5'); 633(6')	
CL-10-2	12.0	5	Yes	12.0	1011	611(0'); 610(3'); 609(6'); 608(9'); 637(12')	
CL-10-3	11.0	5	No	-	-	746(1'); 747(3'); 623(6'); 624(8'); 625(11')	- EP TOX
CL-10-4	6.5	3	Yes	6.5		743(0'); 744(3'); 745(6')	
CL-10-5	11.0	4	Yes	11.0		626(0'); 627(3'); 798(5'); 799(7')	799-Water sample 627 - Dioxin
CL-10-6	11.0	4	Yes	11.0		800(1'); 801(3'); 802(6'); 628 (10')	



EXPLANATION:

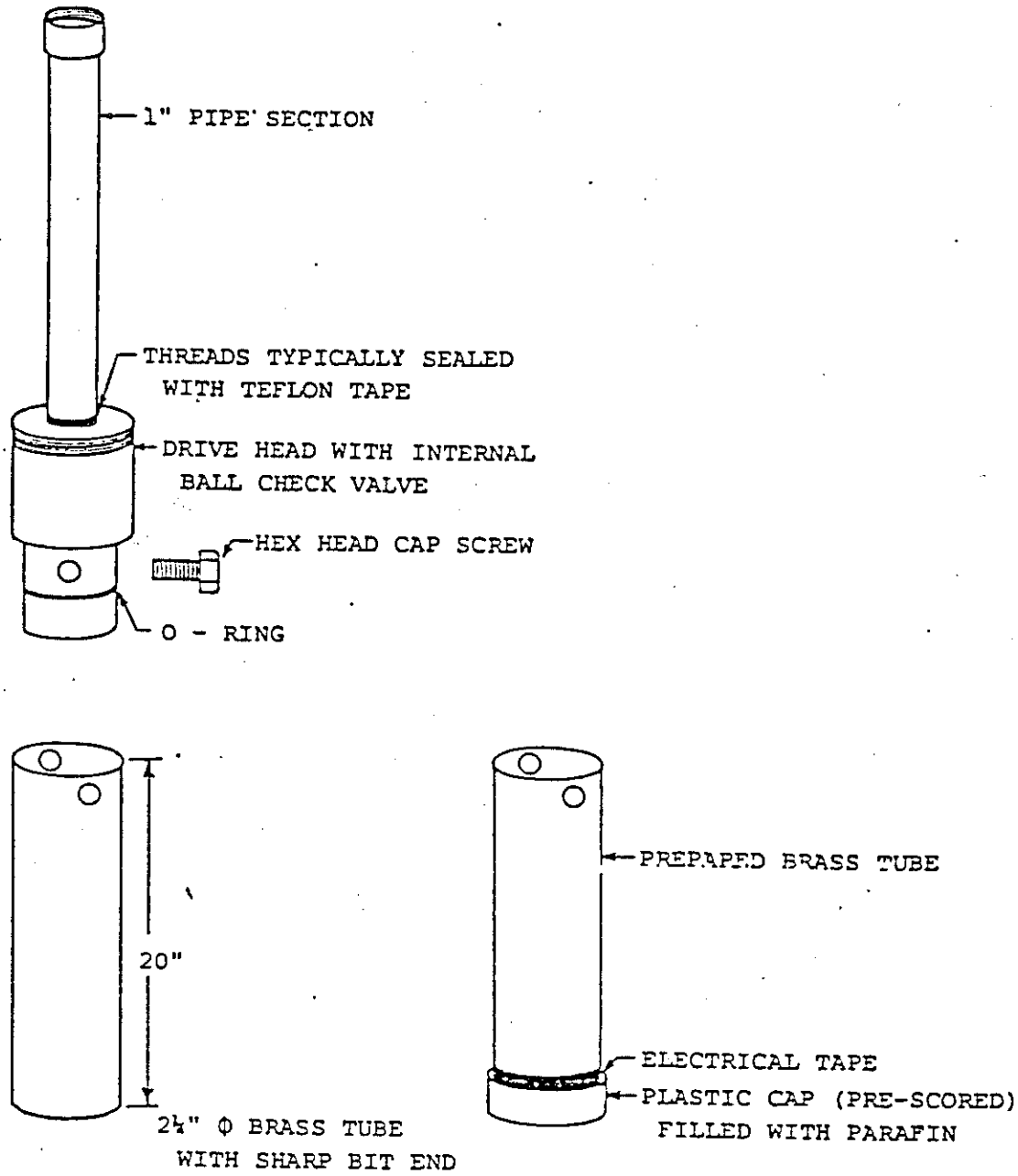
- PROPOSED SAMPLING LOCATION

PROPOSED SAMPLING LOCATIONS

Reference: Base map taken from Facility Location Plan, Project No. 33767, 2/16/83

DAMES & MOORE

FIGURE 1



PISTON TUBE SAMPLER

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FIGURE 2

Attachment 2

Chain-of-Custody and Field Forms

ETC ENVIRONMENTAL TESTING and CERTIFICATION

CHAIN OF CUSTODY FORM (CC1)

Seal Date: _____

Sealed By: _____

SHIP TO:

Company: _____

Facility/Site: _____

Address: _____

Attn.: _____

Phone: ( ) -

SAMPLE IDENTIFICATION

Facility/Site Code: | | | | | | | | | | |

Source Codes:

Well	(W)	River/Stream	(R)	Surface Impoundment	(I)	Lake/Ocean	(L)
Soil	(S)	Bottom Sediment	(B)	Pretreatment Facility	(P)	Treatment Facility	(T)
Outfall	(O)	Generation Point	(G)	Leachate Collection Sys.	(C)	Other	(X)

	Source Code (from above)	Your Sample Point ID (left justify)	Start Date (mo/day/yr)	Start Time (2400 hr. clock)	Elapsed Hours (composite)
Example:	W	101J263P	051581	0930	13

SHUTTLE CONTENTS

Sample Bottle	Condition	Sample Bottle	Condition

CHAIN OF CUSTODY CHRONICLE

1. Shuttle Opened By: (print) _____ Date: _____ Time: _____
   Signature: _____ Seal #: _____ Intact: _____

2. I have received these materials in good condition from the above person.
   Name: _____ Signature: _____
   Date: _____ Time: _____ Remarks: _____

3. I have received these materials in good condition from the above person.
   Name: _____ Signature: _____
   Date: _____ Time: _____ Remarks: _____

4. I have received these materials in good condition from the above person.
   Name: _____ Signature: _____
   Date: _____ Time: _____ Remarks: _____

5. Shuttle Sealed By: (print) _____ Date: _____ Time: _____
   Signature: _____ Seal #: _____

ETC USE ONLY Opened By: _____ Date: _____ Time: _____

Seal #: _____ Condition: _____

ETC ENVIRONMENTAL TESTING and CERTIFICATION

ETC Sample No.: _____

SAMPLE POINT INFORMATION FORM (CC2)

FIELD MEASUREMENT DATA

Select up to 3 parameters to be recorded by entering the appropriate code letter in the first space for each of the 3 data entry fields provided. Enter the actual measurement data (in the units specified) for the three parameters you have selected.

PARAMETERS		ACTUAL (left justify)	EXAMPLE
Flow (CFS)	A		C25
Volume (Gal)	B		
Sample Depth (Ft)	C		
Depth to Water (Ft)	D		F50
Discharge Rate (GPM)	E		
Depth to Bottom (Ft)	F		
Event Time (2400-Hr Clock)	G		G1103
Depth to Screen (Ft)	H		

FIELD TEST DATA

DO (Mg/L) _____ Sample Temp. (°C) _____

pH _____ Single Measurement — _____ 2nd of Quadruplicate — _____ 3rd of Quadruplicate — _____ 4th of Quadruplicate

Specific Conductance (uMHOS/CM) _____ Single Measurement — _____ 2nd of Quadruplicate — _____ 3rd of Quadruplicate — _____ 4th of Quadruplicate

THE FOLLOWING DATA IS FOR YOUR RECORDS ONLY

SAMPLING METHOD (choose one)

AIR-LIFT PUMP ( )
AUGER ( )
BAILER ( )
BOTTLE ( )
COLIWASA ( )
DIPPER ( )
KEMMERER ( )
NISKIN ( )

PERISTALTIC PUMP ( )
PETERSEN ( )
PISTON PUMP ( )
SCOOP/SHOVEL ( )
SQUEEZE PUMP ( )
SUBMERSIBLE PUMP ( )
SUCTION LIFT PUMP ( )
SURBER ( )

THIEF ( )
TRIER ( )
VEHMEYER ( )
OTHER _____

SAMPLE TYPE (choose one)

GRAB ( ) COMPOSITE ( ) OTHER ( )

_____ (describe) _____ (describe)

WEATHER _____ (describe)

SAMPLE DESCRIPTION (e.g., color, odor) _____ (describe)

Form Prepared By: _____ name (print) Employer: _____

ETC Form CC2 6/1/82

Attachment 3

Methodology

METHODOLOGY

The methods employed in the analysis of your soil samples are established EPA methods taken from the "Manual of Analytical Methods for the Analysis of Pesticide Residues in Human and Environmental Samples", May 1979. The soil method can be summarized as follows: A weighed amount of air dried sample, approximately 2 grams, is soxhlet extracted for 5 hours with 1:1 acetone/hexane solution. The extract is dried and concentrated to approximately 3 ml. The concentrated extract is transferred to a silica gel column and eluted with hexane. The eluate is concentrated to a final volume of 1 ml and injected into a gas chromatograph equipped with a ^{63}Ni electron capture detector.

The GC operating parameters were as follows:

COLUMN

6' x 4mm glass 1.5% SP-2250 & 1.95% SP-2401
Supelcoport 100/120 mesh

CARRIER FLOW

60ml/min. Argon/Methane

SEPTUM PURGE

5ml/min. Argon/Methane

COLUMN OVEN

200° C

INJECTOR TEMPERATURE

225° C

DETECTOR TEMPERATURE

300° C

METHODOLOGY

The methods employed in the analysis of your water sample are established EPA methods taken from the "Manual of Analytical Methods for the Analysis of Pesticide Residues in Humans and Environmental Samples," June 1980. The water method can be summarized as follows: A measured volume of sample, approximately 500 ml, to which sodium sulfate has been added, is extracted with methylene chloride. The methylene chloride extract is dried and concentrated to approximately 1 ml. The concentrated extract is transferred to a silica gel column and eluted with hexane. The eluate is concentrated to a final volume of 1 ml and injected into a gas chromatograph equipped with a ^{63}Ni electron capture detector.

The GC operating parameters were as follows:

COLUMN

6' x 4mm glass 1.5% SP-2250 & 1.95% SP-2401
Supelcoport 100/120 mesh

CARRIER FLOW

60ml/min. Argon/Methane

SEPTUM PURGE

5ml/min. Argon/Methane

COLUMN OVEN

200° C

INJECTOR TEMPERATURE

225° C

DETECTOR TEMPERATURE

300° C

Attachment 4

Analytical Results

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below	
ETC Sample No.	*Company*	*Facility*	*Sample Point*	*Date*

		Sample Points, Sampling Dates, and ETC Sample No.'s							
rameters	*Units*	ASF1-0 830518 C3460	ASF2-0 830518 C3471	ASF3-0 830518 C3461	ASF4-0 830518 C3462	ASF5-0 830518 C3451	ASF6-0 830518 C3470	ASF7-0 830518 C3452	ASF8-0 830518 C3453
iscellaneous Parameters									
oclor 1242	mg/kg	<50	<12.5	<5	<5	<25	<5	<5	<5
oclor 1254	mg/kg	<5	<5	<5	<5	<5	<5	<5	7.7
oclor 1260	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5

tnotes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

August 25, 1983
Page 1

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below	
ETC Sample No.	Company	Facility	Sample Point	Date

		Sample Points, Sampling Dates, and ETC Sample No.'s							
arameters	Units	ASF6-0 830518 C3470	ASF2-0 830518 C3471						
iscellaneous Parameters									
.4,5-TP (Silvex)	mg/l	<1	<1						
.4-D	mg/l	<10	<10						
rsenic	mg/l	<0.2	<0.2						
arium	mg/l	<5	<5						
admium	mg/l	<0.8	<0.8						
hromium	mg/l	<1	<1						
ndrin (GC)	mg/l	<0.02	<0.02						
ead	mg/l	<2	<2						
indane (GC)	mg/l	<0.4	<0.4						
ercury	mg/l	<0.002	<0.002						
ethoxychlor (GC)	mg/l	<10	<10						
elenium	mg/l	<0.2	<0.2						
ilver	mg/l	<0.5	<0.5						
oxaphene (GC)	mg/l	<0.5	<0.5						

Notes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

August 23, 1983
Page 1

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below	
ETC Sample No.	Company	Facility	Sample Point	Date

		Sample Points, Sampling Dates, and ETC Sample No.'s							
arameters	Units	EA1-0 830518 C3458	EA2-0 830518 C3467	EA3-0 830518 C3459	EA4-0 830518 C3456	EA5-0 830518 C3466	EA6-0 830518 C3446	EA7-0 830518 C3455	EA8-0 830518 C3454
iscellaneous Parameters									
roclor 1242	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
roclor 1254	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
roclor 1260	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5

Footnotes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below	
ETC Sample No.	Company	Facility	Sample Point	Date

ameters	Units	Sample Points, Sampling Dates, and ETC Sample No.'s							
		EA9-0 830518 C3457							
scellaneous Parameters									
oclor 1242	mg/kg	<5							
oclor 1254	mg/kg	<5							
oclor 1260	mg/kg	<5							

otes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below
ETC Sample No.	*Company*	*Facility*	*Sample Point* *Date*

		Sample Points, Sampling Dates, and ETC Sample No.'s							
rameters	*Units*	RIP-4 830525 C3987	RIP-5 830525 C3989	RIP-7 830525 C3988	RIP-11 830525 C3990				
iscellaneous Parameters									
roclor 1242	mg/kg	<50	<50	<50	<125				
roclor 1254	mg/kg	<5	183	<5	436				
roclor 1260	mg/kg	13.7	28.7	42	140				

Notes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below
ETC Sample No.	Company	Facility	Sample Point Date

ameters	Units	SA1-0 830518 C3465	SA2-0 830518 C3463	SA3-0 830518 C3464					
		Sample Points, Sampling Dates, and ETC Sample No.'s							
scellaneous Parameters									
oclor 1242	mg/kg	<5	<5	<5					
oclor 1254	mg/kg	<5	<5	<5					
oclor 1260	mg/kg	<5	<5	<5					

notes: BMDL=Below Me Detection Limit ND=Parameter not detected '-'=Parameter not tested .

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below
ETC Sample No.	Company	Facility	Sample Point / Date

Parameters	Units	CL1-1-0 830511 C3007	CL1-1-3 830511 C3009	CL1-1-6 830511 C3008	CL1-1-9 830511 C3010	CL1-1-12 830511 C3143	CL1-1-12C 830511 C3468	CL1-2-0 830511 C3137	CL1-2-3 830511 C3135
		Sample Points, Sampling Dates, and ETC Sample No.'s							
Miscellaneous Parameters									
Aroclor 1242	mg/kg	<5	<5	<5	<5	<25	<5	<5	<5
Aroclor 1254	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
Aroclor 1260	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5

Footnotes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below
ETC Sample No.	*Company*	*Facility*	*Sample Point* *Date*

rameters	Units	CL1-2-6 830511 C3136	CL1-2-10 830511 C3145	CL1-2-11C 830511 C3441	CL1-3-3 830512 C3140	CL1-3-6.5 830512 C3139	CL1-3-9 830511 C3142	CL1-3-11C 830513 C3193
		Sample Points, Sampling Dates, and ETC Sample No.'s						
scellaneous Parameters								
oclor 1242	mg/kg	<50	<125	<5	<5	<5	<125	<5
oclor 1254	mg/kg	18.5	310	<5	<5	<5	281	<5
oclor 1260	mg/kg	13.7	24.7	<5	<5	<5	<125	<5

'notes: BMDL=Below Meth[illegible] Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

November 3, 1983
Page 1

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below	
ETC Sample No.	Company	Facility	Sample Point	Date

Parameters	Units	Sample Points, Sampling Dates, and ETC Sample No.'s							
		CLI-3-9 830511 D0328							
Base/Neutral Compounds									
2,3,7,8-TCDD	ug/kg	ND							

Notes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

August 26, 1983
Page 1

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below	
ETC Sample No.	Company	Facility	Sample Point	Date

rameters	Units	Sample Points, Sampling Dates, and ETC Sample No.'s							
		CL4-2-6 830517 C4666							
scellaneous Parameters									
3,7,8-TCDD	ug/kg	18.00							

Notes: BMDL=Below Me' Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

August 24, 1983
Page 1

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below	
ETC Sample No.	*Company*	*Facility*	*Sample Point*	*Date*

		Sample Points, Sampling Dates, and ETC Sample No.'s							
rameters	*Units*	CL4-1-6 830518 C3469	CL4-2-16 830517 C3425						
iscellaneous Parameters									
.4,5-TP (Silvex)	mg/l	<1	<1						
.4-D	mg/l	<10	<10						
rsenic	mg/l	0.4	0.3						
rium	mg/l	<5	<5						
dmium	mg/l	<0.8	<0.8						
romium	mg/l	<1	2						
drin	mg/l	<0.02	<0.02						
ead	mg/l	<2	<2						
ndane	mg/l	<0.4	<0.4						
ercury	mg/l	<0.002	<0.002						
ethoxychlor	mg/l	<10	<10						
elenium	mg/l	0.3	<0.2						
lver	mg/l	<0.5	<0.5						
oxaphene	mg/l	<0.5	<0.5						

Notes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below
ETC Sample No.	*Company*	*Facility*	*Sample Point* / *Date*

ameters	Units	CL6-1-12 830512 C3157	CL6-1-13 830511 C3156	CL6-1-13C 830512 C3411	CL6-1-4 830512 C3138	CL6-1-6 830512 C3159	CL6-1-9 830512 C3158	CL6-2-12 830512 C3152	CL6-2-14.5 830512 C3151
		Sample Points, Sampling Dates, and ETC Sample No.'s							
)clor 1242	mg/kg	<25	<25	<5	<5	<5	<5	<5	<25
)clor 1254	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
)clor 1260	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5

ıotes: BMDL=Below Met' 'election Limit ND=Parameter not detected '-'=Paramete: not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

July 26, 1983
Page 2

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below
ETC Sample No.	Company	Facility	Sample Point Date

		Sample Points, Sampling Dates, and ETC Sample No.'s							
ameters	Units	CL6-2-15C 830512 C3410	CL6-2-3.5 830512 C3155	CL6-2-6.5 830512 C3154	CL6-2-9.5 830512 C3153	CL6-3-12C 830512 C3409	CL6-3-4 830512 C3150	CL6-3-6 830512 C3149	CL6-3-9 830512 C3144
clor 1242	mg/kg	<5	<5	<5	<5	<5	<5	<25	<5
clor 1254	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5
clor 1260	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5

otes: BMDL=Below Meth tection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below
ETC Sample No.	Company	Facility	Sample Point Date

		Sample Points, Sampling Dates, and ETC Sample No.'s							
ameters	Units	CL6-4-11.5 830512 C3171	CL6-4-12C 830512 C3428	CL6-4-3 830512 C3148	CL6-4-6 830512 C3147	CL6-4-9 830512 C3146			
oclor 1242	mg/kg	<25	<5	<5	<5	<25			
oclor 1254	mg/kg	<5	<5	<5	<5	<5			
oclor 1260	mg/kg	<5	<5	<5	<5	<5			

otes: BMDL=Below Meth Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

August 24, 1983
Page 1

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below
ETC Sample No.	Company	Facility	Sample Point Date

Parameters	Units	Sample Points, Sampling Dates, and ETC Sample No.'s							
		CL6-4-12C 830512 C3428							
Miscellaneous Parameters									
2,3,7,8-TCDD	ug/kg	ND							

Notes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

August 24, 1983
Page 1

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below
ETC Sample No.	Company	Facility	Sample Point / Date

rameters	Units	Sample Points, Sampling Dates, and ETC Sample No.'s							
		CL6-3-9 830512 C3144							
scellaneous Parameters									
4,5-TP (Silvex)	mg/l	<1							
4-D	mg/l	<10							
senic	mg/l	<0.5							
rium	mg/l	<5							
dmium	mg/l	<0.5							
romium	mg/l	<1							
drin	mg/l	<0.02							
ad	mg/l	<2							
ndane	mg/l	<0.4							
rcury	mg/l	<0.002							
thoxychlor	mg/l	<10							
lenium	mg/l	<0.5							
lver	mg/l	<0.2							
xaphene	mg/l	<0.5							

Notes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

August 23, 1983
Page 1

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below	
ETC Sample No.	*Company*	*Facility*	*Sample Point*	*Date*

rameters	Units	CL9-1-0 830510 C3032	CL9-1-2 830510 C3031	CL9-1-3 830510 C3030	CL9-1-4 830510 C3029	CL9-1-6 830510 C3043	CL9-1-8 830510 C3045	CL9-1-10C 830510 C3418	CL9-2-0 830510 C3026
		Sample Points, Sampling Dates, and ETC Sample No.'s							
scellaneous Parameters									
oclor 1242	mg/kg	<5	<10	<5	<10	<50	<50	<5	<5
oclor 1254	mg/kg	<5	<10	<5	<10	<5	<5	<5	<5
oclor 1260	mg/kg	<5	<10	<5	<10	<5	<5	<5	<5

Notes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DATA MANAGEMENT SUMMARY REPORT
(DM-OC) - All Parameters Tested, Selected Samples

Chain of Custody Data Required for ETC Data Management Summary Report

See Below	CLEAN WATER, INC.	SITE 690	See Below	
ETC Sample No.	*Company*	*Facility*	*Sample Point*	*Date*

		Sample Points, Sampling Dates, and ETC Sample No.'s							
rameters	*Units*	CL9-2-3 830510 C3028	CL9-2-7 830510 C3027	CL9-2-9 830510 C3025	CL9-3-0 830510 C3012	CL9-3-3 830511 C3011	CL9-3-6 830510 C3013	CL9-3-9 830511 C3050	CL9-3-11C 830510 C3417
scellaneous Parameters									
oclor 1242	mg/kg	<5	<25	<12.5	<5	<12.5	<25	<125	<5
oclor 1254	mg/kg	<5	<5	<5	<5	<5	<5	34.4	<5
oclor 1260	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5

Notes: BMDL=Below Method Detection Limit ND=Parameter not detected '-'=Parameter not tested

SUMMARY OF ANALYTICAL DATA

OF THE

CLOSED PONDS

CHEMICAL WASTE MANAGEMENT, INC.
Vickery Facility
PCB Analysis

Closed Pond #1

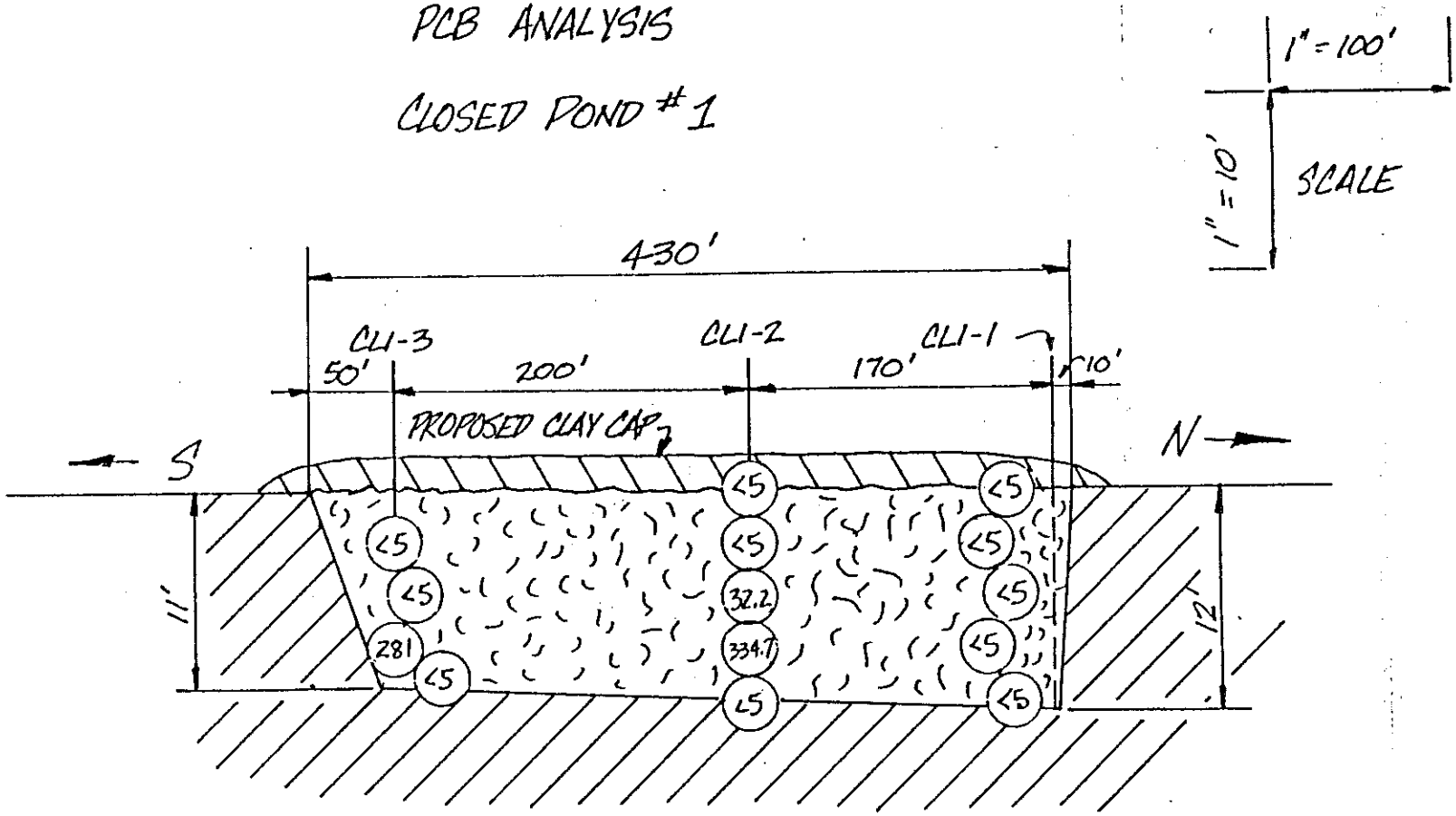
Total No. of Samples: 15
No. of Sludges: 12
No. of Clay: 3
Average Depth of Pond: 11.5
Average PCB Content: 43.19 mg/kg

E.T.C. Code	Aroclor 1242 mg/kg	Aroclor 1254 mg/kg	Aroclor 1260 mg/kg
CL1-1-0	Less than 5	Less than 5	Less than 5
CL1-1-3	Less than 5	Less than 5	Less than 5
CL1-1-6	Less than 5	Less than 5	Less than 5
CL1-1-9	Less than 5	Less than 5	Less than 5
CL1-1-12	Less than 25	Less than 5	Less than 5
CL1-1-12.5 Clay	Less than 5	Less than 5	Less than 5
CL1-2-0	Less than 5	Less than 5	Less than 5
CL1-2-3	Less than 5	Less than 5	Less than 5
CL1-2-6	Less than 50	18.5	13.7
CL1-2-10	Less than 125	310	24.7
CL1-2-11 Clay	Less than 5	Less than 5	Less than 5
CL1-3-0	Less than 5	Less than 5	Less than 5
CL1-3-6.5	Less than 5	Less than 5	Less than 5
CL1-3-9	Less than 125	281	Less than 125
CL1-3-11 Clay	Less than 5	Less than 5	Less than 5

All Results completed by Environmental Testing & Certification of Edison, New Jersey

CHEMICAL WASTE MGT.
VICKERY FACILITY
PCB ANALYSIS

CLOSED POND #1



CLAY

CLOSURE FILL

COVER

(<5) NUMBERS ARE PCB CONCENTRATIONS (TOTALS) BY GC METHOD, IN P.P.M.

CHEMICAL WASTE MANAGEMENT, INC.
Vickery Facility
PCB Analysis

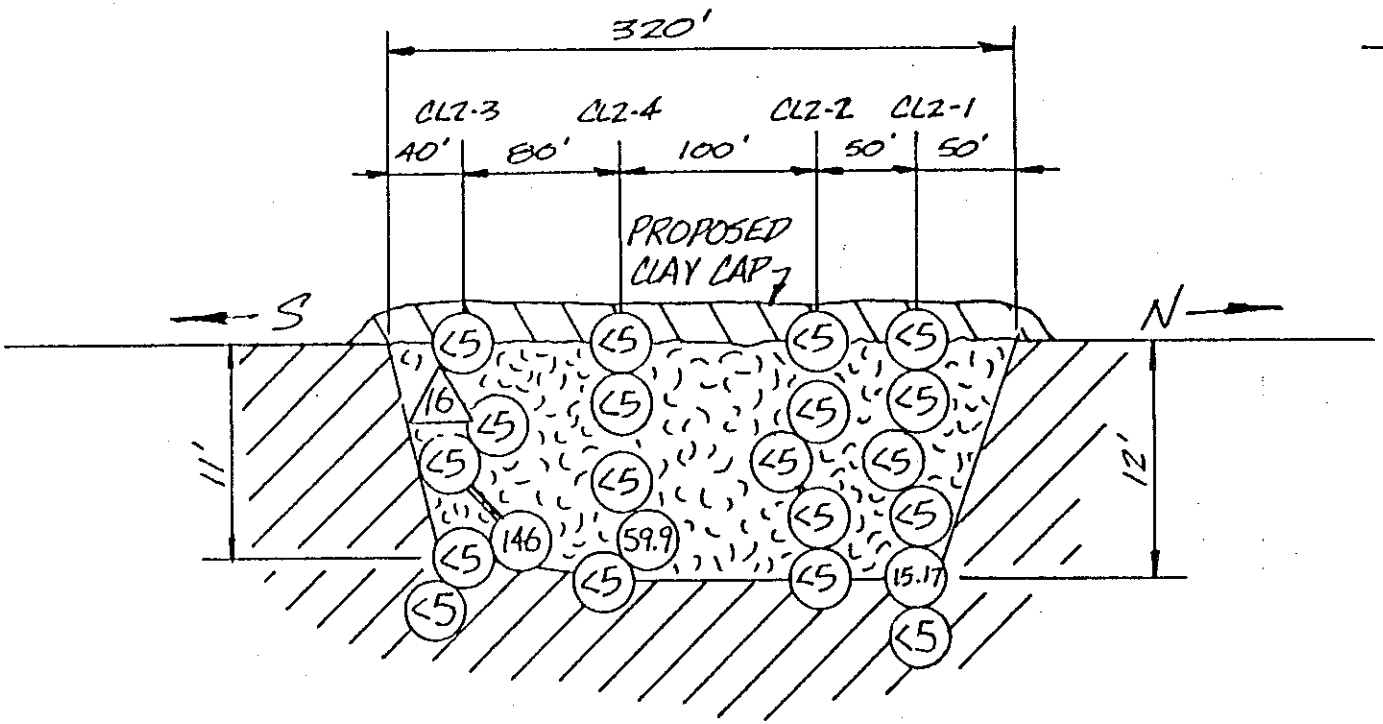
Closed Pond #2

Total No. of Samples: 25
No. of Sludges: 21
No. of Clay: 4
Average Depth of Pond: 11.5
Average PCB Content: 9 mg/kg

E.T.C. Code	Aroclor 1242 mg/kg	Aroclor 1254 mg/kg	Aroclor 1260 mg/kg
CL2-1-0	Less than 5	Less than 5	Less than 5
CL2-1-3	Less than 5	Less than 5	Less than 5
CL2-1-6	Less than 5	Less than 5	Less than 5
CL2-1-9	Less than 5	Less than 5	Less than 5
CL2-1-12	Less than 50	8.89	6.28
CL2-1-12 Clay	Less than 5	Less than 5	Less than 5
CL2-2-0	Less than 5	Less than 5	Less than 5
CL2-2-3.5	Less than 5	Less than 5	Less than 5
CL2-2-6	Less than 5	Less than 5	Less than 5
CL2-2-9	Less than 5	Less than 5	Less than 5
CL2-2-12	Less than 5	Less than 5	Less than 5
CL2-2-12 Clay	Less than 5	Less than 5	Less than 5
CL2-3-0	Less than 5	Less than 5	Less than 5
CL2-3-3 Oil	Less than 10 ug/1	16 ug/1	Less than 10 ug/1
CL2-3-4	Less than 5	Less than 5	Less than 5
CL2-3-6	Less than 50	Less than 5	Less than 5
CL2-3-10	Less than 10	146	Less than 10
CL2-3-11	Less than 5	Less than 5	Less than 5
CL2-3-11 Clay	Less than 5	Less than 5	Less than 5
CL2-4-0	Less than 5	Less than 5	Less than 5
CL2-4-3	Less than 25	Less than 5	Less than 5
CL2-4-7	Less than 5	Less than 5	Less than 5
CL2-4-10	Less than 5	Less than 5	Less than 5
CL2-4-12	Less than 125	37.3	22.6
CL2-4-12 Clay	Less than 5	Less than 5	Less than 5

CHEMICAL WASTE MGT.
VICKERY FACILITY
PCB ANALYSIS

CLOSED POND #2



CLAY
CLOSURE FILL
COVER

(<5) NUMBERS ARE PCB CONCENTRATIONS (TOTALS) BY GC METHOD, IN P.P.M.

△ OIL SAMPLE, P.P.B.

CHEMICAL WASTE MANAGEMENT, INC.
Vickery Facility
PCB Analysis

Closed Pond #3

Total No. of Samples: 9
No. of Sludges: 7
No. of Clay: 3
Average Depth of Pond: 3 feet
Average PCB Content: 25 mg/kg

E.T.C. Code	Aroclor 1242 mg/kg	Aroclor 1254 mg/kg	Aroclor 1260 mg/kg
CL3-1-0	Less than 5	Less than 5	Less than 5
CL3-1-3	Less than 25	12.2	Less than 5
CL3-1-4 CLay	Less than 5	7.9	Less than 5
CL3-2-0	Less than 5	Less than 5	Less than 5
CL3-2-3 (no clay sample)	Less than 125	124	31.8
CL3-3-0	Less than 5	Less than 5	Less than 5
CL3-3-3	Less than 5	9.7	Less than 5
CL1-3-3.5	Less than 5	7.5	Less than 5
CL1-3-6 Clay	Less than 25	24.6	7.05

All Results completed by Environmental Testing & Certification of Edison, New Jersey

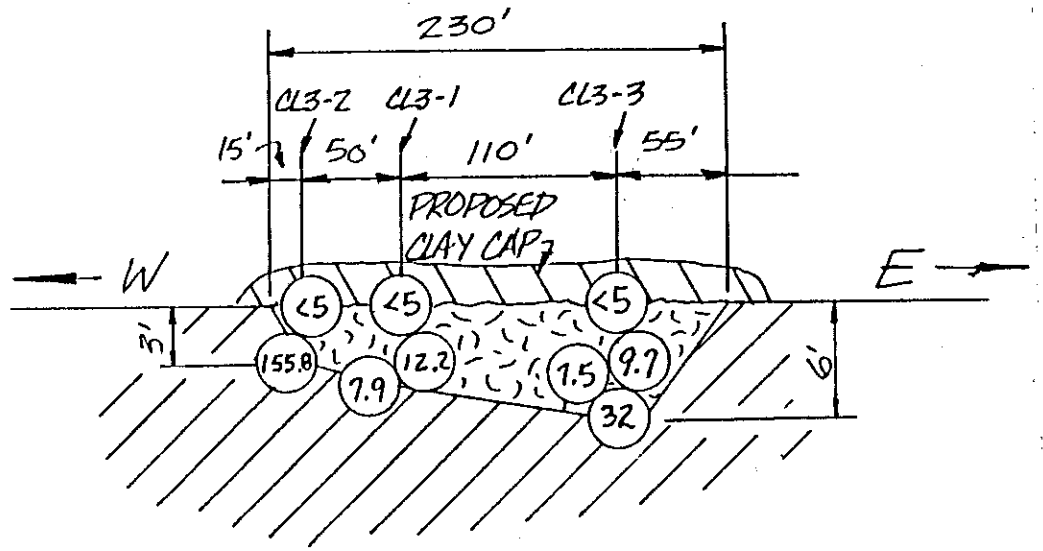
CHEMICAL WASTE MGT.
VICKERY FACILITY
PCB ANALYSIS

CLOSED POND #3

1" = 100'

1" = 10'

SCALE



CLAY
CLOSURE FILL
COVER

(<5) NUMBERS ARE PCB CONCENTRATIONS (TOTAL) BY GC METHOD, IN P.P.M.

CHEMICAL WASTE MANAGEMENT, INC.
Vickery Facility
PCB Analysis

Closed Pond #4

Total No. of Samples: 34
No. of Sludges: 27
No. of Clay: 6
Average Depth of Pond: 15 feet
Average PCB Content: 5.32 mg/kg

E.T.C. Code	Aroclor 1242 mg/kg	Aroclor 1254 mg/kg	Aroclor 1260 mg/kg
CL4-1-0	Less than 50	8.3	Less than 5
CL4-1-3	Less than 50	19.2	Less than 5
CL4-1-6	Less than 125	Less than 50	Less than 50
CL4-1-10	Less than 25	Less than 5	Less than 5
CL4-1-12 (no clay)	Less than 5	Less than 5	Less than 5
CL4-2-0	Less than 5	Less than 5	Less than 5
CL4-2-3	Less than 5	Less than 5	Less than 5
CL4-2-6	Less than 50	Less than 5	Less than 5
CL4-2-9	Less than 125	Less than 125	Less than 125
CL4-2-13 Oil	Less than 250 ug/l	Less than 10 ug/l	392 ug/l
CL4-2-16	Less than 25	Less than 5	Less than 5
CL4-2-17 Clay	Less than 5	Less than 5	Less than 5
CL4-3-3	Less than 5	Less than 5	Less than 5
CL4-3-6	Less than 5	Less than 5	Less than 5
CL4-3-9	Less than 5	Less than 5	Less than 5
CL4-3-13 Clay	Less than 25	Less than 5	Less than 5
CL4-3-15 Clay	Less than 5	Less than 5	Less than 5
CL4-4-1	Less than 5	Less than 5	Less than 5
CL4-4-3	Less than 25	Less than 5	Less than 5
CL4-4-6	Less than 5	Less than 5	Less than 5
CL4-4-9	Less than 5	Less than 5	Less than 5
CL4-4-12 Clay	Less than 5	Less than 5	Less than 5
CL4-5-0	Less than 5	Less than 5	Less than 5
CL4-5-3	Less than 5	Less than 5	Less than 5
CL4-5-6	Less than 25	Less than 5	Less than 5
CL4-5-10	Less than 125	Less than 5	Less than 5
CL4-5-12	Less than 25	Less than 5	Less than 5
CL4-5-16 (no clay)	Less than 25	Less than 5	Less than 5

E.T.C. Code	Aroclor 1242 mg/kg	Aroclor 1254 mg/kg	Aroclor 1260 mg/kg
CL4-6-3	Less than 25	Less than 5	Less than 5
CL4-6-4	Less than 10 ug/l	Less than 10 ug/l	Less than 10 ug/l
CL4-6-6	Less than 125	Less than 5	22.8
CL4-6-9	Less than 25	Less than 5	Less than 5
CL4-6-12	Less than 5	Less than 5	Less than 5
CL4-6-15 Clay	Less than 5	Less than 5	Less than 5

All results by completed Environmental Testing & Certification of Edison, New Jersey

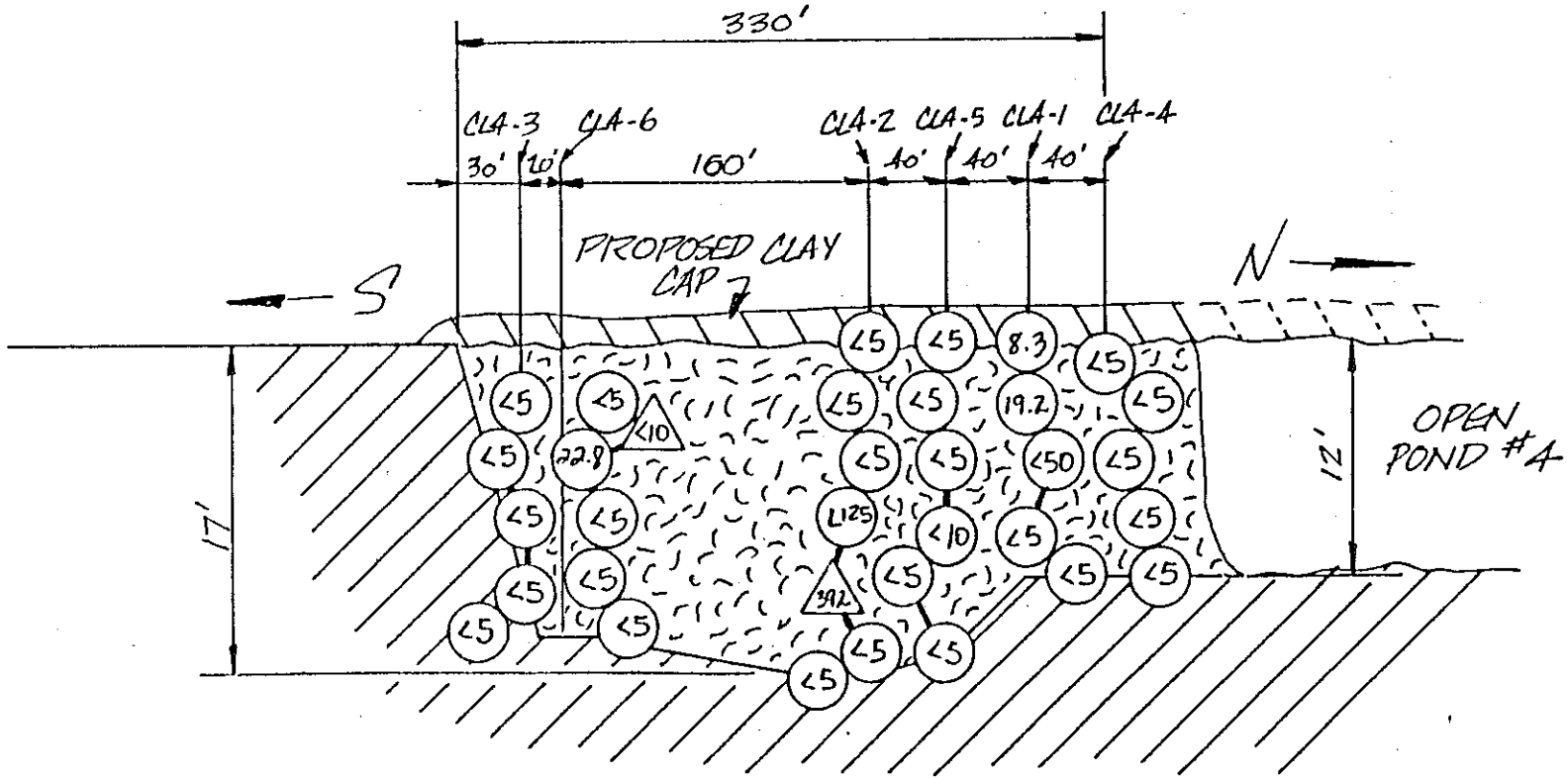
CHEMICAL WASTE MGT.
VICKERY FACILITY
PCB ANALYSIS

CLOSED POND #4

1" = 100'

1" = 10'

SCALE



CLAY
CLOSURE FILL
COVER

(<5) NUMBERS ARE PCB CONCENTRATIONS (TOTAL) BY GC METHOD, IN P.P.M.

△ OIL SAMPLE, P.P.B.

CHEMICAL WASTE MANAGEMENT, INC.
Vickery Facility
PCB Analysis

Closed Pond #6

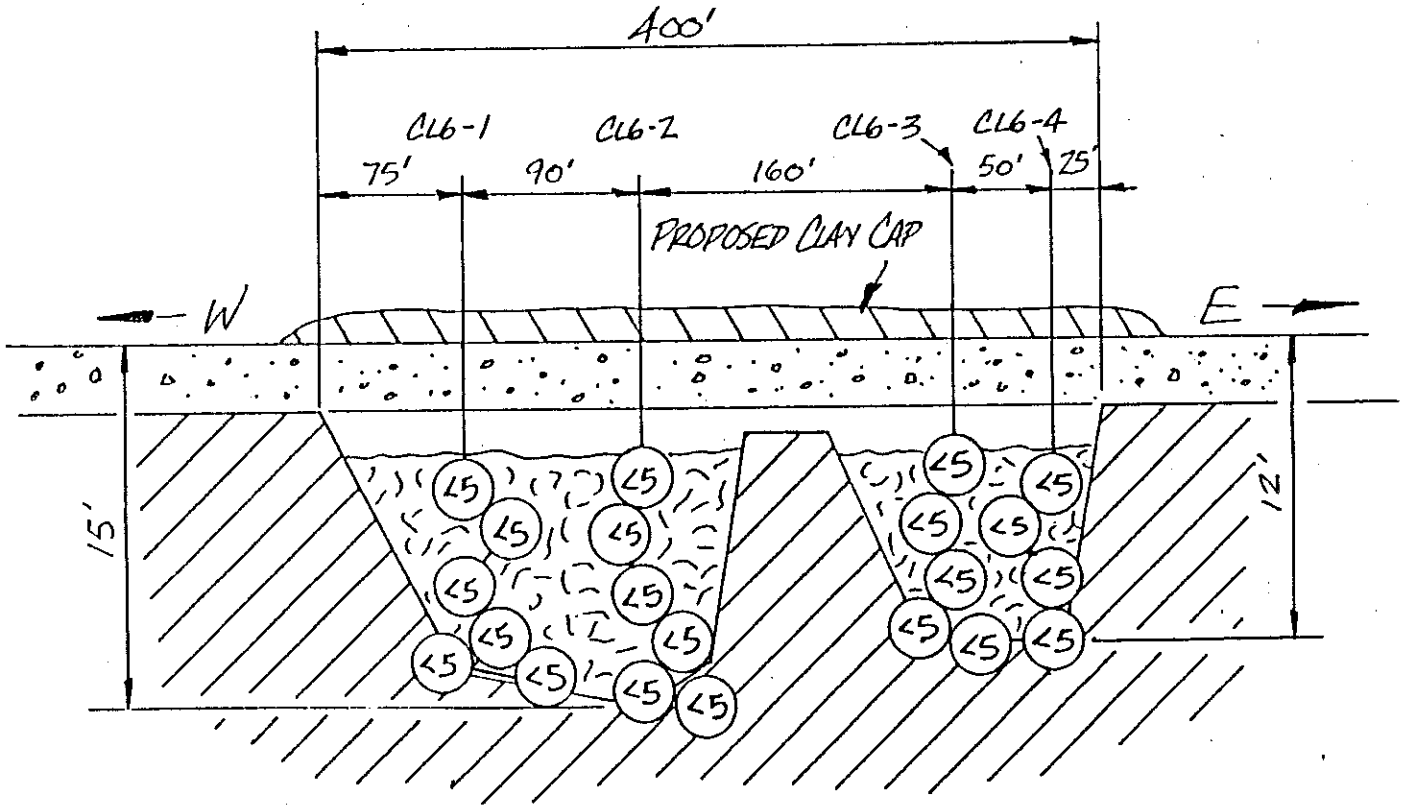
Total No. of Samples: 21
No. of Sectors: 4
Average Depth of Pond: 12.8
Average PCB Content: Less than 5 ppm

E.T.C. Code	Aroclor 1242 mg/kg	Aroclor 1254 mg/kg	Aroclor 1260 mg/kg
CL6-1-4	Less than 5	Less than 5	Less than 5
CL6-1-6	Less than 5	Less than 5	Less than 5
CL6-1-9	Less than 5	Less than 5	Less than 5
CL6-1-12	Less than 25	Less than 5	Less than 5
CL6-1-13	Less than 25	Less than 5	Less than 5
CL6-1-13 Clay	Less than 5	Less than 5	Less than 5
CL6-2-3.5	Less than 5	Less than 5	Less than 5
CL6-2-6.5	Less than 5	Less than 5	Less than 5
CL6-2-9.5	Less than 5	Less than 5	Less than 5
CL6-2-12	Less than 5	Less than 5	Less than 5
CL6-2-14.5	Less than 25	Less than 5	Less than 5
CL6-2-15 Clay	Less than 5	Less than 5	Less than 5
CL6-3-4	Less than 5	Less than 5	Less than 5
CL6-3-6	Less than 25	Less than 5	Less than 5
CL6-3-9	Less than 5	Less than 5	Less than 5
CL6-3-12	Less than 5	Less than 5	Less than 5
CL6-4-3	Less than 5	Less than 5	Less than 5
CL6-4-6	Less than 5	Less than 5	Less than 5
CL6-4-9	Less than 25	Less than 5	Less than 5
CL6-4-11.5	Less than 25	Less than 5	Less than 5
CL6-4-12 Clay	Less than 5	Less than 5	Less than 5

All Results completed by Environmental Testing & Certification of Edison, New Jersey

CHEMICAL WASTE MGT.
VICKERY FACILITY
PCB ANALYSIS

CLOSED POND #6



CLAY
CLOSURE FILL
STONE FILL
COVER

(<5) NUMBERS ARE PCB CONCENTRATIONS (TOTAL) BY GC METHOD, IN P.P.M.

CHEMICAL WASTE MANAGEMENT, INC.
Vickery Facility
PCB Analysis

Closed Pond #9

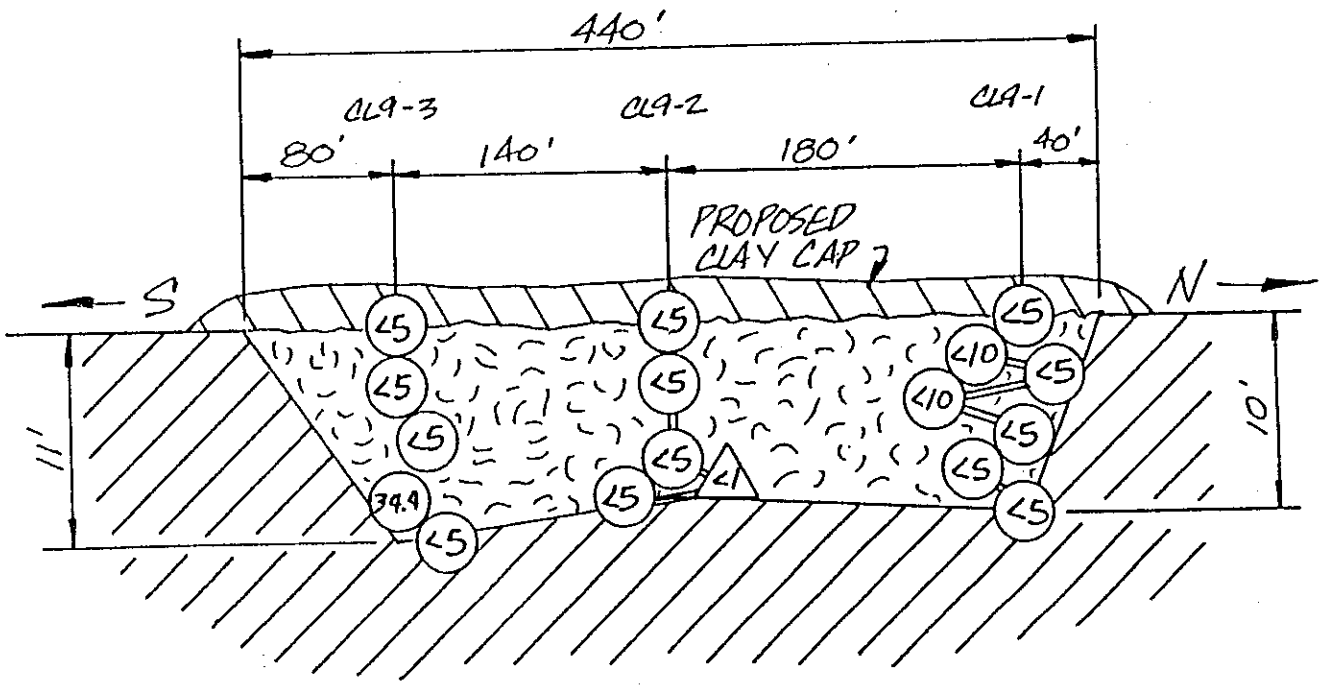
Total No. of Samples: 17
No. of Sectors: 3
Average Depth of Pond: 10
Average PCB Content: 2.02 ppm

E.T.C. Code	Aroclor 1242 mg/kg	Aroclor 1254 mg/kg	Aroclor 1260 mg/kg
CL9-1-0	Less than 5	Less than 5	Less than 5
CL9-1-2	Less than 10	Less than 10	Less than 10
CL9-1-3	Less than 5	Less than 5	Less than 5
CL9-1-4	Less than 10	Less than 10	Less than 10
CL9-1-6	Less than 5	Less than 5	Less than 5
CL9-1-8	Less than 50	Less than 5	Less than 5
CL9-1-10 Clay	Less than 5	Less than 5	Less than 5
CL9-2-0	Less than 5	Less than 5	Less than 5
CL9-2-3	Less than 5	Less than 5	Less than 5
CL9-2-7	Less than 25	Less than 5	Less than 5
CL9-2-9 Clay	Less than 12.5	Less than 5	Less than 5
CL9-2-9 Aqueous	Less than 10 ug/1	Less than 1 ug/1	Less than 1 ug/1
CL9-3-0	Less than 5	Less than 5	Less than 5
CL9-3-3	Less than 12.5	Less than 5	Less than 5
CL9-3-6	Less than 25	Less than 5	Less than 5
CL9-3-9 Sludge	Less than 125	34.4	Less than 5
CL9-3-11 Clay	Less than 5	Less than 5	Less than 5

All Results completed by Environmental Testing & Certification of Edison, New Jersey

CHEMICAL WASTE MGT.
VICKERY FACILITY
PCB ANALYSIS

CLOSED POND #9



CLAY
CLOSURE FILL
COVER

(<5) NUMBERS ARE PCB CONCENTRATIONS (TOTAL) BY GC METHOD, IN P.P.M.
△ AQUEOUS, P.P.B.

CHEMICAL WASTE MANAGEMENT, INC.
Vickery Facility
PCB Analysis

Closed Pond #10

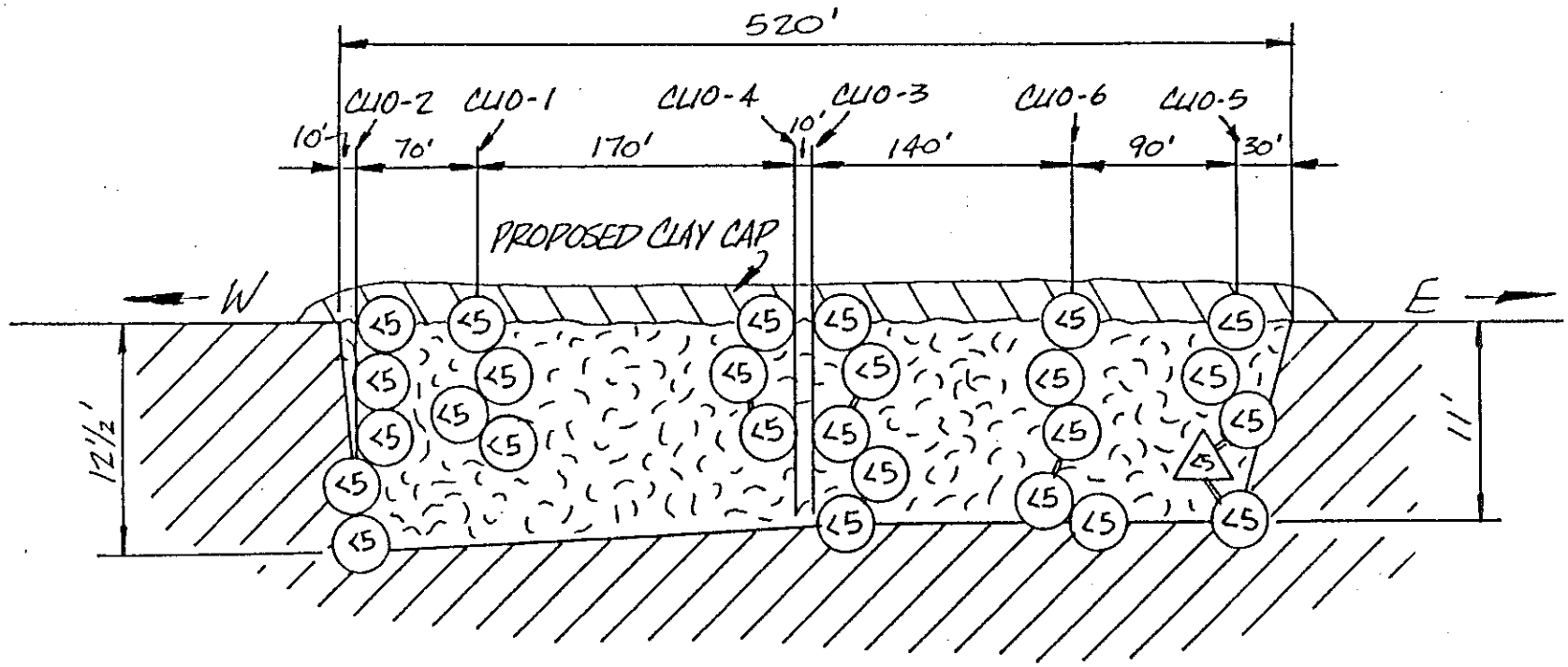
Total No. of Samples: 29
No. of Sectors: 6
Average Depth of Pond: 9.5 feet
Average PCB Content: Less than 5 ppm

E.T.C. Code	Aroclor 1242 mg/kg	Aroclor 1254 mg/kg	Aroclor 1260 mg/kg
CL10-1-0	Less than 5	Less than 5	Less than 5
CL10-1-3	Less than 5	Less than 5	Less than 5
CL10-1-5	Less than 25	Less than 5	Less than 5
CL10-1-6	Less than 50	Less than 5	Less than 5
CL10-2-0	Less than 5	Less than 5	Less than 5
CL10-2-3	Less than 5	Less than 5	Less than 5
CL10-2-6	Less than 5	Less than 5	Less than 5
CL10-2-9	Less than 5	Less than 5	Less than 5
CL10-2-12	Less than 5	Less than 5	Less than 5
CL10-2-12.5 Clay	Less than 5	Less than 5	Less than 5
CL10-3-0	Less than 5	Less than 5	Less than 5
CL10-3-3	Less than 5	Less than 5	Less than 5
CL10-3-6	Less than 5	Less than 5	Less than 5
CL10-3-8.5	Less than 50	Less than 5	Less than 5
CL10-3-11	Less than 125	Less than 5	Less than 5
CL10-4-0	Less than 5	Less than 5	Less than 5
CL10-4-3	Less than 5	Less than 5	Less than 5
CL10-4-6	Less than 5	Less than 5	Less than 5
CL10-4-6 Clay	Less than 5	Less than 5	Less than 5
CL10-5-0	Less than 5	Less than 5	Less than 5
CL10-5-3	Less than 5	Less than 5	Less than 5
CL10-5-5.5	Less than 25	Less than 5	Less than 5
CL10-5-7.5 Aqueous	Less than 5.2 ug/l	Less than 1.04 ug/l	Less than 1.04 ug/l
CL10-5-11 Clay	Less than 5	Less than 5	Less than 5
CL10-6-0	Less than 5	Less than 5	Less than 5
CL10-6-3	Less than 5	Less than 5	Less than 5
CL10-6-6	Less than 5	Less than 5	Less than 5
CL10-6-10	Less than 25	Less than 5	Less than 5
CL10-6-11 Clay	Less than 5	Less than 5	Less than 5

All Results completed by Environmental Testing & Certification of Edison, New Jersey

CHEMICAL, ~~OIL~~ MGT.
VICKERY FACILITY
PCB ANALYSIS

CLOSED POND #10



CLAY
CLOSURE FILL
COVER

(<5) NUMBERS ARE PCB CONCENTRATIONS (TOTAL) BY GC METHOD, IN P.P.M.
△ AQUEOUS, P.P.B.

APPENDIX B

CONSENT AGREEMENT AND FINAL ORDER

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

April 5, 1985

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IN RE:	)	
	)	
CHEMICAL WASTE MANAGEMENT, INC.	)	DOCKET NOS. TSCA-V-C-307
OAK BROOK, ILLINOIS,	)	RCRA-V-C-000
	)	
	)	CONSENT AGREEMENT AND FINAL ORDE
Respondent.	)	
	)	

4/5/85

CONSENT AGREEMENT

WHEREAS:

A. The above-captioned civil administrative proceedings were initiated pursuant to Section 16(a) of the Toxic Substances Control Act (TSCA), 15 U.S.C. §2615(a), and Section 3008 of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6928;

B. A Complaint and Notice of Opportunity for Hearing was filed by Complainant William H. Sanders, III, Director, Environmental Services Division, U.S. Environmental Protection Agency ("U.S. EPA") on January 24, 1985, charging that Respondent violated Section 15 of TSCA, 15 U.S.C. §2614, and implementing regulations at 40 C.F.R. Part 761, et seq. In addition, a Complaint and Notice of Opportunity for Hearing was filed by Complainant, Basil G. Constantelos, Director, Waste Management Division, U.S. EPA on April 4, 1985, charging that Respondent violated Section 3005 of RCRA, 42 U.S.C. §6925 and implementing regulations at 40 C.F.R. 261, 262, 265, and 270, et seq. The

Complaints allege that certain violations occurred at Respondent's facility located at 3956 State Route 412, Vickery, Ohio (the "Facility"). The Facility is an existing hazardous waste management facility, as defined in 40 C.F.R. 260.10.

The alleged violations of TSCA and RCRA at the facility have resulted in no known threat to public health from the Facility. Since becoming aware of such allegations in March of 1983, Respondent has cooperated fully and responsibly with Complainant in taking all appropriate corrective actions.

WHEREFORE, for the purpose of the above-captioned proceedings and without prejudice to any other proceeding:

A. This Consent Agreement and Final Order ("CAFO") of the Regional Administrator is in full and complete settlement of all civil liabilities of Respondent which might have attached as the result of said proceedings under TSCA and RCRA.

B. Other than as set forth in paragraph D below, Respondent neither admits nor denies the factual allegations of the Complaints and Respondent agrees not to contest the jurisdictional allegations contained in the Complaints or the authority of the Regional Administrator to issue this CAFO;

C. For the purposes of this CAFO and its enforcement, Respondent expressly waives its right to request an adjudicatory hearing on the allegations of the Complaints and consents to the assessment of the civil penalties stated in the following Order; and

D. Complainant and Respondent stipulate:

1. That on or about May 22, 1984, Respondent, and the State of Ohio entered into a Consent Decree (the "State Consent Decree"), which was filed in the Court of Common Pleas for Sandusky County, Ohio, without admitting or denying the State of Ohio's allegations, in which Respondent agreed, among other things, to cease the sale of oil products subsequent to entry of the State Consent Decree until it had developed a comprehensive oil management program that was acceptable to the Ohio Environmental Protection Agency ("OEPA") and to decontaminate and close certain surface impoundments and other areas of the facility alleged to be contaminated by polychlorinated biphenyls ("PCBs");

2. That said State Consent Decree requires that PCB-contaminated soils, sludges and other materials be placed into a closure cell to be constructed and operated in compliance with 40 C.F.R. 761.75;

3. That Respondent has, in fact, submitted an application to the Regional Administrator, Region V, for said closure cell pursuant to the State Consent Decree;

4. That Respondent has removed and will remove or decontaminate the buried oil/water separation tank, the concrete pit and oil/water trench, and that portion of a buried pipeline between sampling points identified in Section XVI, paragraph 29, of the State Consent Decree;

DRAFT 5. That Respondent has removed and will remove all sludge with PCBs in concentrations over 500 parts per million ("ppm") and all free oil containing PCBs, and dispose of said material off-site in accordance with 40 C.F.R. Part 761, et seq, as set forth in Section XVI, paragraph 29, of the State Consent Decree.

6. That prior to construction of the closure cell, non-liquid PCB material in concentrations below 500 ppm shall be placed in a temporary stockpile, constructed, covered, located and operated adjacent to Pond 4, as specified in Section XV Schedule for Closure of the State Consent Decree and in accordance with the approval under RCRA by OEPA of Respondent's Closure Plan for Ponds 4, 5, and 7. Such construction and operation are governed solely by the terms of such approval;

Based upon the foregoing stipulations, the parties agree to the following ORDER:

A. Except as provided below, U.S. EPA inspectors shall have full access to all operating areas of the Facility and areas undergoing remedial and/or closure activities during operating hours without delay and without a warrant upon presentation of credentials to company security personnel at the Facility's gate. Except as provided below, full access includes the right to obtain samples (providing a sampling and analysis plan and split samples to Respondent) and to record observations of site conditions, including photographs,

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(providing copies to Respondent) without restriction, interference, or prior approval of Respondent's personnel or other agents of the company. Nothing in this paragraph is intended to limit any other lawful rights of access or inspection which U.S. EPA may have with respect to the Facility. Prior to initial access to the Facility, U.S. EPA inspectors shall complete Respondent's safety training briefing, including signing an acknowledgment of the same and will comply with all reasonable safety procedures of Respondent. A representative of Respondent may accompany U.S. EPA inspectors.

B. Within thirty (30) days after this CAFO is signed by the Regional Administrator and filed with the Regional Hearing Clerk (the "effective date of this CAFO"), Respondent shall implement the Inspection Program for PCB-contaminated fixed sludge attached hereto as Attachment A.

1. Respondent agrees to cooperate with U.S. EPA, during inspections conducted to monitor compliance with this CAFO, provided, however, that during such inspections U.S. EPA shall not request or seek to obtain any environmental audit or internal compliance documents which are not required to be maintained by law or regulation and which are prepared pursuant to the environmental management program described and evaluated in paragraph B of the CAFO.

2. If U.S. EPA requests the Audit Report prepared pursuant to subsection 4 of this Paragraph B (the "Audit Report")

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and documents prepared in connection with the Audit Report by Respondent's Environmental Management Department after six months following the date of delivery of the audit recommendations described in subsection 3, Respondent shall provide such documents. Any documents prepared by Respondent in connection with the Audit Report, excluding documents prepared by Respondent's lawyers, shall be made available to U.S. EPA in accordance with the above. U.S. EPA agrees that such documents shall not be used to initiate an enforcement action or as direct evidence of a violation, but may be used as evidence of the existence of any violation which may remain uncorrected beyond six months after the delivery of the Audit Report and as evidence of knowledge or duration of a violation, provided, however, that Respondent does not waive any legal rights it may have to object to the admissability of such evidence. It is intended that documents prepared for Respondent pursuant to paragraph B are not required by law or regulation.

3.a. Within thirty (30) days after the effective date of this CAFO, Respondent shall submit to U.S. EPA the scope of work for the services of a third-party consultant, as well as its proposed consultant, who shall be expert in environmental auditing, auditing environmental management systems and auditing RCRA and TSCA waste management operations. This scope of work and consultant both shall be agreed upon by U.S. EPA and Respondent in writing prior to the consultant commencing the performance of the professional services as more fully set forth herein below.

D. Little?

The consultant will be retained and the scope of work will be designed to audit waste operation and environmental management systems at the Facility and in the Respondent's corporate Environmental Management Department as they affect RCRA and TSCA compliance at the Vickery Facility.

b. On or before June 30, 1985, Respondent shall submit to U.S. EPA a copy of the audit report prepared by an independent auditor of Respondent's audit of RCRA and TSCA compliance at the Facility completed pursuant to the State Consent Decree.

4. Within one year after agreement upon the scope of work and the consultant, said third-party consultant shall report in writing to Respondent. This report shall:

a. Identify and describe the existing Facility waste management operations. Identify and describe the Respondent's Environmental Management Department environmental management systems, policies and prevailing practices as they affect RCRA and TSCA compliance at the Facility to the extent that they are different from such systems, policies and practices as they affect RCRA and TSCA compliance at Respondent's Emelle, Alabama facility.

b. Evaluate such operations, systems, practices and policies and identify and describe fully the perceived strengths and weaknesses in such operations, systems, practices and policies, to the extent practicable, regarding their ability to

promote compliance with applicable RCRA and TSCA requirements, to the extent that they are different from such systems, policies, and practices as they affect RCRA and TSCA compliance at Respondent's Emelle, Alabama facility. The consultant shall apply its expertise and judgment to the foregoing data base, utilizing such factors as the consultant believes to be relevant and appropriate (which factors shall be stated in the report).

c. Based on the evaluation required in paragraph B.4.a. and b. above, the consultant shall identify and describe fully, with supporting rationales, the perceived areas, if any, where Respondent's waste management operations and environmental management systems, practices and policies may be improved as they affect the Facility regarding RCRA and TSCA compliance obligations, listing specific options for any improvements at The Facility in the following specific areas:

(1) compliance and waste management operation, staffing, education and experience requirements;

(2) compliance management budget, lines of authority, Respondent's corporate Environmental Management Department and relationship to the operating facility manager;

(3) personnel training for individual employees, compliance obligations and emergency spill response;

(4) Operations and Maintenance ("O&M") procedures for pollution prevention and waste management equipment;

(5) preparation of self-monitoring reports required to be filed with the State and U.S. EPA;

(6) evaluation of waste management operations and pollution prevention equipment in terms of adequacy of design and compatibility with wastes being passed through said equipment;

(7) preparation of Quality Assurance and Quality Control programs for sampling and analysis and for environmental testing procedures, including Facility laboratories and contract laboratories for the Facility;

(8) preparation and review of Incident Reports with specific recommendations for corrective steps and preventive O&M, along with reporting procedures for these recommendations to corporate headquarters.

5. Respondent shall notify U.S. EPA upon receipt of such report, and within ninety (90) days after receipt of a final report, Respondent shall submit to U.S. EPA that portion of the report containing all of the recommendations of the consultant, together with Respondent's evaluation of each option it has selected for adoption and the reasons for rejecting other options. The report by Respondent shall set forth the specific actions the company shall take and a schedule for implementation of the recommendations adopted by Respondent.

6. All documents submitted to U.S. EPA pursuant to paragraph B are considered to be "voluntarily submitted information" as defined in 40 CFR §2.201(i) and will be treated as confidential to the extent authorized by law including such protection as is allowed by TSCA and RCRA.

C. On or before July 1 of each calendar year, Respondent shall submit to U.S. EPA a copy of its annual PCB report for the previous calendar year, prepared pursuant to 40 U.S.C. §761.180. Respondent shall submit to U.S. EPA copies of the monthly reports prepared to document compliance with the remedial requirements of the State Consent Decree, pursuant to paragraph 45 of the State Consent Decree, and shall include in such reports, based on currently existing PCB analytical data, the amounts of materials contaminated with PCBs for the preceding month, chemically fixed and temporarily stockpiled, disposed of in the closure cell referred to in paragraphs D.2. and 3. of the State Consent Decree, or removed from the Facility. For materials contaminated with more than 500 ppm PCB's which have been removed from the Facility, such reports shall indicate the concentrations of PCBs in such materials, based on analyses undertaken by Respondent, and shall identify the destination of any such materials removed from the Facility.

D. Respondent waives all claims that all operating records of the Facility previously submitted by Respondent to U.S. EPA are subject to TSCA Confidential Business Information claims, except for customer lists or documents for which customer lists may be compiled.

E. Respondent waives all claims that records pertaining to the design and operating methodology of pollution control equipment at the Facility previously submitted to U.S. EPA for

issuance of a permit, license or the like are subject to Confidential Business Information claims.

F. To assure that the Facility is properly managed and supervised during emergency events, Respondent shall implement the procedures in Attachment B. The reports prepared and submitted pursuant to paragraphs B.2. and 4. of this CAFO shall address whether such measures are sufficient to provide adequate management and supervision at the Facility during emergency events, and if they are not, shall recommend additional measures to meet that objective.

G. Except as longer periods of compliance are contemplated in this CAFO or in the State Consent Decree or otherwise provided in paragraph H below, Respondent shall immediately, upon the signing of this CAFO, achieve and maintain compliance at the Facility with applicable regulations for hazardous waste treatment facilities, as set forth in 40 C.F.R. Parts 265 and 270. The foregoing shall include, but not be limited to, compliance with 40 C.F.R. 270.72 in the event of proposed creation of new waste piles or the addition of new processes in the treatment, storage or disposal of hazardous waste. U.S. EPA shall promptly process and take final action upon any submissions made by Respondent pursuant to this paragraph. U.S. EPA represents that all civil claims of U.S. EPA under RCRA or TSCA, based on facts or circumstances known to U.S. EPA as of the effective date of this CAFO, are alleged in the Complaints.

H. To meet the requirements of 40 C.F.R. §265.90 to .94, Respondent shall implement an initial groundwater program as set forth in subparagraphs 1-11 hereof (the "Initial Groundwater Program") and shall also implement a continuing groundwater program as set forth in subparagraphs 12 and 13 hereof (the "Continuing Groundwater Program") as follows:

1. Within 60 days after the effective date of this CAFO, Respondent shall perform a waste characterization analysis for the constituents listed in Attachment C on the following samples:

   a. Composite aqueous sample from Ponds 11 and 12;

   b. Composite sludge sample from Pond 4;

   c. Composite sludge sample from Pond 5; and

   d. A sludge sample from Pond 7.

2. Within 30 days after the completion of such waste characterization, Respondent shall submit to U.S. EPA and OEPA a list of the constituents identified in the waste characterization performed pursuant to subparagraph 1 above as well as a list of hazardous waste constituents listed in Attachment C which have previously been detected at the Facility. (The combined list of constituents shall hereinafter be referred to as The "Initial List.")

3. As used herein the term:

   a. "Bedrock Well" means a groundwater monitoring well located in the bedrock aquifer beneath the Facility;

b. "Lacustrine Well" means a groundwater monitoring well located in the saturated zone of the lacustrine geological strata beneath the Facility; and

c. "Till Well" means a groundwater monitoring well located in the saturated zone of the glacial till beneath the Facility.

4. Within 60 days after the effective date of this CAFO, Respondent shall submit to U.S. EPA and OEPA a workplan for the Bedrock, Lacustrine, and Till Wells at the approximate locations shown on Attachments D and E. The workplan shall specify the exact locations and depths for screening of all wells and the manner of construction of all wells. The wells shall utilize standard monitoring well technology and shall be designed and constructed to ensure that groundwater samples come into contact with casings and well screens composed only of stainless steel 316. The entire casings and well screens of the Lacustrine Wells shall be composed of stainless steel (316). Respondent's agreement to the foregoing shall in no way be deemed an admission by Respondent that standard monitoring well technology requires the use of stainless steel construction material.

5. Within 90 days after the approval of such workplan by U.S. EPA and OEPA, Respondent shall install:

a. Bedrock Wells at the approximate locations marked MW14-R and MW19-R to MW24-R on Attachment D;

b. Lacustrine Wells at the approximate locations marked L-14, L-19 to L-23, and L-26 to L-35 on Attachment E; and

c. Till Wells at the approximate locations marked T-14, T-19, T-23, T-24, and T-27 on Attachment E.

6. Within 90 days after excavation of fixed sludge, soil and rip-rap from Ponds 4, 5, and 7 pursuant to the State Consent Decree, Respondent shall install:

a. Bedrock Wells at the approximate locations marked MW-15R and MW-16R on Attachment D; and

b. Lacustrine Wells at the approximate locations marked L-15 and L-16 on Attachment E.

7. Within 90 days after removal of the clay liner beneath the temporary stockpile required in the State Consent Decree for closure of Ponds 4, 5, and 7, and regrading the area as required in the closure plan submitted pursuant to the State Consent Decree for such Ponds, Respondent shall install:

a. Bedrock Wells at approximate locations marked MW-17R and MW-18R on Attachment D;

b. Lacustrine Wells at approximate locations marked L-17, L-18 and L-25 on Attachment E; and

c. Till Wells at the approximate locations marked T-17 and T-18 on Attachment E.

8. After installation of the Bedrock Wells described in subparagraphs 5, 6 and 7 and upon approval of OEPA, Respondent may discontinue use of and grout shut groundwater monitoring wells currently in existence at the Facility.

9. After closure of Ponds 11 and 12, if closed under 40 CFR 264.228(a)(1) or 265.228(a)(1) and upon approval of OEPA, Respondent may discontinue use of and grout shut Bedrock Wells marked MW-21 and MW-22 on Attachment D and Lacustrine Wells marked L-21, L-22, L-29 and L-31 through L-35 on Attachment E. If Respondent closes Ponds 11 and 12 under other standards than 40 CFR 26.228(a) or 265.228(a)(1), this subparagraph does not imply that Respondent may not discontinue use of, and grout shut, such wells if approved by U.S. EPA and/or OEPA.

10. In the event the operation of a new water supply well at the Facility alters the groundwater flow direction, Respondent shall modify the groundwater monitoring system, if necessary, to reflect changes in the groundwater flow direction.

11. Respondent shall perform the Initial Groundwater Program by sampling groundwater

a. from each well identified in subparagraph 5 of this paragraph within 60 days after installation of all of such wells;

b. from each well identified in subparagraph 6 of this paragraph within 60 days after installation of all such wells; and

c. from each well identified in subparagraph 7 of this paragraph within 60 days after installation of all such wells

and by analyzing each such sample for the constituents on the Initial List. Respondent shall submit the results of each set of such analyses and reports based on such analyses as required by 40 CFR 265.93(d)(5) to U.S. EPA and OEPA within 30 days after receipt by Respondent of final results of all the analyses in that set of analyses.

12. After the completion of the Initial Groundwater Program, Respondent shall conduct the Continuing Groundwater Program by performing groundwater monitoring for each well identified in subparagraphs 5, 6, and 7 of this paragraph on a semi-annual basis by sampling groundwater from each such well and by analyzing each such sample for chlorobenzene, chloroform, methylene chloride, toulene, 1, 1, 1-Trichlroethane, trichloroethylene, benzene, ethelbenzene, chromium, cadmium, arsenic, lead, zinc, pH, specific conductance, and for a further subset of constituents on the Initial List. Such further subset shall be composed of constituents agreed by U.S. EPA, OEPA and Respondent to be or to have been prominently present in the wastes at the Facility and a meaningful indicator of leakage from the Facility. Respondent shall submit the results of each such semi-annual analyses and a report on the same to U.S. EPA and OEPA within 30 days after receipt of all such final semi-annual results by Respondent.

13. Except as provided below, if Respondent identifies in any sample taken during the Initial Groundwater Program a constituent on the Initial List (excluding the constituents listed by name

in subparagraph 12) in a concentration above the limit of detection, Respondent also shall analyze for each such additional constitutent (the "Additional Constituent") during the first semi-annual groundwater monitoring as follows:

a. If the Additional Constituent is found in a Bedrock Well, Respondent shall analyze for it during such monitoring in samples from all monitoring wells. If it is found in any such sample, analyses for it shall continue in samples from all monitoring wells until it is not found in samples from any monitoring during two successive semi-annual monitorings.

b. If The Additional Constituent is found in any Lacustrine or Till Well (the "Target Well"), Respondent shall analyze for said Additional Constituent during the first semi-annual groundwater monitoring in samples from: (i) said Target Well, (ii) the next adjacent well on each side and in the same strata as said Target Well, and (iii) in the next lower well at the location of the Target Well. In the event The Additional Constituent is not detected in the Target Well for two successive semi-annual monitorings, Respondent may discontinue monitoring for said Additional Constituent in all of the wells set forth in the preceding sentence, <u>provided that</u> if said Additional Constituent is detected in any well described in (ii) or (iii)above,

said well shall be considered a new Target Well and Respondent shall sample at the new Target Well in accordance with the preceeding sentence.

c. The requirements for subsequent analyses in this subparagraph shall not apply to an Additional Constituent that Respondent demonstrates was identified because of error in well installation, sampling, laboratory procedure or analytical method. Where appropriate, Respondent shall demonstrate sampling or laboratory error by immediatel obtaining additional samples from the affected well(s), split the samples in two and obtain analysis of all additional samples by different laboratories. If Respondent identifies an additional constituent due to an error in well installation, Respondent shall promptly correct said error by installing a new well if necessary.

14. All analyses hereunder shall be done using approved U.S. EPA test methods or their equivalent if approved by U.S. EPA. U.S. EPA shall have the right to review the laboratory procedures of any laboratory used hereunder. Respondent will provide notice of such laboratory, and will cooperate in any such review.

15. Nothing in this Paragraph H shall waive any right of U.S. EPA to take any legal, equitible or administrative action, including, but not limited to, action to require Respondent to perform additional groundwater monitoring based upon the

results of the Initial Groundwater Program or Continuing Ground Program pursuant to Section 3013, 3008 or 7003 of RCRA or any other statutory authority.

I. Respondent shall close Ponds 11 and 12 sooner than is required in the State Consent Decree in the following manner:

1. Respondent shall not accept waste from offsite for disposal at the Facility until November 24, 1985 or until the inventory of waste in Ponds 11 and 12 has been reduced to 50 million gallons as determined by field survey, whichever is later. Respondent shall immediately thereafter pump all of such remaining inventory into one of Ponds 11 or 12. Respondent shall not thereafter accept further waste for disposal in the emptied Pond. Disposal into any Injection Wells described in the State Consent Decree shall be in conformity with all requirements of Federal and State law as well as all requirements of the State Consent Decree.

2. Once the inventory of waste in Ponds 11 and 12 has been reduced to 50 million gallons, Respondent shall not increase said inventory over 50 million gallons, and Respondent shall thereafter dedicate at least 50% of the capacity of said Injection Wells to the disposal of the remaining inventory in Pond 11 or 12 as the case may be.

3. The volume of fluids in Ponds 11 and 12 will be determined by field measurement of the pond fluid elevation using standard civil engineering procedures followed by a calculation of the

volume based on the geometric configuration of the ponds, as described in a diagram to be provided by Respondent.

4. Within 90 days after the effective date of this CAFO, Respondent shall submit a closure plan for the emptied Pond to the governmental authority (U. S. EPA or OEPA) having jurisdiction over closure plan approval, with a copy to the other governmental authority. Such plan shall provide for closure of the emptied Pond within one year after the emptying of all liquid from the Pond or the completion of construction of the closure cell required by the State Consent Decree, whichever occurs later. Respondent shall implement such closure plan as approved by such authority, subject to appeal of such approval. The remaining Pond shall be closed in the manner set forth in the State Consent Decree. This subparagraph is not intended to extend the closure date of any Pond beyond the date otherwise provided for in the State Consent Decree.

J. In the event of a material violation of a material requirement of the State Consent Decree, U.S. EPA expressly retains the right to commence enforcement proceedings for penalties provided by RCRA Section 3008 for any violation of RCRA associated with such violations of the State Consent Decree, and Respondent expressly retains the right to contest any such action, including U.S. EPA's jurisdiction to take such action. U.S. EPA may not collect penalties under this paragraph and under paragraph P for the same violation.

K. Notwithstanding any other provision of this CAFO, an enforcement action may be brought pursuant to Section 7003 of RCRA or other statutory provision to abate an imminent and substantial endangerment to human health or the environment. Nothing herein shall be construed to prevent U.S. EPA from seeking legal or equitable relief to enforce the terms of this CAFO in the event Respondent fails to comply with the terms hereof. Nothing herein shall relieve Respondent of either civil or criminal liability for any violation based on facts or circumstances not alleged in the Complaints, including, but not limited to, liability under applicable Underground Injection Control regulations, and, without limitation on the foregoing, nothing herein shall limit U.S. EPA from taking further enforcement action to abate any groundwater contamination attributable to the Facility. Provided that, in consideration of Respondent's consent to this CAFO, Complainant hereby covenants not to initiate or maintain any civil claim or civil cause of action under RCRA or TSCA against Respondent, its parent, subsidiaries, or present or former employees thereof, with respect to the Facility based on facts or circumstances known by Complainant, its agents, employees or contractors as of the effective date of this CAFO except as otherwise provided herein.

L. All documents and plans or other written communications submitted pursuant to this CAFO shall be directed to:

Director
Waste Management Division (5H)
U.S. Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604
Attn: James Brossman

Director
Environmental Services Division
U.S. Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604
Attn: Karl Bremer

M. In resolution of the violations set forth in the Complaints, and in consideration of Respondent's committments set forth in the State Consent Decree and the penalties assessed therein, and the agreement of Respondent to the CAFO, including the environmental audit, groundwater monitoring, and restrictions on receipt of wastes, and in consideration of the responsible manner in which the Respondent has cooperated with Complainants since becoming aware of the alleged violations of RCRA and TSCA in March, 1983, and Respondent's committment to remain in compliance with TSCA and RCRA, Complainants agree to accept a civil penalty in the amount of TWO AND ONE-HALF MILLION DOLLARS ($2,500,000.00). Payment will be remitted within thirty (30) days after the effective date of this CAFO by sending a cashier's or certified check in the amount of $2,500,000.00, made payable to the Treasurer of the United States of America, to the U.S. Environmental Protection Agency, Lockbox 70753, Chicago, Illinois 60673. A copy of the check must also be sent to the Regional Hearing Clerk, 5MF-14, U.S. Environmental Protection Agency, Region V, 230 South Dearborn Street, Chicago, Illinois 60604.

N. Failure to remit the civil penalty will result in a referral of this matter to the United States Attorney for the initiation of a collection action.

O. In the event that U.S. EPA believes Respondent has failed to:

a. Comply with the requirement in Paragraphs H or I;

b. Submit a PCB status report as required in Paragraph C; or

c. Implement emergency procedures as required in paragraph F.

Except for the requirement to submit the PCB status report, U.S. EPA shall notify Respondent of the alleged failure and shall provide Respondent fifteen (15) days in which to remedy the alleged failure.

2. If Respondent has failed to remedy the alleged failure within said fifteen (15) day period and it is not in compliance with this CAFO, Respondent shall pay stipulated penalties from the date of violation as follows:

a. $5,000.00 for one-time violation or $5,000 per week for a continuing violation (but no more than $5,000 for the first month of such continuing violation) for failure to comply with the requirements of of paragraphs H and I.

b. $500.00 per day for failure to implement emergency procedures as required in paragraph F; and

c. $100.00 per day for failure to submit a PCB status report as required in paragraph C.

3. Excluding Paragraphs G and J, the above stipulated penalties are the exclusive penalties which Complainant may obtain from Respondent for failure to comply with the requirements of this CAFO. Nothing in this subparagraph shall be construed as limiting the ability of Complainant to compel specific performance of this CAFO or to seek injunctive relief to abate a condition which may present an imminent and substantial endangerment.

P. If CWM fails to comply with any performance date or other requirement of this CAFO and such failure is caused by

persons or events beyond the control of Respondent, despite the exercise of all reasonable efforts, such failure shall not be considered a violation of this Agreement. When circumstances are occurring or have occurred which may delay the completion of any requirement of this Agreement, Respondent shall notify U.S. EPA and the state in writing of the reason(s) for and duration or expected duration of such delay, the measures to be taken by Respondent to prevent or minimize the delay and the timetable by which those measures will be implemented. Such notice shall be sent no later than thirty (30) business days exluding Saturdays, Sundays, and holidays following the date Respondent's Environmental Management Department becomes aware of the occurrence. Respondent's Environmental Management Department will be responsible for monitoring the implementation of all aspects of Respondent's performance under this Agreement. Respondent's failure to notify U.S. EPA and the State of the fact of the delay shall consitute a waiver of claims or defenses under this provision. U.S. EPA will notify Respondent no later than thirty (30) business days exluding Saturdays, Sundays, and holidays of its objection of such excuse. Failure of U.S. EPA to notify Respondent of such objection shall constitute a waiver of the Agency's objection to such excuse.

Q. The effectiveness of each paragraph of this CAFO shall terminate as follows:

1. Paragraphs B2-6, I, and N shall terminate individually when the action contemplated by each of them respectively has been completed;

2. Paragraph B (excluding 1-6) and C shall terminate when the closure cell required in the State Consent Decree is enclosed;

3. Paragraph H shall terminate when a RCRA Part B Permit, approved closure plan or combination of the same establish groundwater monitoring requirements (or that that no groundwater monitoring is required) for those portions of the Facility for which groundwater monitoring is specified in Paragraph H hereof.

4. All other paragraphs except Paragraphs A, B-1, D, E and G shall terminate when the last of paragraphs B2-6, I, N, B (excluding 1-6), C and H terminate.

Chemical Waste Management, Inc.
Oak Brook, Illinois

Dated: _____

Apr 5, 1985

William H. Sanders, III
Director
Environmental Services Division
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dated: _____

Basil G. Constantelos
Director
Waste Management Division
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dated: _____

It is so ORDERED as agreed to by the parties as stated in the Consent Agreement.

Valdas V. Adamkus
Regional Administrator
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Dated: _____

ATTACHMENT A

The facility inspection plan pursuant to 40 C.F.R. §265.15 will be modified to include inspection of the stockpile of fixed material. As a mimimum the following will be included:

(1) Inspect for evidence of slope instability;

(2) Inspect for cover integrity when cover is required by the approved closure plan;

(3) Inspect for integrity of run-on and run-off control features.

2.0 IMPLEMENTATION OF RESPONSE PROCEDURES

In the event of an emergency which results in fire, explosion or accidental materials release, response activities will be initiated immediately, following observation of the event. An assessment of the situation will be performed immediately by the on-duty Emergency Coordinator(s). A logic diagram of initial response activities leading to implementation of the Contingency Plan is shown in Figure 2-1. In the event of an imminent or actual emergency, the person observing the incident will implement the following procedures:

1. Notify the Shift Supervisor or Primary Emergency Coordinator and secure the area.

2. The Shift Supervisor notified will assume responsibility for performing a preliminary assessment of the situation, implementing the necessary control measures and contacting the alternate Emergency Coordinator(s) (as described in Section 2.1). The following information will be provided to the Emergency Coordinator(s):

   (a) Name of person reporting the incident;

   (b) Location;

   (c) Nature and extent of the incident; and

   (d) Actions taken and/or recommended.

3. The Emergency Coordinator(s) will evaluate the situation using the criteria in Table 2-1 and determine whether the Contingency Plan is to be implemented.

4. If the event is of a minor or controllable nature and presents no potential hazard to human health, the site operations, or the environment, the Emergency Coordinator(s) will insure that control measures and post-emergency (cleanup) procedures are implemented and the necessary reporting is completed. The Contingency Plan is not implemented under these conditions.

5. If the event poses a threat to human health, the site operations, or the environment, the Emergency Coordinator(s) will implement the Contingency Plan. The Emergency Coordinator(s) will take control of the affected area. He will use any resources necessary until the

emergency has been eliminated and any needed cleanup or restoration is completed.

DRAFT

2.1 NOTIFICATION OF EMERGENCY COORDINATOR(S)

On or before the first of every calendar month, the General Manager will post an on-call schedule for the month. The on-call schedule will identify the Emergency Coordinator(s) who are on duty during the month. There are two Emergency Coordinators on duty at all such times. Emergency Coordinators shall be managers and supervisors at the Facility. The Primary Emergency Coordinator is the Shift Supervisor and the Alternate Emergency Coordinator(s) are Regulatory or Technical Supervisors.

Should an emergency occur, the Shift Supervisor or Primary Emergency Coordinator will reference the on-call schedule and immediately notify the Alternate Emergency Coordinator(s) on duty. The Alternate Emergency Coordinator(s) are responsible for assisting the Shift Supervisor and providing operational, technical and regulatory guidance.

The Emergency Coordinator(s) on duty are accessible by phone and/or paging device and are capable of responding to the site immediately. If the event warrants the appearance of the Alternate Emergency Coordinator at the site after normal working hours, they will inform the Shift Supervisor or Primary Emergency Coordinator of the their estimated arrival time and actions to be taken until their arrival. If their arrival time is likely to be greater than 30 minutes, they will direct the caller to contact another designated Alternate Emergency Coordinator and ask them to respond until they can arrive. In the meantime, the Shift Supervisor will continue implementing response procedures without awaiting the arrival of the alternate Emergency Coordinator.

2.2 REPORTING REQUIREMENTS

The following external contacts are made to report an incident:

(1) National Response Center (800/424-8802)

(2) Ohio EPA Emergency Response (800/282-9378)

(3) Ohio EPA - NWDO (419/352-8461)

(4) * U.S. EPA Region V Office (312/353-2197)

(5) * U.S. Coast Guard (216/522-3983)

* These agencies must be notified of any release to a waterway.

FIGURE 2-1

RESPONSE ACTIVITIES
CHEMICAL WASTE MANAGEMENT, INC.

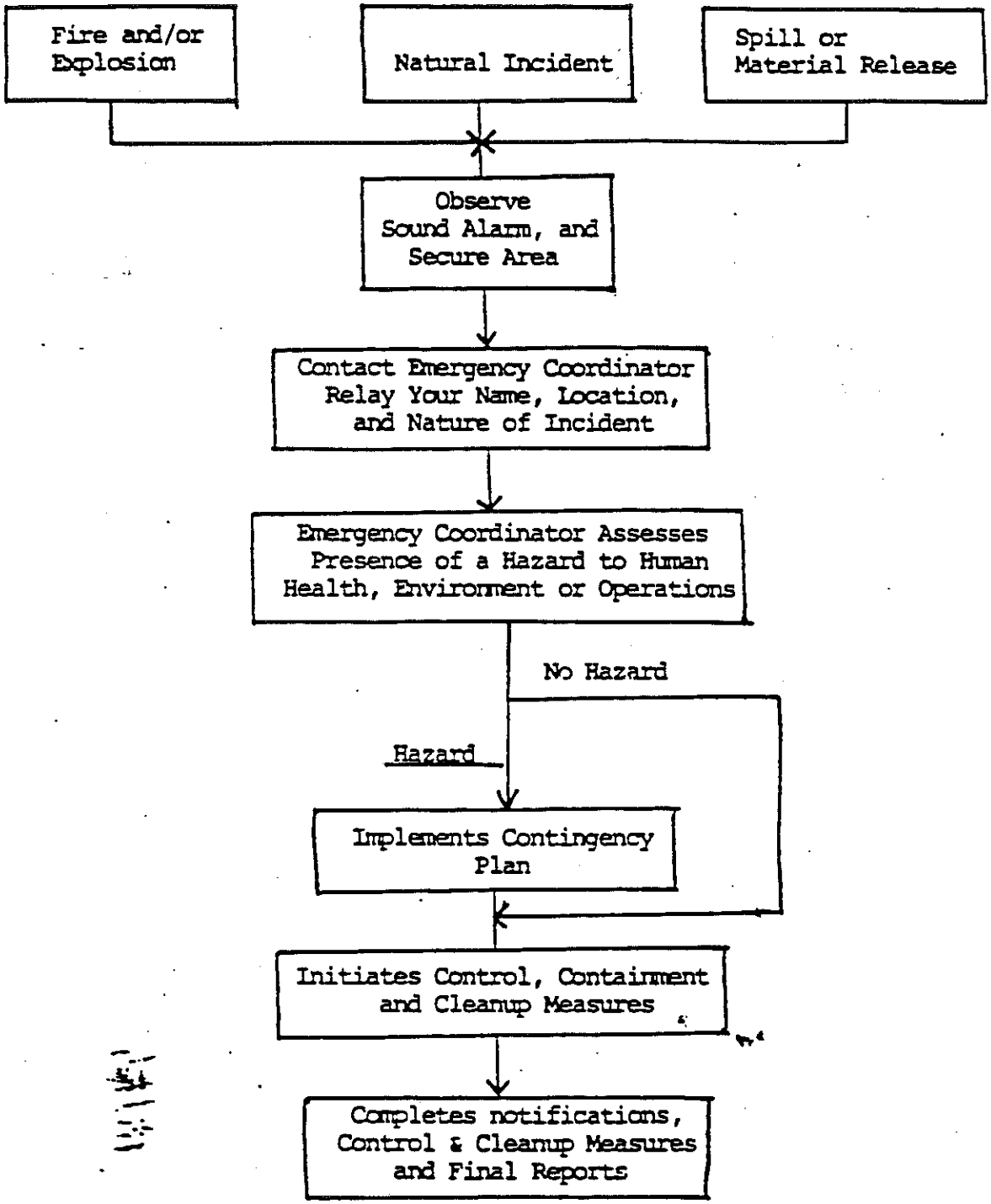


Table 2-1

EVALUATION CRITERIA FOR
IMPLEMENTATION OF CONTINGENCY PLAN

Fire and/or Explosion

* Fire[1] which may cause the release of toxic fumes.

* Fire which may spread and could possibly ignite materials at other locations on-site or off-site, or could cause heat induced leaks or explosions.

* The use of fire suppressants; either chemical or water could result in contaminated runoff.

* Explosion[1] which has or could:

  — result in danger from flying fragments or shock waves;

  — ignite other hazardous waste at the facility;

  — release toxic materials.

Spills or Material Releases

* A spill or reaction that results in the release of toxic vapors.

* A spill that has or could release toxic vapors or significant flammable liquids or vapors, thus representing a fire or gas explosion hazard.

* A spill outside of a secondary containment unit which could result in off-site soil contamination and/or or surface water contamination.

* A spill that could endanger human health or the environment for other reasons.

* Initiation of containment and control procedures.

* An accounting for all facility personnel/visitors by comparing a head count with sign-in/sign-out forms or other appropriate means.

* Implementation of internal notification, outside authorities with an assessment of the situation, and requesting assistance as necessary.

* Coordination of first-aid activities, if casualties are involved, and activation of the casualty control procedures.

* Evacuation, if required, by activation of the Evacuation Plan.

1. Minor or controllable fires or explosions are to be addressed pursuant to Section 2.0(4) without invoking the entire contingency plan.

ATTACHMENT C

PROPOSED ANALYTICAL SCHEME
FOR
APPENDIX VII (SEVEN COMPOUNDS)

Isobutanol
Chloroacetaldehyde
Dichloropropanol
Methanol

Pyridine
Tetrachloroethylene
Methylene Chloride
Trichloroethylene
1,1,1-Trichloroethane
Carbon Tetrachloride
1,1,2-trichloro-1,2,2-trifluoroethane
Trichlorofluoromethane
Chlorobenzene
Toluene
Methyl ethyl ketone
Carbon dissulfide
Chloroform
Methyl Chloride
Acrylonitrile
1,2-Dichloroethane
1,1,2-Trichloroethane
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Vinyl Chloride
1,1-Dichloroethylene
Benzene
1,1,2-Trichloropropane
1,2,3-Trichloropropane
1,2,2-Trichloropropane
Bis (chloromethyl) ether

o-dichlorobenzene
o-cresol
m&p cresol

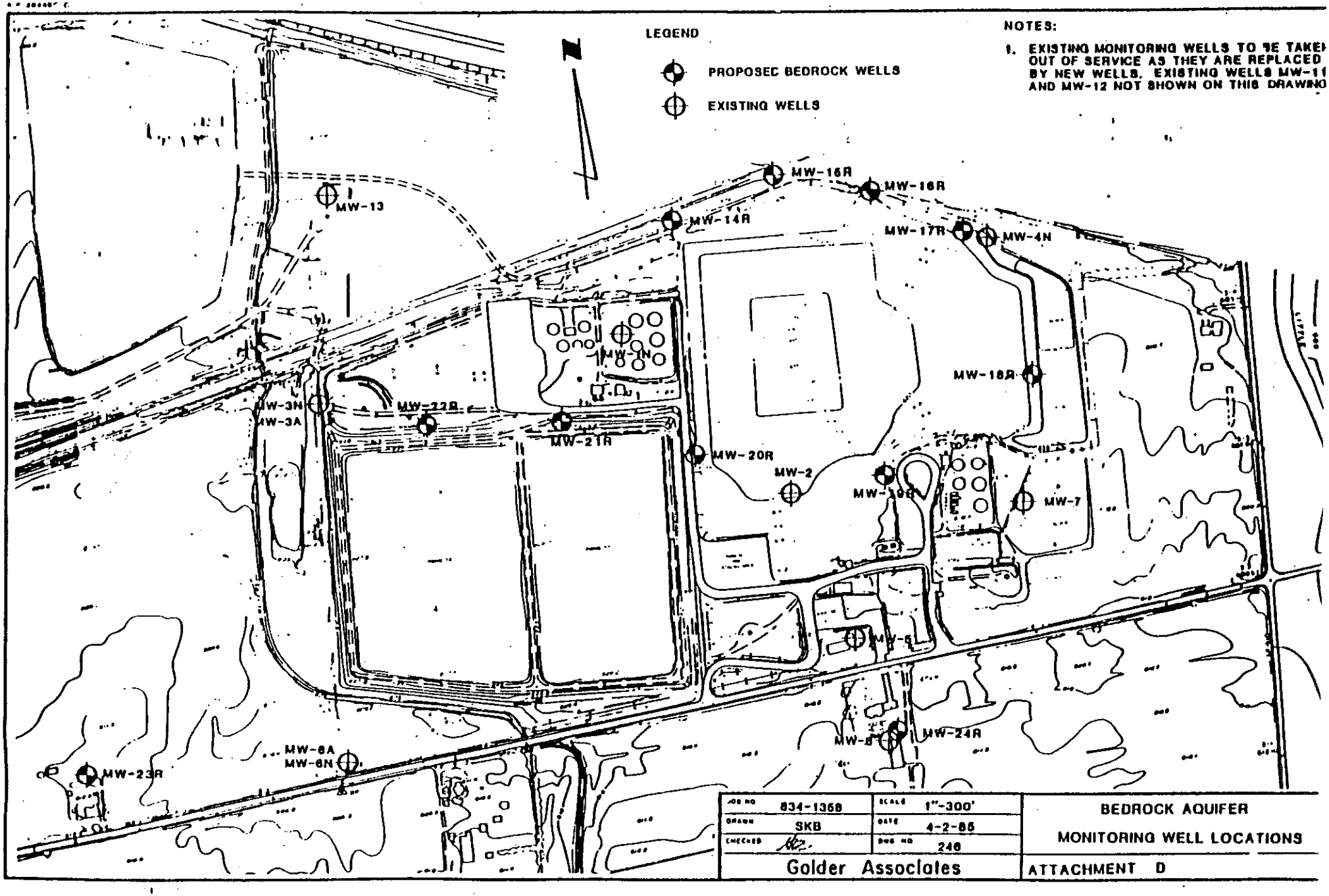
Nitrobenzene
Pentachlorophenol
Phenol
2-Chlorophenol
p-chloro-m-cresol
2,4-Dimethyl phenol
2,4-Dinitrophenol
2,4,5-Trichlorophenol
Bis (2-chloroethyl) ether
2,4,6 trichlorophenol
4 nitrophenol
4,6-dinitro-o-cresol
2,3,5,6-Tetrachlorophenol
2,3,4,6-Tetrachlorophenol
2,3,4,5-Tetrachlorophenol
Chrysene
Naphthalene
Fluoranthene
Benzo (b) Fluoranthene
Benzo (a) pyrene
Indeno (1,2,3-cd) pyrene
Benzo (a) anthracene
Dibenz (a) anthracene
Acenaphthalene
Benzyl Chloride
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
m-Dinitrobenzene
2,4-Dinitrotolune
2-Picoline
Hexachlorocyclopentadiene
2,4-Dichlorophenol
2,6-Dichlorophenol
Aniline
Diphenylamine
m-dichlorobenzene
p-dichlorobenzene
1,2,4-Trichlorobenzene
1,2,3-Trichlorobenzene
2,4,6-Trichlorobenzene
1,2,3,4-Tetrachlorobenzene
1,2,3,5-Tetrachlorobenzene
1,2,4,5-Tetrachlorobenzene
1,4-Naphthoquinone

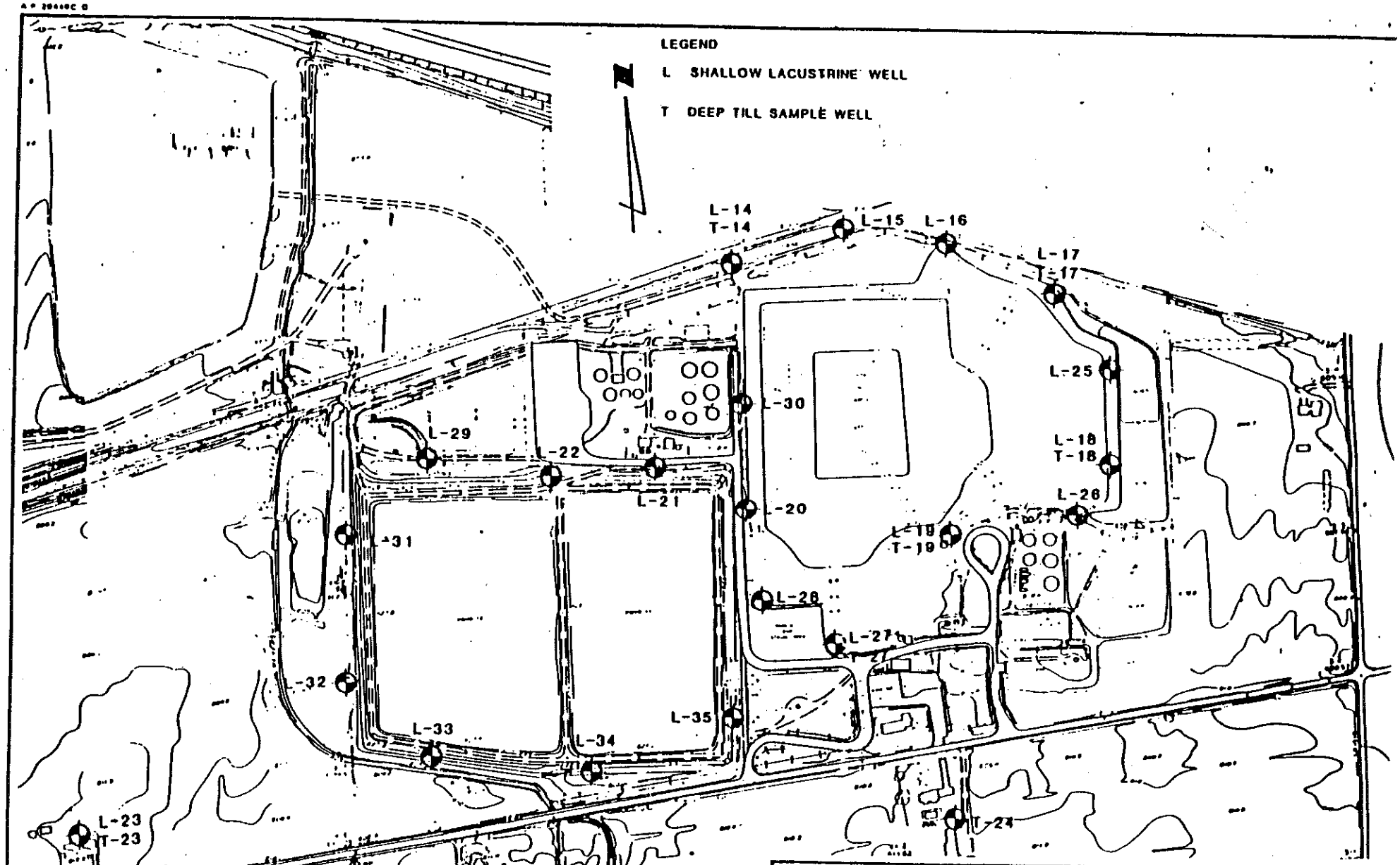
Chlordane
Heptachlor
Toxaphene

Acrylamide
Acetonitrile
2,4 Toluene Diamine
(o,m,p) Phenylenediamine

Cadmium
Hexavalent Chromium
Nickel
Lead
Arsenic
Mercury
Antimony
Chromium

Cyanide, Total


LEGEND
PROPOSED BEDROCK WELLS
EXISTING WELLS
NOTES:
1. EXISTING MONITORING WELLS TO BE TAKEN OUT OF SERVICE AS THEY ARE REPLACED BY NEW WELLS. EXISTING WELLS MW-11 AND MW-12 NOT SHOWN ON THIS DRAWING
MW-13
MW-15R
MW-16R
MW-14R
MW-17R
MW-4N
MW-1N
MW-18R
MW-3N
MW-3A
MW-22R
MW-21R
MW-20R
MW-2
MW-7
MW-24R
MW-6A
MW-6N
MW-23R
JOB NO 834-1368
SCALE 1"=300'
DRAWN SKB
DATE 4-2-86
CHECKED
DWG NO 246
Golder Associates
BEDROCK AQUIFER
MONITORING WELL LOCATIONS
ATTACHMENT D



JOB NO	834-1358	SCALE	1"=300'
DRAWN	SKB	DATE	4-2-85
CHECKED	Gae	DWG NO	254

Golder Associates

LACUSTRINE AND TILL WELL LOCATIONS

ATTACHMENT E

ATTACHMENT C

INVESTIGATION AT HOLE SS-10

APPENDIX C

INVESTIGATION AT HOLE SS-10

Golder Associates Inc.
CONSULTING ENGINEERS

REPORT ON

INVESTIGATION AT HOLE SS-10

VICKERY, OHIO FACILITY

Submitted to:

Chemical Waste Management, Inc.
3956 State Route 412
Vickery, Ohio 43464

DISTRIBUTION:

12 Copies - Chemical Waste Management, Inc.
2 Copies - Golder Associates Inc.

January 1989 853-3022

GOLDER ASSOCIATES INC. • 3730 CHAMBLEE TUCKER ROAD • ATLANTA, GA 30341 • TELEPHONE: (404) 496-1893 • TELEX 700523 • FAX: 404-934-9476

OFFICES IN UNITED STATES • CANADA • UNITED KINGDOM • AUSTRALIA

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Cover Letter

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1.0 INTRODUCTION

Chemical Waste Management, Inc. (CWM) owns and operates a hazardous waste disposal facility in northern Ohio, near the town of Vickery, known as the Vickery Facility. The site is located on State Route 412 near the intersection of State Route 510, about twenty miles southwest of Sandusky, Ohio (Figure 1).

The Facility presently disposes of hazardous waste by underground injection through four deep wells. Three other deep injection wells previously used at the site have been plugged and abandoned. Past operations at the Facility also included the use of various ponds for the treatment and/or separation of oil residues and liquid waste for reclamation and disposal. In accordance with the Consent Decree of May 22, 1984 between CWM and the Ohio Environmental Protection Agency (OEPA), CWM agreed to install eighteen temporary overburden groundwater sampling holes (SS-Series holes). These holes, plus one existing monitoring well, were involved in a single sampling event to sample shallow overburden groundwater. The Consent Decree specified the open interval for the SS-Series holes at 15 feet to 20 feet beneath the original ground surface. Also specified were the locations for each SS-hole. Following the installation of the SS-series holes and the single sample event, levels of organic compounds exceeding concentrations specified in the Consent Decree were reported from the sampling of hole SS-10. Section IX, paragraph 18(D) of the Consent Decree specified the installation of a groundwater monitoring well(s) at hole locations where groundwater sampling results exceed concentrations specified in the Consent Decree, and the sampling of the well(s) for the parameters exceeding those concentrations.

This report briefly describes the geology and hydrogeology of the site, describes the single sample event and results for SS-10, describes the additional investigation including installation of a monitoring well near hole SS-10, and presents the results of the investigation. This investigation and report satisfy the requirements as set forth in Section IX, paragraph 18(D) of the Consent Decree.

2.0 GEOLOGY AND HYDROLOGY

2.1 General Geology

The site geology and hydrogeology have been extensively evaluated and summarized in References 1 through 7. The site is underlain by approximately 33 feet to 52 feet of glacial overburden materials, consisting of lacustrine clay and glacial till, overlying dolomite bedrock. The dolomite bedrock, which comprises the uppermost aquifer underlying the site, is about 500 feet thick. The dolomite bedrock is underlain by a sequence of sedimentary rocks comprising shale, sandstone, limestone, and dolomite. Precambrian granite bedrock ("basement rock") is encountered about 2,900 feet beneath the ground surface.

2.2 Overburden Soils

The overburden soils at the site are the primary soils of concern in this investigation. The overburden soils consist of deposits of glacial and lacustrine silty clays and clays, approximately 50 feet thick. The upper 5 feet to 10 feet of the overburden have been desiccated during the geologic past resulting in fractures which may be open, although none were observed during any of the field sampling programs.

The lacustrine soils extend from the ground surface to depths of 0 feet to 25 feet beneath the ground surface, with a typical thickness of about 15 feet. Sand partings and horizontal laminations 1/4-inch to 1-inch thick have been observed in the lacustrine materials.

Glacial till deposits underlie the lacustrine materials down to bedrock. These till deposits are also comprised of silty clays and clays, with some sand and gravel in the matrix. In some areas of the site, where the lacustrine deposits are thin or absent, the till deposits are at or near the ground surface.

The depth of desiccation can be delineated by lower moisture contents and stiffer consistency than those found deeper in the overburden. Below the limit of desiccation the lacustrine and till soils are typically soft, have a relatively high moisture content, and are near normally consolidated. These soft soil conditions posed particular installation problems for the SS-series holes because the clays would squeeze the hole closed, unless casing was used to support the hole.

2.3 Hydrogeology

The primary aquifer underlying the site is the fractured and solutioned dolomite bedrock. Site water level data indicate on-site pumping from the aquifer can affect the overall groundwater gradients. Furthermore, an on-site pump test, along with past water level data, has clearly demonstrated that local lateral flow in the aquifer can be maintained toward the facility. Regional lateral flow in the aquifer is north toward Lake Erie.

Water levels in the bedrock aquifer, within the area of this study, are approximately at an elevation of 595 feet, about 15 feet to 20 feet beneath the original ground surface. Water levels in the overburden materials have been observed to be within 5 feet of the original ground surface. Therefore, there is a component of flow from the overburden material toward the bedrock aquifer. The vertical and lateral flow velocities in the overburden are estimated using the equation for average linear groundwater velocity,

$$V = \frac{ki}{n_e}$$

where V = velocity
k = hydraulic conductivity
i = hydraulic gradient
n_e = effective porosity

The vertical hydraulic conductivity (k) of the overburden materials has been estimated to be 2×10^{-8} cm/s (2×10^{-2} ft/yr) (Reference 3). Using a nominal thickness of 50 feet for the overburden and a groundwater head difference of 10 feet between the overburden and the bedrock (Reference 3), the vertical hydraulic gradient (i) is calculated as 0.2 ft/ft. The effective porosity (n_e) of the overburden materials is taken as 0.1 (Reference 3). The vertical flow velocity is, therefore, estimated to be on the order of 0.04 ft/yr.

The lateral hydraulic conductivity (k) of the lacustrine soils has been estimated to be 1×10^{-7} cm/s (1×10^{-1} ft/yr) (Reference 3). Using a lateral hydraulic gradient (i) within the lacustrine materials of 1×10^{-4} ft/ft, calculated from groundwater elevations measured January 14, 1986, between lacustrine monitoring wells L-15 and L-23, and an effective porosity (n_e) of 0.1, the lateral flow velocity is estimated to be on the order 0.0001 ft/yr, generally to the northwest. Vertical flow, therefore, dominates lateral flow, as vertical flow rates are two orders of magnitude greater than lateral flow rates.

3.0 SINGLE SAMPLE PROGRAM

3.1 Program Description and Results

The details for placement, installation and sampling of the holes for the single sample program were approved by OEPA prior to commencement of the program. Several modifications were required in the field, which were also approved by OEPA prior to their implementation. Hollow stem augering was required by OEPA to drill dry holes for the SS-Series program. The holes for the single sample event were installed between June 20 and July 13, 1984, and sampled between June 29 and August 15, 1984. Hole SS-10 was installed on July 10, 1984 (see Appendix A) and sampled on August 14, 1984. The program procedures developed with the OEPA are presented in Reference 5 and the results are presented in Reference 6.

The groundwater testing program included several major ions and volatile organic compounds (VOCs) as indicator parameters. The analytical results, discussed in detail in Reference 6, indicated unacceptable constituent levels at hole SS-10. VOCs were reported for the groundwater sample from this hole and oily material was observed in the soils during the installation of the hole (as indicated on the installation log in Appendix A). The VOC data reported for hole SS-10 groundwater included the following compounds with concentrations exceeding the levels stipulated in the Consent Decree:

VOC	Concentration (ug/L)
Benzene	18
Chlorobenzene	14
Chloroform	106
Ethylbenzene	10
Toluene	105
1,1,1 Trichloroethane	13
Trichloroethylene	30

3.2 Potential Sources of VOCs at Hole SS-10

Hole SS-10 is located in the previous oil reclamation tank truck loading/unloading area (see Figure 2). The hole was in the middle of the gravel roadway which was once used by oil tank trucks serving the previous oil reclamation business. SS-10 was constructed with a cap flush with the road surface to avoid being hit by truck traffic.

Minor spills or leaks during past loading and unloading activities near SS-10 are the likely source for the VOCs detected in SS-10. Other potential sources could include the waste oil reclamation and pipe transport system (see Figure 2). The gravel road would allow the surface spills to migrate downward to the underlying soil surface. The observation of oily material at the base of the 3-foot thick gravel layer in the SS-10 borehole (see boring logs SS-10 and SS-10W in Appendix A) indicates past spillage/leaks have settled at the soil surface beneath the gravel roadway.

Installation procedures for the SS-Series program did not include surface casing to seal the final sampling interval from liquids encountered at the base of the road gravel and some of these fluids may have entered the sampled interval. This water was not permitted by OEPA to be flushed from the hole prior to development or sampling, and may have been included in the sample which was taken. These procedures were not conducive to the construction of a clean sampling hole through potentially contaminated soils, and obtaining a representative groundwater sample was, therefore, not possible.

4.0 SS-10 INVESTIGATION

4.1 General

A subsequent investigation was performed around hole SS-10 to verify the compounds detected, to establish the depth of their occurrence, and to identify the medium (soil or water) in which they occurred. This investigation included drilling four boreholes within 10 feet of hole SS-10 (see Figure 2), chemical analysis of soil samples taken from those boreholes, and chemical analysis of water collected from the boreholes. Three of the boreholes, designated SS-10N, SS-10S and SS-10E, were drilled to 4.5 feet below the ground surface in order to completely penetrate the gravel fill and the upper portion of the lacustrine deposit. SS-10N was located 9 feet north of SS-10, SS-10S was located 9.5 feet south of SS-10, and SS-10E was located 8.5 feet east of SS-10. The fourth borehole, designated SS-10W, was located 9.5 feet west of SS-10 and was drilled to 21.7 feet below the ground surface. A monitoring well was then installed in the SS-10W borehole with approximately the some screened interval as SS-10.

4.2 Drilling and Soil Sampling

After hole SS-10 was completed and sampled in 1984, the roadbed was raised as part of other site re-grading. Prior to drilling the boreholes for this SS-10 area investigation, the gravel roadbed in the vicinity of hole SS-10 was removed to the ground surface level which existed when SS-10 was installed. Hollow-stem augers (nominally 6-inches O.D.) were then used to drill the three shallow boreholes and the first 12 feet of the deeper borehole, SS-10W.

Borehole SS-10W was completed using multiple casings to minimize drag-down in the hole. After the first 12 feet were drilled using the 6-inch O.D. augers, the hole was reamed to a 10-inch diameter with larger augers. The augers were removed and the hole was filled with Volclay bentonite grout.

A 6.75-inch O.D. steel surface casing was placed in the hole and hammered 2 feet into the underlying natural clay, to a depth of 14 feet. The grout was flushed from the casing using water from the drillers' water truck. Water was supplied by R & R Water Hauling. The water was then bailed from the casing using a 3-inch diameter PVC bailer. The remaining 9.7 feet of the borehole were advanced by driving and washing 4-inch O.D. steel casing.

Each borehole was continuously sampled using a clean split-spoon for each sample. Cleaning procedures are described in Section 4.5. Two Volatile Organic Analysis (VOA) vials were filled, minimizing headspace, from each split-spoon soil sample. Clean, non-powdered, latex gloves were worn when handling any soil sample. The VOA vials were then placed in a shuttle with ice packs. The remaining sample was placed in a 500 ml jar, the jar opening was covered with aluminum foil, and the lid was screwed on. The sample was then shaken and set aside. Approximately 15 minutes later organic vapors within the jar were measured by puncturing the aluminum foil with an HNU PI-101 probe and recording the relative total organic vapor concentration. These measurements were used to determine which soil samples would be further analyzed in a laboratory for the VOCs listed in Section 3.1. The measurements, along with soil descriptions and boring procedure details, are included on the soil boring logs in Appendix A. Ten soil samples were shipped to ETC Laboratory for analysis.

4.3 Shallow Borehole Water Sampling

Following the completion of the three shallow boreholes, SS-10N, SS-10S, and SS-10E, the augers were removed and the boreholes were left open and covered with plastic to keep debris and precipitation from entering the holes. By the next day, groundwater had collected within the holes to a depth of

approximately 1.7 feet below the ground surface. Approximately 2 gallons to 3 gallons of water were bailed from each borehole using a clean, 3-inch diameter, PVC bailer. The bailer was decontaminated between holes. Decontamination procedures are described in Section 4.5. Approximately 6 inches of water remained in each borehole following bailing. The holes were re-covered with plastic and left for several hours to allow the water to refill the holes. The water recovered to within 0.5 foot of original groundwater level in each borehole.

Groundwater sampling was performed by removing sufficient water from the hole to fill two VOA vials per hole. A clean, stainless steel bailer was used to collect the samples, and the bailer was decontaminated between boreholes. The VOA vials were placed in a shuttle with ice packs and shipped to ETC Laboratory for analysis for the VOCs listed in Section 3.1. Each borehole was then backfilled with 5 gallons of bentonite pellets to approximately 2 feet below the ground surface, followed by soil, removed from the borehole, to the ground surface.

4.4 Well Installation, Development and Sampling

A monitoring well was installed in borehole SS-10W after the borehole drilling was completed. The well was constructed inside the 4-inch steel casing using 2-inch diameter Schedule 40 PVC. Water was bailed from the casing so that only a few inches of water remained at the bottom of the casing. Fine silica sand was slowly poured down the casing to a depth of approximately 21 feet below the ground surface. This located the well screen at the same depth as the screen for hole SS-10. The well was set on top of this sand and the casing was withdrawn a few inches until the top of the sand was just inside the bottom of the casing. More sand was added as a

filter pack in approximately 0.5-foot increments as the casing was withdrawn, always keeping the top of the sand inside of the casing. The sand was added to just over 0.6 foot above the top of the screen. A 2.75-foot bentonite seal was placed above the sandpack by slowly pouring bentonite pellets through the casing as the casing was withdrawn. Thick bentonite grout was then tremied to within 2.5 feet of the ground surface while the 4-inch casing was withdrawn. Concrete was then poured to the ground surface. A vented well cap was placed on the well riser. A locking protective casing was threaded onto the surface casing and coarse sand was poured inside the casing to a few inches below the top of the well pipe. The protective casing had weep holes drilled at its base. The annulus around the surface casing was widened with a shovel to a depth of approximately 1.5 feet and concrete was poured in the annulus. Finally, the concrete was mounded about the casing at the surface.

Well development was performed by Bowser-Morner approximately one week after installation of the well. CWM provided a stainless steel bailer and cable to be dedicated to that well. The bailer was cleaned following the procedure described in Section 4.5. At the well site, the water level in the well was measured from the top of the well pipe. The bailer was then lowered into the well and the well was evacuated. Water removed from the well was placed into a calibrated bucket. Specific conductivity, pH and temperature measurements were made, and then the evacuated well water was collected in an adjacent 55-gallon steel drum. Clean, disposable, latex gloves were used for handling the bailer and cable at all times. At the conclusion of the bailing, the bailer was left in the well with the top of the cable looped around the top of the casing.

Additional evacuation was performed three and four days after the initial evacuation. The water level was measured prior to removing the bailer. The bailer was then removed, all available water was evacuated into a calibrated bucket, and pH and conductivity measurements were then made.

Well SS-10W was sampled on August 23, 1988. Water was poured from the bailer into two 40 ml VOA vials provided by ETC Laboratories and the vials were delivered to ETC for analysis. The evacuation volumes, pH, conductivity measurements, and temperature data that were accumulated on each of the three days, are listed below:

Date	8-19-88	8-22-88	8-23-88
Water Level (ft. below top of PVC)	10.99	21.50	21.72
Gallons removed	2.5	0.5	0.4
pH (s.u.)	7.10	7.14	7.5
Specific Conductivity (umhos/cm)	650	570	780
Temperature (^{o}C)	15	15	18

4.5 Cleaning Procedures

All drilling and sampling equipment was washed using non-phosphate detergent, rinsed using a high-pressure hot water washer, rinsed with laboratory-grade Acetone, then immediately rinsed using the hot water washer. Clean rubber or latex gloves were used when handling the equipment, and all cleaned equipment was either wrapped in plastic for later use or covered with plastic for transport to the drill rig for immediate use. Cleaning took place in the Truck Wash Building using water from the drillers' water truck. Water was supplied by R & R Water Hauling. A sample of this water, labeled XDECON, was taken for analysis (see Section 4.6).

4.6 Quality Assurance (QA) Sampling

Two drip samples from stainless steel bailers were collected during the course of the investigation. The first sample, labeled XDECON, was taken in the Truck Wash Building by pouring water used to clean equipment through a cleaned stainless steel bailer and collecting the water in the VOA vials. The second drip sample, labeled XLABORATORY, was taken in the on-site laboratory by pouring distilled, deionized water into a cleaned stainless steel bailer which was then emptied into the VOA vials.

A field blank sample, labeled WSS10, was collected during the course of the investigation. This sample was collected at the same time that the water sample from well SS-10W was taken.

4.7 Chain-of-Custody Procedures

All laboratory analyses were conducted by Environmental Testing and Certification (ETC) of Edison, New Jersey. ETC prepared all of the sample bottles in their laboratory and shipped them to the site in access-controlled, insulated, sample shuttles. Upon receiving the shuttles at the site, the seals were examined and then broken, and the shuttles were opened. Each shuttle was examined to see that the appropriate number and type of samples bottles were present and that the trip blank vials were intact and contained no air bubbles. This information was entered on the Chain-of-Custody form included in the shuttle. The sample bottles and paper work were replaced into the shuttles, which were then sealed using temporary seals supplied in the shuttles. The ice packs, included in each shuttle, were placed in a freezer.

The sample shuttles were kept in a secure area of the Vickery site office until the date of use. At that time, they were brought to the sample location and the temporary seal was

broken. The shuttles were opened, ice packs were placed in the shuttles, the Chain-of-Custody and Field Parameter forms were filled out, the sample bottles were filled, and the bottles were placed in the shuttles. The shuttles were returned to the Vickery office, more ice packs were added, the Chain-of-Custody form was completed, and the sample shuttle was sealed. The samples were shipped, via courier, for overnight delivery to the laboratory. At all times, the samples were in the possession of the sampler, sealed in the shuttles in the CWM office, or in the possession of the courier. Copies of the Chain-of-Custody and Field Parameters forms are included in Appendix B.

5.0 ANALYTICAL RESULTS AND EVALUATION

5.1 Soil Samples

The soil encountered in the borings for this investigation consisted of 3 feet of gravel fill underlain by 9 feet of lacustrine silty clay, then clay till to the base of the deepest boring (21.7 feet).

Two soil samples from boring SS-10S, one soil sample from boring SS-10E, and one soil sample from boring SS-10N were analyzed for the VOCs that exceeded the concentrations stipulated in the Consent Decree. These three borings were completed at a depth of 4.5 feet below the ground surface in order to penetrate the gravel fill and the uppermost lacustrine clay. The results are included in Appendix B and are summarized below:

	SOIL			
VOC	SS-10S 1.5-3 ft Depth Conc. (ug/kg)	SS-10S 3-4.5 ft Depth Conc. (ug/kg)	SS-10E 1.5-3 ft Depth Conc. (ug/kg)	SS-10N 0-1.5 ft Depth Conc. (ug/kg)
Benzene	591	BMDL(1)	62.9	BMDL
Chlorobenzene	1440	195	264	1760
Chloroform	944	116	174	432
Ethylbenzene	2980	117	536	3450
Toluene	10,100	422	1400	3030
1,1,1-Trichloroethane (TCA)	20	BMDL	105	ND(2)
Trichloroethylene (TCE)	3740	156	766	1580

(1) Below Method Detection Limit
(2) Not Detected

An additional six soil samples from boring SS-10W were analyzed for the same VOCs. This boring was completed at a depth of 21.7 feet below the ground surface, and the new

monitoring well was installed within this boring. The soil sample VOC results are included in Appendix B and are summarized below:

SOIL

SS-10W DEPTH (FT)

VOC	1.5-3 Conc. (ug/kg)	3-4.5 Conc. (ug/kg)	4.5-6 Conc. (ug/kg)	6-7.5 Conc. (ug/kg)	10.5-12 Conc. (ug/kg)	18-19.5 Conc. (ug/kg)
Benzene	BMDL(1)	ND(2)	47.1	ND	5.62	ND
Chlorobenzene	3870	BMDL	319	861	ND	ND
Chloroform	923	ND	881	2190	41.6	ND
Ethylbenzene	3120	ND	465	1010	ND	ND
Toluene	10,600	BMDL	1350	2570	19.1	ND
TCA	601	BMDL	30.6	ND	ND	ND
TCE	3390	4,170,000	549	ND	12.4	ND

(1) Below Method Detection Limit
(2) Not Detected

From these data, it is apparent that there are significant concentrations of VOCs in the shallow soil, even above the groundwater table. In boring SS-10W soil sample VOC concentrations diminished substantially with depth. Also, VOCs were not detected in the deepest soil sample analyzed from boring SS-10W.

5.2 Groundwater Samples

Groundwater samples were collected from the three shallow boreholes and were analyzed for VOCs. The results are included in Appendix B and are summarized below:

GROUNDWATER

VOC	SS-10S Conc. (ug/L)	SS-10E Conc. (ug/L)	SS-10N Conc. (ug/L)
Benzene	BMDL(1)	222	BMDL
Chlorobenzene	ND(2)	216	BMDL
Ethylbenzene	ND	138	ND
Toluene	BMDL	1800	748
TCA	ND	317	ND
TCE	470	876	312

(1) Below Method Detection Limit
(2) Not Detected

These results are consistent with the soil analysis results and indicate that VOCs are present in the very shallow groundwater when sampled within the contaminated soil interval.

Groundwater was also sampled from a PVC well installed in boring SS-10W and screened at the same interval as well SS-10. The results, along with the original results from well SS-10, are included in Appendix B and are summarized below:

GROUNDWATER

VOC	SS-10W Conc. (ug/L)	SS-10 Conc. (ug/L)
Benzene	ND(1)	18(3)
Chlorobenzene	ND	14
Chloroform	ND	106
Ethylbenzene	ND	10
Toluene	BMDL(2)	105
TCA	ND	13
TCE	ND	30

(1) Not Detected
(2) Below Method Detection Limit

The SS-10W results are consistent with the SS-10W soil sample results which do not indicate VOCs at depth in that hole. Note that the SS-10W results are also substantially different than the SS-10 results, even though the two wells are screened at the same interval and are less than ten feet apart.

5.3 QA Samples

The three QA samples, XDECON, XLABORATORY, and WSS10, were analyzed for the same VOCs as the other samples collected during this investigation. The results of the analyses are included in Appendix B and are summarized below:

VOC	XDECON Conc. (ug/L)	XLABORTORY Conc. (ug/L)	WSS10 Conc. (ug/L)
Benzene	ND(1)	ND	ND
Chlorobenzene	ND	ND	ND
Chloroform	11.1	ND	ND
Ethylbenzene	ND	ND	ND
Toluene	ND	ND	ND
TCA	ND	ND	ND
TCE	ND	ND	4.9

(1) Not Detected

6.0 CONCLUSIONS

The VOC results from soil and water samples from the four borings indicate that volatile organic compounds are present in the shallow soil, even above the groundwater, and in the groundwater in contact with those soils, and the compounds present in both soil and water diminish in concentration with depth. The soil sample taken at a depth of 18 to 19.5 feet below the ground surface contained none of the seven VOCs analyzed for during this investigation. At a depth of approximately 16.1 feet below the ground surface, the depth of the top of the well screen, the groundwater contains none of the seven VOCs analyzed for during this investigation.

The potential for the VOC concentrations in the SS-10 area to have originated from a source other than accumulated spills/leaks associated with truck loading/unloading appears to be negligible. There are no other potential source areas south (regionally upgradient) of the SS-10 area. The closest other potential sources were the previous oil reclamation system to the east of the SS-10 area and previously used oil transfer lines north of the SS-10 area (see Figure 2). Since lateral groundwater movement across the site in the lacustrine soil is on the order of 10^{-4} feet per year, and these other potential source areas are about 50 feet or more away from the SS-10 area, lateral migration of VOCs with groundwater through the lacustrine soils from these potential sources is not expected. Furthermore, the evidence of higher concentrations of VOCs in the soils above the groundwater clearly indicates the VOCs originated from the surface in the SS-10 area. However, the total lateral extent of VOCs from accumulated spills/leaks in the loading/unloading area has not been completely defined.

The results of this investigation indicate, as previously suspected, that the compounds detected in the groundwater sample from hole SS-10 were dragged down the hole during drilling and installation of the screen and riser pipe, and are not present in the groundwater at the depth of the well screen, approximately 17 feet below the ground surface. Therefore, those compounds which were detected in the SS-10 sample do not reflect the true groundwater quality at the 15 feet to 20 feet depth interval below the original, natural ground surface, which was the investigation interval specified in Section IX, paragraph 18 (A) of the Consent Decree. This investigation demonstrates the groundwater at the specified depth interval to be free from the organic compounds of interest. Therefore, in keeping with the intent of paragraph 18 (D) of the Consent Decree, there is no reason for a permanent well to be installed at this location as part of the CWM groundwater monitoring plan for the Vickery Facility.

GOLDER ASSOCIATES INC.

James F. Durrett
Hydrogeologist

Gary H. Collison, P.E.
Principal

JFD:GHC:rcs

REFERENCES

1. Bowser-Morner, Inc. "Hydrogeologic Assessment, Northern Ohio Treatment Facility, Vickery, Ohio," May 1983.

2. Golder Associates, "Geotechnical and Geohydrologic Data Review, Vickery, Ohio, Chemical Waste Management Facility," June 1983.

3. Golder Associates, "Summary and Characterization of Site Geohydrologic Conditions, Chemical Waste Management, Inc., Vickery, Ohio Facility," September 1983.

4. Golder Associates, "Groundwater Monitoring Program, CWM Northern Ohio Treatment Facility, Vickery, Ohio," April 1984.

5. Golder Associates, "Overburden Groundwater Testing Program Description," June 1984 and Addendum dated July 2, 1984.

6. Golder Associates, "Overburden Groundwater Testing Program, Vickery, Ohio Facility," September 1984.

7. Golder Associates, "Monitoring Program Hydrogeologic Study, Chemical Waste Management, Inc., Vickery, Ohio Facility," July 1986.

APPENDIX D

INVESTIGATION OF L19

Golder Associates Inc.

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Golder Associates

LETTER REPORT ON

REVIEW OF THE L-19 INVESTIGATION
POTENTIAL SOURCE OF GROUNDWATER CONTAMINATION
VICKERY, OHIO FACILITY

Submitted to:

Chemical Waste Management, Inc.
3956 State Route 412
Vickery, Ohio 43464

DISTRIBUTION:

3 Copies - Chemical Waste Management, Inc. - Vickery, Ohio
1 Copy - Ohio Environmental Protection Agency
2 Copies - Golder Associates Inc.

March 1992

923-3370

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Golder Associates

March 25, 1992

923-3370

Mr. Steve Lonneman
Chemical Waste Management, Inc.
3956 State Route 412
Vickery, Ohio 43464

RE: LETTER REPORT ON REVIEW OF THE L-19 INVESTIGATION
POTENTIAL SOURCE OF GROUNDWATER CONTAMINATION
VICKERY, OHIO FACILITY

Dear Mr. Lonneman:

As requested in your letter to Golder Associates Inc. (Golder Associates) dated March 13, 1992, Golder Associates has reviewed the data in the L-19 Investigation Report. The review was performed primarily to evaluate potential sources of the contamination identified from analyses of groundwater samples obtained from well L-19. The lacustrine soils tested around well L-19 did not have contamination detected in them. Therefore, as previously concluded, the probable source of contamination in well L-19 is water flowing through the fill, then downward through the desiccated zone to the well screen interval. This conclusion is based on information contained in the L-19 Investigation Report and previous reports submitted to OEPA. No new information has been included in this letter report.

Background

As part of the Consent and Final Order (CAFO) entered into between the United States Environmental Protection Agency (USEPA) and Chemical Waste Management, Inc. (CWM) on April 4, 1985, a groundwater monitoring program was developed and implemented for the Vickery, Ohio, facility. Subsequently, the Ohio Environmental Protection Agency (OEPA) conducted a groundwater monitoring operation and maintenance inspection in April 1989, with a report submitted on August 28, 1989. The OEPA report stated that since the groundwater samples from monitoring well L-19 had consistently indicated the presence of 1,2-dichloroethane (1,2-DCA), this well was considered contaminated. As a result, CWM conducted an investigation of the area around L-19. The report on this investigation, dated July 24, 1990, was prepared by Golder Associates.

The groundwater monitoring program for the Vickery Facility included wells in the lacustrine materials, till materials, and the underlying bedrock materials. Each of these wells were designated L-, T-, or MR-. Therefore, well L-19 is a lacustrine well. The general location for the Vickery Facility is shown on attached Figure 1 and the approximate locations of well L-19 and investigation borings are shown on the attached Figure 2. The boring log for well L-19 and the well construction notes are also included as Attachment A to this letter report.

Geology

The site geology and hydrogeology have been extensively evaluated at the Vickery Facility. Generally, the site is underlain by about 33 feet to 52 feet of glacial overburden materials, consisting of lacustrine clay and glacial till. Underlying these overburden materials is a dolomite bedrock about 500 feet thick, which constitutes the uppermost aquifer underlying the facility. The dolomite bedrock is subsequently underlain by a sequence of sedimentary rocks comprising shales, sandstone, limestone, and dolomite. Granite bedrock ("basement rock") is encountered at a depth of about 2,900 feet beneath the ground surface. The lacustrine soils are generally encountered in the area of the active facility and have been found to vary from a depth of 0 feet to 25 feet beneath the ground surface. The typical thickness of the lacustrine soils is about 15 feet.

Surficial soils at the facility have been subject to historic desiccation, possibly to depths of 10 feet to 20 feet below the ground surface, due to water level variations and alternate wetting and drying of these materials. Thus, the materials have been consolidated, with greater degrees of consolidation near the ground surface. The depth of desiccation has been delineated by lower moisture contents, stiffer consistency, higher strength, and lower unit weight than those encountered at deeper depths in the overburden, as illustrated from the data on the attached Figures 3 and 4. Also, as shown on Figure 3, this depth is transitional. Below the level of desiccation, the lacustrine and till soils are typically soft, have a relatively high moisture content and are near normally consolidated. The softer materials are indicated by much lower standard penetration resistance, or blow counts, which generally range from 4 to 10. Figure 5 shows that elevated concentrations of tritium only penetrated to a depth of 17 feet below the ground surface. This also illustrates some connection between surface water and the desiccated zone.

Evaluation

The L-19 investigation was performed in June 1990. During this program, four boreholes were drilled around L-19, at about the location shown on Figure 2. Each boring was advanced to a depth of about 22 feet using auger drilling methods. Copies of the borehole logs are included in Attachment B. During the investigation, soil samples were collected using split spoon samplers and tested in the

field for the occurrence of organics using a Foxboro Century 128 organic vapor analyzer. The samples with the ten highest total volatile organic compound readings were sent to Environmental Testing and Certification Corporation (ETC) for analysis for 1,2-DCA. In addition, the groundwater in each of the boreholes was allowed to recover, the borehole was bailed dry, and then allowed to recover again. Each recovery period was about 24 hours. Subsequently, samples of groundwater were collected for analyses for 1,2-DCA by ETC. Details of the investigation and sampling and analyses are provided in the "Investigation at Well L-19, Vickery, Ohio, Facility" report dated June 24, 1990.

As indicated in the "Monitoring Well System, Analytical Data Evaluation, Vickery, Ohio Facility" report dated April 22, 1988, Golder Associates believes that the occurrence of 1,2-DCA in groundwater samples from well L-19 are due to localized releases associated with spills or leaks due to past waste handling practices in the area. The data do not suggest that there is evidence of overall contamination or chemical plume. The results from the L-19 investigation do not alter this evaluation. In particular, analysis of the soil samples that were obtained in the boreholes drilled around well L-19 did not indicate the presence of 1,2-DCA above the detection limits. Therefore, the presence of this compound as a contaminant in the soil samples was not demonstrated. Water samples collected from these boreholes, however, did show some presence of 1,2-DCA; concentrations were encountered up to about two parts per million. Therefore, groundwater in the vicinity of well L-19 does contain 1,2-DCA.

Lacustrine soils in the vicinity of well L-19 were encountered at depths of 9 feet to 19 feet beneath the ground surface, beneath the fill, and generally within the zone of desiccation. Well L-19 has an open interval beginning about three feet beneath the top of the lacustrine soils which is partially, or completely, within this zone of desiccation. Further, each of the boreholes that were sampled was open to the fill above the lacustrine till. As indicated in attached borehole logs, the depth to water was between three feet and eight feet beneath the ground surface. In each of these holes, the depth to lacustrine material was about seven feet beneath the ground surface. Also, in each of these holes the material became softer at a depth of about 16 feet beneath the ground surface. Finally, as shown on the sampling sheets in Attachment C the depth to water at the time of sampling was also at about three feet to eight feet beneath the ground surface. These data suggest that the source of contaminated groundwater is likely the groundwater in the fill material above the lacustrine soils. The higher blow counts in the lacustrine material above the depth of 16 feet are consistent with past information suggesting desiccation of the surface materials. Therefore, the water that is being sampled in L-19, which was sealed about 3 feet into the lacustrine material, is likely due to the short circuiting or flow from the overlying fill material downward into the well interval, possibly through desiccation cracks.

The premise of hydraulic connection of L-19 with the overlying fill material is also substantiated by past water level data collected by the site indicating higher water levels in L-19 after rainfall events. This also indicates a higher degree of connection at well L-19 than observed elsewhere in the facility. This higher degree of connection with the surface could allow communication of contaminated water in the fill with the well screen interval.

Finally, an additional suggestion that the contamination is due to localized spills, rather than from the ponds or the waste piles, is indicated by the occurrence of 1,2-DCA in well L-19 only . Based on the proximity of the wells to the ponds or the stockpile area, flows through the ground into L-14, L-15, L-16, L-20, and L-28, would be indicative of releases from the ponds. Groundwater samples from none of these wells have had 1,2-DCA detected in them. Further, if the presence of 1,2-DCA at L-19 was due to releases from the stockpile area due to consolidation of the underlying material from the height of the stockpile, contaminants should also be found in L-16 and L-26. Again, groundwater from neither of these wells has contained 1,2-DCA. Therefore, the occurrence of 1,2-DCA in groundwater samples from well L-19 is still suspected to be due to contaminants in the overlying fill.

If you have any questions, please do not hesitate to contact us.

Very truly yours,

GOLDER ASSOCIATES INC.

James F. Durrett, P.G.
Project Hydrogeologist

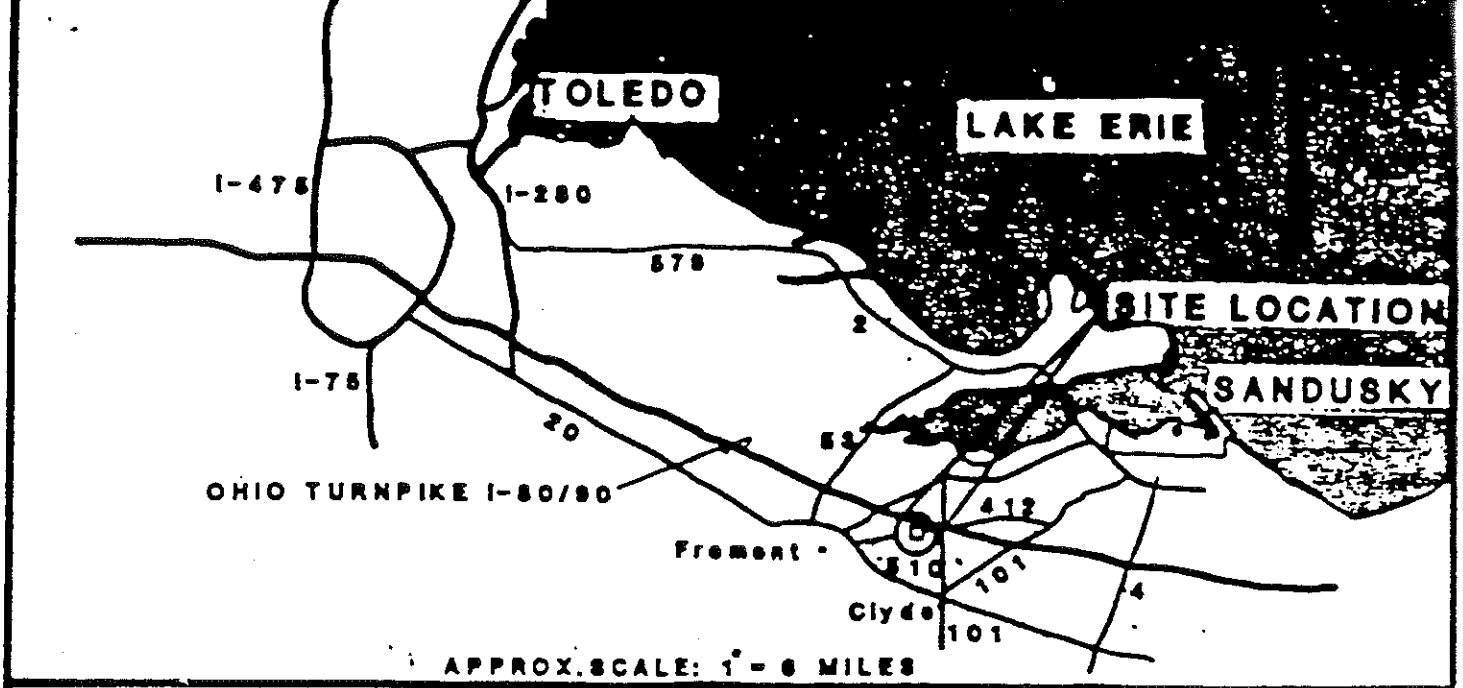
John F. Clerici, P.E.
Principal

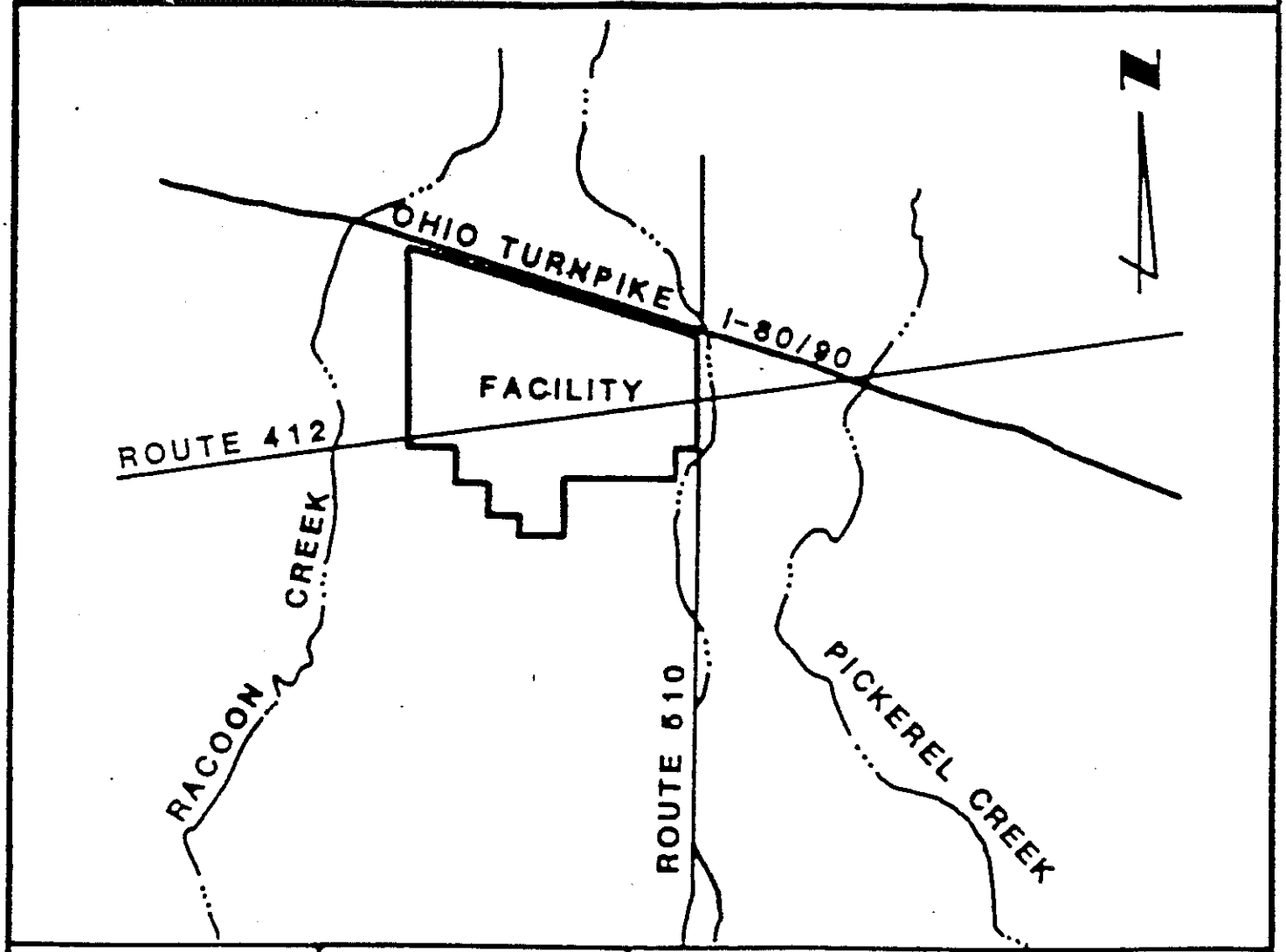
JFC:maa

ATTACHMENTS:

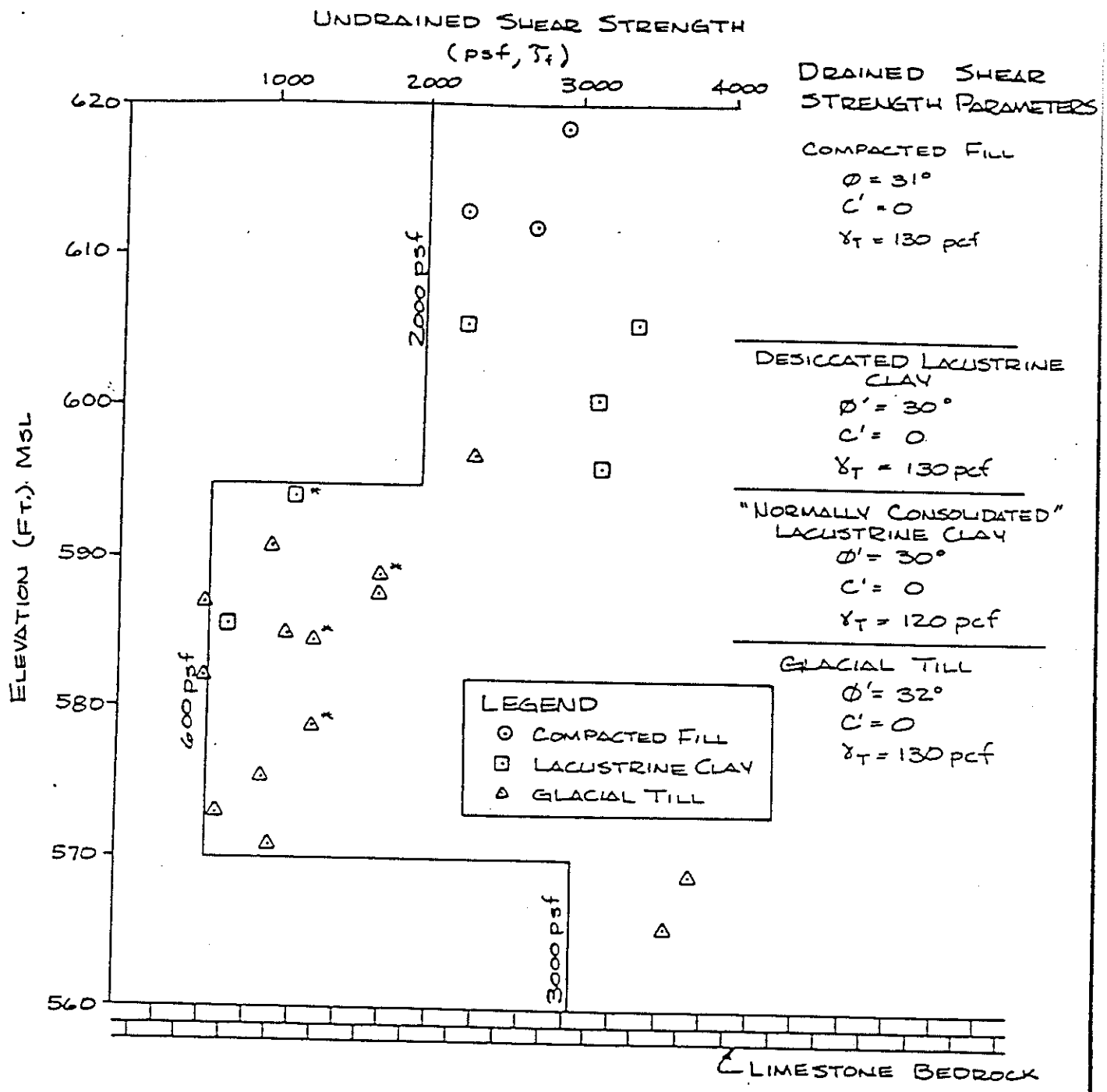
FIGURE 1 - Site Location Plan
FIGURE 2 - Well L-19 Investigation Location
FIGURE 3 - Engineering Properties of Glacial Deposits
FIGURE 4 - Shear Strength Profile for Closure Cell Area
FIGURE 5 - Tritium and Chloride Concentrations Versus Depth Below Ground Surface
ATTACHMENT A - Monitoring Well Installation Log
ATTACHMENT B - Borehole Logs
ATTACHMENT C - Chemical Analysis Data

FN: 3370REV.L19\15\MAA





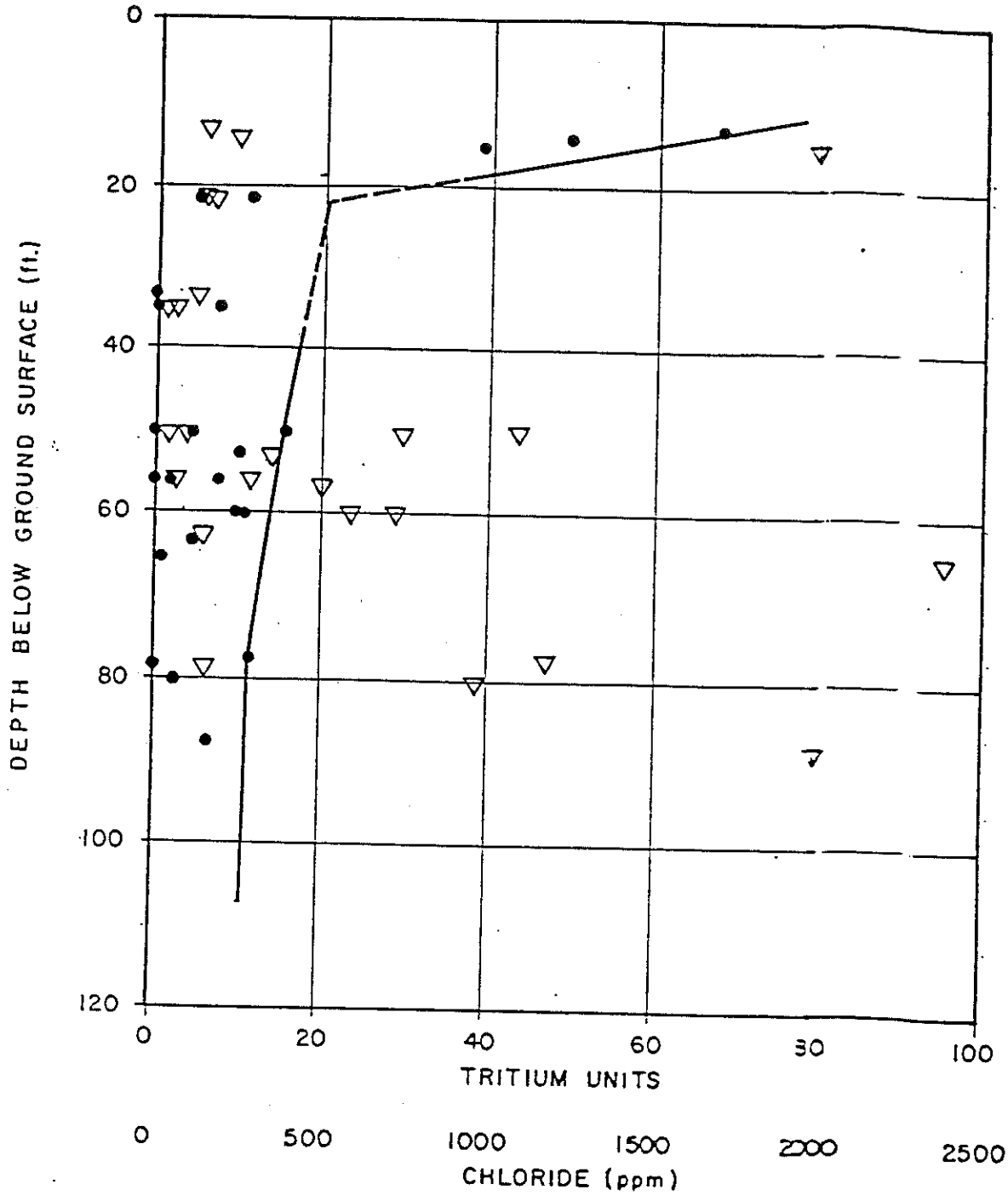
JOB NO. 834-1358	SCALE NO SCALE	SITE LOCATION PLAN
DRAWN JLW	DATE 3/13/86	
CHECKED WAD	DWG. NO. 391	
Golder Associates	CHEMICAL WASTE MANAGEMENT, INC.	FIGURE 1



* FIELD VANE SHEAR TESTS DENOTED WITH AN ASTERISK MAY HAVE BEEN RUN AT A TOO STRAIN RATE YEILDING UNCONSERVATIVELY HIGH VALUES OF UNDRAINED SHEAR STRENGTH

JOB NO. 834-1358	SCALE AS SHOW	SHEAR STRENGTH PROFILE FOR CLOSURE CELL AREA
DRAWN SKB	DATE 8-23-84	
CHECKED MRB	DWG. NO. 178	
Golder Associates	CHEMICAL WASTE MANAGEMENT, INC.	FIGURE 4

AF 2044DA-B



LEGEND

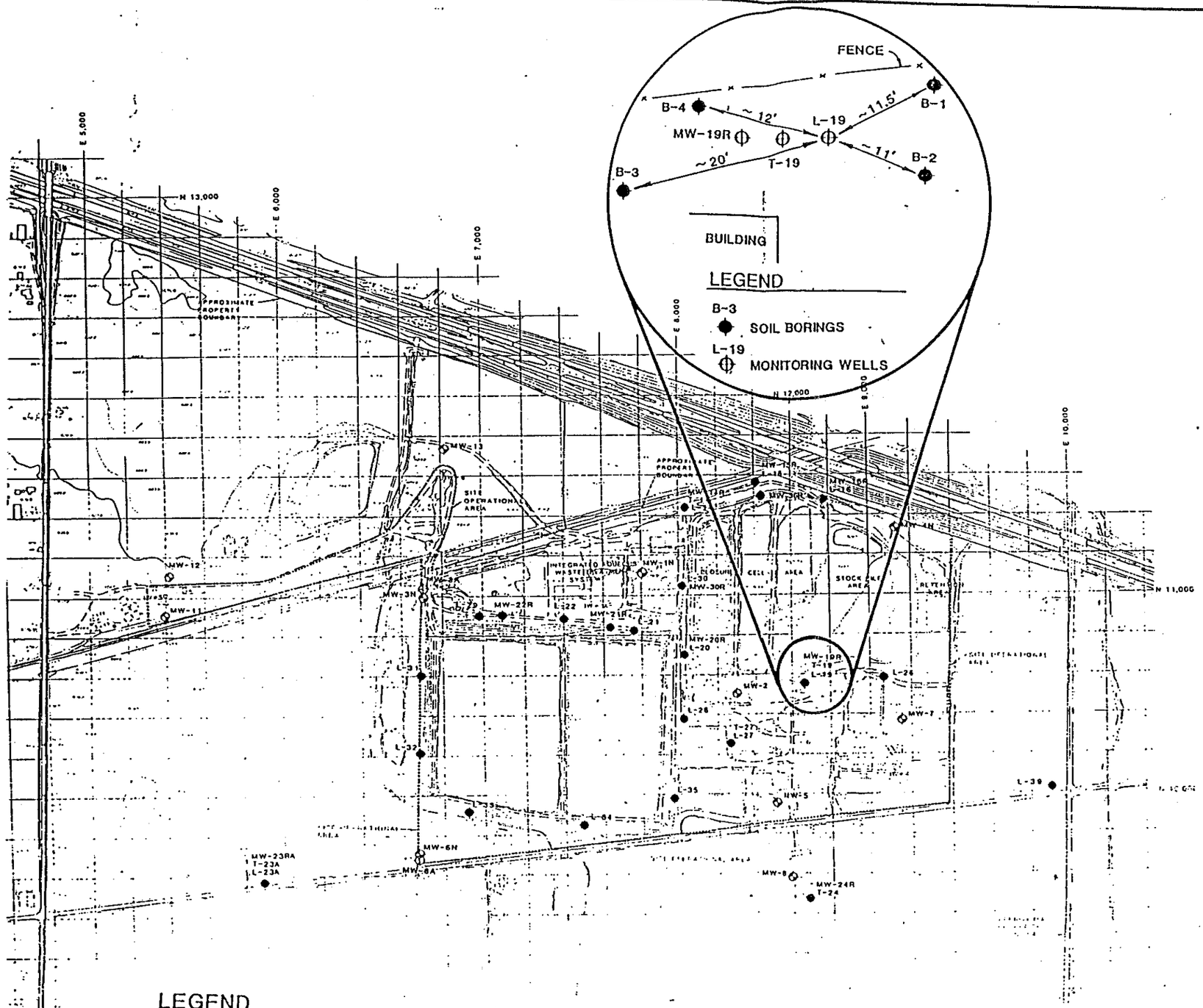
——— TREND OF H_3 VALUES

– – – INFERRED TREND OF H_3 VALUES

● TRITIUM

▽ CHLORIDE

JOB NO. 834-1358	SCALE AS SHOWN	TRITIUM AND CHLORDE CONCENTRATIONS VERSUS DEPTH BELOW GROUND SURFACE
DRAWN SKB	DATE 12-9-83	
CHECKED MTF	DWG. NO. 84	
Golder Associates		CHEMICAL WASTE MANAGEMENT, INC. FIGURE 5



NOTES:

1. BASEMAP PROVIDED BY CHEMICAL WASTE MANAGEMENT, INC. DATE OF AERIAL PHOTOGRAPHY MARCH, 1985.
2. COORDINATES ARE APPROXIMATE TO THE NEAREST 5 FEET AND ARE BASED ON FIELD LOCATIONS OF THE WELLS. IN WELL GROUPS, WELLS ARE SPACED 3 FEET APART AND ARE GIVEN THE SAME COORDINATES.
3. MW-36R, T-36 AND L-36 WELLS ARE NOT PART OF THE RCRA MONITORING SYSTEM.
4. WELL MW-1N WAS DECOMISSIONED MARCH 1988.

WELL NUMBER	EASTINGS	NORTHINGS
L-14	8,035	11,435
L-15	8,410	11,560
L-16	8,780	11,470
L-19	8,670	10,550
L-20	8,020	10,700
L-21	7,760	10,820
L-22	7,405	10,880
L-23A	5,890	9,582
L-26	9,065	10,580
L-27	8,265	10,250
L-28	8,020	10,380
L-29	6,980	10,900
L-30	8,020	11,065
L-31	6,690	10,608
L-32	6,685	10,210
L-33	6,915	9,915
L-34	7,500	9,840
L-35	7,970	9,980
L-39	9,915	10,020
MW-2	8,300	10,500
MW-5	8,515	9,950
MW-7	9,155	10,360
MW-8	8,600	9,580
MW-11	5,395	10,905
MW-12	5,400	11,105
MW-13	6,825	11,740
MW-3A	6,710	11,040
MW-6A	6,670	9,680
MW-1R	7,810	11,110
MW-3R	6,710	10,990
MW-4N	9,130	11,330
MW-6N	6,670	9,710
MW-14R	8,035	11,435
MW-15R	8,410	11,560
MW-16R	8,780	11,470
MW-19R	8,670	10,550
MW-20R	8,020	10,700
MW-21R	7,640	10,840
MW-22R	7,095	10,900
MW-23RA	5,890	9,582
MW-24R	8,680	9,475
MW-37R	9,780	8,500
MW-38R	9,780	8,495
T-14	8,035	11,435
T-19	8,670	10,550
T-23A	5,890	9,582
T-24	8,680	9,475
T-27	8,265	10,250
T-37	9,780	8,500
T-38	9,780	8,495
MW-30R	8,020	11,035
MW-36R	8,463	11,492

0 100 200 400 600 800
SCALE IN FEET

LEGEND

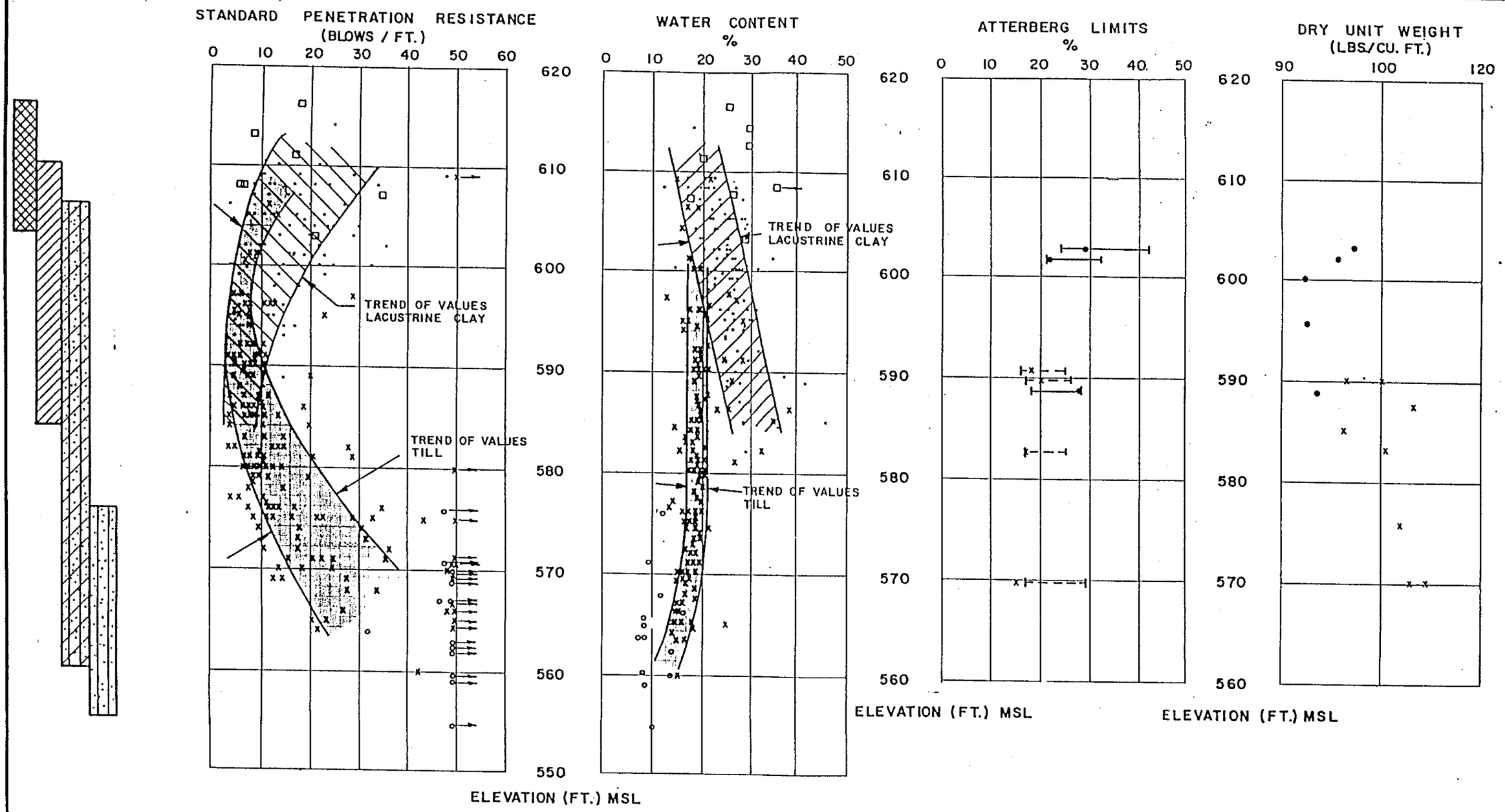
- EXISTING BEDROCK MONITORING WELLS
- EXISTING OVERBURDEN MONITORING WELLS
- "RCRA 265" MONITORING WELLS
- MW-19R DESIGNATES BEDROCK WELLS
- T-19 DESIGNATES TILL WELLS
- L-19 DESIGNATES LACUSTRINE WELLS

Golder Associates
Atlanta, Georgia

CLIENT/PROJECT
CHEMICAL WASTE MANAGEMENT, INC.

TITLE
WELL L-19 INVESTIGATION LOCATION

DRAWN	CHECKED	REVIEWED	DATE	SCALE	JOB NO.
JLW			7/19/90	AS SHOWN	853-3027
			FILE NO. 834-1358	DWG. NO. / REV. NO. 629	FIGURE 2



STRATIGRAPHY	SYMBOL
GRAVEL TO CLAYEY SILT (FILL)	□
SOFT TO HARD BROWN TO GRAY CLAY TO CLAYEY SILT (GLACIO-LACUSTRINE CLAY)	•
SOFT TO HARD BROWN TO GRAY CLAYEY SILT, SOME SAND, TRACE GRAVEL (TILL)	x
HARD GRAY SILT, SOME SAND AND GRAVEL AND CLAY (LOWER TILL)	o

NOTE : FROM BOWSER-MORNER BORING DATA.

JOB NO. 834-1358	SCALE AS SHOWN	ENGINEERING PROPERTIES OF GLACIAL DEPOSITS
DRAWN CAB	DATE 4-26-83	
CHECKED	DWG. NO. 3	
Golder Associates		CHEMICAL WASTE MANAGEMENT, INC. — FIGURE 3

PERIMETER REPROGRAPHICS

ATTACHMENT A

MONITORING WELL INSTALLATION LOG

MONITORING WELL INSTALLATION LOG

JOB NO. 853-3020 PROJECT CWM / VISKERY / OH WELL NO. L-19 SHEET 1 OF 1
GA INSP L.F. JDC DRILLING METHOD AUGER / ROTARY GROUND ELEV 616.5 WATER DEPTH 11.52'
WEATHER SUNNY DRILLING COMPANY BOWSER MORNER COLLAR ELEV 617.97 DATE/TIME 10/23/95 11:00
TEMP _____ DRILL RIG CME 55 DRILLER T. ROEHNER STARTED 10/23/95 (TIME / DATE) COMPLETED 10/23/95 (TIME / DATE)

MATERIALS INVENTORY

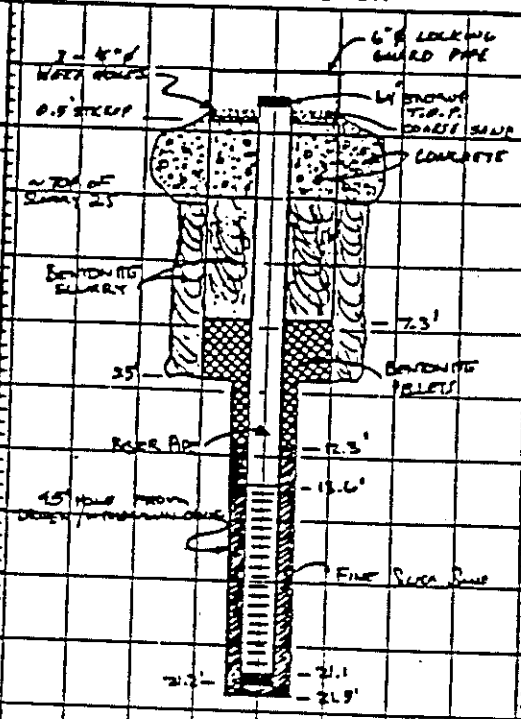
WELL CASING 2 in. dia. 15.0' lf
CASING TYPE 316 STAINLESS STEEL
JOINT TYPE FLUSH, COUPLED
GROUT QUANTITY —
GROUT TYPE BENTONITE SLURRY

WELL SCREEN 2 in. dia. 7.5' lf
SCREEN TYPE 316 STAINLESS WIRE WOUND
SLOT SIZE 0.0060 in
CENTRALIZERS NONE
DRILLING MUD TYPE NONE

BENTONITE SEAL PELLETS
INSTALLATION METHOD GRAVITY FALL
FILTER PACK QTY ~5.5 GALS
FILTER PACK TYPE FINE SILICA SAND
INSTALLATION METHOD GRAVITY FALL

ELEV/DEPTH	SOIL/ROCK DESCRIPTION
	GROUND SURFACE
0.0	
1.0	FIRM TO STIFF, BROWN-TAN, CLAYEY SILT, LITTLE F-C SAND, LITTLE F-C GRAVEL (FILL)
8.5	FIRM, BLACK-BROWN-TAN CLAYEY SILT, TRACE ORGANICS
9.4	FIRM TO STIFF, GRAY-TAN, MOTTLED, SILTY CLAY, TRACE FINE SAND (LACUSTRINE)
11.2	LOOSE TO COMPACT BROWN SILT, SOME FINE SAND (LACUSTRINE)
12.8	SOFT TO STIFF, TAN-GRAY, LAMINATED SILTY CLAY, TRACE FINE SAND (LACUSTRINE)
19.0	SOFT TO HARD, GRAY SILTY CLAY, TRACE F-C SAND, TRACE F-C GRAVEL (TILL)
21.9	

WELL SKETCH



INSTALLATION NOTES

Attached

WL 10.1 BGS

WELL DEVELOPMENT NOTES

WELL DEVELOPED BY BAILING AND SURGING WITH 1" ID STAINLESS STEEL BAILER.

BAILER AND TEFLON CHECK VALVE WAS STEAM CLEANED AND RINSED WITH DEIONIZED WATER BEFORE DEVELOPMENT

TOTAL VOLUME REMOVED DURING DEVELOPMENT HAS APPROX. 8-4 gallons

CAPACITY OF WELL WHEN STATIC W.L. IS 11.47' (1-14-96) BELOW TOP OF RISER IS 1.9 GALS.

MEASUREMENTS DURING DEVEL

DATE	GALLONS BAILED	pH	SPECIFIC COND.	COMMENTS
11-13-95	2.0	6.4	7,500	
11-17-95	2.2	6.5	7,300	WATER MILKY
11-19-95	2.2	6.7	6,700	SLIGHTLY TURBID
11-21-95	2.0	—	—	RECOVERY TEST PERFORMED

STATIC W.L. 1-14-96 WAS 11.47'

Golder Associates

SUBJECT WELL INSTALLATION NOTES

Job No. 853-3020 | Made by JJC | Date 11-6-85
Ref. L-19 | Checked | Sheet 1 of 2
Reviewed GFL

1. a) Augered 10"Ø hole to 9.5' bgs. Sounded hole at 8.9'. Reaugered to 9.5 [illegible] hole at 9.5'

b) Set 10' 6"Ø surface casing bottoming @ 9.5'.

c) Grouted borehole annulus (between 6" casing and 10" augur hole) with a bentonite grout slurry. Used 20 gallons of bentonite bottling ~ 5 gal overflow.

d) 6"Ø casing was diller and flushed to 9.5 until clean. Bailed to within 0.5' of bottom of hole.

2. a) Drove 4"Ø casing from 9.5' to 15.0. Drilled and flushed clean. Sounded hole at 14.9'. Hammered casing from 14.9' to 21.9. Drilled and flushed clean. Bailed water to within 0.5 of bottom. Sounded @ 21.9

b) Pulled 4"Ø casing up a foot. Sounded at 21.9. Added 0.7' of sand. Set 7.5' screen and 13.0' of riser pipe. Stickup of riser pipe is 1.3'. (0.1 ft at end cap on bottom of screen)

c) Backfilling: 4"Ø casing was pulled up a foot at a time and added sand. Sounded last time to ensure no sloughing of hole or sand bridge had occured. Backfilled sand to 12.3' bgs. Calculated amt. sand used was ~5.7 gals. Sample of sand was taken.

d) 4"Ø casing was pulled up a foot and pellets were added up to 7.3. Drilling up a foot at a time and sounded to ensure no sloughing or bridging had occured. Volume of pellets used was ~4.4 gal. (calculated).

e) Remaining open borehole annulus was filled with bentonite slurry to ground surface.

3. a) Water level upon completion was 11.52' @ 1200 on 10/28/85

4. a) Aluminum 6"Ø Protectoc flush joint pipe was threaded on to the 6"Ø surface casing and secured with a lock.

5. a) The well cap was vented by drilling a small hole in the cap.

6. a) A 30' hole was hand dug around the 6"Ø surface casing and was filled with concrete. Sloped so water would run away from well.

Golder Associates

SUBJECT WELL INSTALLATION NOTES

Job No. 85s-3020 | Made by [illegible] | Date 11-6-85

Ref. L-19 | Checked | Sheet 2 of 2

Reviewed [illegible]

7. a) Three 1/4 diameter drain holes were drilled near top of cement mound. Bentonite grout was taken out of the 6" Ø surface casing to 2.5' below ground surface. Cement was added to replace the grout removed.

b) Coarse sand was poured on top of the hardened cement to about .5 inches below the top of well pipe.

ATTACHMENT B

BOREHOLE LOGS

Geosol Associates

Field Boring Log

DEPTH HOLE 21.8'	JOB NO. 852-5271	PROJECT CWM / L-19 / VICKERY OHIO				BORING NO. B-1	
DEPTH SOIL DRILL 21.8'	QA INSP. LEL	DRILLING METHOD HOLLOW STEM AUGERS				SHEET 1 OF 2	
DEPTH ROCK CORE	WEATHER SUNNY	DRILLING COMPANY BOWSER-MORNER				SURFACE ELEV.	
NO. DIST. SA. / UD. SA.	TEMP. 74°F	DRILL RIG MOBILE A-61	DRILLER JIM WALSH			DATUM	
DEPTH WL. 6.0'	HRS. PROD.	WT. SAMPLER HAMMER 140 LBS	DROP 30 IN			STARTED 1355 (PM) 16-9-90	
TIME WL. 1435 / 6-11-90	HRS. DELAYED	WT. CASING HAMMER	DROP			COMPLETED 1525 (PM) 16-9-90	

SAMPLE TYPES: AS AUGER SAMPLE; CS CHUNK SAMPLE; DO DRIVE OPEN; DS DENISON SAMPLE; PS PITCHER SAMPLE; RC ROCK CORE; ST SLOTTED TUBE; TO THIN-WALLED, OPEN; TP THIN-WALLED, PISTON; WS WASH SAMPLE

ABBREVIATIONS: BL BLACK; BR BROWN; C COARSE; CA CLASTIC; CL CLAY; CLY CLAYEY; F FINE; FRAG FRAGMENTS; GL GRAVEL; LYD LAYERED; LI LITTLE; M MEDIUM; MIC MICACEOUS; MOT MOTTLED; NP NON-PLASTIC; OR ORANGE; ORGS ORGANIC; PH PRESSURE HYDRAULIC; PM PRESSURE MANUAL; R RED; RES RESIDUAL; RK ROCK; SA SAMPLE; SAT SATURATED; SD SAND; SI SILT; SLT SILTY; SM SOME; TR TRACE; WL WATER LEVEL; WOH WEIGHT OF HAMMER; Y YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION: "TRACE" 0-1%; "LITTLE" 1-10%; "SOME" 10-20%; "AND" 20-50%

ELEV. / DEPTH	DESCRIPTION	BLOWS / FT	SAMPLES NO.	TYPE	BLOWS 6" & FT PENETR.	REC / ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
								11.4' NE of L-19
2	Firm to stiff gray to brown CLAYEY SILT to SILTY CLAY, little to some f sand, trace m-c sand, trace organic matter (FILL)	9	1	DO	2.3.6.7	8/24		(1A) 0.0-1.6' Firm med brown CLAYEY SILT and f sand, little angular c sand, fibrous roots throughout brittle, dry, OVA head space 0.0 ppm
4		15	2	DO	5.7.8.9	24/24		(1B) 1.6-2.0' Very stiff med brown CLAYEY SILT and f-m sand, brittle dry. F-C gravel layer at 1.8'. OVA head space 0.0 ppm
6		7	3	DO	3.4.3.6	14/24		(2A) 2.0-3.0' Firm to stiff med brown CLAYEY SILT and f sand, trace m sand, fibrous roots, brittle, dry, OVA head space 0.0 ppm.
8	Very stiff to stiff brown and gray CLAYEY SILT, some f sand, trace wood (LACUSTRINE).	14	4	DO	4.7.7.8	24/24		(2B) 3.0-4.0' Stiff gray and brown CLAYEY SILT and f sand, interbedded with gray and rust silt layers, dry, OVA head space 0.0 ppm
10		17	5	DO	2.6.11.13	17/24		(3A) 4.0-5.0' Stiff med brown CLAYEY SILT little f sand, trace angular c sand, dry, OVA head space 0.0 ppm
12		12	6	DO	3.4.8.9	21/24		(3B) 5.0-6.0' Firm med brown SILTY CLAY some f sand, trace m sand, gray silt lenses, dry to moist, OVA head space 0.0 ppm
14		12	7	DO	5.5.7.10	8/24		(4A) 6.0-7.0' Firm dark gray SILTY CLAY little to some f sand, fibrous roots, slight odor, moist, OVA head space 450 ppm
16		10	8	DO	3.4.6.8	24/24		(4B) 7.0-8.0' Firm to stiff brown SILTY CLAY some f sand, red brown silt layers interbedded, moist, OVA head space 1.7 ppm
18		9	9	DO	2.4.5.5	24/24		(5A) 8.0-9.0' Firm to stiff gray brown SILTY CLAY little f sand, trace of bark, slight to moderate odor, moist, OVA head space 1000 ppm.
20	Very soft brown to gray CLAY, trace f sand, gray w/c brown silt laminations (FILL)	5	10	DO	2.2.3.3	24/24		(5B) 9.0-10.0' Stiff SAME AS ABOVE. OVA head space 350 ppm
22	21.8' BORING TERMINATED	5	11	DO	2.2.3.4	24/24		(6A) 10.0-11.0' Stiff brown and gray mottled CLAYEY SILT and f sand, dry to moist, OVA head space 100 ppm.
								(6B) 11.0-12.0' SAME AS ABOVE, OVA head space 95 ppm.
								(7A) 12.0-13.0' SAME AS ABOVE, OVA head space 18 ppm
								(7B) 13.0-14.0' Soft SAME AS ABOVE, OVA head space 30 ppm
								(8A) 14.0-15.0' Firm SAME AS ABOVE, OVA head space 98 ppm
								(8B) 15.0-16.0' Soft SAME AS ABOVE, OVA head space 12 ppm
								(9A) 16.0-17.0' Very soft gray SILTY CLAY interbedded with rust silt layers, moist, OVA head space 43 ppm

CONTINUED ON NEXT PAGE

Golder Associates

Field Boring Log

DEPTH HOLE 21.8	JOB NO. 853-3027.1	PROJECT CWM / L-19 / VICKERY OHIO		BORING NO. B-1	
DEPTH SOIL DRILL 21.8	GA INSP. LCL	DRILLING METHOD HOLLOW STEM AUGERS		SHEET 2 OF 2	
DEPTH ROCK CORE	WEATHER SUNNY	DRILLING COMPANY BOWSER-MORNER		SURFACE ELEV.	
NO. DIST. SA. UD. SA.	TEMP. 74°F	DRILL RIG MOBILE B-61	DRILLER JIM WALSH	DATUM	
DEPTH WL. 6.0'	HRS. PROD.	WT. SAMPLER HAMMER 140 LBS	DROP 30 IN	STARTED 1355 / 6-9-90	
TIME WL. 1434 / 6-11-90	HRS. DELAYED	WT. CASING HAMMER	DROP	COMPLETED 1525 / 6-9-90	

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.D.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SIT	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	Y	YELLOW
LI	LITTLE	RK	ROCK		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" 0 1% "SOME" 12 20%
"LITTLE" 0 10% "AND" 20 50%

RELATIVE DENSITY		BLOWS	CONSISTENCY		FINDER PRESSURE
VERY LOOSE	VLS	0-4	VERY SOFT	VS	EXTRUDES
LOOSE	LS	4-10	SOFT	S	MOLDS EASILY
COMPACT	CP	10-30	FIRM	FM	MOLDS
DENSE	DN	30-50	STIFF	ST	THUMB INDENTS
VERY DENSE	VDN	50	VERY STIFF	VST	THUMBNAIL INDENT
			HARD	H	RESISTS THUMBNAIL

ELEV. DEPTH	DESCRIPTION	BLOWS/FT		SAMPLES NO.	TYPE	BLOWS PER 6 IN (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
									CONTINUED FROM PAGE 1
									(9B) 17.0'-18.0' Very soft gray SILTY CLAY little f sand, rust silt layers throughout, laminated sticky OVA head space 3.2 ppm
									(10A) 18.0'-19.0' Very soft gray brown SILTY CLAY and f sand, brown f sand layers throughout. OVA head space 15 ppm
									(10B) 19.0'-20.0' Very soft gray SILTY CLAY gray silt layers throughout, laminated sticky, plastic, moist OVA head space 6.4 ppm
									(11A) 20.0'-21.0' Very soft brown clay trace f sand, interbedded with med brown silt layers, sticky, plastic wet. OVA head space 17 ppm
									(11B) 21.0'-22.0' Very soft gray CLAY trace f sand, gray silt lenses throughout laminated, plastic, sticky, moist OVA head space 0.0 ppm
									21.8' Bottom of hole. Boring terminated water level at 17.2' at boring termination

Field Boring Log

DEPTH HOLE 21.8'	JOB NO. 555-5027.1	PROJECT CWM / L-19 / VICKERY OHIO				BORING NO. B-3	
DEPTH SOIL DRILL	BA INSP. LEI	DRILLING METHOD HOLLOW STEM AUGERS				SHEET 1 OF 2	
DEPTH ROCK CORE	WEATHER CLOUDY	DRILLING COMPANY BOWSER-MORNER				SURFACE ELEV.	
NO. DIST. BA. / UD. BA.	TEMP. 74° F	DRILL RIG MOBILE B-61		DRILLER JAY WALSH		DATUM	
DEPTH WL. 6.5'	HRS. PROD.	WT. SAMPLER HAMMER MACLES		DROP 30 IN.		STARTED 1700 (TIME) 6-9-90 (DATE)	
TIME WL. 1435 / 6-11-90	HRS. DELAYED	WT. CASING HAMMER		DROP		COMPLETED 1085 (TIME) 6-9-90 (DATE)	

SAMPLE TYPES

AS	AUGER SAMPLE	BL	BLACK
CS	CHUNK SAMPLE	BR	BROWN
DO	DRIVE OPEN	C	COARSE
DS	DENISON SAMPLE	GA	GARNET
PS	PITCHER SAMPLE	GL	CLAY
RC	ROCK CORE	CLY	CLAYEY
ST	SLOTTED TUBE	F	FINE
TO	THIN-WALLED, OPEN	FRAG	FRAGMENTS
TP	THIN-WALLED, PISTON	GL	GRAVEL
WS	WASH SAMPLE	LYD	LAYERED
		LI	LITTLE

ABBREVIATIONS

M	MEDIUM	SA	SAMPLE
MIC	MICACEOUS	SAT	SATURATED
MOT	MOTTLED	SD	SAND
NP	NON-PLASTIC	SI	SILT
OR	ORANGE	SLT	SILTY
ORG	ORGANIC	SM	SOME
PH	PRESSURE HYDRAULIC	TR	TRACE
PM	PRESSURE MANUAL	WL	WATER LEVEL
R	RED	WOH	WEIGHT OF HAMMER
RES	RESIDUAL	Y	YELLOW
RK	ROCK		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" 0 - 5% "SOME" 12 - 35%
"LITTLE" 5 - 12% "AND" 35 - 50%

RELATIVE DENSITY	BLOWS	CONSISTENCY	BLOWS
VERY LOOSE	0-3	VERY SOFT	0-5
LOOSE	3-8	SOFT	5-9
COMPACT	8-15	FIRM	9-16
DENSE	15-30	STIFF	16-32
VERY DENSE	30+	VERY STIFF	32-64
		HARD	64+

ELEV. / DEPTH	DESCRIPTION	BLOWS / FT		SAMPLES NO.	TYPE	BLOWS (6" INCREM.)	REC. / ATT	PID READ.	SAMPLE DESCRIPTION AND BORING NOTES
	Soft to very stiff gray to brown CLAYEY SILT to SILTY CLAY, little to some f sand, trace m-c sand, trace organic matter. (FILL).	13		1	DO	4-5-8-14	12/24		SE OF L-19
2		18		2	DO	5-7-11-14	20/24		(1A) 0.0'-1.0' Stiff brown mottled CLAYEY SILT and to some f sand little to trace m sand, dry brittle OVA head space 0.01 ppm
4		11		3	DO	4-5-6-9	20/24		(1B) 1.0'-2.0' Stiff to very stiff med brown CLAYEY SILT, some f sand little to trace m sand, fibrous roots, dry, brittle, OVA head space 0.02 ppm
6		9		4	DO	4-4-5-7	21/24		(2A) 2.0'-3.0' Stiff to very stiff brown mottled CLAYEY SILT, some f sand fibrous roots throughout, dry, brittle OVA head space 0.00 ppm
8	Firm to stiff brown SILTY CLAY to CLAYEY SILT, little f sand, red brown silt lamination (LACUSTRINE).	14		5	DO	3-6-8-12	22/24		(2B) 3.0'-4.0' SAME AS ABOVE OVA head space 23 ppm
10		14		6	DO	3-6-8-10	18/24		(3A) 4.0'-5.0' Firm to stiff med. brown SILTY CLAY some f sand, trace c sand (angular), moist. OVA head space 42 ppm
12		14		7	DO	3-6-8-10	24/24		(3B) 5.0'-6.0' Soft to firm gray-brown, SILTY CLAY, little to some f sand trace angular med sand, moist. OVA head space 800 ppm
14		12		8	DO	3-5-7-11	24/24		(4A) 6.0'-7.0' Soft to stiff gray brown SILTY CLAY, little f sand, moist. OVA head space 470 ppm
16		11		9	DO	3-5-6-8	24/24		(4B) 7.0'-8.0' Soft gray SILTY CLAY little f sand, tan silt lenses throughout, traces of wood, moist. OVA head space 13 seconds over 1000 ppm
18		9		10	DO	3-4-5-6	24/24		(5A) 8.0'-9.0' Firm med brown CLAYEY SILT some f sand interbedded with rust silt lenses, dry to moist OVA head space 200 ppm
20	Very soft gray SILTY CLAY to CLAY little to trace f sand, rust silt lenses (TILL)	4		11	DO	1-2-2-4	24/24		(5B) 9.0'-10.0' Firm, med brown, mottled SILTY CLAY, and to some f sand, med brown f sand lenses throughout dry to moist. OVA head space 700 ppm
22	21.8 BORING TERMINATED								(6A) 10.0'-11.0' Soft dark brown CLAYEY SILT, little f sand, interbedded with rust silt layers moist. OVA head space 92 ppm
									(6B) 11.0'-12.0' Stiff dark brown CLAYEY SILT, little f sand, interbedded with rust silt layers, moist OVA head space 60 ppm
									(7A) 12.0'-13.0' Firm dark brown CLAYEY SILT little f sand, interbedded with rust silt layers, moist OVA head space 87 ppm
									(7B) 13.0'-16.0' Stiff med brown SILTY CLAY and f sand, interbedded with rust f sand layers and gray silt layers OVA head space 910 ppm

CONTINUED ON NEXT PAGE

Geiser Associates

Field Boring Log

DEPTH HOLE 21.8'	JOB NO. 853-3027 /	PROJECT CWIM / L-19 / VICKERY OHIO		BORING NO. B-2	
DEPTH SOIL DRILL 21.8'	GA INSP. LEI	DRILLING METHOD HOLLOW STEM AUGERS		SHEET 2 OF 2	
DEPTH ROCK CORE ___	WEATHER CLOUDY	DRILLING COMPANY BONSER - MORNER		SURFACE ELEV. ___	
NO. DIST. SA. ___ UD. SA. ___	TEMP. 74°F	DRILL RIG MOBILE B-61	DRILLER JIM WALSH	DATUM ___	
DEPTH WL. 6.5'	HRS. PROD. ___	WT. SAMPLER HAMMER 140 LBS	DROP 30 IN	STARTED 1700 (Time) 16-9-90 (Date)	
TIME WL. 1452 / 6-11-90	HRS. DELAYED ___	WT. CASING HAMMER ___	DROP ___	COMPLETED 1835 16-9-90	

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	GA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SPT	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LFD	LAYERED	RES	RESIDUAL	Y	YELLOW
LI	LITTLE	RK	ROCK		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" 0-5% "SOME" 12-30%
"LITTLE" 5-12% "AND" 30-50%

RELATIVE DENSITY		BLOWS	CONSISTENCY		FINGER PRESSURE
VERY LOOSE	VLS	0-4	VERY SOFT	VS	EXTRUDES
LOOSE	LS	4-10	SOFT	S	MOLDS EASILY
COMPACT	CP	10-30	FIRM	FM	MOLDS
DENSE	DN	30-50	STIFF	ST	THUMB INDENTS
VERY DENSE	VDN	50	VERY STIFF	VST	THUMBNAIL INDENT
			HARD	H	RESISTS THUMBNAIL

ELEV. DEPTH	DESCRIPTION	BLOWS/FT	SAMPLES NO.	TYPE	DRAWN BLOWS PER 6 IN (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
								CONTINUED FROM PAGE 1
								(8A) 14.0'-15.0' Firm med. brown SILTY CLAY and f sand, interbedded with rust f sand layers and gray silt layers OVA head space 20 ppm
								(8B) 15.0'-16.0' SAME AS ABOVE OVA head space 5.0 ppm
								(9A) 16.0'-17.0' SAME AS ABOVE OVA head space 9.0 ppm
								(9B) 17.0'-18.0' Soft brown SILTY CLAY Some f sand, interbedded with red brown silt layers, moist. OVA head space 3.2 ppm.
								(10A) 18.0'-19.0' Very soft brown SILTY CLAY to CLAY, little f sand, sticky, plastic, moist to wet. OVA head space 2.5 ppm
								(10B) 19.0'-20.0' Very soft gray SILTY CLAY little to trace f sand, laminated sticky, plastic, moist to wet OVA head space 1.2 ppm
								(11A) 20.0'-21.0' Very soft, gray SILTY CLAY, trace f sand, layers of rust silt throughout, very sticky, plastic, laminated, wet. OVA head space 2.5 ppm
								(11B) 21.0'-22.0' Very soft gray CLAY trace f sand, plastic, sticky, laminated wet OVA head space 0.05 ppm
								21.8' Bottom of hole Boring terminated water level at 20.0' at boring termination

Golder Associates

Field Boring Log

DEPTH HOLE 21.8'	JOB NO. 853-3027	PROJECT CWM/L-19/VICKERY OHIO				BORING NO. A-2	
DEPTH SOIL DRILL 21.8'	BA INSP. LEL	DRILLING METHOD HOLLOW STEM AUGERS				SHEET 1 OF 2	
DEPTH ROCK CORE	WEATHER SUNNY	DRILLING COMPANY BOWSER-MORNER				SURFACE ELEV.	
NO. DIST. BA.	UD. BA.	TEMP. 64°	DRILL RIG MOBILE B-61		DRILLER JIM WALSH	DATUM	
DEPTH WL. 3.6'	HRS. PROD.	WT. SAMPLER HAMMER 140 LBS		DROP 30 IN.		STARTED 0860 (TIME) 6-10-90 (DATE)	
TIME WL. 1404/6-12-90	HRS. DELAYED	WT. CASING HAMMER		DROP		COMPLETED 1110 (TIME) 6-10-90 (DATE)	

SAMPLE TYPES

AS	AUGER SAMPLE	BL	BLACK
CS	CHUNK SAMPLE	BR	BROWN
DO	DRIVE OPEN	C	COARSE
DS	DENISON SAMPLE	CA	CASING
PS	PITCHER SAMPLE	CL	CLAY
RC	ROCK CORE	CLY	CLAYEY
ST	SLOTTED TUBE	F	FINE
TO	THIN-WALLED, OPEN	FRAG	FRAGMENTS
TP	THIN-WALLED, PISTON	GL	GRAVEL
WS	WASH SAMPLE	LTD	LAYERED
		LI	LITTLE

ABBREVIATIONS

M	MEDIUM	SA	SAMPLE
MC	MICACEOUS	SAT	SATURATED
MOT	MOTTLED	SD	SAND
NP	NON-PLASTIC	SI	SILT
OR	ORANGE	SLT	SILTY
ORG	ORGANIC	SM	SOME
PH	PRESSURE-HYDRAULIC	TR	TRACE
PM	PRESSURE-MANUAL	WL	WATER LEVEL
R	RED	WM	WEIGHT OF HAMMER
RES	RESIDUAL	Y	YELLOW
RK	ROCK		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" 0-1% "LITTLE" 1-12% "SOME" 12-30% "AND" 30-50%

RELATIVE DENSITY	BLOWS	CONSISTENCY	PENETROMETER
VERY LOOSE	0-2	VERY SOFT	0.5 LIT. PLASTIC
LOOSE	2-4	SOFT	0.5 MEDIUM EARTH
COMPACT	4-10	FIRM	1.0 SOLID
DENSE	10-30	STIFF	2.0 THUMB INDENTS
VERY DENSE	>30	VERY STIFF	4.0 THUMBNAIL INDENT
		HARD	>4.0 FINGER IN THUMBNAIL

ELEV. DEPTH	DESCRIPTION	BLOWS/FT		SAMPLES NO.	TYPE	BLOWS 6" (FORCE)	REC/ATT	RQD	SAMPLE DESCRIPTION AND BORING NOTES
									SW of L-19
2	Very loose to loose brown F-C SAND, little C gravel, little clayey silt. (FILL).	9		1	DO	2.3.6.6	9/24		(1) 0.0-2.0' Loose gray F-C SAND, little C gravel, little clayey silt, moist. OVA head space 4.8 ppm
4		2		2	DO	2.1.1.1	18/24		
6		>61		3	DO	1.1.50/1"	2/24		Note: Little recovery, therefore only one sample taken
		8		4	DO	3.3.5.6	18/24		(2A) 2.0-3.0' Very loose brown F SAND, some to little clayey silt, trace m sand, sticky, wet, OVA head space 0.0 ppm
8	Soft to stiff med. brown to dark gray SILTY CLAY, some to little f sand, trace f-c gravel, trace m-c sand, trace organic matter, brown silt lamination. (LACUSTRINE).	14		5	DO	2.5.9.13	15/24		(2B) 3.0-4.0' Very loose brown F SAND, trace silt, trace m sand, wet to moist. OVA head space 10 ppm
10		21		6	DO	4.9.12.17	18/24		(3A) 4.0-6.0' Very loose to very dense brown F-M SAND and f-c gravel, very wet, saturated. Hit something hard at 5.0' OVA head space 60 ppm
12		11		7	DO	5.5.6.11	11/24		
14		10		8	DO	3.5.5.8	24/24		Note: Hit something hard at 5.0' therefore pulled forward (west) 4'. Tried to drill throughout before moving. Drilled 5' again but something hard, could be a foundation. Decided to move 5' SW of 2ND HOLE
16		8		9	DO	4.4.4.6	24/24		
18	Very soft & firm gray CLAY with gray silt lamination. (TILL).	5		10	DO	2.2.3.4	24/24		
20		6		11	DO	3.3.3.3	24/24		(3B) AUGER SAMPLE FROM SECOND ATTEMPT AT 5.0' Dark gray F SAND, some clayey silt, sticky, wet, strong odor OVA head space 48 ppm
22	21.8' BORING TERMINATED								(4A) THIRD HOLE 6.0-7.0' Soft to firm med brown CLAYEY SILT and f sand, little f gravel, trace m sand, moist OVA head space 3.8 ppm
									(4B) 7.0-8.0' Firm to stiff dark gray SILTY CLAY, some f sand, fibrous roots and bark, moist, slight odor OVA head space 15 seconds over 1000 ppm
									(5A) 8.0-9.0' Loose brown and gray F-C SAND, little f-c gravel, turning to brown F SAND and SILT, saturated OVA head space 3.4 ppm
									(5B) 9.0-10.0' Soft to firm dark gray SILTY CLAY, some f sand, trace fibrous roots, dry to moist. OVA head space 1000 ppm
									(6A) 10.0-11.0' Very soft dark gray SILTY CLAY, little f sand, sticky, moist OVA head space 350 ppm
									(6B) 11.0-12.0' Firm gray mottled SILTY CLAY some f sand, interbedded with rust silt layers throughout. OVA head space 140 ppm

CONTINUED ON NEXT PAGE

Field Boring Log

DEPTH HOLE 21.5'	JOB NO. BES-3007.1	PROJECT CWM / L-R / VICKERY DRIVE		BORING NO. B-5	
DEPTH SOIL DRILL 21.5'	BA INSP. LFL	DRILLING METHOD HOLLOW STEM AUGERS		SHEET 2 OF 2	
DEPTH ROCK CORE	WEATHER SUNNY	DRILLING COMPANY BOWSER-MORNER		SURFACE ELEV.	
NO. DIST. BA. / UD. BA.	TEMP. 60°	DRILL RIG MOBILE B-61	DRILLER JIM WALSH	DATUM	
DEPTH WL. 3.4'	HRS PROD.	WT. SAMPLER HAMMER 140 LBS	DROP 30 in	STARTED 0950 (Time) 16-10-90 (Date)	
TIME WL. 16:4 / 6-12-90	HRS. DELAYED	WT. CASING HAMMER	DROP	COMPLETED 1110	16-10-90

SAMPLE TYPES

AS	AUGER SAMPLE	BL	BLACK
CS	CHUNK SAMPLE	BR	BROWN
DD	DRIVE OPEN	C	ORANGE
DS	DENISON SAMPLE	CA	CASING
PS	PITCHER SAMPLE	CL	CLAY
RC	ROCK CORE	CLY	CLAYEY
ST	SLOTTED TUBE	F	FINE
TO	THIN-WALLED, OPEN	FRAG	FRAGMENTS
TP	THIN-WALLED, PISTON	GL	GRAVEL
WS	WASH SAMPLE	LYD	LAYERED
		LT	LITTLE

ABBREVIATIONS

M	MEDIUM	SA	SAMPLE
MC	MICACEOUS	SAT	SATURATED
MOT	MOTTLED	SD	SAND
NP	NON-PLASTIC	SI	SILT
OG	ORANGE	SIY	SILTY
ORG	ORGANIC	SM	SOME
PH	PRESSURE-HYDRAULIC	TR	TRACE
PM	PRESSURE-MANUAL	WL	WATER LEVEL
R	RED	WHC	WEIGHT OF HAMMER
RES	RESIDUAL	Y	YELLOW
RK	ROCK		

SOIL DESCRIPTION - RANGE OF PROPORTION

TRACE 0-1% SOME 12-20%
LITTLE 5-12% AND 20-50%

RELATIVE DENSITY	BLOWS	CONSISTENCY	PHASE FRACTURE
VERY LOOSE VLS	0-4	VERY SOFT VS	EXTREMELY F
LOOSE LS	4-10	SOFT S	MEDIUM FAMILY
COMPACT CP	10-30	FIRM FM	MEDIUM
DENSE DN	30-50	STIFF ST	THICKLY FRACTURED
VERY DENSE VDN	50	VERY STIFF VST	THIN/VERY THICKLY
		HARD H	BLOCKY THIN/THICKLY

ELEV. / DEPTH	DESCRIPTION	BLOWS / FT		SAMPLES NO.	TYPE	BLOWS PER 6 IN (FORCE)	REC / ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
									CONTINUED FROM PAGE 1
									(7A) 12.0'-13.0' Firm to stiff dark gray SILTY CLAY little f sand, moist OVA head space 8 seconds over 1000ppm
									(7B) 13.0'-14.0' Firm to stiff brown and med gray mottled SILTY CLAY, little f sand, gray vertical weathering OVA head space 10ppm
									(8A) 14.0'-15.0' Very soft to soft dark gray SILTY CLAY, little f sand, red brown silt lenses throughout, OVA head space 140 ppm
									(8B) 15.0'-16.0' Firm gray and rust mottled SILTY CLAY, little f sand, silt lenses throughout, OVA head space 25ppm
									(9A) 16.0'-17.0' Soft red brown CLAY trace f sand, laminated, sticky, moist OVA head space 61 ppm
									(9B) 17.0'-18.0' Stiff to firm gray and brown mottled SILTY CLAY trace f sand, silt lenses throughout, wet to moist, OVA head space 64 ppm
									(10A) 18.0'-19.0' Very soft to soft red gray CLAY, brown silt layers throughout laminated, sticky, OVA head space 100ppm
									(10B) 19.0'-20.0' SAME AS ABOVE OVA head space 17ppm
									(11A) 20.0'-21.0' Very soft to soft gray and brown mottled SILTY CLAY, gray and brown silt lenses throughout, laminated, sticky, moist OVA head space 72ppm
									(11B) 21.0'-22.0' Soft to firm gray CLAY interbedded with gray silt layers laminated, sticky, plastic, moist OVA head space 31ppm
									21.8' Bottom of hole. Boring terminated water level at 20.7' at boring termination

Geosol Associates

Field Boring Log

DEPTH HOLE 21.9'	JOB NO. 855-2027.1	PROJECT CWM / L-19 / VICKERY OHIO				BORING NO. A-4	
DEPTH SOIL DRILL 21.9'	BA INSP. LEL	DRILLING METHOD HOLLOW STEM AUGERS				SHEET 1 OF 2	
DEPTH ROCK CORE	WEATHER SUNNY	DRILLING COMPANY BOWSER-MORNER				SURFACE ELEV.	
NO. DIST. BA. / UD. BA.	TEMP. 74° F	DRILL RIG MOBILE B-61	DRILLER JM WALSH			DATUM	
DEPTH WL. 7.5'	HRS. PROD.	WT. SAMPLER HAMMER 140 LBS	DROP 30 IN			STARTED 1515 (TIME) 16-10-90 (DATE)	
TIME WL. 14:05 / 6-12-90	HRS. DELAYED	WT. CASING HAMMER	DROP			COMPLETED 1800 16-10-90	

SAMPLE TYPES: AS AUGER SAMPLE; CS CHUNK SAMPLE; DD DRIVE OPEN; DS DENISON SAMPLE; PS PITCHER SAMPLE; RC ROCK CORE; ST SLOTTED TUBE; TO THIN-WALLED OPEN; TP THIN-WALLED, PISTON; WS WASH SAMPLE

ABBREVIATIONS: BL BLACK; BR BROWN; C COARSE; DA DARK; GL GLAY; GLY GLAYEY; F FINE; FRAG FRAGMENTS; GL GRAVEL; LYR LAYERED; LI LITTLE; M MEDIUM; MIC MICACEOUS; MOT MOTTLED; OP NONPLASTIC; ORG ORGANIC; PH PRESSURE HYDRAULIC; PM PRESSURE MANUAL; R RED; RES RESIDUAL; RK ROCK; SA SAMPLE; SAT SATURATED; SD SAND; SI SILT; SLT SILTY; SM SOME; TR TRACE; WL WATER LEVEL; WH WEIGHT OF HAMMER; Y YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION: TRACE 0-1%; LITTLE 1-10%; SOME 10-20%; AND 20-50%

ELEV. / DEPTH	DESCRIPTION	BLOWS / FT		SAMPLES NO.	TYPE	BLOWS 6 IN (MOIST)	REC. / ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
2	Loose to very stiff brown SILTY CLAY, little to some f-m Sand. (FILL).	14		1	DD	9.5.9.15	17/24		NW OF L-19
4		18		2	DD	7.8.10.17	19/24		(1A) 0.0'-1.0' Loose to compact gray F-C SAND and f-c gravel, some brown SILTY CLAY, dry. OVA head space 3.6 ppm
6		22		3	DD	6.9.13.16	19/24		(1B) 1.0'-2.0' Very stiff med. brown SILTY CLAY, little to trace f sand, gray vertical weathering, rust and gray silt lenses throughout, dry. OVA head space 41 ppm
8	Soft to stiff gray SILTY CLAY, little to some f sand, trace organic matter, brown silt lamination. (LACUSTRINE).	12		4	DD	4.6.6.10	18/24		(2A) 2.0'-3.0' Soft med brown SILTY CLAY some f-m sand, dry. OVA head space 45 ppm
10		12		5	DD	5.4.8.10	18/24		(2B) 3.0'-4.0' Very stiff med brown SILTY CLAY, little f sand, gray vertical weathering, dry. OVA head space 410 ppm
12		14		6	DD	4.6.8.10	20/24		(3A) 4.0'-5.0' Stiff to very stiff med brown SILTY CLAY, little f sand, f sand and silt layer from 4.5'-5.0'. OVA head space 370 ppm
14		15		7	DD	4.6.9.12	20/24		(3B) 5.0'-6.0' Very stiff brown and med brown SILTY CLAY little f sand, grading to dark gray SILTY CLAY, strong odor. OVA head space 910 ppm
16		11		8	DD	3.5.6.8	24/24		(4A) 6.0'-7.0' Stiff gray mottled SILTY CLAY, some f sand, rust weathering. OVA head space 452 ppm
18		10		9	DD	3.4.6.7	24/24		(4B) 7.0'-8.0' Firm dark gray SILTY CLAY some f sand, moist, strong odor. OVA head space 44 seconds over 1000 ppm
20		7		10	DD	3.3.4.5	24/24		(5A) 8.0'-9.0' Firm dark brown SILTY CLAY and to some f sand, mottled with red brown silt throughout, dry. OVA head space 19 seconds over 1000 ppm
22	Very soft gray CLAY, gray silt lamination. (FILL).	4		11	DD	1.2.2.3	24/24		(5B) 9.0'-10.0' Soft dark gray SILTY CLAY little f sand, strong odor. OVA head space 22 seconds over 1000 ppm
	21.9' BORING TERMINATED								(6A) 10.0'-11.0' Firm gray mottled SILTY CLAY little f sand, rust weathering. OVA head space 790 ppm
									(6B) 11.0'-12.0' Firm gray and rust mottled SILTY CLAY and f sand, fibrous roots throughout. OVA head space 220 ppm
									(7A) 12.0'-13.0' SAME AS ABOVE. OVA head space 240 ppm
									(7B) 13.0'-14.0' STIFF SAME AS ABOVE. OVA head space 64 ppm
									(8A) 14.0'-15.0' SAME AS ABOVE. OVA head space 36 ppm
									(8B) 15.0'-16.0' SAME AS ABOVE. OVA head space 20.0 ppm
									(9A) 16.0'-17.0' SAME AS ABOVE. OVA head space 7.1 ppm
									(9B) 17.0'-18.0' SAME AS ABOVE WITH gray and red brown silt lenses throughout. OVA head space 14 ppm

CONTINUED ON NEXT PAGE.

Field Boring Log

DEPTH HOLE 21.9'	JOB NO. 853-3027	PROJECT CWM / L-19 / VICKERY OHIO		BORING NO. B-4	
DEPTH SOIL DRILL 21.9'	GA INSP. LEL	DRILLING METHOD HOLLOW STEM AUGERS		SHEET 2 OF 2	
DEPTH ROCK CORE	WEATHER SUNNY	DRILLING COMPANY BOWSER-MORNER		SURFACE ELEV.	
NO. DIST. SA. UD. SA.	TEMP. 74° F	DRILL RIG MOBILE B-61	DRILLER JIM WALSH	DATUM	
DEPTH WL. 7.8'	HRS. PROD.	WT. SAMPLER HAMMER 140 LBS	DROP 30 IN	STARTED 1315 (Time) 6-10-90 (Date)	
TIME WL. 1405 / 6-12-90	HRS. DELAYED	WT. CASING HAMMER	DROP	COMPLETED 1500 6-10-90	

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SIT	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	Y	YELLOW
LI	LITTLE	RK	ROCK		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" 0 - 5% "SOME" 12 - 20%
"LITTLE" 5 - 12% "AND" 20 - 50%

RELATIVE DENSITY		BLOWS	CONSISTENCY		FINGER PRESSURE
VERY LOOSE	VLS	0-4	VERY SOFT	VS	EXTRUDES
LOOSE	LS	4-10	SOFT	S	MOLDS EASILY
COMPACT	CP	10-30	FIRM	FM	MOLDS
DENSE	DN	30-50	STIFF	ST	THUMB INDENTS
VERY DENSE	VDN	50	VERY STIFF	VST	THUMBNAIL INDENT
			SHARD	H	RESISTS THUMBNAIL

ELEV. DEPTH	DESCRIPTION	BLOWS/FT		SAMPLES NO.	TYPE	PHASE BLOWS PER 6 IN (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
									CONTINUED FROM PAGE 1
									(10A) 18.0'-19.0' Soft to firm brown SILTY CLAY, some f sand brown silt layers throughout, moist, OVA head space 16 ppm
									(10B) 19.0-20.0 SAME AS ABOVE OVA head space 20 ppm
									(11A) 20.0'-21.0' Very soft gray CLAY, gray silt lenses throughout, laminated, plastic, sticky, wet, OVA head space 12 ppm
									(11B) 21.0-22.0' SAME AS ABOVE. OVA head space 6.6 ppm
									21.9' Bottom of hole. Boring terminated water level at 21.8' at boring termination.

ATTACHMENT C

BOREHOLE WATER SAMPLING FORMS

ETC

FIELD PARAMETER FORM (CC2)

Form 0002
Sample Management
12/89

ETC JOB # [illegible]

Sample Point [X] Source Code [B-1] Sample Point I D

FIELD PROCEDURES

PURGE DATE (YY MM DD)	START PURGE (2400 Hr Clock)	ELAPSED HRS	WATER VOL IN CASING (Gallons)	VOLUME PURGED (Gallons)
90 06 10 [illegible]	1600	27 [illegible]	37.04	37.04

SAMPLING METHOD:

Sampler Type [E] A-Submersible Pump B-ISCO C-Bladder Pump D-Dipper/Bottle E-Bailer F-Scoop/Shovel X-Other (SPECIFY OTHER)

Sampler Material [B] A-Teflon B-Metal C-PVC D-Plastic X-Other (SPECIFY OTHER)

Tubing Material [ ] A-Teflon B-Tygon C-Polyethylene D-Silicon X-Other (SPECIFY OTHER)

Sample Composited [Y/N] Procedure/Proportions

FIELD MEASUREMENTS

Well Elevation (ft/msl)

Depth to Ground water (ft) 6.00

Groundwater Elevation (ft msl)

Well Depth (ft) 21.80

Sample Depth (non-well) (ft)

	ph		spec. cond.		(other parameter)	value	units
1st	6.4	(STD)	9200	um/cm at 25°C	temp (H_2O)	9.2	°C
2nd		(STD)		um/cm at 25°C			
3rd		(STD)		um/cm at 25°C			
4th		(STD)		um/cm at 25°C			

Sample Temp (°C) Turbidity NTU

FIELD COMMENTS

Sample Appearance:

Weather Conditions: SUNNY WINDY 78°F

Other:

FILTERING: Use Chain of Custody (CC1) to indicate which bottles were filtered

Sampler: LORI E LUZIER (Print) Employer: GOLDER ASSOCIATES

I certify that sampling procedures were in accordance with applicable EPA state and corporate protocols.

6-13-90 (Date) [signature] (Signature)

ORIGINAL

ETC

FIELD PARAMETER FORM (CC2)

Form 0002
Sample Management
12/89

ETC JOB # FA9483

Sample Point [X] Source Code [B-2] Sample Point I.D.

FIELD PROCEDURES

PURGE DATE (YY MM DD)	START PURGE (2400 Hr Clock)	ELAPSED HRS	WATER VOL. IN CASING (Gallons)	VOLUME PURGED (Gallons)
900610	1655	26	39.66	39.66

SAMPLING METHOD:

Sampler Type [E] A-Submersible Pump B-ISCO C-Bladder Pump D-Dipper/Bottle E-Bailer F-Scoop/Shovel X-Other _____ (SPECIFY OTHER)

Sampler Material [B] A-Teflon B-Metal C-PVC D-Plastic X-Other _____ (SPECIFY OTHER)

Tubing Material [ ] A-Teflon B-Tygon C-Polyethylene D-Silicon X-Other _____ (SPECIFY OTHER)

Sample Composited [Y/N] _____ Procedure/Proportions

FIELD MEASUREMENTS

Well Elevation (ft/msl) [ ]

Depth to Ground water (ft) [6.50]

Groundwater Elevation (ft msl) [ ]

Well Depth (ft) [21.80]

Sample Depth (non-well) (ft) [ ]

	ph		spec. cond.		(other parameter)	value	units
1st	6.45 (STD)	1st	5800	um/cm at 25°C	H2O temp	6.7	°C
2nd	(STD)	2nd		um/cm at 25°C			
3rd	(STD)	3rd		um/cm at 25°C			
4th	(STD)	4th		um/cm at 25°C			

Sample Temp [ ] (°C) Turbidity [ ] NTU

FIELD COMMENTS

Sample Appearance:

Weather Conditions: SUNNY WINDY 78°F

Other:

FILTERING: Use Chain of Custody (CC1) to indicate which bottles were filtered

Sampler: LORI E LOZIER (Print) Employer: GOLDER ASSOCIATES

I certify that sampling procedures were in accordance with applicable EPA state and corporate protocols.

6-13-90 (Date) [signature] (Signature)

ORIGINAL

ETC

FIELD PARAMETER FORM (CC2)

Form 0002
Sample Management
12/89

ETC JOB # FA9454

Sample Point [X] B-3
Source Code — Sample Point I.D

FIELD PROCEDURES

PURGE DATE (YY MM DD)	START PURGE (2400 Hr Clock)	ELAPSED HRS	WATER VOL IN CASING (Gallons)	VOLUME PURGED (Gallons)
900611	1800	24	48.9	48.9

SAMPLING METHOD:

Sampler Type [E] A-Submersible Pump, B-ISCO, C-Bladder Pump, D-Dipper/Bottle, E-Bailer, F-Scoop/Shovel, X-Other _____ (SPECIFY OTHER)

Sampler Material [B] A-Teflon, B-Metal, C-PVC, D-Plastic, X-Other _____ (SPECIFY OTHER)

Tubing Material [ ] A-Teflon, B-Tygon, C-Polyethylene, D-Silicon, X-Other _____ (SPECIFY OTHER)

Sample Composited [Y/N] _____ Procedure/Proportions

FIELD MEASUREMENTS

Well Elevation (ft/msl) [ ]

Depth to Ground water (ft) [3.4]

Groundwater Elevation (ft msl) [ ]

Well Depth (ft) [21.8]

Sample Depth (non-well) (ft) [ ]

	ph		spec. cond.		(other parameter)	value	units
1st	6.93	(STD)	1050	um/cm at 25°C	H_2O temp.	21.0	°C
2nd		(STD)		um/cm at 25°C			
3rd		(STD)		um/cm at 25°C			
4th		(STD)		um/cm at 25°C			

Sample Temp [ ] (°C) — Turbidity [ ] NTU

FIELD COMMENTS

Sample Appearance:

Weather Conditions: SUNNY, WINDY, 78°F

Other:

FILTERING: Use Chain of Custody (CC1) to indicate which bottles were filtered

Sampler: LORI E. LOZIER (Print) Employer: GOLDER ASSOCIATES

I certify that sampling procedures were in accordance with applicable EPA state and corporate protocols.

6-13-90 (Date) [signature] (Signature)

ORIGINAL

ETC

FIELD PARAMETER FORM (CC2)

Form 0002
Sample Management
12/89

ETC JOB # FA9455

Sample Point [X] B-4
Source Code — Sample Point I.D

FIELD PROCEDURES

PURGE DATE (YY MM DD)	START PURGE (2400 Hr Clock)	ELAPSED HRS	WATER VOL IN CASING (Gallons)	VOLUME PURGED (Gallons)
900611	1820	25	35.86	35.86

SAMPLING METHOD:

Sampler Type [E] A-Submersible Pump, B-ISCO, C-Bladder Pump, D-Dipper/Bottle, E-Bailer, F-Scoop/Shovel, X-Other _____ (SPECIFY OTHER)

Sampler Material [B] A-Teflon, B-Metal, C-PVC, D-Plastic, X-Other _____ (SPECIFY OTHER)

Tubing Material [ ] A-Teflon, B-Tygon, C-Polyethylene, D-Silicon, X-Other _____ (SPECIFY OTHER)

Sample Composited [Y/N] _____ Procedure/Proportions

FIELD MEASUREMENTS

Well Elevation (ft/msl) [ ]

Depth to Ground water (ft) [7.80]

Groundwater Elevation (ft msl) [ ]

Well Depth (ft) [21.9]

Sample Depth (non-well) (ft) [ ]

	ph		spec. cond.		(other parameter)	value	units
1st	6.55	(STD)	3100	um/cm at 25°C	H_2O temp	13.9	°C
2nd		(STD)		um/cm at 25°C			
3rd		(STD)		um/cm at 25°C			
4th		(STD)		um/cm at 25°C			

Sample Temp [ ] (°C)

Turbidity [ ] NTU

FIELD COMMENTS

Sample Appearance:

Weather Conditions: SUNNY, WINDY, 78°F

Other:

FILTERING: Use Chain of Custody (CC1) to indicate which bottles were filtered

Sampler: LORI E. LOZIER (Print) Employer: GOLDER ASSOCIATES

I certify that sampling procedures were in accordance with applicable EPA state and corporate protocols.

6-13-90 [signature]
(Date) (Signature)

ORIGINAL

APPENDIX E

OIL RECOVERY FACILITY REPORT

INVESTIGATION OF OIL RECOVERY AREA
CHEMICAL WASTE MANAGEMENT, INC.
VICKERY, OHIO

JOB NO. 07722-006-17
FEBRUARY 1, 1984

Dames & Moore

Dames & Moore

644 Linn Street
Suite 501
Cincinnati, Ohio 45203
(513) 651-3440

February 1, 1984

Environmental Testing and
Certification Corporation
284 Raritan Center Parkway
Edison, NJ 08837

Attention: Ms. Merna Hurd

Gentlemen:

Report
Investigation of Oil Recovery Area
Vickery, Ohio
For Chemical Waste Management, Inc.

INTRODUCTION

This report describes the recent investigation and sampling operation conducted by Dames & Moore in the vicinity of the oil recovery area of Chemical Waste Management, Inc. (CWMI)'s Vickery, Ohio waste disposal site (Plate 1). As outlined in our draft plan of August 22, 1983, the investigation was designed to fulfill two objectives:

1. To characterize the subsurface conditions, physically and chemically, in the oil recovery area

2. To locate potential seepage paths, primarily along active or abandoned pipelines between the oil recovery area and open or closed lagoons.

GENERAL SAMPLING PLAN

The investigation was performed in three phases. The first phase was a geophysical survey of the area. This survey was an attempt to locate buried pipelines leading from the oil recovery area. It was also thought that any large concentrations of gravel or loose fill might be located. Survey techniques employed included electromagnetics (electromagnetic induction meter), ground-penetrating radar, and resistivity soundings. Complexity of the near-surface materials and high attenuation due to high clay content severely limited the usefulness of the geophysical surveys in locating subsurface features (Appendix A - Geophysical Surveying).

Phase 2 involved excavation of trenches using a backhoe provided by CWMI and sampling of any potentially contaminated material encountered. Additionally, some samples were recovered where no contamination was thought to exist in order to determine the limits of contaminated material. The trench locations were selected to intersect known or suspected

pipelines or other seepage paths. Interviews with employees to help pinpoint pipe locations minimized the amount of excavation required. One trench, ORT-6, did not intersect the expected pipeline. It is believed that a portion of this pipe (abandoned) was removed at some time in the past. Subsurface conditions exposed by the trenches were generally better than expected, and no trenches in addition to those initially planned were excavated, because all pipelines were found.

During trench excavation, samples were obtained at any point where distinct changes in soil type occurred, or where any obviously oily material was present. Additionally, some samples of subsurface aqueous material were recovered. Shallow soil samples were transferred directly from the ground to sample bottles. Deeper samples were taken from the middle of the hoe bucket with a steel spoon. Material was sampled which had not contacted the bucket itself, and placed in a stainless bowl. Care was taken not to cross-contaminate the sample by handling with unwashed tools or gloves. The bottles were filled from the bowl using the same spoon.

Piston tube cores were taken where water or oily material was present in order to obtain samples uncontaminated by the liquid. The prepared tube was made by pouring molten paraffin into a plastic end cap, inserting the bit end of the tube and taping the cap to the tube with electrical tape. The drive head is fitted with an O-ring which keeps water from contaminating the inside of the tube. All pipe threads were sealed with Teflon tape when a prepared tube was used.

The stainless steel bowl, spoon, and soil knife used to trim samples were cleaned and rinsed with hexane followed by methanol and finally potable water after each sample to prevent cross-contamination. The backhoe bucket was steam-cleaned initially and after completion of each trench. Likewise, the piston sampler was steam-cleaned and rinsed with hexane, methanol, and water after each use.

As the digging progressed, the trench was logged descriptively by a Dames & Moore engineer. The logs included detailed descriptions and depths of each sample taken, general observations of the trench, and depth and recovery of the clay core taken in the native clays. Any problems incurred during the sampling were also noted.

All samples were obtained and handled by Dames & Moore personnel only. Samples were placed in 1-liter sample bottles provided by ETC. Custody of

all samples and sample shuttles was controlled by Dames & Moore. Chain-of-custody procedures were used that documented all sample locations, depths, and descriptions. Ohio EPA was present during some sampling operations, and splits of some samples were provided on their request.

Concurrent with Phase 2 excavation, samples were also obtained from the CPS separator tank and the concrete sump of the oil recovery building. A composite oil sample was recovered from the CPS separator comprised of a surface sample from the tank plus a sample from a vertical standpipe. An aqueous sample (mostly water) was taken from the leach bed around the CPS tank through a vertical vent pipe. An oil sample was taken from the concrete sump in the oil recovery building. An additional aqueous sample was collected from the nitrating acid tank north of lagoon 7. This sample was amber-colored and acidic (pH approximately 0.5). The sample was not submitted to ETC for analysis.

All aqueous and oil samples were recovered using a Masterflex peristaltic pump and flexible tygon tubing. Lengths of tubing were used for one sample and discarded, eliminating any possible cross-contamination. Samples were pumped directly into the sample bottles at each location. In addition to aqueous and oil samples, a sludge sample from the concrete sump in the oil recovery building was obtained using a stainless steel scoop attached to a pole.

Phase 3 sampling was accomplished by means of a truck-mounted drill rig. Drilling services were provided by Bowser-Morner of Toledo. Two factors resulted in the choice of Bowser-Morner as the drilling subcontractor: (1) ease and speed of mobilization, and (2) familiarity with site conditions. Bowser-Morner has previously done a great deal of work on and around the Vickery site. Hollow-stem augers (3-1/4-inch I.D.) were used for all drilling; sampling was done with a 3-inch O.D. split-spoon driven with a 300-pound hammer. A total of five borings were drilled to a maximum depth of 8 feet. All borings were terminated at least 1 foot into native clay. No ground water or oil material were encountered in any of the borings. Therefore, no sealed piston tube samples were required, although preparations for sealed sampling had been made.

Originally, installation of piezometers in borings was planned. However, prior to initiation of any sampling, we were informed by CWMI that piezometer data were not necessary. Since no ground water was encountered other than trace moisture in ORB-5, piezometers would not have been installed in any event.

Samples from the split-spoon were trimmed and placed in sample bottles using a soil knife. The knife, split-spoon samples, and gloves were cleaned and rinsed as in Phase 2 sampling using hexane, methanol, and water. The drill rig and augers were steam-cleaned prior to each boring.

OBSERVATIONS

Trenches were excavated in numerical order, and the numbers do not necessarily correspond to those in the preliminary sampling plan. A total of 10 trenches were dug as shown on Plate 2. Five borings were drilled, not in numerical order. Again, location numbers do not necessarily correspond to the preliminary plan. It was necessary to alter boring locations significantly from the preliminary plans, primarily due to above ground piping and other obstacles in the vicinity of the oil recovery facility. Details applicable to individual trenches and borings are presented below. Copies of boring logs and field identification logs were provided to Ms. Kathy Trent of CWMI on September 28, 1983 following completion of field investigations.

°ORT-1: In gravel roadway on NW corner of oil and water building. Oily water encountered at 2 feet, flowing freely. Transfer line to lagoon 5 not visible, but screenings used to backfill pipe trenches evident. Screenings appeared clean as far as visible. Black coating on gravel 2 to 2-1/2 feet. Clay at 4 feet.

°ORT-2: Gravel area adjacent to road and truck parking. Some water at 1-1/2 to 3 feet. Trench with screenings. Four-inch PVC transfer line (abandoned) at 4 feet. Clay at 4 feet. Water at this location appears to be from surface infiltration; natural drainage to east behind oil and water building.

°ORT-3: Gravel parking. Within boundary of closed lagoon 4. Steel-cased fibercast transfer line (active) at 2-1/2 feet. No seepage; screenings clean. Pipe trench directly in lagoon backfill.

°ORT-4: Gravel roadway. Two-inch steel transfer line at 1 foot. Clay at 1 foot. Bottom of trench 1-1/2 feet. No seepage encountered. Former dike between ponds 5 and 6E.

°ORT-5: Large crushed stone storage area. Six-inch ceramic tile transfer line to sump (abandoned) at 4 feet. Black discoloration (heavy) below 1 foot. Clay at 4 feet. Impossible to determine presence or absence of subsurface infiltration due to flow of ponded surface water into trench during excavation.

°ORT-6: Gravel and fines between tank and wet well. Trench excavated to 4-1/2 feet. Gravel, rubble, roots (fill). Assume ceramic pipe previously moved. Minor seepage - very localized.

°ORT-7: Gravel road adjacent to wet well. Three-inch steel pipe at 2 feet. Clay fill at 2-1/2 feet (dike). No seepage along pipe or otherwise evident.

°ORT-8: Gravel on dike, near midpoint. Silt/clay at 1-1/2 feet. No seepage.

°ORT-9: Gravel on dike, near east end. Oil and water seepage at 5 feet. Overnight accumulation mostly water. Some oil. Definite potential seepage path.

°ORT-10: Grass on fill. Four-inch PVC transfer pipe at 5-1/2 feet. Clay at 4-1/2 feet (fill). Undisturbed clay approximately 6-1/2 feet. "Field tile" - preliminary test for PCB in oil positive. Oil and water pumped from trench. Clay backfill carefully tamped to seal pipe.

°ORB-1: Gravel between acid tank and oil/water reactors. Clay at 4 feet. No seepage. Boring to 8 feet.

°ORB-2: Gravel, south of reactor tank pad. Clay at 1-1/2 feet. Discoloration and moisture at clay/gravel interface - surface runoff. Boring to 6 feet.

°ORB-3: Wet clay - approximately 3 feet of crushed stone previously removed. Native clay at less than 1 foot. Surface discoloration nearby. No seepage. Boring to 6 feet.

°ORB-4: Sandy, between tanks W-1 and W-2. Clay at 1 foot. Trace moisture associated with silty seams in clay.

°ORB-5: Gravel - west of oil recovery tanks. Native clay at 2-1/2 feet. No seepage.

CONCLUSIONS

The extent of subsurface oil migration appears to be less than expected. Although some trenches exposed some oily residue, it did not appear to result from seepage along buried pipelines. In fact, ORT-9 (in dike on south side of wet well - lagoon 9) is the only location where lateral migration appeared to be a potential problem. ORT-1, ORT-2, and ORT-5 exhibited layers of potentially contaminated material which probably resulted from infiltration from the surface. According to plant personnel, the area west of the oil recovery facility as far as the old maintenance building and lagoon 4 drains through the oil recovery area following any significant rainfall. Any incidental spills in the roadways or transfer areas would most likely infiltrate through the crushed stone and fill until the underlying clay is reached. Discolored and oily material uncovered was concentrated at or near the clay/fill interface, lending support to this theory. Also, several localized seeps of black oily material in the immediate vicinity of the oil recovery building were uncovered during excavation of fill material prior to the start of this investigation. In each case, the seeps occurred at the clay/fill interface, and probably resulted from the downward and subsequent lateral leaching through the fill.

At no point did any potentially contaminated material penetrate the underlying clay, so any remedial efforts involving removal of contaminated material would be limited to the crushed stone and fill. Except in areas of former lagoons or dikes, the depth to undisturbed clay did not exceed 5 feet, and top layers were generally clean. In the area around the oil recovery buiding, all of the fill was previously stripped and stockpiled, so estimates of volumes can easily be made visually.

As mentioned in Appendix A, one anomalous area occurred within the recorded survey area, possibly indicating subsurface concentrations of conductive material. However, since oil in general and the material contained in the wet well (lagoon 9) is not conductive, it does not appear that any seepage from the wet wells is responsible for this anomaly.

Specific locations where no evidence of any seepage was present include ORT-3, ORT-4, ORT-6, ORT-7, ORT-8, and ORT-10, as well as all five borings.

SITE MAP

A map showing locations sampled during the investigation, as well as previous sampling locations is included with this report.

--ooOoo--

We trust that this report provides the information you currently require, and if you have any questions you will contact us. We appreciate having the opportunity to be of continued service to ETC and CWMI, particularly in view of the technical and logistic challenges that this project represented.

Very truly yours,

DAMES & MOORE

R. Scott Stephens

R.Scott Stephens
Assistant Engineer

S. Edwards by EM Menzies

Stuart Edwards, P.E.
Project Manager

RSS/SE/ds

APPENDIX A

GEOPHYSICAL SURVEYING
AT CHEMICAL WASTE MANAGEMENT, INC.
VICKERY, OHIO

INTRODUCTION

A geophysical survey was performed as a portion of the Chemical Waste Management, Inc., waste treatment and disposal site located at 3956 State Route 412, in Vickery, Ohio. The site is several miles east of the town of Fremont and just south of the Ohio Turnpike. Part of the site is illustrated in Plate 1. It is generally covered with gravel or lawn and has a maximum relief of about 10 feet. The site is underlain by clays with some silts; bedrock is not visible. The surrounding area is farmed.

The primary area of survey was adjacent to the oil recovery facility. Recent excavation and soil analysis in this area have revealed the presence of PCBs in the soil. One possible mechanism for this soil contamination is considered to be seepage of liquids from the ponds by way of gravel-lined pipe trenches. A former road, with gravel to a depth of 10 feet, could also provide a porous medium. The purpose of the survey was to investigate these potential migration pathways.

The survey was performed by Mr. Bruce Bevan of Geosight, P.O. Box 135, Pitman, NJ 08071, during the week ending September 16, 1984. Methods used were electromagnetic induction and ground-penetrating radar.

The electromagnetic survey could not locate the plastic pipes or the gravel bedding and backfill in trenches that are known to be in the survey area; the buried gravel road in the area also could not be detected. Due to the high attenuation of the soil, the ground-penetrating radar was not suitable at this site.

SURVEY METHODS AND RESULTS

Electromagnetic Survey

The electromagnetic (EM) induction meter used for this was a Geonics (EM31) Terrain Conductivity Meter. This 15-foot-long, bar-like instrument measures the surface-weighted average conductivity of the earth to a maximum effective depth of about 20 feet.

In one area, 200 by 250 feet in size, measurements were made at a 10-foot spacing. At each point, a pair of measurements were made with the instrument bar swung about a horizontal right angle between measurements. A total of 1,054 measurements were made at 531 points in about 6 hours. For these readings, the meter was carried on a backpack with a remote meter

connected to it with a cable. While there were overhead power lines and electric machinery in the vicinity, these caused no significant interference.

Ground-Penetrating Radar Survey

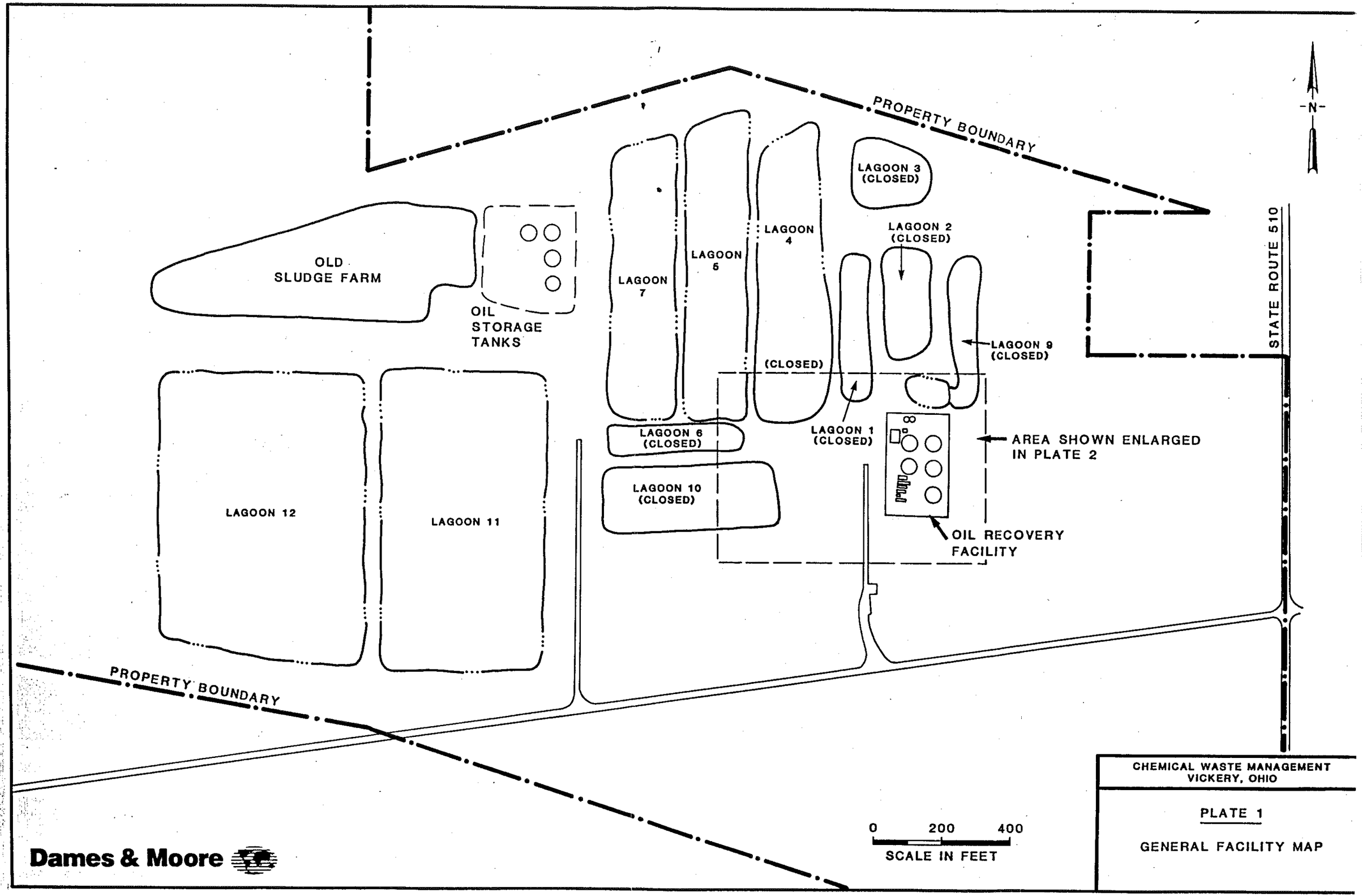
A ground-penetrating radar was tested on the site in case it could be used to detect gravel fill in the pipe trenches. A SIR System-7 radar, developed by Geophysical Survey Systems, was used with a model 3055 antenna and high-gain receiver for deep profiles. The high attenuation of the earth allowed only shallow profiling. In places, echoes were similar to those from shallow pipes or wires, but no reliable identifiable anomalies were found which corresponded to the known buried pipe locations, and this phase of the survey was terminated.

Electromagnetic Results

A number of electromagnetic anomalies were identified (shown on Figure A-1 and as summarized in Figure A-2); however, they appeared unrelated to the trenches and pipes that were the focus of this investigation.

While several plastic pipes and their trenches are known to be in the survey area, they were not detected. They could be too small for the resolution of the instrument or they could be hidden in the complex gravel fill in the area. The deep gravel road bed is not seen either; this could happen if it is masked by a clay admixture, or by overlying high conductivity material.

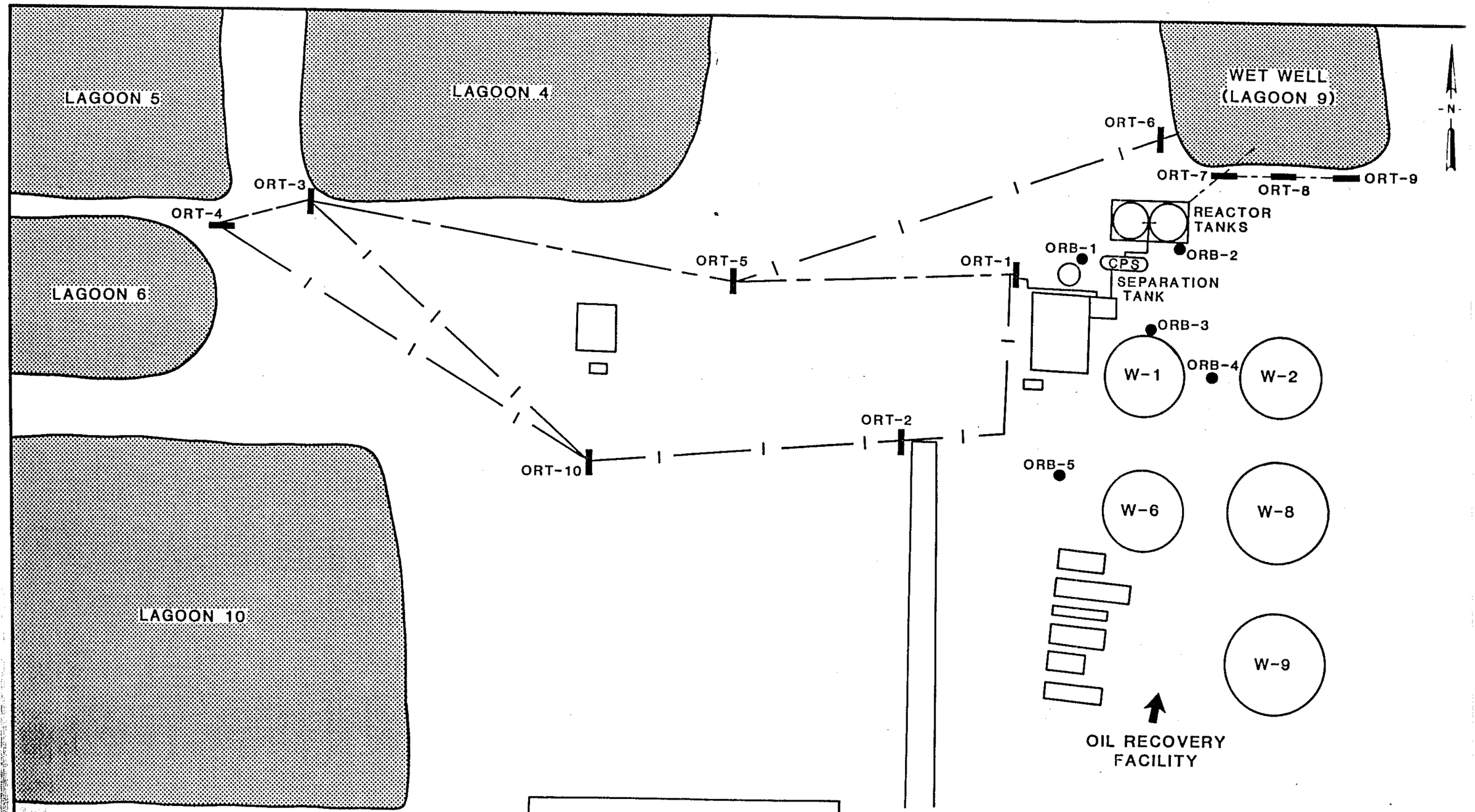
The clayey soils at this site have a moderately high conductivity with a range of 35 to 45 millisiemens per meter (mS/m). Clean, deep gravel would have a conductivity of about 10 percent of this. Calculations showed that the material causing the anomaly shown on Figure A-1 had an indicated conductivity of 222 mS/m.



CHEMICAL WASTE MANAGEMENT
VICKERY, OHIO

PLATE 1

GENERAL FACILITY MAP



LEGEND:

- ● BORING LOCATION
- ▬ TRENCH LOCATION
- —|— ABANDONED PIPELINE
- —-— ACTIVE PIPELINE

0 50 100
APPROX. SCALE IN FEET

Dames & Moore

CHEMICAL WASTE MANAGEMENT
VICKERY, OHIO

PLATE 2

PLOT PLAN

OIL RECOVERY AREA
INVESTIGATION

FIGURE A-1

Electrical Conductivity

apparent conductivity, in millisiemens per meter, $\frac{mS}{m}$
contour interval = 10 $\frac{mS}{m}$

measurements 13 Sep 83, 9:15AM-4:00PM
Geonics EM31 Terrain Conductivity Meter
dipoles vertical, bar height ≈ 1.1 m
temporal variation < 0.5 $\frac{mS}{m}$
measurement spacing = 10 ft
traverse E→W
N = measurement with bar oriented N-S
E = measurement with bar oriented E-W
numbers recorded here are average: $\frac{1}{2}$ (N+E)

grid N

0 10 20 30 40 50 ft

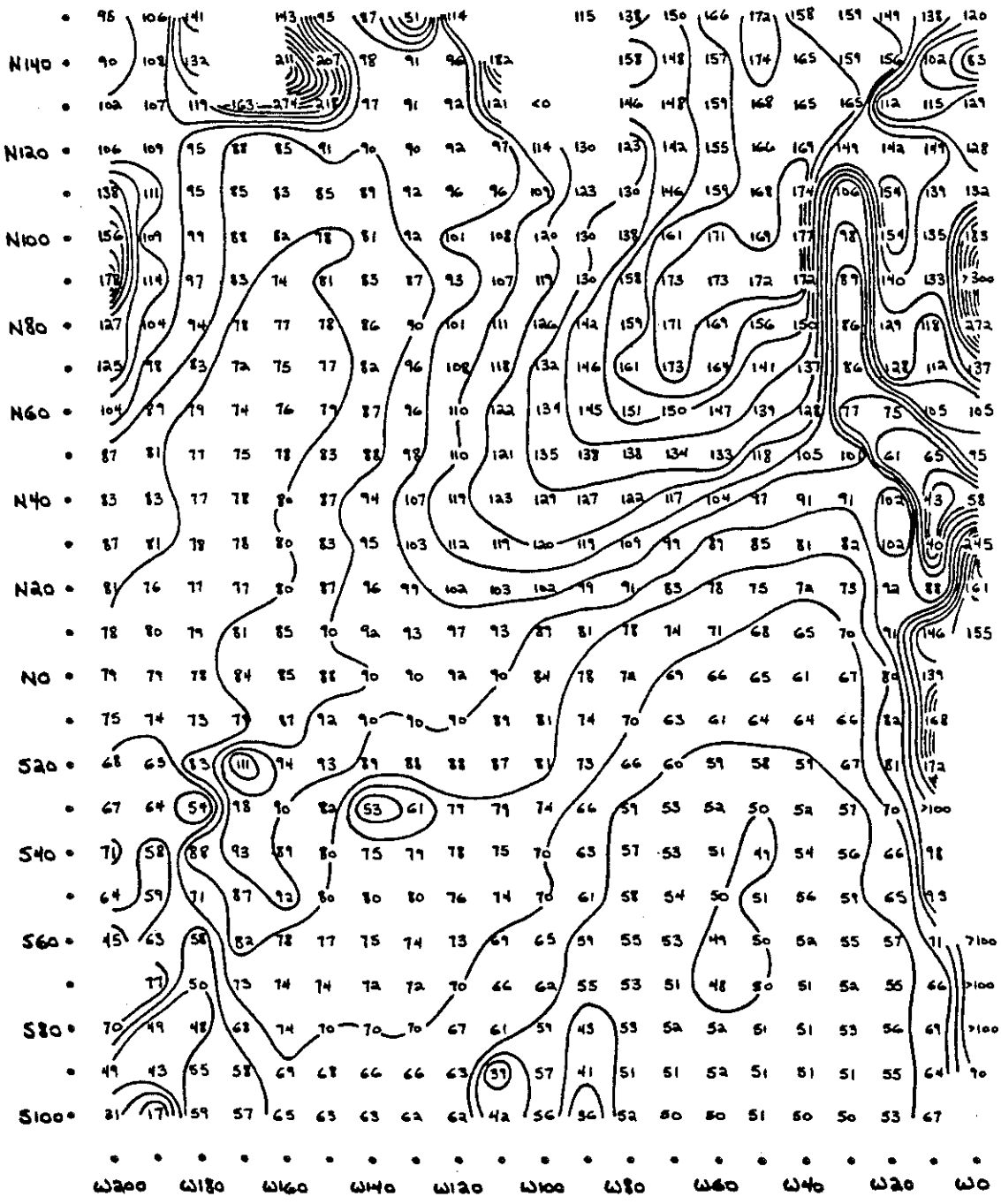
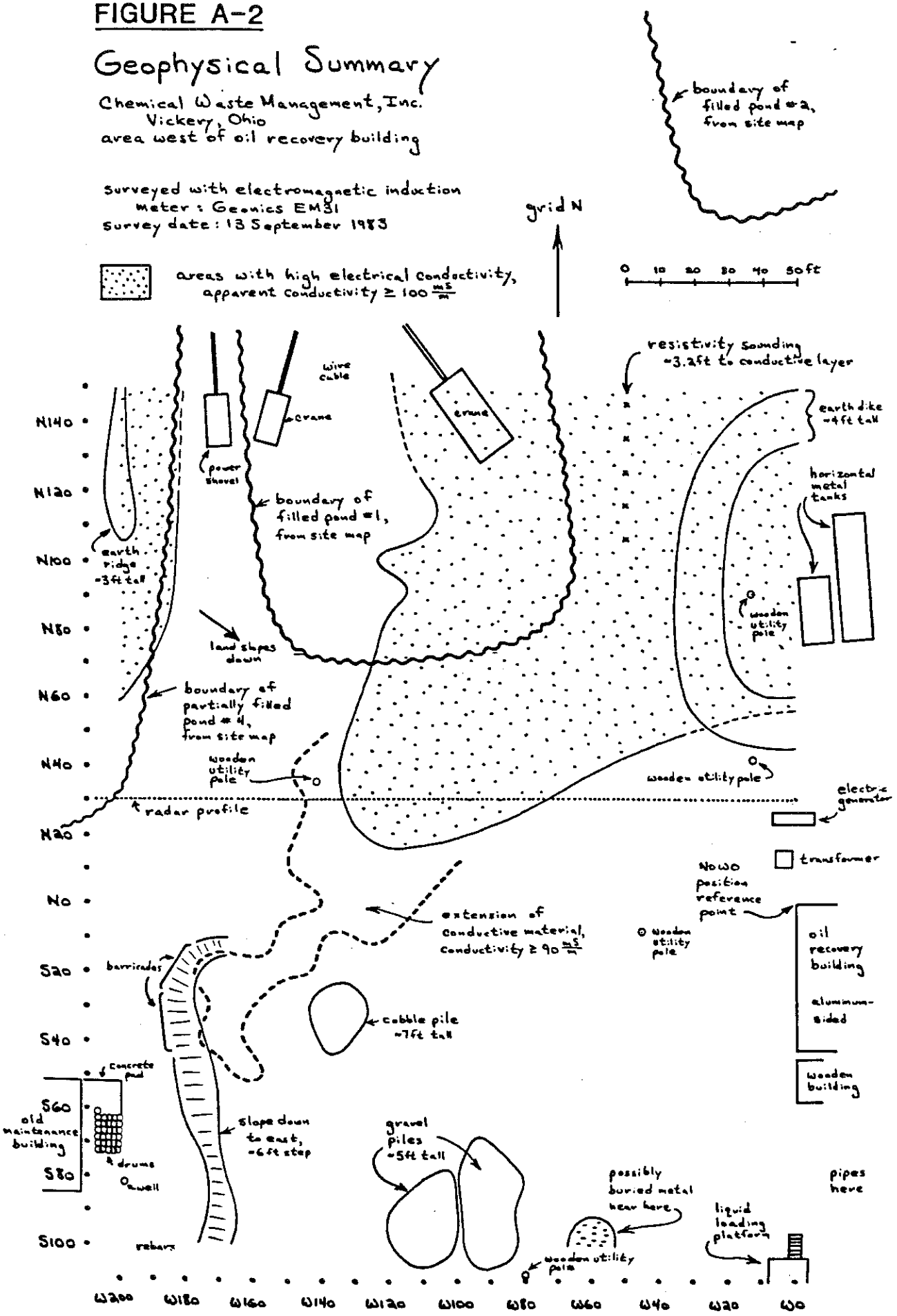


FIGURE A-2

Geophysical Summary

Chemical Waste Management, Inc.
Vickery, Ohio
area west of oil recovery building

surveyed with electromagnetic induction meter: Geonics EM31
survey date: 13 September 1983



APPENDIX F

CLOSURE REPORT FOR W-TANKS

CLOSURE OF W-TANKS
CHEMICAL WASTE MANAGEMENT, INC.
VICKERY, OHIO

Chemical Waste Management, Inc.
3956 State Route 412
Vickery, Ohio 43464

Attention: Mr. Michael F.R. Curry

Report No. 52865-292-048

February 7, 1992

BOWSER
MORNER

BOWSER MORNER

COMMITTED TO EXCELLENCE
SINCE 1911

122 S. St. Clair Street
P.O. Box 838
Toledo, OH 43696-0838
419-255-8200

419-255-7935 FAX

February 7, 1992

Chemical Waste Management, Inc.
3956 State Route 412
Vickery, Ohio 43464

Attention: Mr. Michael F.R. Curry

RE: Closure of W-Tanks
Chemical Waste Management, Inc.
Vickery, Ohio
Report No. 52865-292-048

Gentlemen:

Enclosed is our independent registered professional engineer report for the closure of the W-Tank area. The report summarizes our observations made during the closure process and our evaluation of analytical test results supplied by Chemical Waste Management, Inc. As concluded in the report, it is our opinion that the tanks were closed in substantial accordance with the approved closure plans.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please contact us if you have any questions regarding our report.

STATE OF OHIO
GLENN L. FITKIN III
E-43728
REGISTERED PROFESSIONAL ENGINEER

Respectfully submitted,

BOWSER-MORNER ASSOCIATES, INC.

Glenn L. Fitkin

Glenn L. Fitkin, P.E.
Civil/Environmental Engineer

GLF:hmr
10-Client

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ATTACHMENT B 1990 Soil Analysis Results

ATTACHMENT C 1991 Soil Analysis Results

ATTACHMENT D W-5 Soil Analysis Results for F Waste and PCB Constituents

BOWSER MORNER

I. INTRODUCTION

The W-Tanks, W-3, W-4, W-5 and W-7, were storage and treatment tanks used in conjunction with and prior to filtration and deep well injection of liquid wastes. The tanks and associated piping were closed under interim status regulations. The four tanks were located directly adjacent to the newer T-Tanks. Tanks W-3 and W-4 were located to the east of the T-Tanks, Tank W-5 was located to the northeast of the T-Tanks, and Tank W-7 was located to the north of the T-Tanks. Each of the tanks was a vertical steel cylindrical tank constructed on a soil foundation.

Bowser-Morner was retained by Chemical Waste Management, Inc., to serve as the independent registered professional engineer required by OAC 3745-66-15 and 40 CFR 265.115. As such, the purpose of Bowser-Morner's work was to evaluate compliance with the closure specifications in the approved closure plans.

II. CLOSURE PLANS

On February 1, 1988, Chemical Waste Management, Inc., submitted to Ohio EPA a closure plan for the W-Tanks. Revisions to the closure plan were submitted on June 2, 1988. Ohio EPA approved the plan subject to conditions on July 19, 1988. Chemical Waste Management, Inc., prepared a revision to the closure plan dated April 7, 1989, which was approved by Ohio EPA on September 29, 1989, after Ohio EPA received authorization to administer the federal program. On March 16, 1990, Chemical Waste Management, Inc., notified Ohio EPA of minor alterations to the closure process necessary primarily to comply with new land disposal restrictions.

After performing initial soil sampling following removal of the tanks in 1990, and after discussions with Ohio EPA representatives, Chemical Waste Management, Inc., submitted

a revised soil sampling plan to Ohio EPA. Ohio EPA approved the revised plan with conditions on March 5, 1991.

III. CLOSURE WORK

A. Parties Involved

Several parties performed different tasks during the closure of the W-Tanks. The environmental cleanup contractor engaged for the project was the ENRAC Division of Chemical Waste Management, Inc. ENRAC cleaned the tanks, disassembled the tanks and piping, arranged for the disposal of waste materials, excavated contaminated soil and performed the required rinseate and soil sampling for disposal and for closure.

Rinseate and soil analyses were performed by Aqua Tech Environmental Consultants, Inc. Samples were delivered directly to Aqua Tech by representatives of ENRAC or Chemical Waste Management, Inc.

Bowser-Morner was engaged as the independent registered professional engineer for certification of closure. During the closure field work, representatives of Bowser-Morner made periodic spot check visits to the site to observe the contractor's procedures and most of the rinseate and soil sampling performed by the contractor or Chemical Waste Management, Inc., representatives.

During the later portions of the work, representatives of Sirrine Environmental Consultants provided technical overview and field assistance, for example, in regard to soil sampling.

B. Dates of Work

Closure field work was commenced in mid-March 1990. From commencement through mid-May 1990, the contractor cleaned and disposed of the tanks and associated piping. The contractor performed the initial excavation of contaminated soils from under the previous locations of tanks from April through mid-May 1990. Initial soil samples were taken during that period as well. During June and July 1990 the contractor performed additional excavation at tank sites showing indications of residual contamination and sampled soil from those areas.

After negotiations with Ohio EPA and approval of a revised soil sampling plan, each of the four tank areas was resampled in April 1991 following additional excavation of soil, in accordance with the revised soil sampling plan. Between then and July 1991 the contractor performed additional rounds of excavation followed by soil sampling until all areas were thought to be clean. The contaminated soil was transported from the facility and disposed of in late August 1991. In September through early October 1991, the tank sites were backfilled with clean soil and graded. The area was seeded on October 9, 1991.

As discussed in further detail in Section III (F), additional excavation of contaminated soil was performed in the W-5 area from mid-December 1991 through early January 1992. The soil was transported for disposal between December 16, 1991, and February 6, 1992. The area was backfilled with clean clay soil on January 29, 1992, and will be seeded in the spring.

C. Tank Content Removal and Disposal

Each of the four tanks had a few inches of residual waste material remaining at the bottom of the tank. The materials were removed from the tanks with a vacuum truck. After the contractor determined that the materials were not filterable and, therefore, not

disposable through the on-site deep well injection system, the materials were solidified, placed in containers and transported to the TWI facility in Sauget, Illinois, for treatment and disposal as hazardous waste.

D. Tank Decontamination and Disposal

The contractor pressure-washed the interior of each tank. The rinse water was collected and transported to a Chemical Waste Management, Inc., facility in Newark, New Jersey, for treatment and disposal as hazardous waste.

At the completion of the rinsing of each tank, a sample of the rinseate water was collected by the contractor as required by the closure plan. Samples for each tank were analyzed by Aqua Tech for the required constituents listed in the closure plan. The laboratory test results are presented in Attachment A. The test results were compared by Chemical Waste Management, Inc., with the closure performance standards listed in the closure plan and the tanks were thought to be successfully decontaminated; however, an inadvertent error was made in evaluating the Tank W-5 results. The Tank W-5 rinseate results met all but one of the standards, as described below. The approved closure plan, as originally written, listed a decontamination standard of 20 ppm cyanide in rinseate water. Ohio EPA, in its approval letter, did not accept the 20 ppm limit and conditioned approval upon the establishment of a 1 mg/l limit for cyanide. The cyanide result for the tank W-5 rinseate water was 1.81 mg/l which is slightly over the limit required by Ohio EPA. The discrepancy between the limit in the original plan and the limit imposed by Ohio EPA was not recognized by Chemical Waste Management, Inc., until after the tank materials had been disposed of at a solid waste landfill. (Also, there was a rinseate result of 1.03 mg/l phenols for tank W-4, which might appear to exceed the maximum limit of 1 mg/l imposed by Ohio EPA, but which technically is equivalent to the limit and, therefore, did not actually exceed the limit.) Chemical Waste Management, Inc., immediately reported the

mistake to Ohio EPA on May 14, 1990. Ohio EPA responded that the tank materials could be left at the landfill. With this exception, the rinseate results for each tank did meet the clean standards in the closure plan.

The metal tanks were cut into pieces with a hydraulic shear between April 9 and May 9, 1990, and transported to Evergreen Landfill in Northwood, Ohio, for disposal as solid waste.

E. Piping Material Decontamination and Disposal

Fiberglass pipe insulation materials were removed from the piping undergoing closure between late March and early May 1990. The contractor inspected the insulation for signs of contamination by waste materials and in all cases, after finding no visual contamination, collected the materials in containers for disposal at Evergreen Landfill in Northwood, Ohio, as solid waste. PVC pipes and pumps were dismantled and cut into short pieces. The sections were triple-rinsed in a basic solution followed by a clean water rinse. Following rinsing, the materials were placed in containers and transported to Adams Center Landfill in Fort Wayne, Indiana, for disposal as hazardous waste. The rinse solutions were disposed of with the tank rinsing water.

F. Soil Removal and Disposal

The contractor performed initial soil excavation at each tank site as described in the 1989 closure plan. Following the initial excavation, a total of 40 soil samples were collected from the four areas at locations determined in accordance with the closure plan. The samples were collected by the contractor and submitted to Aqua Tech for chemical analysis. Results of the analyses are presented in Attachment B.

Upon review of the results, Chemical Waste Management, Inc., determined that contamination remained in some areas. Consequently, the contractor performed additional

depth and width excavation in the tank areas. Additional soil samples were then collected and analyzed. The results, which are also included in Attachment B, show that concentrations of some closure constituents continued to exceed the standards in the approved closure plan.

After two rounds of sampling and analysis, Chemical Waste Management, Inc., determined that the soil sampling plan in the approved closure plan was not reasonable because it appeared to require that each tank area be treated in the aggregate, rather than allowing subareas within each tank area to be deemed clean while focusing additional soil removal efforts in other subareas determined to not yet be clean. Consequently, Chemical Waste Management, Inc., initiated negotiations with Ohio EPA which culminated in the approval by Ohio EPA of a revised soil sampling plan in March 1991.

Based on the soil sample results from 1990 (presented in Attachment B), Chemical Waste Management, Inc., then had the contractor excavate additional soil in early 1991 from grid areas containing residual contamination. After excavation, the revised sampling plan was implemented and a total of 40 samples were collected in accordance with the revised plan. The samples were collected by the contractor and submitted to Aqua Tech for chemical analysis. The laboratory results are presented in Attachment C. A comparison of the new analytical data with the clean limits established in the revised plan showed that additional soil removal was required in select areas.

One deviation from the procedures in the revised plan has been noted. In the first round of soil sampling in 1991, the closure parameter "phenols" was analyzed by the colorimetric method approved in the original closure plan, rather than the GC/MS method proposed in the revised plan. Acceptance of the colorimetric method for certifying closure is reasonable since its detection limit is comparable or lower than the detection limits achievable by the GC/MS method and since the method was accepted by Ohio EPA in the

original approved closure plan. Consequently, the phenols results are accepted for the purposes of evaluating successful decontamination. Note that in subsequent rounds of analysis the GC/MS method was used, if additional phenols testing was needed based on a previous finding of residual phenols contamination.

The contractor performed additional rounds of excavation followed by soil sampling in 1991, until all sample areas were thought to meet the closure standards. The results for the additional samples are also contained in Attachment C.

Subsequently, during a review of the soil analysis data, it was determined that some data assumed to be available for soil samples from the tank W-5 area from 1990 were not, in fact, available. Specifically, some F-waste organic constituent and PCB test data were missing. Some, but not all, of the F-waste data were available from Aqua Tech from archived GC/MS testing results performed in 1990. Those results revealed that some residual contamination remained in the W-5 area. Chemical Waste Management immediately informed Ohio EPA and initiated plans to remove the clean backfill, excavate contaminated soil and obtain new soil samples. Field excavation work, including initial excavation in the whole W-5 area and then additional excavation in grid areas found to contain residual contamination, was initiated in mid-December 1991 and completed on January 2, 1992. Following this excavation work, soil samples indicated that all areas met the clean criteria established in the 1989-approved plan, as modified by the 1991-approved revised plan. The analytical data described in this paragraph are presented in Attachment D.

The soil excavated by the contractor was segregated by tank area and transported for disposal as follows. Potentially PCB-contaminated soil from the Tank W-3 area was transported to the TSCA-permitted Chemical Waste Management, Inc., facility at Model City, New York, for disposal as a PCB-contaminated hazardous waste. Other

contaminated soils were transported to the Adams Center Landfill in Fort Wayne, Indiana, for disposal as hazardous waste.

G. Backfilling of Site

After evaluation of the test results for the soil samples and the determination that an area was clean in accordance with the procedures established in the approved revised sampling plan, the tank area was backfilled by the contractor. (For the reasons described above, the W-5 area was backfilled twice). The depressions due to soil excavation were filled with clean clay soil from an on-site borrow pit. The area was final-graded in order to promote drainage off of the area to on-site drainage ditches and to prevent ponding.

H. Waste Manifests

Chemical Waste Management, Inc., has retained records on waste transportation and disposal in its files at the facility.

IV. SUMMARY AND CONCLUSIONS

Bowser-Morner representatives visited the W-Tank closure project periodically during closure activities to make observations of the closure procedures. Based upon those observations and a review of the rinseate and soil sample results provided by Chemical Waste Management, Inc., it is Bowser-Morner's opinion that the closure work was performed in substantial accordance with the specifications in the approved closure plans and that the W-Tanks have been successfully closed clean under OAC 3745-66-97(A).

FIGURES

ETC ENVIRONMENTAL TESTING and CERTIFICATION CORPORATION

MERNA HURD
Vice President, Risk Management

February 6, 1984

Ms. Kathy Trent
Chemical Waste Management
555 Metro Place North
Suite 525
Dublin, Ohio 43017

Dear Kathy,

Enclosed is the revised sampling report from Dames & Moore for the Buried Tank project. I've incorporated this report into our data management report, which should be completed by tomorrow.

Sincerely,

Merna

Merna Hurd

MH/cs
Enclosure

DRAFT

DRAFT

284 RARITAN CENTER PARKWAY • EDISON, NJ 08837 (201) 225-6703 TELEX 710-998-0504

DOCUMENT REVIEW
INFORMATION SHEET

DOCUMENT NAME: REVIEW OF THE L19 INV.
DOCUMENT NUMBER: PERMITTING SOURCE OF CONT. & 1054
LOCATION: FILE ROOM
AUTHOR: GOLDEQ
DATE: 3/92

ANY ANALYTICAL DATA?
DID YOU COPY DATA/DOC.? Yes

SUMMARY:

COPIES OF THIS INFORMATION IS ATTACHED

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

Overburden Groundwater Testing

Program Description

Submitted to:

Chemical Waste Management, Inc.
555 Metro Place North
Suite 525
Dublin, Ohio 43017

DISTRIBUTION:

4 copies - Chemical Waste Management, Inc.
2 copies - Golder Associates

June 1984

844-1451.1

Golder Associates
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

June 7, 1984

844-1451.1
F/N 307.3

Mrs. Kathryn A. Trent
Chemical Waste Management, Inc.
555 Metro Place North
Suite 525
Dublin, Ohio 43017

RE: OVERBURDEN GROUNDWATER TESTING PROGRAM
CWM NORTHERN OHIO TREATMENT FACILITY
VICKERY, OHIO

Dear Mrs. Trent:

Enclosed is a description of the proposed Overburden Groundwater Testing Program for the Vickery Facility. The proposed program has been prepared in accordance with the terms set forth in paragraph 18 of the Consent Decree of May 22, 1984 between Chemical Waste Management, Inc., and the State of Ohio.

In the event there are any questions regarding this program, we will be available to discuss them with CWM or Ohio EPA personnel at your convenience. We are prepared to begin field work within 7 days of your notice to proceed.

Very truly yours,

GOLDER ASSOCIATES

Gary H. Collison

Gary H. Collison, P.E.
Principal

GHC/mrf

SECTION	PAGE
Cover Letter	
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2.0 DRILLING AND WELL INSTALLATION	2
3.0 SAMPLING AND ANALYTICAL TESTING	4
4.0 REPORT	6
Appendix - Methods for Site 690 Overburden Study	In Order Following Page 6
Figure 1 - Groundwater Overburden Sampling Locations	
Figure 2 - Typical Overburden Sampling Well Installation Details	

1.0 INTRODUCTION

In accordance with the Consent Decree of May 22, 1984 between Chemical Waste Management, Inc. (CWM), and the State of Ohio, an overburden groundwater sampling and analysis program will be performed at locations around the open lagoons at CWM's Northern Ohio Treatment Facility (Vickery Facility). This Overburden Groundwater Testing Program will consist of a single sampling event and analytical testing of those samples of overburden groundwater for selected organic and inorganic constituents as listed in the Consent Decree and as repeated for reference in Section 3.0 of this program proposal report. The samples will be obtained from depths between 15 ft. and 20 ft. beneath the original ground surface at 19 locations shown on Figure 1, attached, as per the requirements of the Consent Decree. Of these 19 locations, 18 will consist of wells installed for the specific purpose of obtaining the samples (designated as SS-1 to SS-18 on Figure 1) and one will be existing monitoring well MW-1A.

Because of the low permeability of the overburden soils, the 18 holes drilled for this program may have to remain open for a period of one to three weeks before they are sampled. It is also considered prudent to leave the holes open until the analytical results are completed in the event a second sampling of selected holes is desired because of suspected sampling contamination; a period of an additional 2 to 4 weeks. Considering a time frame on the order of 2 months for keeping these holes open, it is proposed that a completed sampling well be installed in each hole. At the completion of the program, these well will be grouted closed or be used for post closure monitoring if required and approved by the Ohio EPA.

2.0 DRILLING AND WELL INSTALLATION

The 18 sampling wells will be installed as per the details shown on Figure 2. Because low detection level analytical testing will be done for volatile organic compounds and other common chemical compounds, special equipment cleaning procedures described on Figure 2 will be used to reduce to a minimum potential contamination of the groundwater samples by the drilling tools and well materials installed in the holes.

The schedule of the program is based on completing one installation per day per drill rig with two drill rigs being used. Three sets of down-hole tools will be used with a separate crew on hand for cleaning. Thus, about 9 working days will be required for well installation. Drilling and well installation will not be permitted in rainy weather.

Based on previous experience at the site with shallow overburden wells, a period of 3 days to 7 days is required for a well to recover after bailing. It is planned that each well (including MW-1A) will be bailed once before or at the completion of the installation program after several feet of water has accumulated in the well. The well will then be permitted to recharge for a period of about a week. The sample for analytical testing will then be obtained from the well. Because of the slow recharge rate anticipated in these wells, the wells cannot be bailed immediately before sampling. Groundwater levels in each well will be measured prior to bailing and sampling.

At the completion of the program the sampling wells (excluding MW-1A) will be grouted closed and cut-off at the ground surface.

The drilling and well installation will be done by Bowser-Morner, Inc., of Toledo Ohio with all work directed, inspected, and documented by Golder Associates.

3.0 SAMPLING AND ANALYTICAL TESTING

In accordance with the agreement between CWM and the State of Ohio, the overburden wells will be analyzed for the following parameters, pH, Specific Conductance, Total Organic Carbon, Total Organic Halogens, Arsenic, Barium, Cadmium, Calcium, Chromium, Lead, Magnesium, Mercury, Selenium, Silver, Sodium, Sulfate, Carbonate, Bicarbonate, Chloride, Cyanide, Chloroform 1, 1, 2 - Trichloroethane, 1,1,1 - Trichloroethane, Benzene, Trichloroethylene, Tetrachloroethylene, Toluene, Ethylbenzene, Chlorobenzene, and PCBs. The procedures for performing the analytical testing are included in the appendix.

The samples will be obtained with a stainless steel bailer. Each sample will be approximately 2 liters in volume. Each sample will be divided and treated in accordance with the EPA protocol for the various analytical tests to be performed. The divided samples will be placed in sealed containers designed for preservation during shipment. Chain of custody will be kept for each sample. These procedures will generally follow those used at the site for previous groundwater sampling and testing.

The bailer will be steam cleaned and rinsed with distilled water before being used in each well. A new rope will be attached for each use.

In addition to one sample per well, the following samples will also be obtained for analyses:

1. Two samples of water used in cleaning the drilling tools for complete suite of analyses and one sample per rinse of each set of tools between holes for TOH analysis.

2. Four sample blanks will be taken by bailing distilled water with the bailer immediately before using the bailer for well sampling.

3. Duplicate groundwater samples from two wells where there is sufficient water volume and/or rapid recharge for the complete suite of analyses.

4.0 REPORT

At the completion of the program, a report of the program will be provided. This report will include a description of the drilling, well installation details, sampling protocol, analytical results, and an assessment of the meaning of the results with respect to contamination of the overburden groundwater around the surface impoundments. This report will be submitted to Ohio EPA within 90 days after their approval of this Overburden Groundwater Testing Program.

GOLDER ASSOCIATES

Gary H. Collison

Gary H. Collison, P.E.
Principal

GHC/mrf

Methods for Site 690 Overburden Study

pH	EPA 150.1
Specific Conductance	EPA 120.1
TOC	EPA 415.1
TOX	EPA 450.1
Arsenic	EPA 206.2
Barium	EPA 200.7 ICP
Cadmium	EPA 200.7 ICP
Calcium	EPA 200.7 ICP
Chromium	EPA 200.7 ICP
Lead	EPA 239.2
Magnesium	EPA 200.7 ICP
Mercury	EPA 245.1
Selenium	EPA 270.2
Silver	EPA 200.7 ICP
Sodium	EPA 200.7 ICP
Sulfate	EPA 375.3
Carbonate	Std Method 403
Bicarbonate	Std Method 403
Chloride	EPA 325.1
Cyanide	EPA 335.3
Volatile Compounds	EPA 624
PCB's (GC/ECD)	EPA 608

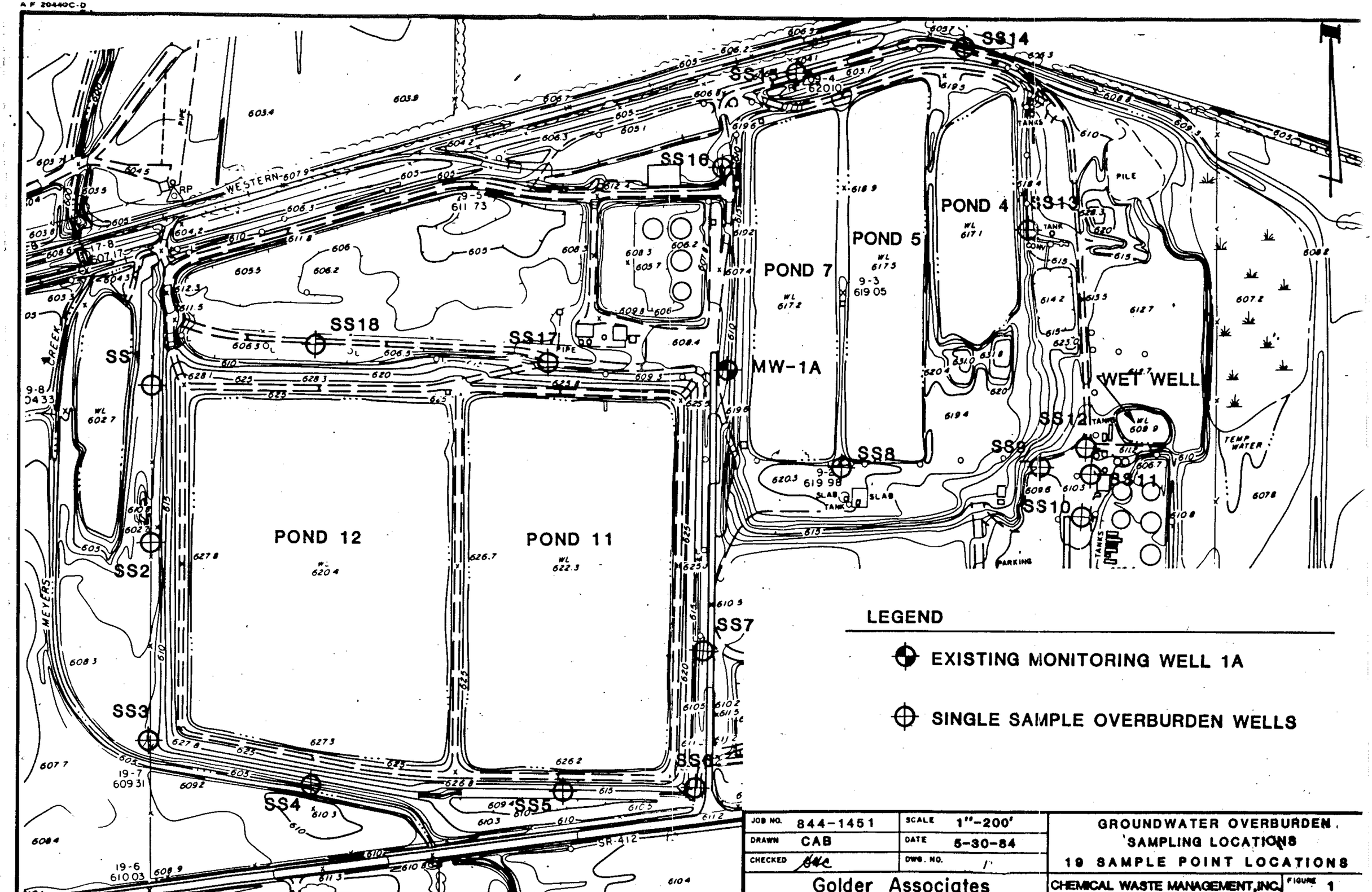
References:

Methods for Chemical Analysis of Water and Wastes EPA 600/4-79-020 Revised March 1983

Method for Organic Chemical Analysis of Municipal and Industrial Wastewater EPA 600/4-82-057 July 1982

Standard Methods for the Examination of Water and Wastewater APHA 1975 14th edition

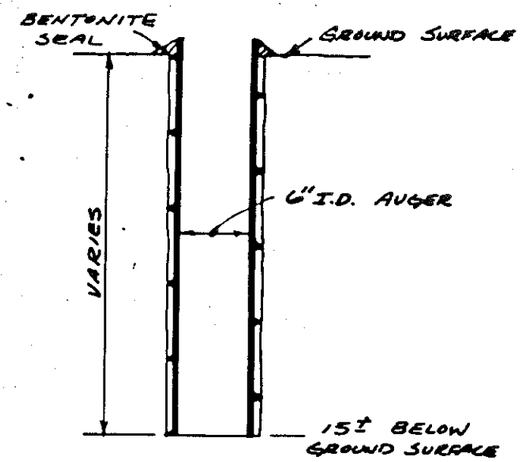
A F 20440C-D



JOB NO. 844-1451	SCALE 1"=200'	GROUNDWATER OVERBURDEN SAMPLING LOCATIONS	
DRAWN CAB	DATE 5-30-84	19 SAMPLE POINT LOCATIONS	
CHECKED	DWG. NO.		
Golder Associates		CHEMICAL WASTE MANAGEMENT, INC.	FIGURE 1

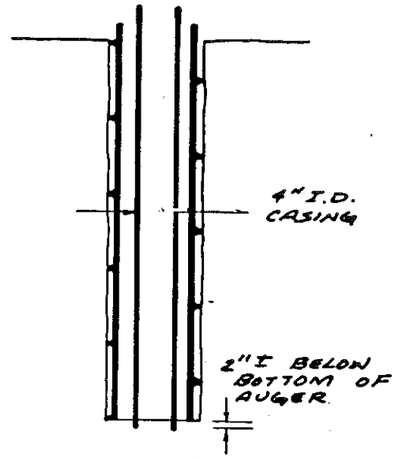
A F 20440C-D

STEP 1



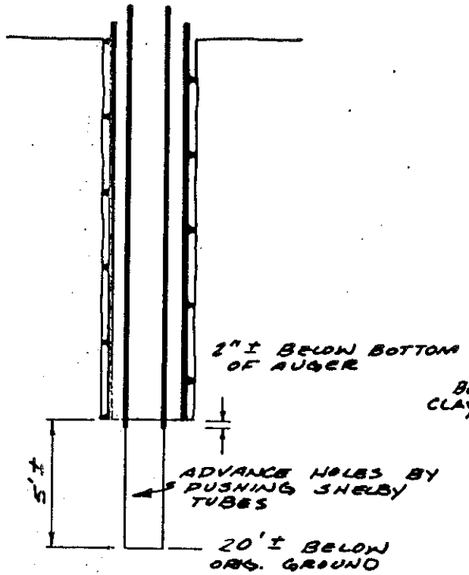
ADVANCE HOLE WITH 6" I.D. AUGER TO A POINT 5 F.T. ABOVE THE PLANNED BOTTOM OF THE HOLE. CLEAN OUT SOIL FLUSH TO BOTTOM OF AUGERS WITH A CLEAN-OUT BIT OR DRIVE PIPE. PLACE BENTONITE SEAL AGAINST AUGERS AT GROUND SURFACE

STEP 2



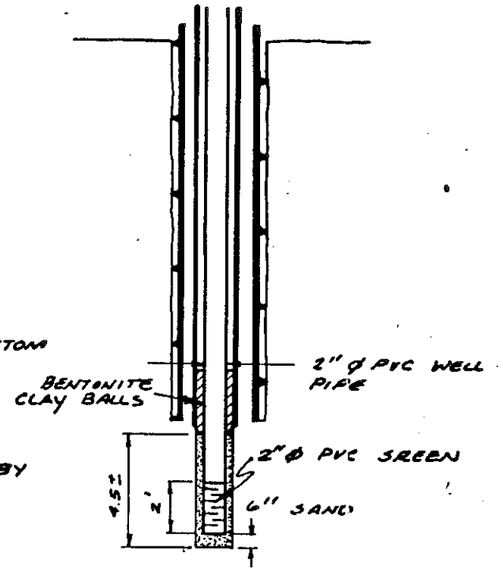
INSERT 4" I.D. CASING INSIDE AUGERS AND DRIVE TO ABOUT 2" BELOW AUGERS. CLEAN-OUT SOIL FLUSH TO BOTTOM OF CASING WITH CLEAN-OUT AUGER OR SHELBY TUBE.

STEP 3



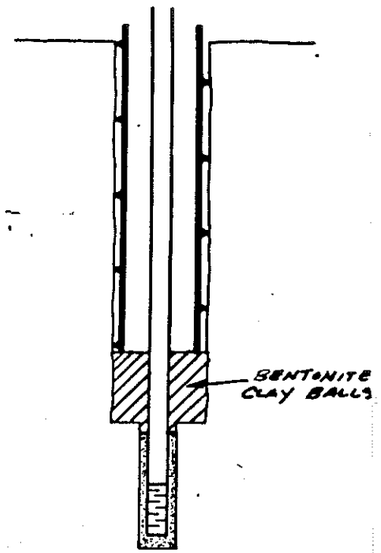
ADVANCE OPEN HOLE TO 5' ± BELOW CASING BY CONSECUTIVELY PUSHING SHELBY TUBES. EACH TUBE SHALL BE CLEANED BEFORE BEING USED

STEP 4



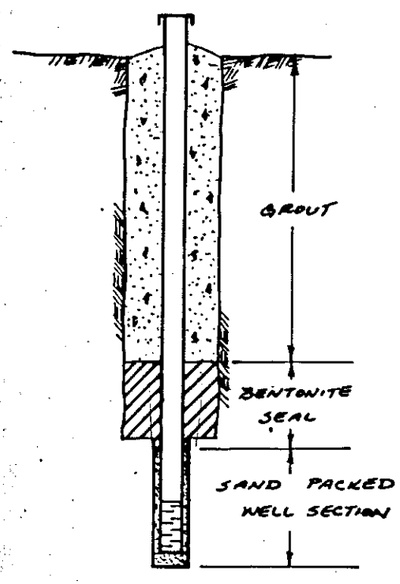
PLACE 6" OF SAND IN BOTTOM OF HOLE. INSTALL 2" WELL SCREEN AND PIPE. PLACE SAND TO A LEVEL 2' ± ABOVE TOP OF WELL SCREEN. PLACE BENTONITE CLAY BALLS ABOVE SAND TO A POINT ABOUT 2' ± ABOVE BOTTOM OF 4" I.D. CASING.

STEP 5



REMOVE 4" I.D. CASIN ALLOWING BENTONITE BALLS TO RUN OUT T AUGERS. RETRACT AUGERS 1' ± AND TAMP BENTONITE. PLACE ADDITI NAL 2' ± OF BENTONITE IN HOLE AS AUGERS ARE SLOWLY RETRACTE RETRACT AUGERS AND GROUT TO SURFACE

STEP 6



COMPLETED SAMPLING WELL

NOTES:

1. BEFORE DRILLING EACH OVERBURDEN SAMPLING WELL, ALL AUGERS, CASING, SHELBY TUBES, RODS, AND OTHER DOWN-HOLE TOOLS SHALL BE THOROUGHLY WASHED WITH ACETONE OR HEXANE AND STEAM CLEANED.
2. THE ENDS OF ALL SHELBY TUBES, RODS, CASINGS, AUGERS, ETC. SHALL BE CAPPED WITH ALUMINUM FOIL AFTER CLEANING.
3. SHELBY TUBES MAY BE RE-USED IF UNDAMAGED. UNDISTURBED SOIL SAMPLES WILL NOT BE RETAINED.
4. PVC WELL SCREEN AND CASING SHALL BE THREAD CONNECTED AND SHALL BE DELIVERED CLEAN FROM THE MANUFACTURER IN SEALED PROTECTIVE PACKAGING.
5. ONLY WASHED SILICA SAND SHALL BE USED IN THE HOLES
6. ALL WATER USED IN CLEANING AUGERS, CASING, AND OTHER DOWN-HOLE TOOLS WILL BE OBTAINED FROM AN APPROVED OFF-SITE MUNICIPAL SUPPLY.
7. NO OIL OR GREASE SHALL BE USED ON ANY DOWN-HOLE DRILLING TOOLS.

JOB NO. 844-1451	SCALE NOT TO SCALE	TYPICAL OVERBURDEN SAMPLING WELL INSTALLATION DETAILS	
DRAWN CAB	DATE 6/4/84		
CHECKED [illegible]	DWG. NO. 2		
Golder Associates		CHEMICAL WASTE MANAGEMENT	FIGURE 2