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Toxic and Hazardous Materials Agency

Manitowoc Army Reserve Center Manitowoc, Wisconsin

Final Report Follow-On Site Investigation

February 1992

Prepared for:

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Prepared by:

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FINAL REPORT OF
FOLLOW-ON SITE INVESTIGATION AT THE
MANITOWOC ARMY RESERVE CENTER (MARC)
REPORT NO. CETHA-IR-CR-92008
CONTRACT NO. DAAA15-90-D-0019
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Submitted to:

United States Army Toxic and Hazardous Materials Agency Aberdeen Proving Ground, Maryland

Submitted by:

OHM Remediation Services Corp.
Pittsburgh, Pennsylvania
A Subsidiary of OHM Corporation

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EXECUTIVE SUMMARY

This Follow-On Site Investigation (FSI) Report for the Manitowoc Army Reserve Center (MARC) has been prepared by OHM Remediation Services Corp. (OHM), a wholly owned subsidiary of OHM Corporation, as a requirement of Task Order 002 of Contract No. DAAA15-90-D-0019 with the United States Army Toxic and Hazardous Materials Agency (USATHAMA). This report summarizes the findings and conclusions of the FSI.

The objectives of the MARC FSI were to:

- o Determine if the Reserve Center is the source of low-level trichloroethylene (TCE) contamination (i.e., 5 to 9 μ g/l) detected in a nearby Ranney collector well (Collector "B") operated by Manitowoc Public Utilities (MPU)
- o Determine if 1,2-dichloroethane contamination detected in MARC Well MW-6 by E. C. Jordan Co. (Jordan) has migrated off site toward Collector "B."

TCE was not found on site in any sampled soils or groundwater. However, very low concentrations [i.e., just above certified reporting limits (CRLs)] of four VOCs ranging from 0.505 μ g/l to 1.15 μ g/l were found in groundwater in the vicinity of the septic tank drainage field. These included 1,2-dichloroethane, that the chloroethane, 1,2-dichloroethylene, and tetrachloroethylene. Only one VOC, 1,2-dichloroethane, was detected at the same well (MW-6) in both rounds of groundwater sampling. This compound is not a transformation product of TCE, nor can it be transformed to TCE by natural processes.

The Wisconsin Department of Natural Resources (WDNR) discounted the wash rack/dry well, motor vehicle storage shed, and the POL shed as being sources of groundwater contamination at MARC. The WDNR, based on the first investigation, was concerned about:

- o The potential migration of 1,2-dichloroethane to Collector "B"
- o Potential migration of TCE (if present) to the lower aquifer.

The WDNR then requested that additional investigations be conducted in the septic tank/drainage field area and in the area between MARC and Collector "B." USATHAMA contracted OHM to conduct the additional investigations.

The field investigation program conducted by OHM between July and November 1991 focused on further evaluation of the septic tank/drainage field area as a contamination source of 1,2-dichloroethane, and potentially TCE, and defining the subsurface geology as well as assessing the groundwater flow direction and chemical quality just east of MARC to Collector "B." The field program consisted of an initial site reconnaissance: installation of five monitoring wells; and analysis of two soil, one sediment sample, and groundwater samples from the monitoring wells. Two rounds of groundwater sampling were performed. The first round of sampling included all wells (existing and new), and the second round of sampling included only newly installed wells.

Based on data evaluation, the following conclusions can be drawn:

- o MARC is not the source of the TCE detected in the MPU collector "B." TCE has not been detected in any of the soil samples collected from the potential on-site source areas. In addition, TCE has never been detected in any of the groundwater samples from the perched system, clay till aquitard, or silts/sands aquifer.
- o 1,2-Dichloroethane has not likely migrated off site toward Collector "B." 1,2-Dichloroethane was not detected in any of the groundwater samples in 1991 and was detected at concentrations only slightly above the detection limit in one well in 1989. Therefore, 1,2-dichloroethane possibly never a actually existed in groundwater on the MARC. If 1,2-dichloroethane ever did exist on the MARC, the concentration has decreased to below detection limits since it was not detected in any groundwater sample collected under this investigation.

1.0 INTRODUCTION

This FSI Report has been prepared by OHM to support Task Order No. 002 of Contract No. DAAA15-90-D-0019 for the requirement entitled "Follow-On Site Investigation at the Manitowoc Army Reserve Center (MARC)." This task order is being performed for USATHAMA under the aforementioned Total Environmental Program Support (TEPS) contract.

The purposes of this investigation were to:

- o Determine if MARC was the source of low level TCE contamination detected in an off-site Ranney collector well (Collector "B") operated by MPU
- o Determine if 1,2-dichloroethane, which was detected in previous sampling events, has migrated off site toward Collector "B."

The site background (i.e., location, history, and previous investigations) and project approach are presented in Section 2.0. Section 3.0 describes the field investigation. Results of the field investigation and the evaluation of the findings are presented in Section 4.0. The conclusions of the investigation are presented in Section 5.0.

2.0 BACKGROUND

This section discusses background information pertinent to the site investigation including location, history, and summary of previous investigations conducted at MARC.

2.1 SITE LOCATION AND HISTORY

MARC is located in the east-central portion of Wisconsin, approximately 75 miles north of Milwaukee and 35 miles southeast of Green Bay, and borders the western shore of Lake Michigan (Figure 2-1). The MARC is situated on a 5-acre parcel of land atop a small knoll, surrounded by Silver Creek Park, and is on the southern edge of the city limits of Manitowoc in Manitowoc County. The approximate surface elevation of the MARC is 650 feet above mean sea level (MSL). Collector "B" is located approximately 1,000 feet to the east on a bluff overlooking Lake Michigan. It has an approximate surface elevation of 610 feet (Jordan, 1990) and is on top of a small knoll.

MARC is a military training center for reserve troops and is supported by Fort McCoy (Sparta, Wisconsin). Since the mid-1950s, light industrial operations have been conducted at the MARC. The operations were primarily related to servicing and maintenance of U.S. Army motor vehicles, including trucks, jeeps, and armored combat vehicles.

The MPU Collector "B" is maintained on standby status for potential municipal supply use (Jordan, 1990).

2.2 PREVIOUS INVESTIGATIONS

TCE contamination in Collector "B" was first identified in 1985 by the WDNR. Six sampling events from 1985 to 1988 detected TCE in the groundwater at Collector "B" in concentrations ranging from 5.4 to 9.4 micrograms per liter (μ g/l). These concentrations exceed the WDNR Groundwater Enforcement Standard for TCE of 1.8 μ g/l and the U.S. Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) of 5 μ g/l. In addition, the WDNR sampled nearby private water supply wells but found no detectable levels of TCE or other VOCs.

The WDNR findings prompted the MPU in 1986 to investigate their operations and maintenance practices for the pump station at Collector "B." These practices included cleaning of the pump motors and heads with a degreaser and the use of a petroleum-based oil in one of the station pumps. Both of these operations were potential contaminant sources. Subsequently, corrective action to existing maintenance practices was implemented with steam cleaning of the well pump motors and all associated equipment, and replacement of

the petroleum-based oil in the station pump with a food-grade oil. Repeated sampling events after the corrective action was taken resulted in consistent detectable levels of TCE in Collector "B."

Based on a review of these events and a review of potential sources of TCE contamination in the Collector "B" area, the WDNR concluded that the most likely source of the TCE contamination was MARC. This led to the U.S. Army contracting Jordan in 1989 to investigate the MARC as a potential source of TCE contamination.

2.2.1 Summary of Jordan Site Investigation

The Jordan site investigation (SI) focused on identifying potential on-site contamination sources, defining subsurface geology, and assessing the groundwater flow direction and chemical quality within the MARC boundaries which are upgradient of Collector "B."

Field activities conducted by Jordan during the fall of 1989 as part of this investigation included:

- o An initial site reconnaissance to select soil/ sediment sampling locations and monitoring well locations
- o The field investigation program, consisted of geologic logging of ten exploration borings, conversion of seven test borings to monitoring wells (MW-1A, MW-2A, MW-2B, MW-3, MW-4, MW-5, and MW-6), completion of three test borings (TB-1, MW-2T, and MW-5T), collection of six soil samples, two sediment samples, and one surface water seep sample for chemical analysis, and completion of aquifer testing of the seven wells
- Horizontal location and vertical elevation surveys of the monitoring wells, test borings, and seep.

Figure 2-2 presents a site plan depicting monitoring well/borehole locations; soil, sediment, and seep sample locations; and the location of Collector "B." Cross Sections A-A, B-B, and C-C, indicated on Figure 2-2, present geologic interpretations by Jordan of the subsurface data gathered from the test borings. Sections A-A, B-B, and C-C are depicted on Figures 2-3, 2-4, and 2-5, respectively.

Five of the six soil samples were collected from Test Boring TB-1, which was advanced through the dry well. The dry well is the area where most of the cleaning of the mechanical equipment occurred. As such, the dry well was

considered to be the most likely source of groundwater contamination at MARC. The sixth soil sample was collected from the ground surface near Monitoring Well No. 2B (MW-2B) and served to provide background concentrations of naturally-occurring metals. Two sediment samples were also collected from the dry well. The seep sample was collected from one of two observed seeps northeast of the site. All samples including groundwater were analyzed for volatile organic compounds (VOCs), metals (including mercury), and total petroleum hydrocarbons, per USATHAMA-certified methods.

2.2.1.1 Geologic/Hydrogeologic Findings

As described in Jordan's Final SI Report (August 1990), the geologic setting beneath MARC is generally characterized by a fine- to medium-grain silty sand overlying a moderately to highly plastic clay till, beneath which is a fine- to medium-grain sand. The clay till is interpreted as being the Haven Till, and appears to be present from the eastern boundary of MARC to Collector "B" at the shore of Lake Michigan as shown in Section A-A on Figure 2-3.

The clay till layer beneath MARC acts as an aquitard and effectively creates a locally perched water-table aquifer in the upper silty sand. Jordan concluded that recharge to this perched system is a result of infiltration of precipitation. Jordan's interpretation of the water level data indicated a groundwater divide which trends north-south through MARC for this perched system. Groundwater discharge from this perched system occurs as seeps which trend north-south along the eastern side of the hill as shown on Figure 2-2. Horizontal groundwater velocities in the perched system on the eastern side of MARC, as determined by Jordan, are approximately 60 feet/year.

The lower sand aquifer (i.e., beneath the clay till layer) is saturated, as indicated by water level data. According to Jordan, the clay till aquitard is a confining aquifer for the saturated lower sand aquifer. The computed downward vertical hydraulic gradient is 0.53 foot per foot from the shallow to the deep aquifer (Jordan 1990). The low gradient and the fact that there is perched groundwater in the upper silty sand suggests that the clay till aquitard is relatively impermeable to the downward migration of water. Because of these conditions, the groundwater from the perched system is not interpreted to be in communication with or within the zone of influence of Collector "B."

2.2.1.2 Contamination Assessment

Based on actual and interpreted findings of the SI, Jordan prepared a contamination assessment which addressed the distribution, behavior, and significance of those chemicals considered to be site contaminants. The assessment included changes in concentrations and distributions of contaminants over time. TCE was not found on site in any of the soil, sediment, or groundwater samples. VOCs were not found in the downgradient wells of three potential sources of groundwater contamination:

- o Vehicle/equipment wash rack and dry well
- o The motor vehicle storage shed
- o The Petroleum, Oil, and Lubricant (POL) shed.

However, sampling results from the septic tank/drainage field area (a fourth potential contaminant source) indicated very low concentrations of VOCs, ranging from 0.505 μ g/L to 1.15 μ g/L in groundwater during the two rounds of groundwater sampling. The VOCs found included 1,2-dichloroethane, 1,1-dichloroethane, tetrachloroethylene, and 1,2-dichloroethylene. Only one VOC, 1,2-dichloroethane, was detected at the same well (MW-6 - a shallow well) in both rounds of groundwater sampling. This compound is not a transformation product of TCE, nor can it be transformed to TCE by natural processes (Jordan, August 1990). Jordan also estimated contaminant velocities in the perched groundwater system and predicted that if TCE were discharged from the septic tank area, it would have traveled 50 feet beyond the eastern boundary of MARC. This prediction is based on the discharge occurring since initial operations began at the site in the mid-1950s (Jordan, August 1990).

Analysis of soil and sediment samples for metals indicated concentrations at or above background for cadmium, copper, lead, and zinc. However, based on interpretation of analytical data and of the behavior of metals in soil, Jordan determined that these metals did not appear to be migrating through the soil column nor were they detected in groundwater (with the exception of copper at or below CRLs).

Based on the above findings and interpretations, Jordan concluded that the presence of TCE in MPU Collector "B" is not attributable to activities at MARC. The most common transformation product of TCE, 1,2-dichloroethylene, was detected in MW-6 just above the CRL of 0.5 μ g/L at 0.741 μ g/L only once in both rounds of groundwater sampling; and estimated contaminant velocities in the perched system indicated that TCE could have traveled only 50 feet beyond the eastern boundary of MARC since the time of initial operations at the Reserve Center (Jordan, August 1990).

More detailed information concerning the Jordan SI can be found in the Final Site Investigation Report prepared by Jordan for USATHAMA, August 1990.

2.2.2 Request for Additional Investigation

Upon review of Jordan's SI, the WDNR agreed that 'the vehicle/equipment wash rack and dry well, the motor vehicle storage shed, and POL shed are not likely contributors to groundwater contamination at MARC. However, the WDNR requested Fort McCoy, in a letter dated July 17, 1990, to perform additional work to better define groundwater quality and flow direction east of the septic tank and drainage field. This request was made out of concern for potential migration of 1,2-dichloroethane detected in MW-6, towards Collector "B." Detection of 1,2-dichloroethane at 0.83 µg/L and 0.653 μ g/L in MW-6 was of particular concern since 't exceeds WDNR groundwater standards of 0.5 µg/L. The WDNA requested that an additional conitoring well nest be installed about 300 and 500 feet east of MW-6, between MW-6 and Collector "B." The well nest would consist of at least one observation well and one deep aquifer piezometer well, each similar in construction to MW 3 and MW-2B, respectively. The deeper well would monitor the lower aquifer and would be screened at the same elevation as Collector "B." The observation well would mon the upper water table aquifer for VOCs that use not penerciale the clay till layer.

2.3 PROJECT APPROACH AND RATIONALE

The purpose of the rs' for MARC was to determine if MARC is the source of sub at Collector "B" and if 1,2-dichloroethane, detected in MW-6, was present or if it migrated off site toward Collector "B." The following field activities were planned by OHM:

- o An initial site reconnaissance to select soil and sediment sampling locations and monitoring well locations
- o Installation of four monitoring wells (MW-7, MW-8, MW-9, and [W-10], collection of two soil samples (SB-1 and SB-2), and one sediment (SB-3, from septic tank sample for chemical analysis
- o Collection of two rounds of groundwater samples from the newly installed monitoring wells for chemical analysis
- o Measurement of groundwater levels in all of the site wells (new and existing)
- o Horizontal location and vertical elevation survey of the monitoring wells and soil/ sediment sample locations.

Field sampling and investigation activities were initiated in August 1991 and completed by November 16, 1990.

Monitoring well locations were selected to:

- o Evaluate potential contamination sources (see Table 2-1 for project rationale)
- o Assess groundwater chemical quality between the MARC site and Collector "B" to determine whether contamination is attributable to MARC
- o Verify groundwater flow direction in the deep groundwater aquifer
- o Provide subsurface soil profile information
- o Provide information to evaluate groundwater contaminant migration pathways.

Monitoring well and soil/sediment sampling locations for the FSI are shown on Figure 2-2, and monitoring well and soil/sediment sampling rationale are presented in Table 2-1. Four monitoring wells, which included two deep groundwater wells (MW-9 and MW-10) and a two-well cluster (MW-7 and MW-8) were installed for groundwater quality evaluation. Monitoring Well MW-11 (scope change) was installed near the two-well cluster as an intermediate well to monitor the clay till aquitard. The rationale for these monitoring wells is discussed below.

A two-well cluster (MW-7 and MW-8) is located between the MARC and Collector "B." The cluster is located east of the drainage field, approximately 300 feet east of MW-6 and about 600 feet west of the municipal well. Monitoring Well MW-7 has a total depth of 16 feet, and is approximately 110 feet west of MW-8. The bottom of the well screen is at elevation 628.1 and the top of screen is at elevation 638.1. The cluster is located east of the drainage field. The purpose of the shallow well is to monitor the shallow groundwater table (i.e., perched system) to determine if 1,2-dichloroethane (detected in MW-6) migrated off site toward Collector "B."

Monitoring Well MW-8 has a total depth of 105 feet and is approximately 110 feet east (downgradient) of Monitoring Well MW-7. The bottom of the well screen is at elevation 529.7 and the top of screen is at elevation 544.7. The well screen is at the approximate elevation of the lowest water intake of Collector "B," which is at elevation 534 feet MSL (Jordan, August 1990). The purpose of MW-8 is to monitor the deeper silts/sands aquifer for TCE at approximately the same

elevation as the intake of Collector "B." Also, the boring will provide subsurface data to better define the geologic strata between MARC and Collector "B."

Monitoring Well MW-9 monitors the lower aquifer and is about 300 feet northeast of the wash rack and about 600 feet west of Lake Michigan (Figure 2-2). The total depth of MW-9 is 95 feet. The bottom of the well screen was set at elevation 521.5 and the top of screen is at elevation 536.5. The purpose of this well is to monitor the deeper silts/sands aquifer for TCE which may have migrated from the dry well. The bottom of the well is at approximately the same level as the Collector "B" intakes. In addition, the boring will provide information on the geologic conditions between MARC and Lake Michigan.

Monitoring Well MW-10 is located adjacent to existing MW-6, approximately 50 feet east of the septic tank and drainage field. The total depth of Monitoring Well MW-10 is 120 feet and is screened at approximately the same elevations as MW-8 and the lower intakes of Collector "B." The purpose of this well is to monitor the lower aquifer to determine whether 1,2-dichloroethane has migrated into the deeper silts/sands aquifer and to Collector "B" and whether MARC is the source of TCE at Collector "B."

Monitoring Well MW-11 is located between MW-7 and MW-8. The total depth of MW-11 is 69 feet and it is screened in the clay till aquitard below the perched system monitored by MW-7 and above the aquifer monitored by MW-8. The top of the 15-foot screen is at elevation 584.45 and the bottom is at elevation 569.45. The purpose of this well is to monitor the clay till aquitard for 1,2-dichloroethane and TCE, and determine if either is migrating, toward Collector "B."

Soil and sediment sampling locations were selected to investigate the septic tank/drainage field area as a potential source area of 1,2-dichloroethane and/or TCE.

Specific drilling and monitoring well installation/ development procedures, soil/sediment sampling procedures, and groundwater sampling procedures are described in Section 3.0.

This section describes the field activities for this FSI from August 1990 to mid-November 1990. Soil borings and monitoring well installations were completed by Exploration Technology, Inc., of Milwaukee, Wisconsin. Boring logs were prepared by OHM and are presented in Appendix A. Well development data and field measurement data collected by OHM, and monitoring well diagrams prepared by OHM are presented in Appendix B. Physical analyses of the soil was performed by Geotechnics of Pittsburgh, Pennsylvania and data results are presented in Appendix C. Chemical analyses of the soil, sediment, and groundwater samples were performed by PACE, Inc. (a USATHAMA-certified laboratory), Minneapolis, Minnesota. Analytical data is presented in Appendix D. A summary of analytical methods is presented in Table 3-1. The laboratory and field quality assurance/quality control (QA/QC) procedures followed those presented in the Quality Control Plan, prepared by Jordan (June 1990). Approved water for drilling and decontamination activities was obtained from the Cleveland Water District (Village of Cleveland) Cleveland, Wisconsin. The field work was conducted in accordance with an Addendum to the Sampling Design Plan prepared by OHM. This addendum was submitted to USATHAMA and subsequently approved by USATHAMA.

3.1 SOILS AND SEDIMENT

Two soil samples, SB-1 and SB-2, were collected on August 28, 1991, from the drainage field area. These samples were collected from hand-augered holes completed to a depth of approximately 4.5 feet. A sediment sample, SB-3, from the bottom of the septic tank was collected remotely by a bucket. Sample locations are shown on Figure 2-2. Rationale for selecting these locations, as previously described in Section 2.3, is presented in Table 2-1. These samples were analyzed for those VOCs presented in Table 3-2. The corresponding USATHAMA Installation Restoration Data Management Information System (IRDMIS) test name is also listed in Table 3-2.

Physical soil testing was performed on 20 soil samples collected from borings for Monitoring Wells MW-7, MW-8, MW-9, MW-10, and MW-11. Tests included Atterberg limits, sieve grain-size distribution, and water content. Based on these test results, Unified Soil Classification System (USCS) symbols were assigned. This data is provided in Appendix C.

3.2 GROUNDWATER

Monitoring Wells MW-7, MW-8, MW-9, MW-10, and MW-11 were installed to evaluate water quality between MARC and Collector "B," and to further identify geologic and

hydrogeologic characteristics in the vicinity of the site. Monitoring well locations are shown on Figure 2-2. Rationale for these locations, as previously described in Section 2.3, is presented in Table 2-1. Two rounds of groundwater sampling were performed in September 1991 and November 1991, respectively. Samples were analyzed for the VOCs presented in Table 3-2.

3.2.1 Monitoring Well Installation and Development

Monitoring Well MW-7 was installed using a 6.25-inch inside-diameter (I.D.), hollow-stem auger with advancement being extremely slow due to hard clays and dense sands and gravels. In anticipation of difficult geologic conditions, MW-8, MW-9, MW-10, and MW-11 were installed using mud rotary drilling methods. All wells were constructed of 2-inch I.D., Schedule 80 polyvinyl chloride (PVC) pipe materials; 0.010-inch-wide machine-slotted PVC well screen; and PVC riser sections with the aded, flush joints. No glues or solvents were used in well c struction. The total well screen length at he storing Well MW-7 is 10 feet, and the well screen length .s 15 feet for the other wells. When installed, the water table intersected the well screens at all well locations. After a well was set at the designated elevation, a sand filter pack was placed in the annular space around each well screen. For MW-8, MW-9, MW-10, and MW-11, the sand filter packs extended a minimum of 7 feet above the top of the well screen (length varied from 7 to 25 feet); a bentonite pellet seal extended above the sand pack (length varied from 5 to 9 feet); and a bentonite slurry extended from the top of the bentonite pellet seal (length varied from 22 to 80 feet) to within 5 feet of the ground surface. Because MW-7 was shallow, the sand filter pack was extended only 1 foot above the top of the well screen, the bentonite pellet seal extended only 2 feet above the sand pack, and no bentonite slurry was added. Three feet of neat cement was placed in the annular space from the top of the bentonite seal to ground surface in all wells.

A 6-inch-diameter, protective steel casing with lockable cap was installed at each well. The protective steel casing extended 3 feet into the neat cement. Four 4-inch-diameter, protective steel guard posts and a 6-inch-thick concrete pad were placed around each well. A summary of well installation and construction details are presented in Table 3-3 and details are presented in Appendix B.

As per USATHAMA requirements, at least 48 hours elapsed before well development activities began. The monitoring wells were developed by pump-and-surge methods using a submersible pump and/or a hand-pump and bailer. Purge volumes varied depending on the recharge rate. Well development was considered complete when the water was relatively free of

fines/sediments and specific conductivity readings were stable. Well development data is presented in Appendix B.

Drill cuttings were placed on plastic sheeting and purge/development water and decontamination water was containerized in 55-gallon drums. The soil samples from the borings were initially screened with a PID. Since PID screening indicated no detectable VOC concentrations, the drill cuttings were spread on site as fill material. The drummed wastewater was temporarily stored on wooden pallets within the fenced area next to the POL shed. PID screening in the drummed water indicated no detectable VOC concentrations and the water was transported to the Manitowoc Water Authority for disposal/treatment.

3.2.2 Survey

On August 15 and 28, 1991, Brey, Stuewe & Braun, Inc., of Manitowoc, Wisconsin completed a horizontal location and vertical elevation of the five newly installed wells (MW-7, MW-8, MW-9, MW-10, and MW-11), and the two soil samples (SB-1 and SB-2). The sediment sample (SB-3) was located later by map coordinates given from the survey. Horizontal coordinates are based on the Wisconsin State Plane Coordinate System. Elevations are based on the National Geodectic Vertical Datum of 1983. This information is presented on the geologic logs of the boreholes in Appendix A.

3.2.3 Groundwater Sample Collection

Two rounds of groundwater sampling were performed. The first round of groundwater samples was collected from the 12 MARC wells (includes the seven existing and five newly installed) for chemical analysis of the parameters listed in Table 3-2. The second round of groundwater sampling was performed for MW-7, MW-8, MW-9, MW-10, and MW-11 only. The first round of sampling was performed on September 25 and 26, 1991, and the second round was performed on November 14 and 15, 1991. Each round of sampling included three quality assurance/quality control samples (i.e., one equipment blank, one field blank, and one trip blank). Prior to sample collection, water level measurements were obtained at each well. The wells were purged with a submersible pump or bailer and purge water was monitored for temperature, pH, and specific conductance, in accordance with USATHAMA requirements prior to sampling. Groundwater data is presented in Table B-1 of Appendix B.

3.3 DATA MANAGEMENT

Using the USATHAMA IRDMIS, data files were transmitted to the USATHAMA subcontractor, Potomac Research, Inc. (PRI). OHM submitted map sites for MW-7, MW-8, MW-9, MW-10, MW-11, SB-1, SB-2, and SB-3. PRI performed group and record checks

and upon passing these checks, the files were uploaded to the IRDMIS. PACE, Inc. submitted chemical data files for soil and groundwater to PRI by lot. Upon acceptance of the data, USATHAMA directed PRI to upload these files to the IRDMIS.

4.0 DATA PRESENTATION AND EVALUATION

The data presented in this section include the chemical analytical data from the three sampling events (one of soil borings and septic tank sediment and two of groundwater) and geotechnical data from the soil boring samples. An evaluation of the chemical and geotechnical data and hydrogeologic information is also presented in this section.

4.1 DATA PRESENTATION

The soil, sediment, and groundwater samples collected at the site were analyzed for the chemical parameters listed in Table 3-2 by PACE, Inc. Soil geotechnical analysis was conducted by Geotechnics. Analytical results and geological findings are discussed in the following sections.

4.1.1 Soil and Sediment

The analytical results of the sampling event for the soil borings and septic tank sediment are presented in Table 4-1. Soil samples SB-1 and SB-2 represent samples taken from the two soil borings in the MARC drainage field. Sample SB-3 represents the sediment sample from the septic

4.1.2 <u>Groundwater</u>

The analytical results of the first groundwater sampling event are shown in Table 4-2. These results include analyses of groundwater from MW-1A, MW-2A, MW-2B, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, and MW-11.

Table 4-3 presents the analytical results of the second groundwater sampling event. These results include analyses of groundwater from MW-7, MW-8, MW-9, MW-10, and MW-11.

Figures 4-1 and 4-2 present groundwater contour maps for the perched system and lower silts/sands aquifer, respectively, based on water level readings taken from all wells during the second round of groundwater sampling (i.e., November 14 and 15, 1991). These water level readings are presented in Table B-2 of Appendix B.

4.1.3 Geological Data

The geology encountered by borings for MW-7, MW-8, MW-9, MW-10, and MW-11 is very similar to the general stratigraphic sequence observed by Jordan (Jordan, August 1990). The boring logs from the new well locations provide additional geologic information off site to the east between the MARC and the Ranney Collector "B" well, while the Jordan report could only infer geologic information beyond the MARC area.

The site geology, as interpreted by Jordan, is depicted on Figures 2-3, 2-4, and 2-5 for Cross Sections A-A, B-B, and C-C, respectively, of Figure 2-2. A new Section D-D, which passes through four of the new wells, has been created on Figure 2-2 to show the additional information gained. The subsurface profile for Cross Section D-D is interpreted on Figure 2-6.

As shown on Figures 2-3, 2-4, and 2-5, the principal strata correlate with the strata identified on Figure 2-6. Figure 2-6 shows the uppermost interval as silts/sands with clay lenses in the vicinity of MW-7, MW-8, and MW-11. The silts/sands aquifer is the perched system described by Jordan. Water in the perched zone may seasonally discharge near Well MW-7. The discharged volume would be fairly low since the recharge area is limited. The clay lenses, indicated on Figure 2-6 near MW-7, MW-8, and MW-11 may also create perched water conditions and result in additional low-volume discharges.

The perched system overlies a lower permeability zone which is the clay till aquitard described by Jordan. The information acquired from the deep monitoring wells indicates the clay till aquitard consists of clay layers, silts, and sands. Beneath the clay till aquitard is a silts/sands aquifer comparable to the sand aquifer identified by Jordan.

A clay or silty clay layer was identified in all boring logs which intersected the upper portion of the clay till aquitard. In Boring S-29, this same clay/silty clay layer is probably indicated as the "yellow clay." Although Jordan surmised that the clay till aquitard is probably the Haven Till and outcrops on the shoreline bluffs, the drilling logs for nearby Boring S-29 do not indicate low permeability layers except the "yellow clay." This apparent discrepancy can be resolved by considering that the purpose of Boring S-29 was to locate thick, highly-permeable zones for Collector "B" and not to detect relatively thin clays or silts. Therefore, although only the clay/silty clay upper portion of the clay till aquitard can be shown to extend from MARC to S-29, the complete clay till aquitard likely also extends across the site.

4.2 DATA EVALUATION

An evaluation of the analytical results for soil, sediment, and groundwater is presented in the following sections. The analytical results are presented in Tables 4-1, 4-2, and 4-3 for the chemical parameters listed in Table 3-2. In addition, an interpretation of the geological findings and a hydrogeologic evaluation are also presented as part of the geologic evaluation.

4.2.1 Soil and Sediment

The results of the chemical analyses for the soil samples and septic tank sediment sample (Table 4-1) were below detection limits (i.e., CRLs) for each of the analytes. This indicates that the soil and sediment samples were not contaminated with any of the chemicals in the list of parameters (Table 3-2).

4.2.2 Groundwater

The results of the chemical analyses for the first (Table 4-2) and second (Table 4-3) rounds of groundwater samples were below detection limits for each of the analytes. This indicates that the groundwater samples were not contaminated with any of the chemicals in the parameters list. Based on this FSI, the groundwater analyses also indicate that the groundwater quality at the time of sampling meets the MCLs of the federal primary drinking water standards for all of the analytes for which MCLs exist. Additionally, the groundwater analyses indicate that the groundwater quality meets Wisconsin groundwater standards for trichloroethylene and 1,2-dichloroethane.

4.2.3 Geological Evaluation

Three distinct water-bearing zones were identified from Cross Section D-D (Figure 2-6). These include the perched system (i.e., upper silts/sands unit) that overlies the clay till aquitard that in-turn overlies the lower silts/sands aquifer. The perched system was monitored by MW-7. The lower permeability zone was monitored by MW-11. The silts/ sands aquifer is tapped by Collector "B" and was monitored by MW-10, MW-8, and MW-9. The significant ground-water zones are the perched system and the deeper silts/sands aquifer. The clay till aquitard is also saturated, however, due to the low permeability, the clay till aquitard is not considered a significant groundwater zone. Groundwater elevations are tabulated in Appendix B for November 14 and 15, 1991. Groundwater contour maps of the perched system and deeper silts/sands aquifer are shown on Figures 4-1 and 4-2, respectively.

The groundwater contour map of the perched system, Figure 4-1, shows a groundwater divide near MW-6. This same divide was shown in Jordan's water table contour map for October 1989. The divide could result from recharge from the drainage field, topography, surface permeability contrasts such as paved areas and ditches, or a combination of these factors. Since the perched system is thin and near the surface, the divide may also be affected by seasonal changes.

Surface drainage into the perched zone from the eastern portion of MARC towards Collector "B" is restricted by the divide. Since the recharge area is relatively small, any perched water discharged in the seeps would be a low volume.

The divide also affects the direction of the perched system groundwater gradient. As indicated on Figure 4-1, MW-6 is upgradient of MW-2A and MW-7. Therefore, even if seasonal factors significantly affect the divide (and the gradients) either MW-7 or MW-2A will always be downgradient of MW-6. Since 1,2-dichloroethane was detected only in MW-6 and never in MW-2A or MW-7, the source of the 1,2-dichloroethane possibly never existed, or is unique to MW-6, or has degraded to concentrations below detection limits prior to reaching MW-7 or MW-2A.

The groundwater contour map for the deeper silts/sands aquifer, Figure 4-2, indicates a local groundwater gradient to the southeast. Monitoring Wells MW-8, MW-9, and MW-10 monitor the deeper aquifer and are downgradient of MARC. Notably, MW-9 does not monitor the groundwater quality for TCE which may have migrated from the dry well (as was planned), due to the direction of the groundwater gradient. In addition, 1,2-dichloroethane and TCE were not detected in MW-8 and MW-10. Therefore, the deep aquifer in the vicinity of Wells MW-2B, MW-8, MW-9, and MW-10 does not contain detectable concentrations of 1,2-dichloroethane, TCE, or any of the analytes listed in Table 3-2.

4.3 DATA SUMMARY

The same type of geology identified by Jordan was found from this FSI; namely, three distinct water-bearing zones including the perched system, the clay till aquitard, and a deeper aquifer were identified. While Jordan's investigation included monitoring of the groundwater quality in the perched system and deeper aquifer within the MARC boundaries, OHM monitored the groundwater quality downgradient in those same units both within and beyond the Marc boundaries.

Analytical results from groundwater, soil, and sediment sampling during this FSI were not significant in defining limits/sources of contamination. In summary, analytical results of groundwater, soil, and sediment indicate that all analytes, in particular, TCE and 1,2-dichloroethane, are below detection limits. Therefore, the drainage field and septic tank areas where the soil and sediment samples were taken, respectively, are not sources of TCE or 1,2-dichloroethane contamination; or any such contamination which may have originated there has degraded. In addition, based on analytical results from MW-7, MW-8, MW-9, MW-10, and MW-11, groundwater data between MARC and Collector "B" does not indicate the presence of 1,2-dichloroethane or TCE.

Because of the groundwater divide identified at or near MW-6 and gradients of the perched system identified towards the east and west, it is not certain whether 1,2-dichloroethane detected in MW-6 by Jordan degraded in this vicinity or migrated east or west. It is appropriate to say, though, that if it migrated either way, it has degraded since analytical results from groundwater samples from MW-7 (to the east) and from MW-2A (to the west) did not contain detectable concentrations.

5.0 CONCLUSIONS

Based on the data presented and evaluated in the preceding sections and in response to the objectives, the following conclusions can be drawn:

- o MARC is not the source of the TCE detected in the MPU Collector "B." TCE has not been detected in any of the soil samples collected from the potential on-site source areas. In addition, TCE has never been detected in any of the groundwater samples from the perched system, clay till aquitard, or silts/sands aquifer.
- o 1,2-Dichloroethane has not likely migrated off site toward Collector "B." 1,2-Dichloroethane was not detected in any of the groundwater samples collected in 1991 and was detected at concentrations only slightly above the detection limit in one well in 1989. Therefore, 1,2-dichloroethane possibly never actually existed in groundwater on the MARC. If 1,2-dichloroethane ever did exist on the MARC, the concentration has decreased to below detection limits since it was not detected in any groundwater sample collected under this investigation.

TABLES

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TABLE 2-1

MONITORING WELL AND SOIL SAMPLING INFORMATION AND RATIONALE MANITOMCC ARMY RESERVE CENTER FOLLOW-ON SITE INVESTIGATION

RATIONALE/CONNENTS	Shallow well in a 2-well cluster (MM-8) downgradient of MM-6 screened in the shallow water table to determine if 1,2-dichloroethane (confirmed from MM-6 has migrated off site toward Collector Well "B."	Deep well in 2-well cluster (MM-7) screened at the same elevation as Collector Well "B" to determine whether MARC is the source of TCE at Collector Well "B."	Deep well screened at the same elevation as Collector Well "8" to determine whether MARC is the source of TCE at Collector Well "8."	Dcep well in a 2-well cluster (MV-6 shallow) screened at the same elevation as Collector Well "B" to determine if 1,2-dichloroethane has migrated into deep zone and whether MARC is the source of TCE at Collector Well "B."	Intermediate well between a 2-well cluster (MM-7, MM-8) screened in an intermediate water t ble to determine if 1,2-dichloroethane (confirmed from MM-6) has migrated off site toward Collector Well "8,"
SCREEN LENGTH	10 feet	15 feet	15 feet	15 feet	15 feet
TOTAL DEPT OF WELL	16 feet	105 feet	95 feet	120 feet	69 feet
PROPOSED LOCATION	East (downgradient) of septic tank and drainage field. On Silver Creek Park property.	East (downgradient) of septic tank and drainage field. On Silver Creek Park property.	East of vehicle wash rack and seeps. On Silver Creek Park property.	East of septic tank and drainage field on MARC property next to MM-6.	Between MJ-7 and MJ-8
MONITORING WELL/ TEST BORING ID NO.	2-M	89-7 4	6-784	MV-10	MV-11

TABLE 2-1 (CONTINUED)

RATIONALE/COMMENTS	Determine if the septic system is the source of 1,2-dichloroethane.	Determine if the septic system is the source of 1,2-dichloroethane.	Determine if the septic system is the source of 1,2-dichloroethane.
SCREEN LENGTH	N/A	N/A	N/A
TOTAL DEPTH	5 feet	5 feet	Bottom of tank
PROPOSED LCCATION	Drainage Field	Drainage Field	Septic Tank
SOIL SAMPLE NO.	58-1	SB-2	M:-85

ANALYTICAL METHODS SUMMARY FOLLOW-ON SITE INVESTIGATION MANITOWOC ARMY RESERVE CENTER

TABLE 3-1

USATHAMA METHOD NO.	USEPA METHOD NO.	CERTIFIED PARAMETERS	MATRIX
UG03	601/8010	Volatile halocarbons (e.g., trichloroethylene)	Water
LG03	8010	Volatile halocarbons	Soil/Sediment
UP01	602/8020	Volatile aromatic hydro- carbons (e.g., benzene)	Water
LP01	8020	Volatile aromatic hydro- carbons	Soil/Sediment

TABLE 3-2

VOLATILE ORGANIC COMPOUNDS FOLLOW-ON SITE INVESTIGATION MANITOWOC ARMY RESERVE CENTER

TEST <u>NAME</u>	VOLATILE HALOCARBONS
NAME 111TCE 112TCE 11DCE 11DCLE 12DCE 12DCLE 12DCLP C2H3CL CCL4 CH2CL2 CHCL3 TCLEE TCLTFE	1,1,1-Trichloroethane 1,1,2-Trichloroethane 1,1-Dichloroethylene 1,1-Dichloroethylene 1,2-Dichloroethylenes (cis and trans isomers) 1,2-Dichloroethane 1,2-Dichloropropane Chloroethene/Vinyl Chloride Carbon Tetrachloride Methylene Chloride Chloroform Tetrachloroethylene 1,1,2-Trichloro-1,1,2-trifluoroethane
TRCLE	Trichloroethylene

VOLATILE AROMATIC HYDROCARBONS

C6H6	Benzene
MEC6H5	Toluene
TXYLEN	Total Xylene

Note: Test names correspond to the analytes presented in Appendix D, Analytical Results.

SUMMARY OF MONITORING WELL INSTALLATION
AND CONSTRUCTION DETAILS
FOLLOW-ON SITE INVESTIGATION

TABLE 3-3

MANITOWOC ARMY RESERVE CENTER

MONITORING	DIAMETER	TOTAL DEPTH	SCREEN LENGTH		VATION (SL)
WELL	(INCHES)	(FEET)	(FEET)	GROUND	TOP OF PVC
7	2	16	10	644.09	646.33
8	2	105	15	634.69	636.95
9	2	95	15	616.47	619.02
10	2	120	15	650.62	652.99
11	2	69	15	638.45	640.18

TABLE 4-1

ANALYTICAL RESULTS SOIL AND SEDIMENT SAMPLING FOLLOW-ON SITE INVESTIGATION MANITOWOC ARMY RESERVE CENTER SAMPLING DATE - AUGUST 28, 1991

	SB-1	SB-2	SB-3
PARAMETER	(MB/B)	(ng/g)	(ME/E)
Benzene	<1.20	<1.20	<1.20
Toluene	<0.65	<0.65	<0.65
Xylenes	<4.94	<4.94	<4.94
1,1,1-Trichloroethane	<8.10	<8.10	<8.10
1,1,2-Trichloroethane	<7.00	<7.00	<7.00
1,1-Dichloroethylene	<8.50	<8.50	<8.50
1,1-Dichloroethane	<2.90	<2.90	<2.90
1,2-Dichloroethylenes	<3.30	<3.30	<3.30
1,2-Dichloroethane	<3.00	<3.00	<3.00
1,2-Dichloropropane	<5.90	<5.90	<5.90
Vinyl Chloride	<0.92	<0.92	<0.92
Carbon Tetrachloride	<1.70	<1.70	<1.70
Methylene Chloride	<3.60	<3.60	<3.60
Chloroform	<2.90	<2.90	<2.90
Tetrachloroethylene	<4.10	<4.10	<4.10
1,1,2-Trichloro-1,2,2-Trifluoroethane	<7.20	<7.20	<7.20
Trichloroethylene	<2.60	<2.60	<2.60

Notes:

¹⁾SB-1 and SB-2 - Soil samples from the drainage field, hand-augered to approximately 4.5 feet.

²⁾SB-3 - A sediment sample from the septic tank.

TABLE 4-2

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AWALYTICAL RESULTS
GROUNDWATER SAMPLING
FOLLOW-ON SITE INVESTIGATION
MANITOMOC ARMY RESERVE CENTER
SAMPLING DATE - SEPTEMBER 26, 1991

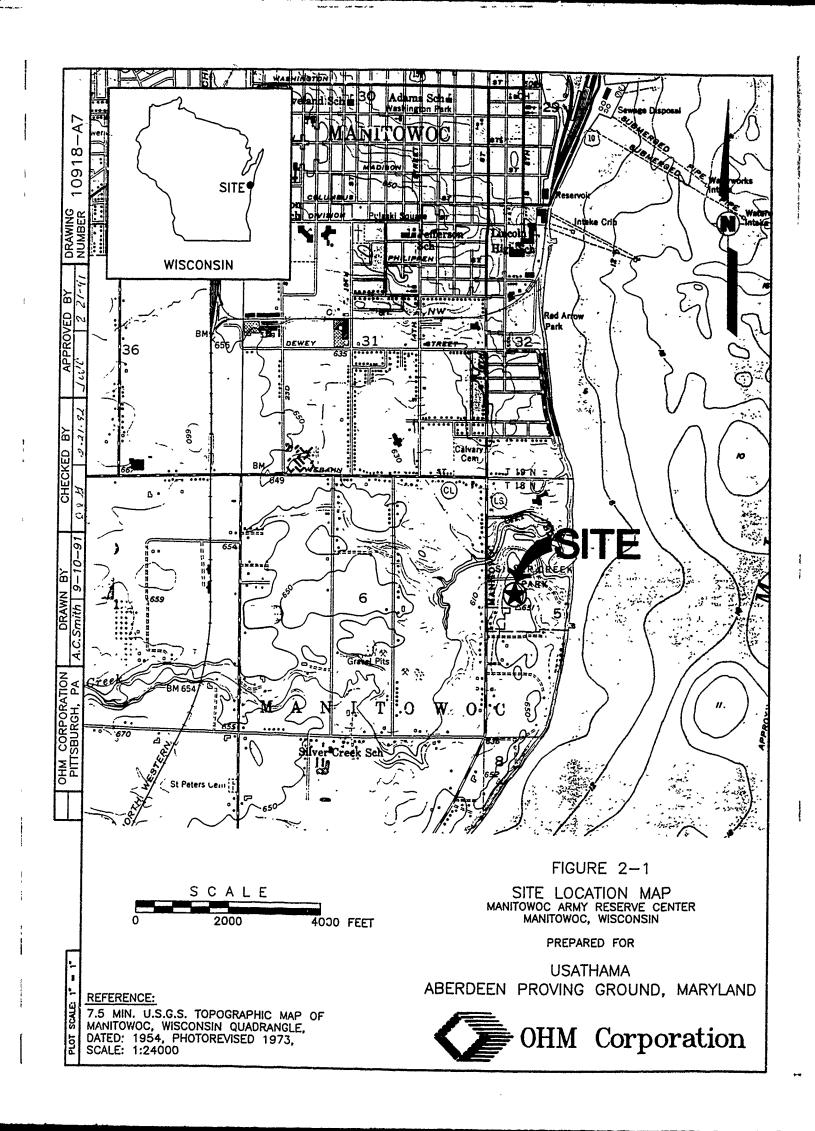
DAPAMETER	MV-1A	MV-2A	MV-28	M4-3	7-74	H4-5	9-M	7-W	FR8	6-NH	HW -10	HU-11
NATIONAL INVESTIGATION OF THE PROPERTY OF THE	77671	(1/6#)	(1/6#)	(176#)	(1/6#5	(1/6#5	(1/6#)	71/6#3	(1/6#)	(1/6#)	(1/6#)	(1/6#)
Benzene	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.4;	<0.41	<0.41	<0.41	17 0>	£0 71
Toluene	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	<0.87	78.0>
Xylenes	<8.28	<8.28	<8.28	<8.28	<8.28	<8.28	<8.28	<8.28	<8.28	<8.28	28.28	\$ 60 80 80 80 80 80 80 80 80 80 80 80 80 80
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	41.00	4.00	41.00	×1.00	2. C
1,1,2-Trichloroethane	<1.00	<1.00	~1. 00	<1.00	<1.00	<1.00	×1.00	<1.00	<1.00	41.00	<1.00	.00 .00
1,1-Dichloroethylene	<1.00	<1.00	~1. 00	~1. 00	~1.00	~1. 00	×1.00	٠1.00	<1.00	<1.00	×1.00	<1,00
1,1-Dichloroethane	<0.78	<0.78	<0.78	<0.78	<0.78	60.78	<0.78	<0.78	<0.78	<0.78	<0.78	<0.78
1,2-Dichloroethylenes	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	<1.00	~1. 00	<1.00	~1. 00	<1.00	~1. 00	<1.00	<1.00	<1.00	<1.00	61. 00	<1.00
Vinyl Chloride	<1.90	~1. %	~1. %	4.8	41.9 0	۸. <u>۲</u>	~1. 90	41.90	<u>م.</u> 2	<1.90	۸. 8.	.1°
Carbon Tetrachloride	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30
Methylene Chloride	<3.20	<3.20	<3.20	<3.20	<3.20	<3.20	<3.20	<3.20	<3.20	<3.20	<3.20°	<3.20
Chloroform	<0.72	40.7 2	6.7 2	40.72	40.72	¢0.72	6.72	6.72	40.72	6.72	40.72	\$0.5°
Tetrachloroethylene	<1.00	<1.00	⊶ .00	~1. 00	<1.00	<1.00	~1.00	~1. 00	×1.00	٠ <u>1</u> .00	٠ <u>۲</u>	6.5
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.00	 0	~1.00	~1.0 0	~1. 00	~1. 00	~1. 00	<1.00	41.00	<1.00	×1.00	<1.00
Trichloroethylene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

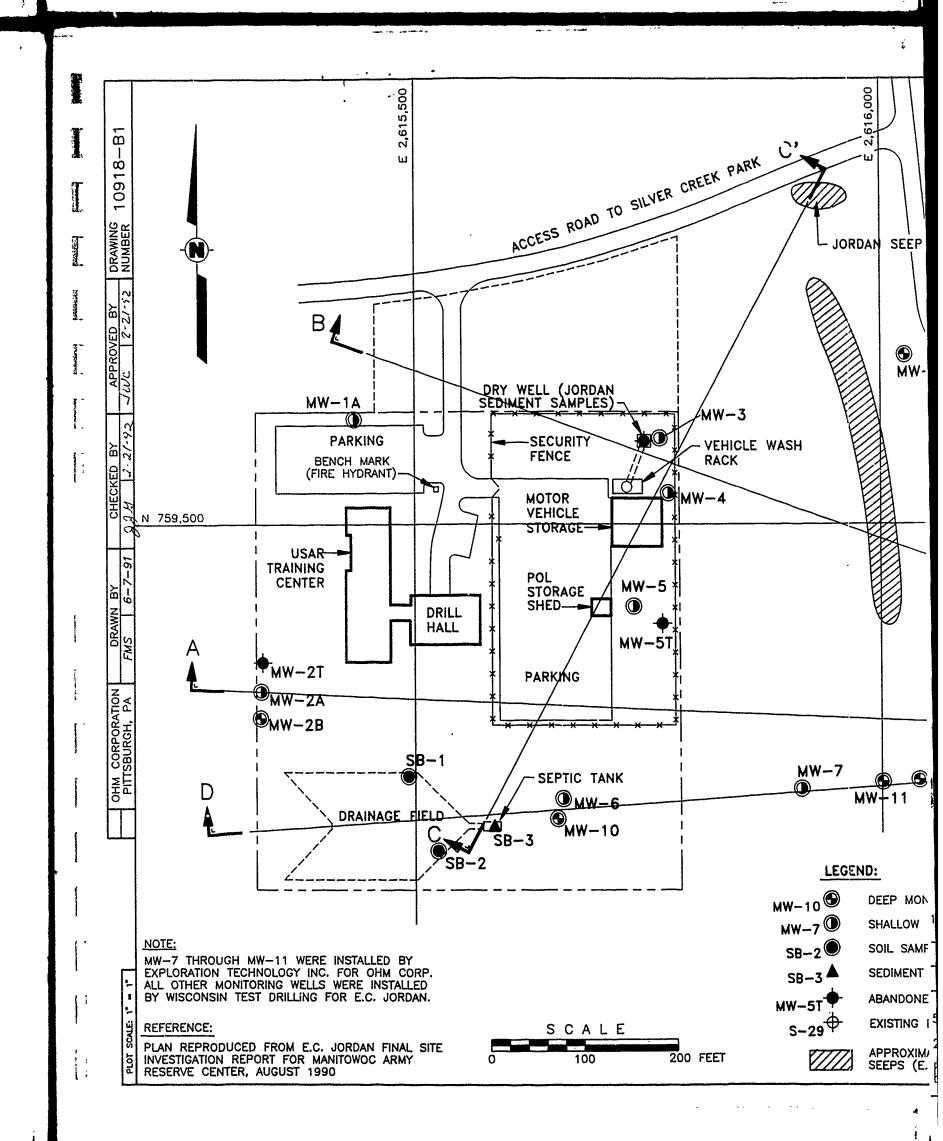
TABLE 4-3

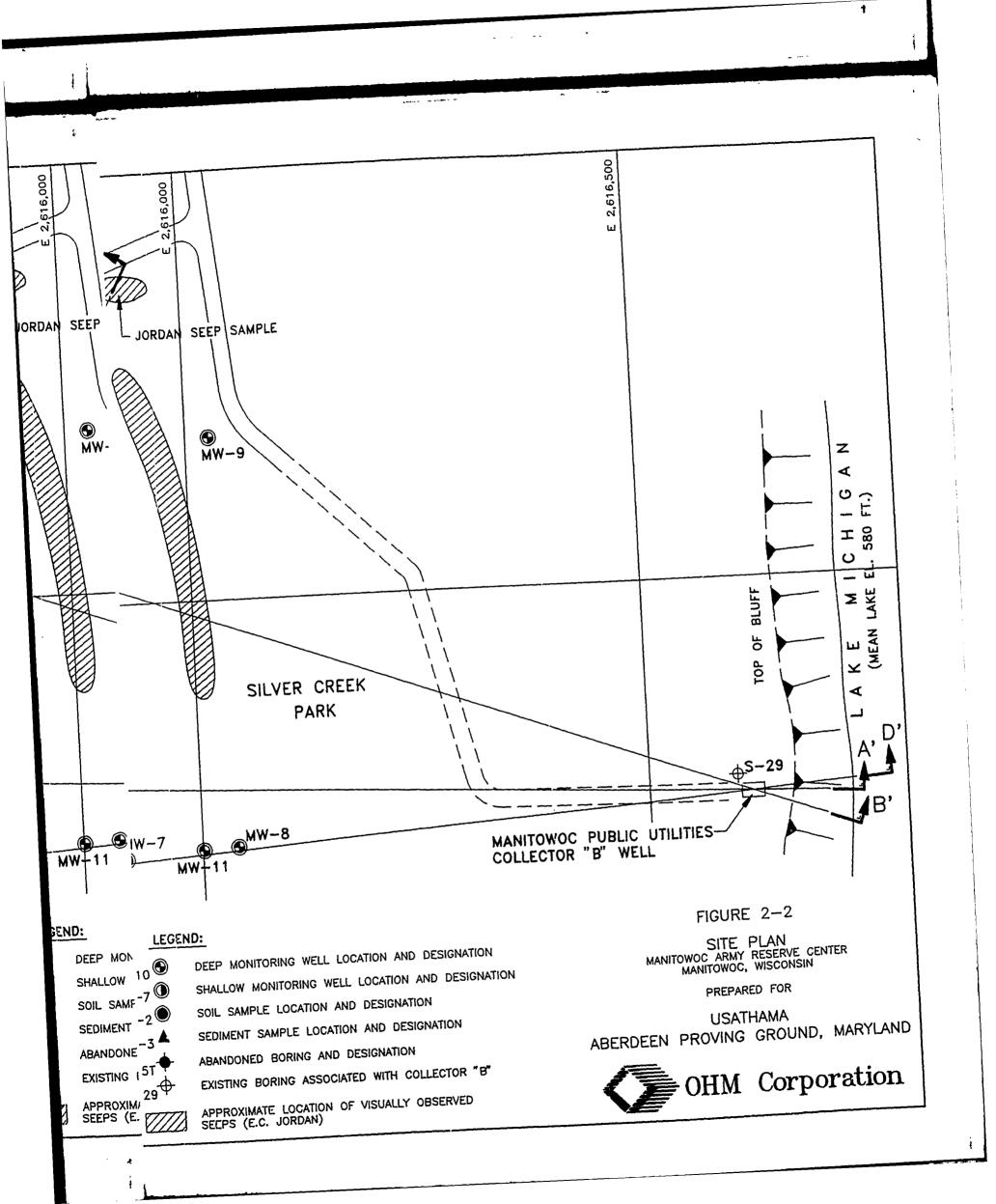
ANALYTICAL RESULTS GROUNDWATER SAMPLING FOLLOW-ON SITE INVESTIGATION MANITOWOC ARMY RESERVE CENTER SAMPLING DATE - NOVEMBER 14 AND 15, 1991

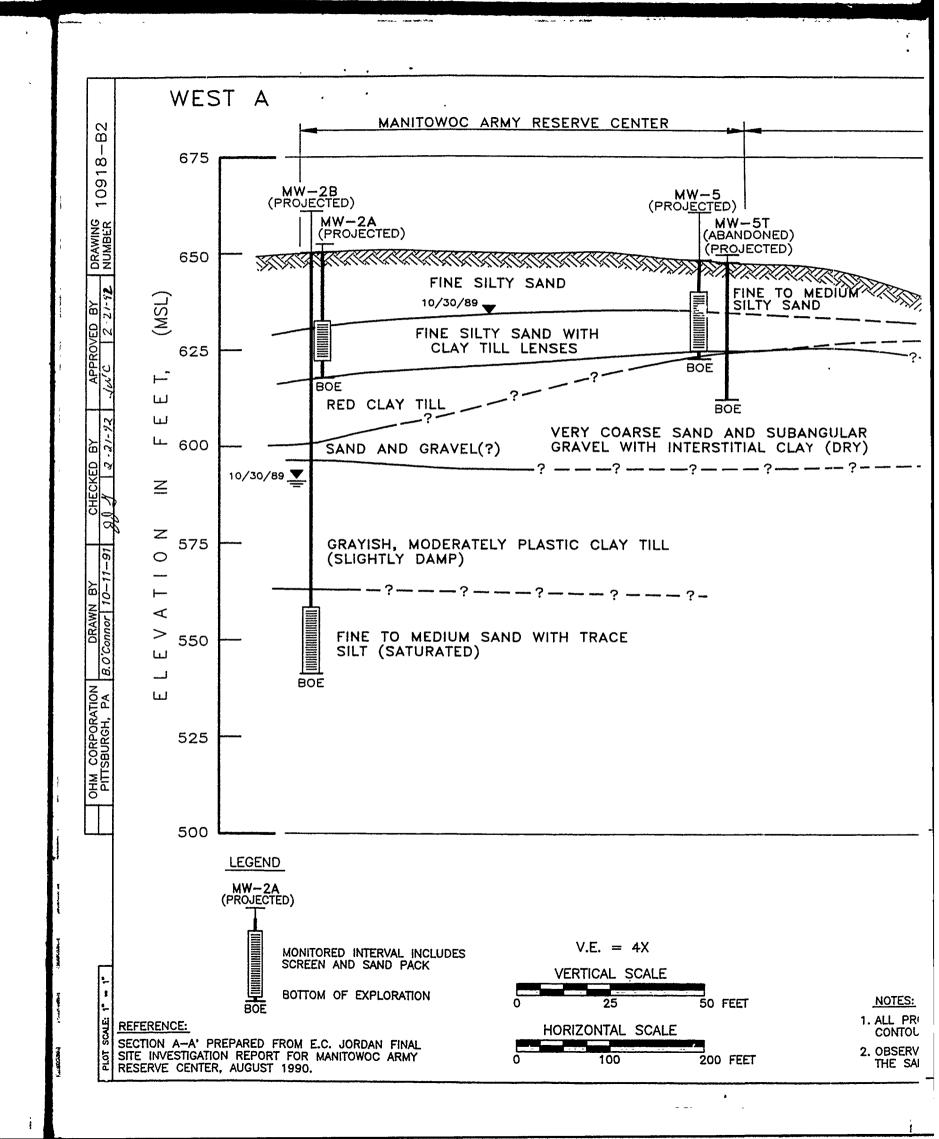
PARAMETER '	MW-7 (49/1)	MW-8 (1\04)	MW-9 (<u>49/1)</u>	MW-10 (#g/l)	MV-11 (µg/l)
Benzene	<0.41	<0.41	<0.41	<0.41	<0.41
Toluene	<0.87	<0.87	<0.87	<0.87	<0.87
Xylenes	<8.28	<8.28	<8.28	<8.28	<8.28
1,1,1-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloroethane	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00
1,1-Dichloroethane	<0.78	<0.78	<0.78	<0.78	<0.78
1,2-Dichlorcethylenes	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	<1.00	<1.00	<1.00	<1.00	<1.00
Vinyl Chloride	<1.90	<1.90	<1.90	<1.90	<1.90
Carbon Tetrachloride	<1.30	<1.30	<1.30	<1.30	<1.30
Methylene Chloride	<3.20	<3.20	<3.20	<3.20	<3.20
Chloroform	<0.72	<0.72	<0.72	<0.72	<0.72
Tetrachloroethylene	<1.00	<1.00	<1.00	<1.00	<1.00
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.00	<1.00	<1.00	<1.00	<1.00
Trichloroethylene	<0.50	<0.50	<0.50	<0.50	<0.50

FIGURES









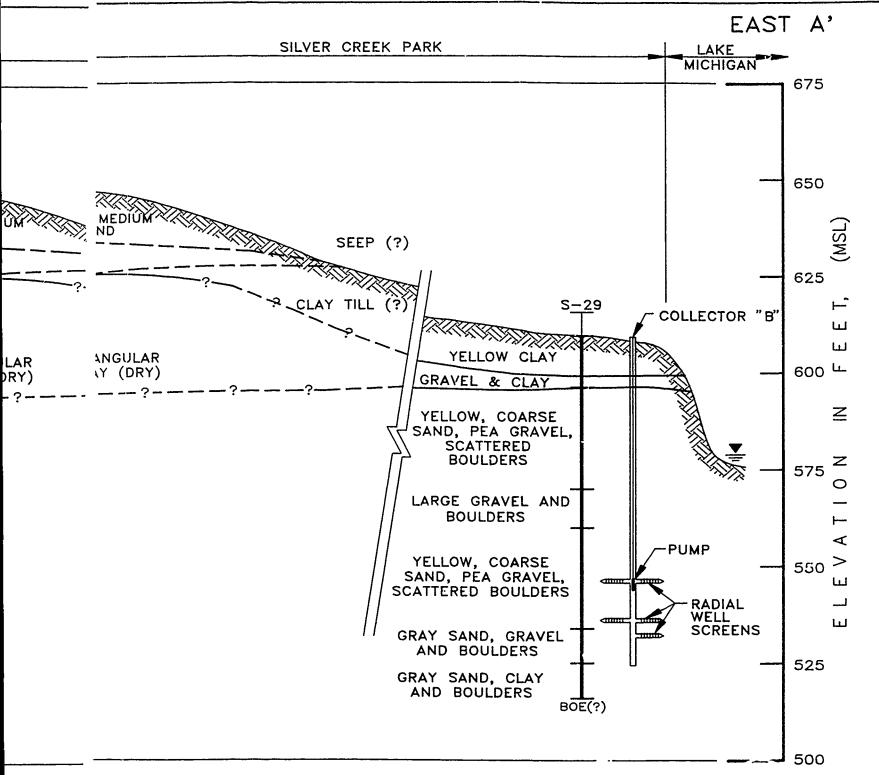


FIGURE 2-3

INTERPRETIVE GEOLOGIC CROSS—SECTION A—A' MANITOWOC ARMY RESERVE CENTER MANITOWOC, WISCONSIN

PREPARED FOR

USATHAMA ABERDEEN PROVING GROUND, MARYLAND

NOTES:

1. ALL PRI CONTOL

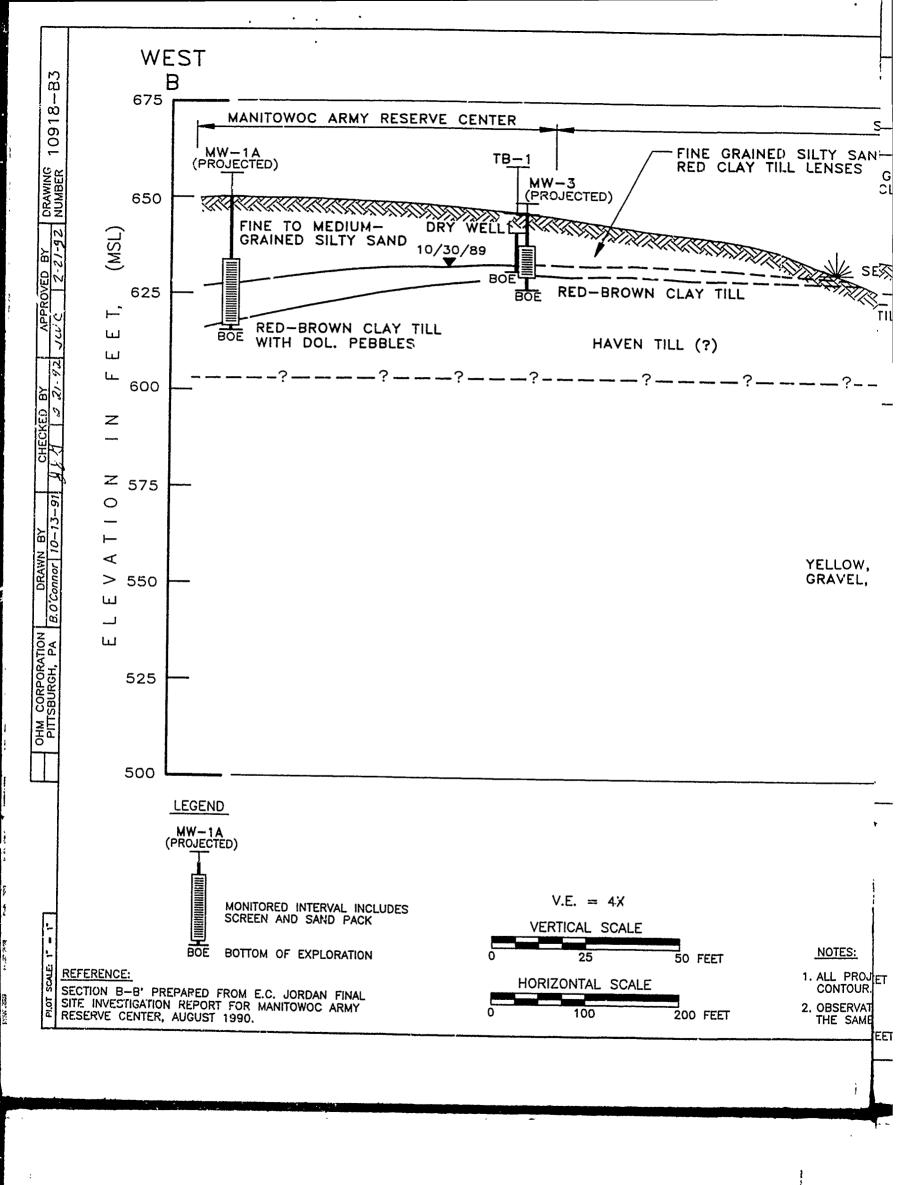
2. OBSERV THE SAI

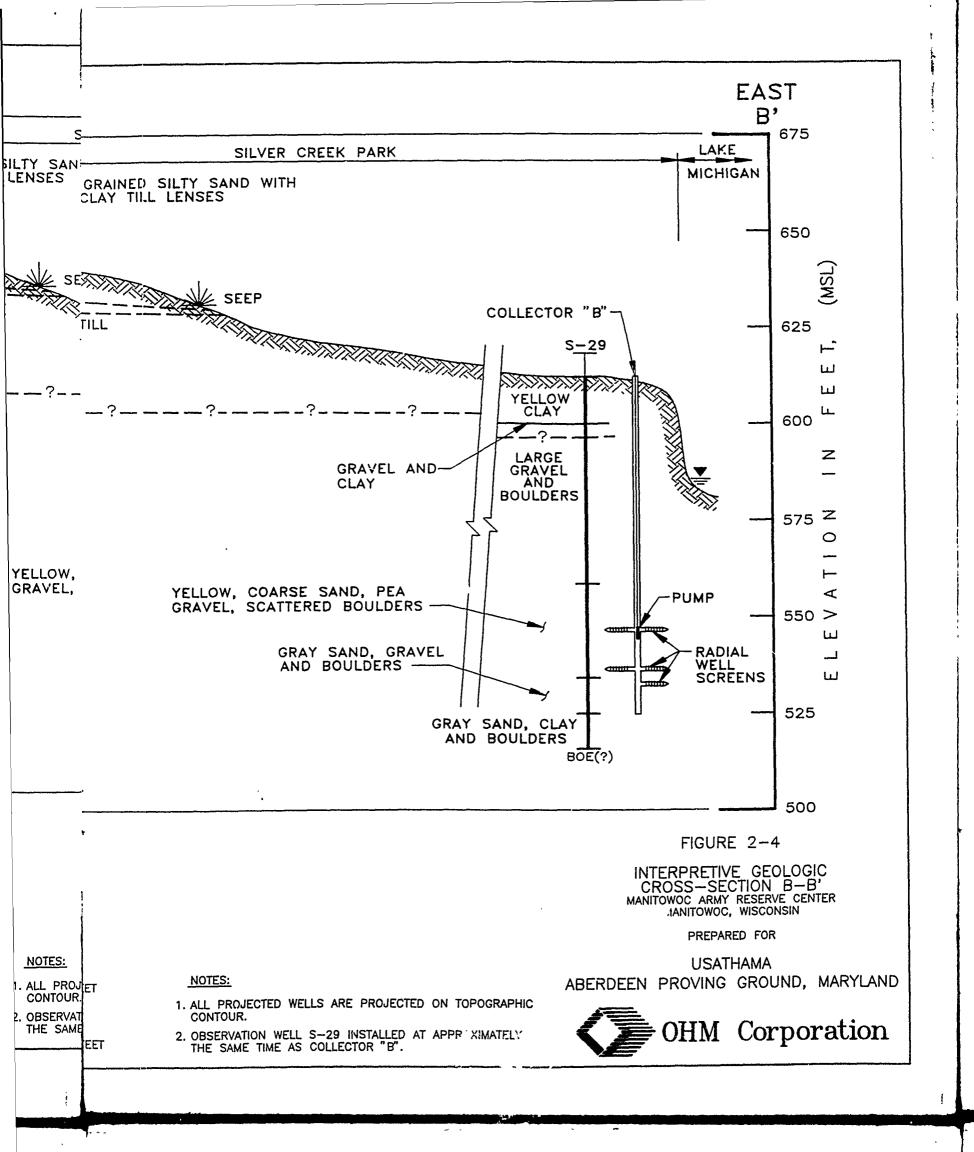
NOTES:

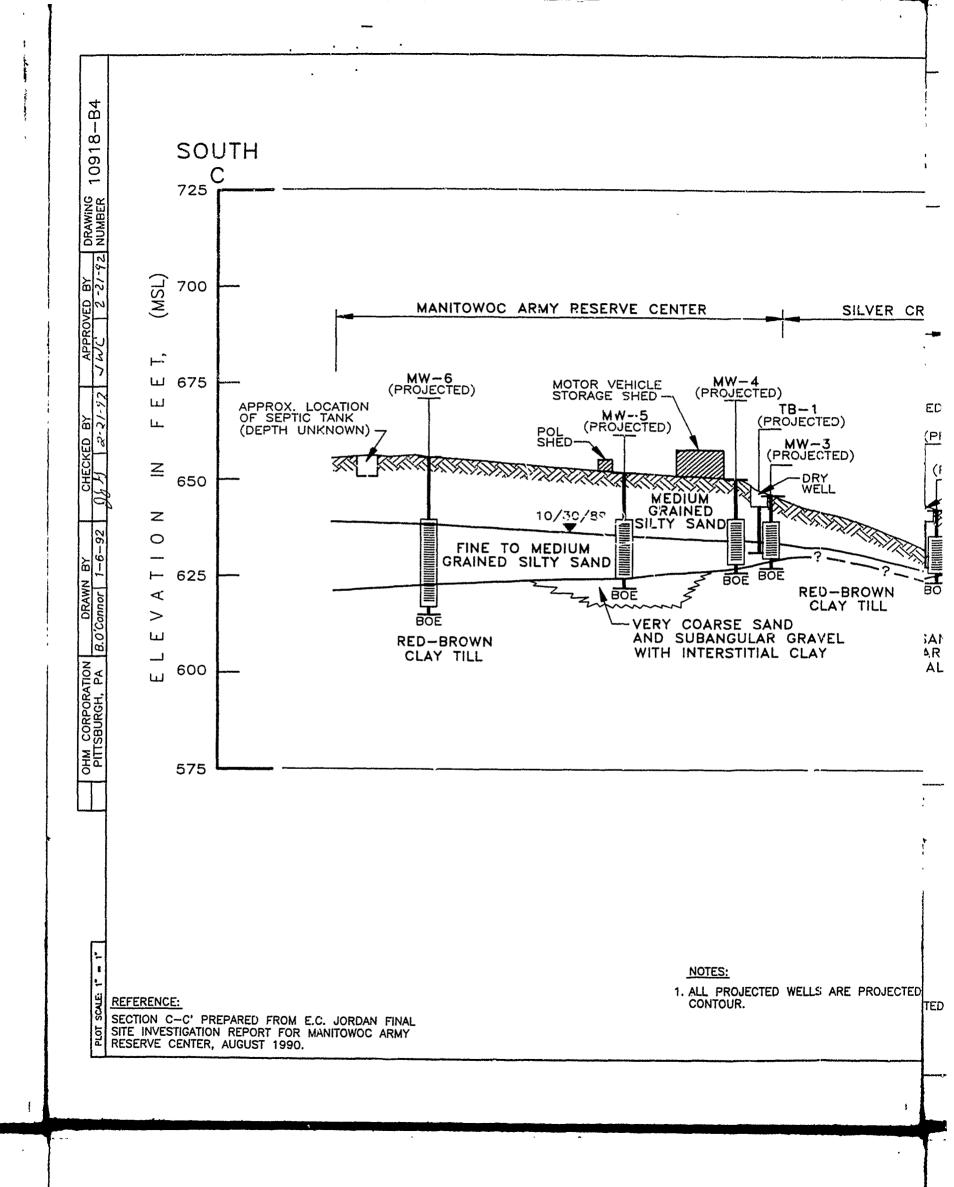
- 1. ALL PROJECTED WELLS ARE PROJECTED ON TOPOGRAPHIC CONTOUR.
- 2. OBSERVATION WELL S-29 INSTALLED AT APPROXIMATELY THE SAME TIME AS COLLECTOR "B".



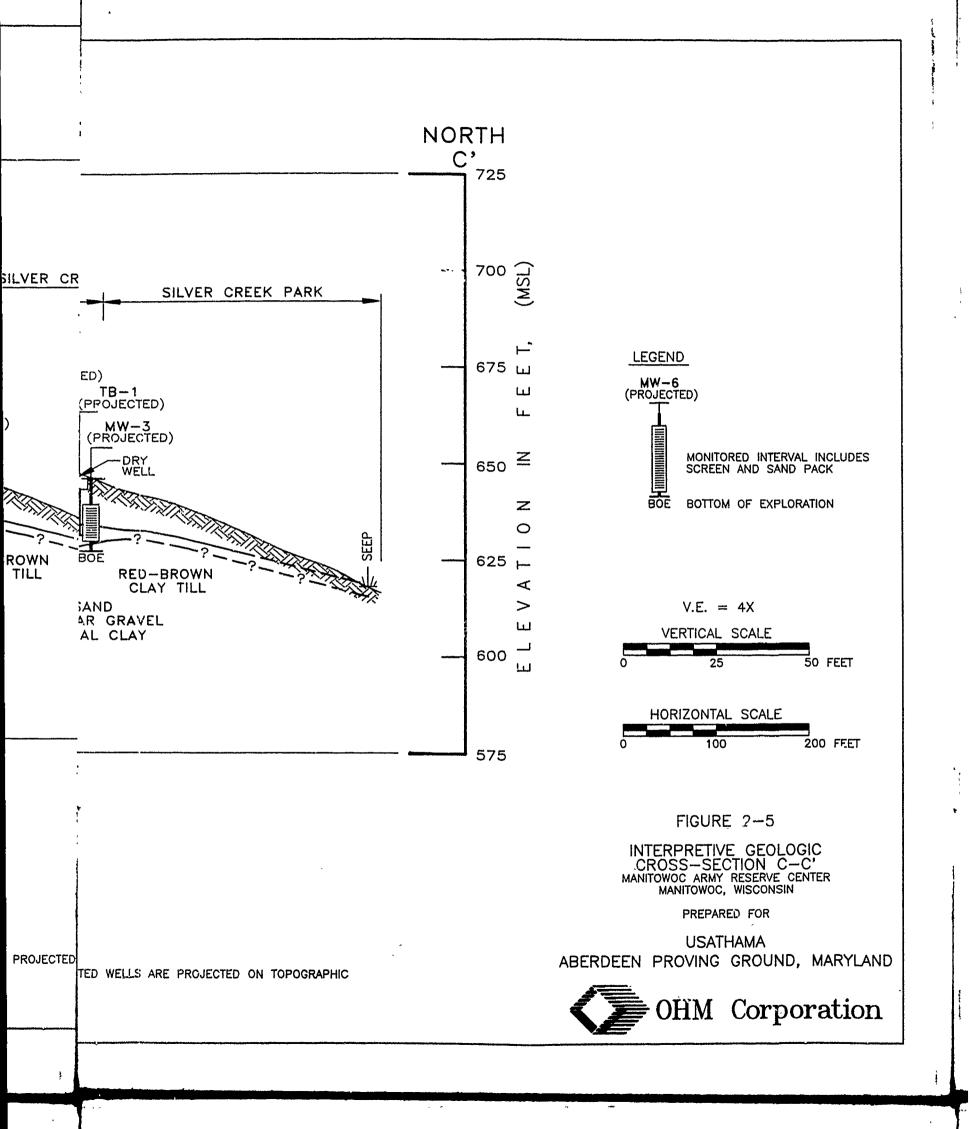
OHM Corporation

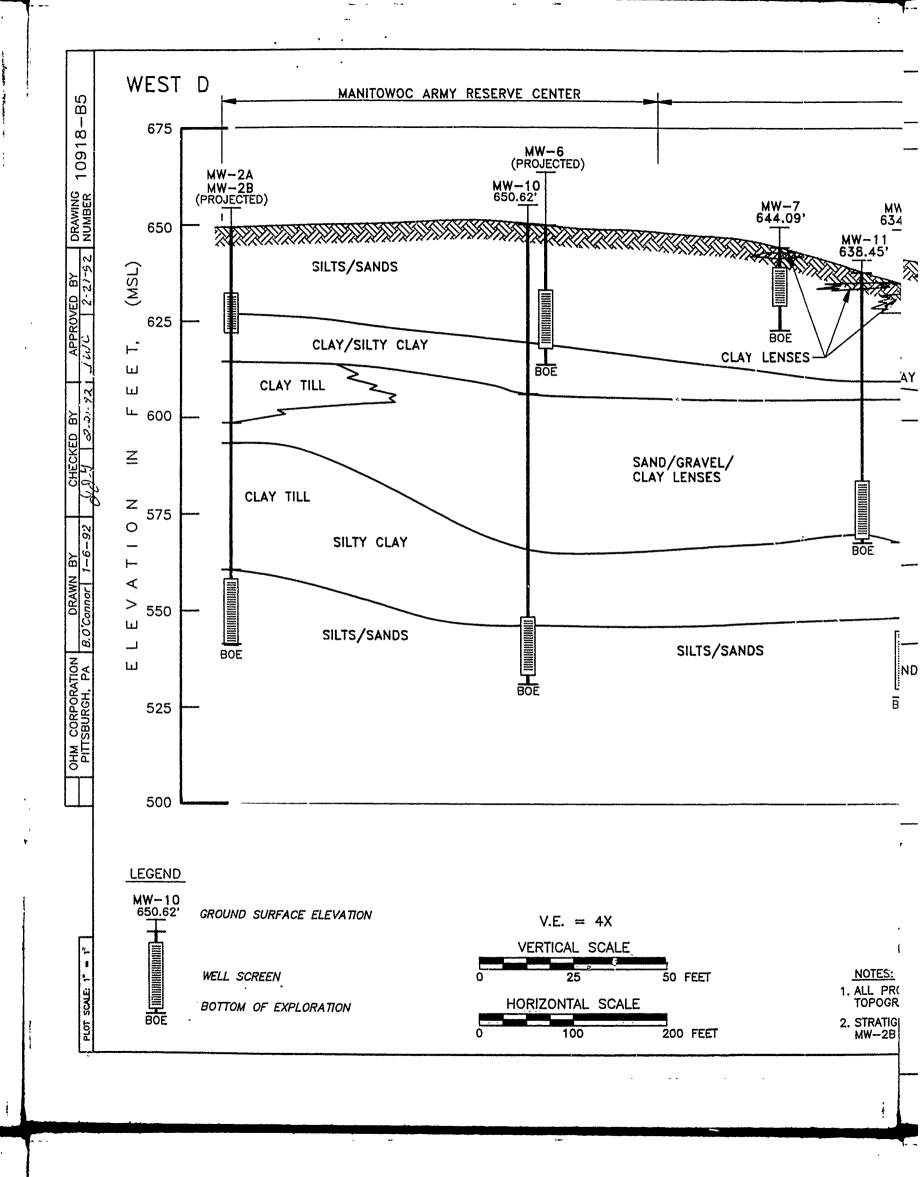


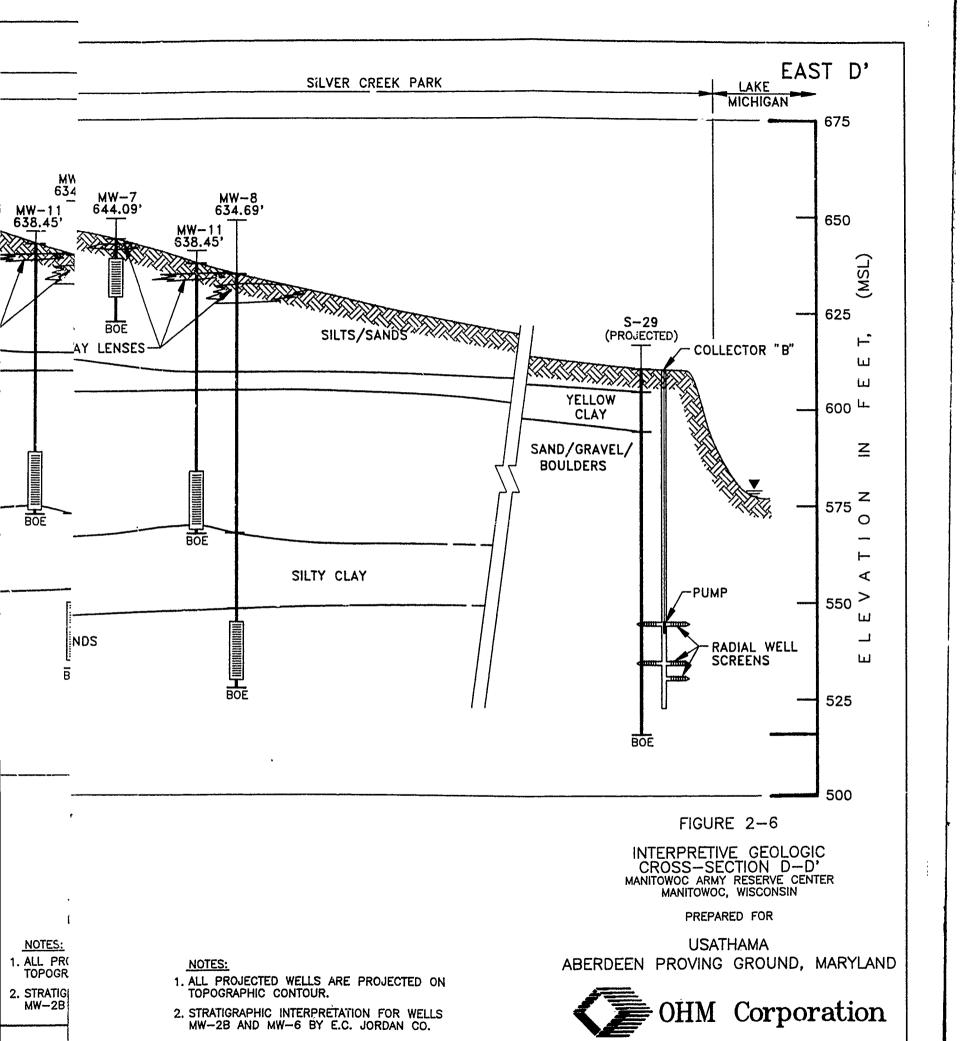


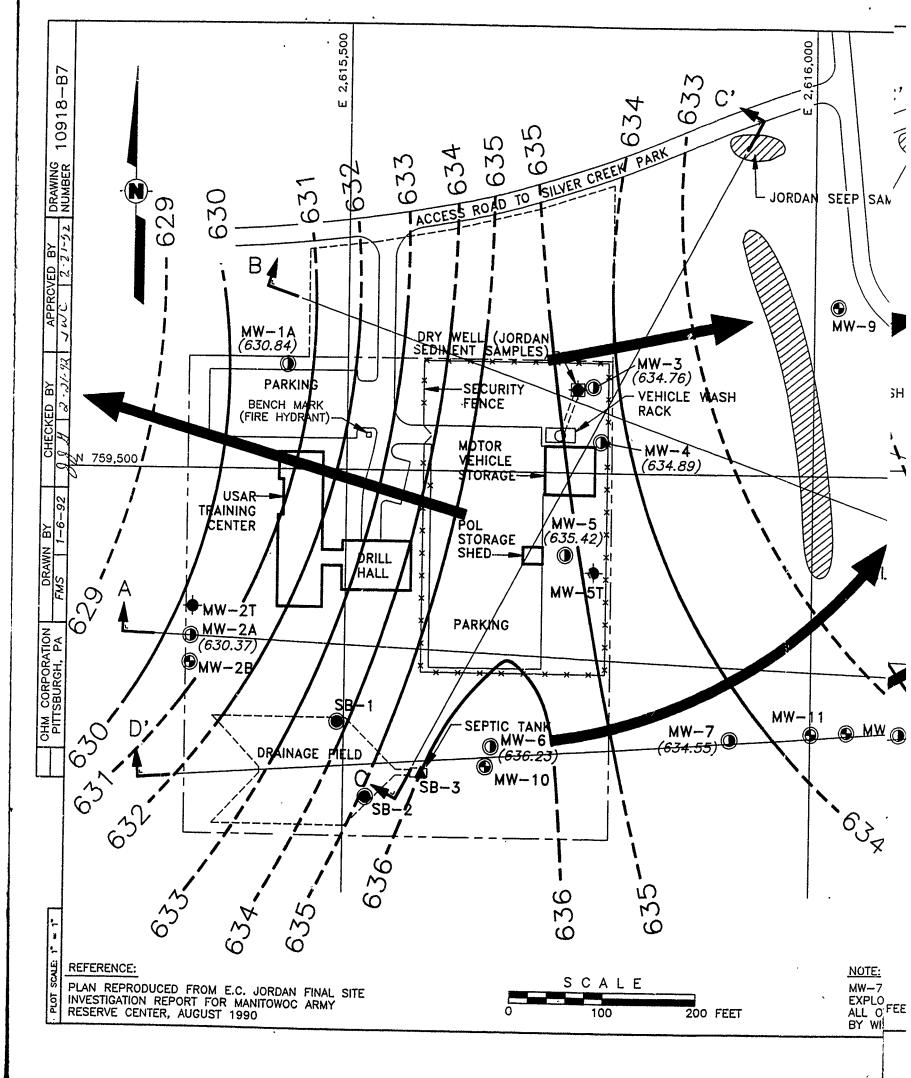


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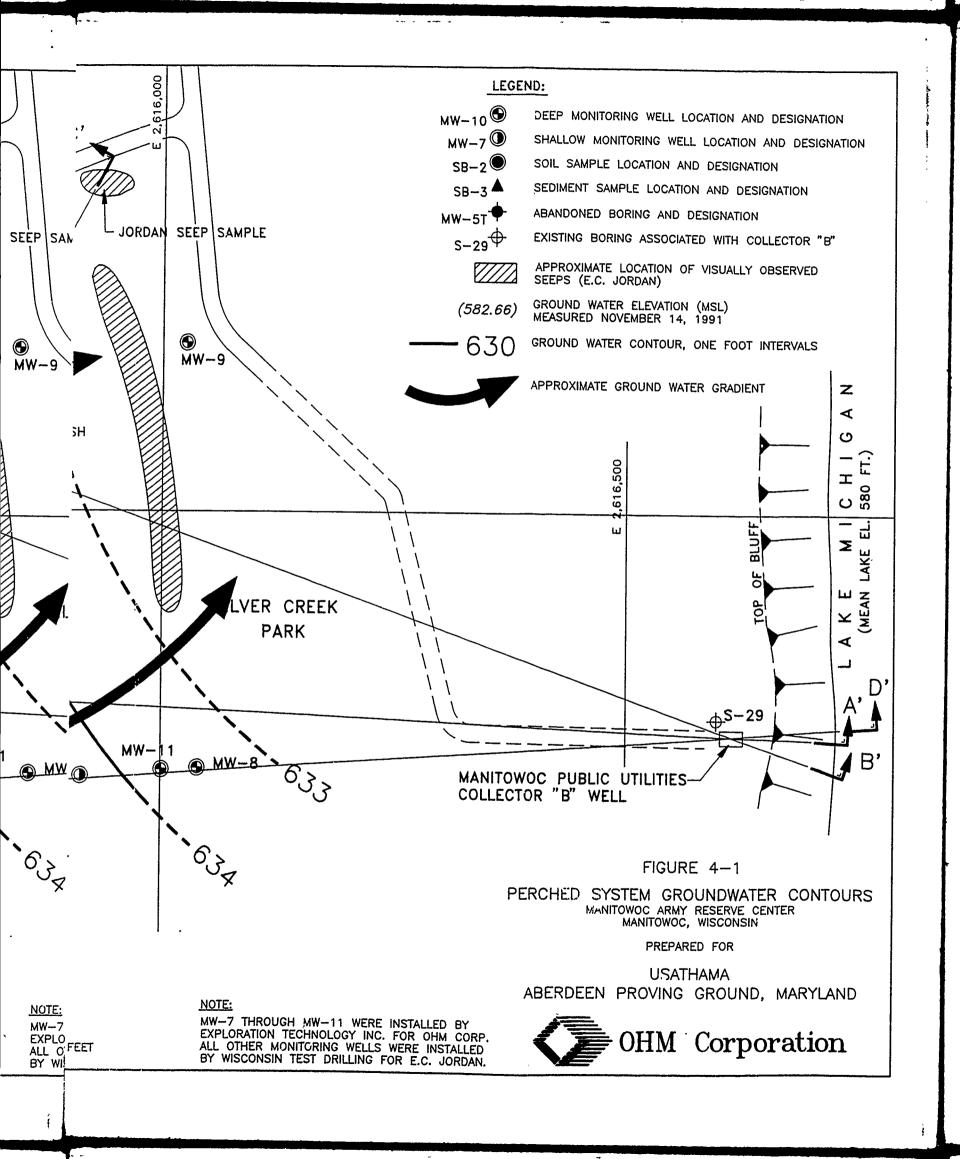


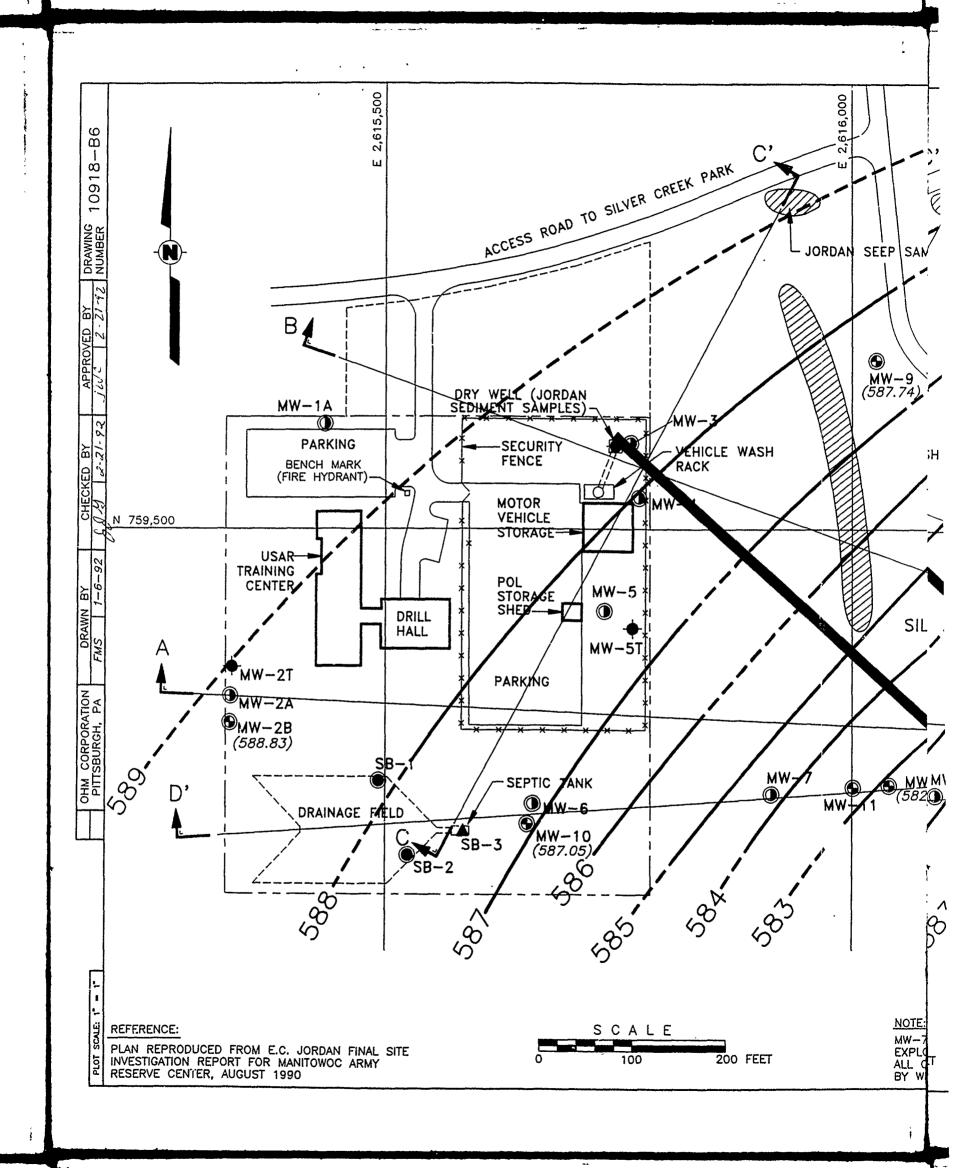
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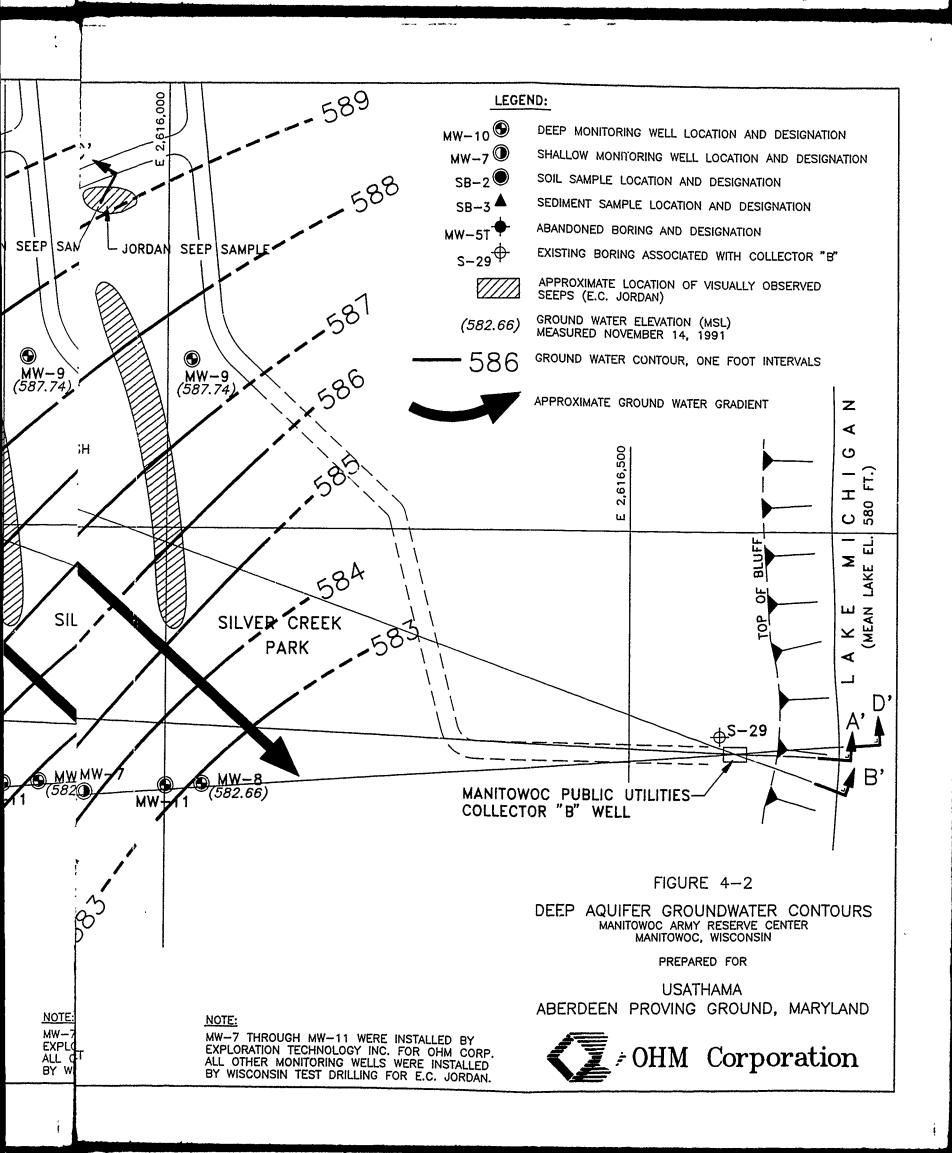
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APPENDIX A

BORING LOGS

SOIL BORING LOG INFORMATION Route To: State of Wisconsin Form 4400-122 7-91 Department of Natural Resources ☐ Solid Waste ☐ Emergency Response ☐ Underground Table ☐ Haz. Waste ☐ Water Resources □ Wastewater □ Other Page ______ of _____ 2 License/Permit/Monitoring Number Boring Number Facility/Project Name MW-7 MANITOWOC ARMY RESERVE CENTER Date Drilling Started Date Drilling Completed Drilling Method Boring Drilled By (Firm name and name of crew chief) EXPLORATION TECHNOLOGY, INC. HOLLOW-STEM <u>0 8 /1 3 /9</u> M M D D Y **AUGER** KEN TAYNOR DNR Facility Well No. W. Unique Well No. Common Well Name Final Static Water Level Surface Elevation Borehole Dia. 644.09 Feet MSL MW-7~629 _ Feet MSL <u>6</u> inches Local Grid Location (if Boring Location 44° 03' 45' 759,226.61 2,615,913.24 ΠN State Plane _ Long 87° 39' 35' SW 1/4 of NW 1/4 of Section 5 , T 18 N, R 24 E .Fect □W . Feet □S DNR County Code Civil Town/City/or Village County MANITOWOC 6 MANITOWOC SOIL PROPERTIES SAMPLE CLOUNTS DIAGRAM STANDARD
PENETRATION
MOISTURE
CONTENT LIMIT SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT Ø LENGTH REC. (in) PID/FID PLASTIC. NUMBER LIQUID ပ 200 BLOW WELL S ۵. \supset MEDIUM STIFF, DARK BROWN, ORGANIC SILT, SOME FINE SAND, MOIST ol CEMENT 2 sm VERY LOOSE, BROWN, FINE SAND, SOME SILT 1.0' S-1 3 2 VERY LOOSE, LIGHT BROWN, FINE SAND, TRACE sp - 2 SILT AND ROCK FRAGMENTS, MOIST 0 3.0 1 S-2 22 1 VERY SOFT, LIGHT BROWN, CLAY, SOME 뙲 2 GRAVEL STRINGERS 4.0' 2 LOOSE, DARK BROWN, MEDIUM TO COARSE 3 SW S-317 - 5 SAND, MOIST 4 5 6.0' **-** 6 LOOSE, LIGHT BROWN, FINE SAND, SOME 3 SILT, TRACE GRAVEL, MOIST 7.0 6 0 20 S-4 4 HARD, BROWN, SILT, MOIST ml 7 13 20 ML N/A 18.6% N/A N/A 99% HARD, BROWN, SILT, MOIST SCREEN 9 S-5 20 23 29 WELL 9 13 0 HARD, LIGHT BROWN, SILT, SOME SAND, MOIST S-6 21 ml 18 I hereby certify that the information on this form is true and correct to the best of my knowledge Firm OHM Remediation Services Corp. This Form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is separate offense, pursuant to ss 141.99 and 162.06, Wis. Stats.

W-74

State of Wisconsin Department of Natural Resources SOIL BORING LOG INFORMATION SUPPLEMENT Form 4400-122A 7-91

Boring		ber_	<u>MW-7</u>	7		,			,		2			_
SAM	PLE	ιχ					_	NOI		S	OIL P	ROP	RTIE	S
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	רוסחום רושוב	PLASTIC LIMIT	P 200
S-7	22	8 14 18 20	15	HARD, DARK BROWN, SILT, SOME SAND, MOIST	ml			SAND WELL SCREEN PACK	0					
S-8	22	9 21 36 37	18 	VERY DENSE, LIGHT BROWN AND WHITE, SAND, SOME GRAVEL, MOIST 22.0°	sw			BENTONITE SLURRY	0					
мw-78				NOTE: (1) USCS CLASSIFICATION IN CAPITAL LETTERS INDICATES GEOTECHNICAL LABORATORY ANALYSIS										

Department of Natural Resources Solid Waste Emergency Response		ION
Solid Waste ☐ Emergency Response ☐ Haz. Waste ☐ Underground Table ☐ Wastewater ☐ Water Resources	7.	91
□ Other Page 1		
1, 2, 3, 3, 3, 3, 4, 4, 5, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6,	ng Number <i>MW-8</i>	
Boring Drilled By (Firm name and name of crew chief) Date Drilling Started Date Drilling Completed	Drilling Meth	nod
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	MUD ROTA	RY
DNR Facility Well No. Wi Unique Well No. Common Well Name Final Static Water Level Surface Elevation MW-8 ~572 Feet MSL 634.69 Feet MSL	Borehole Did	
Boring Location Local Grid Location (if o	applicable)	
State Plane		□E □W
County DNR County Code Civil Town/City/or Village MANITOWOC 3 6 MANITOWOC		
	ROPERTIES	3
	<u> </u>	
(in) (in) (in) (in) (in) (in) (in) (in)	LIMIT	
H H H H H H H H H H H H H H H H H H H	1 D L	200
NUMBER REC. (in) BLOW CLOUNTS C (in) A C S (1) C S C S (1)	PLASTIC LIM	P 2(
SOFT, DARK BROWN, ORGANIC SILT ol	-	
2.2'		
VERY SOFT, BROWN, SILT, SOME SAND, TRACE		
S-2 18 1 E 3 GRAVEL, MOISI 3.2'		
3 E STIFF, BROWN, SILTY CLAY, TRACE SAND, MOIST CI		
S=3 18 4 = 5 0 1		
S-4 22 8 16 7 HARD, BROWN, SILTY CLAY, MOIST CI		
7 - HARD LIGHT BROWN, SILT, SOME FINE SAND MI		
7 HARD LIGHT BROWN, SILT, SOME FINE SAND mI		
S-5 20 15 - 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
11 = 10		
1 20 HARD LIGHT BROWN, SILT, SOME FINE SAND MI		
3-0 22 20		
24 = 12		
I hereby certify that the information on this form is true and correct to the best of my knowledge		
Signature Firm OHM Remediation Services (
This Form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Pend not less than \$10 nor more than \$5000 for each violation. Fined not less than \$10 or more than \$100 or im	alties: Forfei prisoned no	it ot
less than 30 days, or both for each violation. Each day of continued violation is separate offense, pursuant to and 162.06, Wis. Stats.	ss 141.99	

Borino	Num	ber	MW-8	3						0	2		e	
	IPLE	T	T		Τ	Ι	<u> </u>	z	 		e_2		ERTIE	<u>. </u>
NUMBER	L-SNGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	U S C S (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	No.		רושחום רושוב	PLASTIC LIMIT	P 200
			13											
S-7	23	10 27 27 27 27	16	VERY DENSE, LIGHT BROWN, SILTY SAND	sm				0					
			18											
S-8	23	14 25 27 31	21 21 22 22	VERY DENSE, BROWN, SILTY SAND, MOIST	sm			BENTONITE SLURRY	0					
		10	23 23 24 25	25.4'	Sin			BENT						
S-9	22	17 24 27	26 = = = = 27	DENSE, BROWN, MEDIUM SAND, SOME CLAY, MOIST (CLAY CONTENT INCREASING WITH DEPTH)	sc				N/A					
			28 28 29 30											
S-10	20	18 23 31 32	31 32	VERY DENSE, LIGHT BROWN, COARSE SAND, TRACE SILT	SP				0	N/A	1.7%	N/A	N/A	7.3%
ww-8B														

Boring		ber	MW-8		·	,			·		. 3			
SAM	PLE	Ş					-	NOI	٦			ROP	RTIE	S
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	P 200
			33											
			34 											
S-11	20	14 27 36 40	35 36 	VERY DENSE, LIGHT BROWN, MEDIUM SAND	sp				0					
			37 - - - - -38											
			39 											
S-12	22	14 37 42 55		VERY DENSE, LIGHT BROWN, MEDIUM SAND	sp			BENTONITE SLURRY	0					
			42 					BEN						
		16	44 											
S-13	20	30 31 51	-46 -47	VERY DENSE, GRAY AND BROWN, COARSE SAND AND GRAVEL, MOIST	gp				0					
			48											
		-	-49 -50											
S-14	19	21 32 33 27	51 - 52	VERY DENSE, GRAY AND BROWN, COARSE SAND AND GRAVEL, MOIST	gp				0					
MM-80		~	٠٠		·		<u> </u>	(

G8-WM

Boring Number <u>MW-8</u> Page 4 of 6 SOIL PROPERTIES SAMPLE DESCRIPTION CLOUNTS (mdd) WELL DIAGRAM GRAPHIC LOG STANDARD PENETRATION MOISTURE CONTENT SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT LENGTH REC. (in) PID/FID PLASTIC NUMBER LIQUID O DEPTH 200 BLOW WELL <u>α</u> E-53 ENCOUNTERED GROUND WATER ● ≅54.0' DENSE, GRAY TO BROWN, GRAVELLY COARSE SAND, WET (PARTICAL SIZE OF GRAVEL DECREAS-ING WITH DEPTH) 21 gp 0 -56 S-15 18 27 25 -58 SLURRY BENTONITE -60 VERY DENSE, GRAY TO BROWN, GRAVELLY COARSE SAND, WET (PARTICAL SIZE OF GRAVEL DECREASING WITH DEPTH) 14 57 S-16 14 0 79/0.5 -62 E 64 -65 E 66 25 VERY DENSE, GRAY TO BROWN, GRAVELLY COARSE SAND, WET (PARTICAL SIZE OF GRAVEL DECREASING WITH DEPTH) 45 S-17 14 gр 43 47 -68 -69 BENTONITE PELLET SEAL HARD, BROWN, LEAN CLAY, SOME FINE SAND, CL~ 42 N/A 12.4% 22% 11% 82.5% 20 0 S-18 50 50

MW-8E

Boring Number <u>MW-8</u> Page. 5 of 6 SAMPLE SOIL PROPERTIES WELL DESCRIPTION BLOW CLOUNTS (mdd) WELL DIAGRAM $\widehat{\Xi}$ STANDARD PENETRATION MOISTURE CONTENT GRAPHIC LOG SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT LIQUID LIMIT S LENGTH REC. (in) PID/FID NUMBER PLASTIC ပ 200 S \supset ۵ BENTONITE PELLET SEAL 24 HARD, BROWN, LEAN CLAY, TRACE SAND, WET 39 22 S-19 N/A 15.2% 18% 13% 89.9% 44 80/0.3 79 cl-ml 21 =_81 == == 31 81.0' S-20 22 0 45 HARD, GRAY, SANDY CLAY ci 31 -82 83 84 85 85 86 PACK SAND HARD, GRAY, SANDY CLAY 21 cl 37 6.03 S-21 20 0 37 VERY DENSE, GRAY, COARSE SAND, TRACE 41 sp GRAVEL _87 -88 89 VERY DENSE, GRAY, COARSE SAND, SOME CLAY SCREEN 27 LENSES THROUGHOUT 34 S-22 20 sc 0 31 WELL 38 - 92

Boring		ber	MW−8							Page	<u>. 6</u>	_ of_	6	
SAM	PLE	ເດ	1				_	NO		S	OIL F	ROPE	RTIES	3
NUMBER	LENGTH REC. (in)	вгом сгопитѕ	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	P 200
			93 93 94 95											
S-23	10	29 47 38 47	96 	VERY DENSE, GRAY, COARSE SAND	sp			SCREEN	0					
			98					WELL S						
S-24	20	30 37 40 44	101	VERY DENSE, BROWN TO GRAY, SILTY FINE SAND	CL- ML				0	N/A	18.1%	N/A	N/A	27.6%
			103											
S-25	20	25 37 30 47	105 	HARD, GRAY, SILTY CLAY, SOME FINE SAND	CL ML			SAND PACK	0	N/A	15.7%	19%	12%	81.9%
				BOTTOM OF BORING 107.0' NOTE: (1) USCS CLASSIFICATION IN CAPITAL LETTERS INDICATES GEOTECHNICAL LABORATORY ANALYSIS										

MW-8F

State (of Wis	consi	n	D	Route To:						IL B			OG II	VFOR		ION '-91
Departi	ment	of N	aturai	Resources	□ Solid Was □ Haz. Was □ Wastewate	te 🗆	Emergency Undergroun Water Reso	d Ta	ble	, ,						,	•
		···········			□ Other		111			•===			Page				
Facility,				ESERVE CENT	TER		License/Per	mit/N	N/A	-	Numbe	er			g Nui MW-:		
1					of crew chief))	Date Drilling	Stai			ate Dr	illing	Compl	eted	Drillin	Met	hod
DAV	Æ CRI	EWS		OLOGY, INC.			0 8/2 M M D										
DNR F	acility	Well N	o. Wi	Unique Well No	Common We		1		r Leve : MSL	.	<i>616.4</i>	<u> </u>	eet M	SL		inche	
Boring	Locati	on 75	9.674	<i>85</i> N	2,616,026.	.04 F	Lot 44	4° 03	3' 45	" L	ocal G	rid Lo	cation aN	-	pplic	ible)	σE
Stole I	/4 of	NW	.1/4 of	Section 5	, T <u>18</u> N, R	<i>24</i> E	Long 8	7° 39	g ' 35	<u>"</u> _	N/A	Fe			/A	Feet	
County		VITON	юс				unty Code 3 6		Civil	Гоwп		or Vil N <i>ITO</i>	-				
SAM	PLE										No		S	OIL P	ROPE	RTIE	S
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	AND	IL/ROCK DESC GEOLOGIC OI EACH MAJOR	RIGIN FO	I DR	USCS(1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	Р 200
-		1	=	MEDIUM STIFF	, DARK BROWN,	ORGANIC	SILT 0.6'	ol									
S-1	18	2 3 4	111111	MEDIUM STIFF	, BROWN, SAND	OY SILT	1.8'	ml			T CEMENT	0					
		7	2	STIFF, BROWN	I, SANDY SILT,	SOME GR	AVEL 2.6'	sm			NEAT						
S-2	16	5 6 7	3	STIFF, BROWN	I, SANDY CLAY,	SOME GF	RAVEL 3.8'	cl				0					
S-3	18	1 0 3 3	111111111111111111111111111111111111111	very soft, e	BROWN, LEAN C	LAY, SOM	E GRAVEL	cl				0					
S-4	20	7 10 12 10	7	very stiff, i	BROWN, LEAN C	CLAY, SOM	ie gravel	cl			NITE SLURRY	0					
S-5	18	16 25 26 27	9 10	HARD, DARK	BROWN, LEAN (CLAY		CL			BENTONITE	0	N/A	15.6%	32%	14%	98.37
			= - - - - - 12														
		rtify t	hat the	information o	n this form is	true and	Trism										
Signa	cure						tum	ОНМ	Rer	nec	diatio	on S	ervio	ces	Corp),	
not less	ess the than 3	an \$1 10 day	O nor	more than \$50	44.147 and 16 000 for each vi violation. Each	iolation. F	ined not les	s tha	n \$10	or	more	than	\$100	or in	npriso	ned r	ot

MW-9B

Boring	Num	ber _	<u> М₩-9</u>							Page	2	_ of_	6	
SAM	PLE							ION	(S	OIL P	ROP	RTIE	S
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	P 200
			13											
S-6	10	1 6 9 11	16	STIFF, GRAY, GRAVELLY CLAY	<u>c</u> !				0					
			18											
S-7	10	8 8 13 15	21	VERY STIFF, BROWN, SILTY CLAY, SOME GRAVEL	cl			NITE SLURRY	0					
			23					BENTONITE						
S-8	22	6 11 16 16	26	VERY STIFF, BROWN, SILTY CLAY, SOME GRAVEL	cl				0					
			28 - 29 - 30											
S-9	23	9 14 20 22	31	HARD, BROWN, SILTY CLAY, SOME GRAVEL	cl				0					

Boring		ber_	MW-9				,				3			
SAM	PLE	S					_	NOL		S	OIL F	ROP	ERTIE	s
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	P 200
			33 											
S-10	18	8 7 10 11	36 = 37	VERY STIFF, BROWN, CLAYEY SILT, TRACE GRAVEL AND SAND	m!— gm				0					
			38 -38 -39 -39											
S-11	22	9 13 20 20	40 41 42	HARD, BROWN, CLAYEY SILT, TRACE GRAVEL AND SAND, (SAND CONTENT INCREASING WITH DEPTH)	ml gm			BENTONITE SLURRY	0					
			43					BENT						
S-12	22	10 15 23 28	45 - 46 - 47	HARD, BROWN, CLAYEY SILT, TRACE GRAVEL AND SAND, (SAND CONTENT INCREASING WITH DEPTH)	m!- gm				0					
			48											
S-13		6 11 13 16	50 	HARD BROWN, CLAYEY SILT, SOME SAND, TRACE GRAVEL (SAND CONTENT INCREASING WITH DEPTH)	ml- gm				0					

		nber .	MW-	9							Pag	e4	of	6	_
SAN	MPLE	<u>ν</u>				T			NO		_			PERTI	ES
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	(1) S O S (1)) }	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	רוסחום רואוב	PLASTIC LIMIT	P 200
			53 												
S-14	16	26 27 26 38	56 57	VERY DENSE, GRAY, COARSE SAND, SOME GRAVEL	sp					0					
			58 						SLURRY						
S-15	16	32 37 44 44	-61 -62	VERY DENSE, GRAY, COARSE SAND, SOME GRAVEL (GRAVEL CONTENT INCREASING WITH DEPTH)	sp				BENTONITE	0					
			63												
S-16	14	35 53 54 42	66	VERY DENSE, GRAY, COARSE SAND, SOME GRAVEL (GRAVEL CONTENT INCREASING WITH DEPTH)	эp	T				0					
			68						IIIE SEAL						
S-17	22	19 22 30 34	—70 —71 —71 —72	HARD, BROWN, LEAN CLAY	CL				BENIONIE PELLET SEAL	0	N/A 1	7.4%	24%	10%	97.6%

Boring		ber_	MW-S	9						Pag	e5	of.	6	•
SAM	IPLE	Ş					_	NOI			OIL I			:s
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	P 200
S-18	22	20 28 42 22	77	HARD, BROWN TO GRAY, LEAN CLAY	cl			SAND PACK	0					
S-19	18	25 21 40 40	80	HARD, BROWN, SILT, SOME FINE SAND	ML				0	N/A	18.1%	N/A	N/A	71.4%
S-20	16	25 21 35 29	82 - 83 - 84 - 85 - 86 - 87 - 88 - 88 - 89 - 90	HARD, BROWN, SILT, SOME FINE SAND	ml			WELL SCREEN	0					
S21	14	52 57 49 49	91 - 92	VERY DENSE, BROWN, SANDY GRAVEL, SOME SILT	gm				0					:

State of Wisconsin

SOIL BORING LOG INFORMATION SUPPLEMENT Form 4400-122A

Department of Natural Resources Boring Number <u>MW-9</u> Page 6 of 6 SOIL PROPERTIES SAMPLE WELL DESCRIPTION BLOW CLOUNTS PID/FID (ppm) WELL DIAGRAM Ξ STANDARD
PENETRATION
MOISTURE
CONTENT GRAPHIC LOG (feet) LIMIT SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT LIQUID LIMIT S LENGTH REC. (in) PLASTIC NUMBER O DEPTH 200 S \supset ۵. 93 = 94 = 95 SCREEN WELL 96 - 97 SAND PACK 45 VERY DENSE, BROWN, SANDY GRAVEL, SOME GM N/A 7.8% N/A N/A 20.9% 0 S-22 16 49 45 BOTTOM OF BORING 97.0' NOTE: (1) USCS CLASSIFICATION IN CAPITAL LETTERS INDICATES GEOTECHNICAL LABORATORY ANALYSIS

MW-9F

SOIL BORING LOG INFORMATION Route To: State of Wisconsin Form 4400-122 Department of Natural Resources ☐ Solid Waste ☐ Emergency Response ☐ Haz. Waste □ Underground Table ☐ Water Resources □ Wastewater Page 1 of 7 □ Other License/Permit/Monitoring Number Facility/Project Name Boring Number MANITOWOC ARMY RESERVE CENTER N/A MW-10 Date Drilling Started Date () illing Completed Drilling Method Boring Drilled By (Firm name and name of crew chief) EXPLORATION TECHNOLOGY, INC. $\frac{0}{M} \frac{8}{M} \frac{2}{D} \frac{0}{D} \frac{9}{Y}$ $\frac{0}{M} \frac{8}{M} \frac{2}{D} \frac{1}{D} \frac{9}{Y}$ MUD ROTARY DAVE CREWS Final Static Water Level Surface Elevation DNR Facility Well No. WI Unique Well No. Common Well Name MW-10 650.62 Feet MSL ~580 Feet MSL 6 inches Local Grid Location (if applicable) Boring Location Lat 44' 03' 45" 759,199.19 2,615,652.51 F State Plane _ пΝ Long 87° 39' 35' SW 1/4 of NW 1/4 of Section 5 , T<u>18</u> N, R <u>24</u> E N/A Feet □S _ _Feet DW **DNR County Code** Civil Town/City/or Village MANITOWOC **MANITOWOC** SAMPLE SOIL PROPERTIES WELL DESCRIPTION CLOUNTS (mdd) DIAGRAM Ξ STANDARD PENETRATION LIMIT SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT S PID/FID NUMBER **PLASTIC** O LIQUID DEPTH BLOW S Δ MEDIIJM STIFF, DARK BROWN, ORGANIC SILT οί 4 0 S-1 ι8 4 CEMENT - 2 MEDIUM DENSE, LIGHT BROWN, SAND, SOME sp 9 0 S-2 19 11 16 4.0' VERY LOOSE, WELL-GRADED, SAND, 0 S-319 - 5 TRACE SILT 1 2 2 SLURR 2 VERY LOOSE, WELL-GRADED, SAND. 0 19 1 TRACE SILT 2 BENTONITE - 8 VERY LOOSE, WELL-GRADED, SAND. 1 N/A 6.8% N/A N/A 11.0% S-5 18 - 9 TRACE SILT 0 ·10 I hereby certify that the information on this form is true and correct to the best of my knowledge Signature Firm OHM Remediation Services Corp. This Form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is separate offense, pursuant to as 141.99

and 162.06, Wis. Stats.

MW-10B

Boring		ber	MW-10	2			,			Page				
SAM							_	NOI			OIL P	ROPE	RTIES	S
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	U S C S (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	P 200
			13 											
S-6	10	5 8 10 11	16 16 	MEDIUM DENSE, LIGHT BROWN, SAND, SOME GRAVEL	зр				0					
			18 -18 -19 -19 20											
S-7	10	8 10 11 15	21 	VERY STIFF, BROWN, SILTY CLAY	cl			NITE SLURRY	0					
			23 					BENTONITE						
S-8	18	11 14 16 16	26 - 26 - 27	MEDIUM DENSE, BROWN, SAND, SOME CLAY	sc				0					
			28 = 28 = 29											
S-9	20	6 4 14 14	= 30 = 31 = 32	vERY STIFF, BROWN, SILT AND CLAY	ml- cl				0					

State of Wisconsin Department of Natural Resources SOIL BORING LOG INFORMATION SUPPLEMENT Form 4400-122A 7-91

Boring	Numt	per/	<u> </u>	<u>)</u>						Page	3	_ of_	7	
SAM								NO.			IL P			
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	רוסתום רואוב	PLASTIC LIMIT	P 200
			33 34 35											
S-10	22	10 10 10 10	36 = 37	VERY STIFF, GRAY, SILTY CLAY	cl				0					
			38					RY						
S-11	22	8 12 13 13		VERY STIFF, GRAY, SILTY CLAY	CL			BENTONITE SLURRY	0	N/A	19.2%	25%	14%	99.2%
			43					38						
S-12	6	100 0.5'	F	VERY DENSE, LIGHT GRAY GRAVEL, SOME PEBBLES	gp				0					
			48											
S-13	20	12 19 18 33	51 - 52	DENSE, LIGHT BROWN, SAND, SOME SILT	sm				O					

MW-10C

Boring	Numi	ber	UW-1C	2				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			4			
SAM							_	NOI		S	OIL P	ROP	ERTIE	S
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (fee')	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	רוסחום רואוב	PLASTIC LIMIT	P 200
			53 54 55											
S-14	18	25 20 25 80 0.0'	56 	CENSE, LIGHT BROWN, SAND, SOME SILT	sm				0					
			58 58 59 60					SLURRY						
S-15	4	100/ /0.75'	E	VERY DENSE, LIGHT GRAY GRAVEL, SOME PEBBLES	gp			BENTONITE	0					
			63											
S-16	10	12 14 15	65	VERY STIFF, BROWN, CLAY, SOME SILT 66.0'	cl	7			0					
		17	67 E	MEDIUM DENSE BROWN, COARSE, SAND, SOME GRAVEL	ab									
			68 69 - 70											
S-17	10	29 28 33 25	71 72		gp				0					

Roring				2						Page	5	_ of_	7_	
Boring NumberMW-10											OIL P			
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	רוסחום רושוז	PLASTIC LIMIT	P 200
			73 											
S-18	12	26 34 23 32	76 -77	VERY DENSE, GRAY, GRAVEL	gp				0					
			78					BENTONITE SLURRY						
S-19	10	30 36 40 34	81	VERY DENSE, BROWN, CLAYEY GRAVEL, SOME SAND	GC				0	N/A	8.1%	N/A	N/A	25.0%
			83 = 84 = 84											
S-20	20	28 34 60 68	85 	HARD, BROWN, SANDY CLAY	CL			PELLET SEAL	0	N/A	12,7%	22%	11%	71.9%
			88 					BENTONITE PELLET						
S-21		12 23 25 29	90 	HARD, BROWN, SANDY CLAY	cl			SAND	0					

Boring	Numl	oer	MW-10	2				عادودانو					7_	
SAM	PLE						_	NOI		SC	OIL P	ROP	ERTIE	s]
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	רוסחום רושוב	PLASTIC LIMIT	P 200
			93											
S-22	20	22 26 40 38	96 96 97	HARD, BROWN, SANDY CLAY	cl			¥	0					
			99					SAND PACK						
S-23	22	19 24 36 35	101	HARD, GRAY, SILT, SOME SAND	ml				0					
			11 03 104 104 111											
S-24	15	23 24 32 37	106	VERY DENSE, GRAY, SAND, SOME SILT	sm				0					
			108 109					WELL SCREEN						
S-25	18	14 27 23 33	110 	VERY DENSE, GRAY, SAND, SOME SILT	sm				0					

Boring	Numl	ber	MW-10	<u>o</u>						Page	7	_ of_	7			
												OIL PROPERTIES				
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS(1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	P 200		
			13 13 14 14 15					7								
S-26	15	27 31 33 35	- - - - - - - - - 17	VERY DENSE, GRAY, SAND, SOME SILT	SM			WELL SCREEN	0	N/A	16.1%	N/A	N/A	14.8%		
			118 													
S-27	16	30 29 30 43			SM			SAND PACK	0	N/A	13.3%	N/A	N/A	14.8%		
				NOTE: (1) USCS CLASSIFICATION IN CAPITAL LETTERS INDICATES GEOTECHNICAL LABORATORY ANALYSIS												

SOIL BORING LOG INFORMATION State of Wisconsin Route To: Form 4400-122 Department of Natural Resources ☐ Solid Waste ☐ Emergency Response ☐ Haz. Waste □ Underground Table □ Wastewater ☐ Water Resources □ Other Page _______ of ______4 License/Permit/Monitoring Number Facility/Project Name Boring Number MANITOWOC ARMY RESERVE CENTER N/A MW-11 Date Drilling Started Boring Drilled By (Firm name and name of crew chief) Date Drilling Completed Drilling Method EXPLORATION TECHNOLOGY, INC. $\frac{0}{M} \frac{8}{M} \frac{/2}{D} \frac{6}{D} \frac{/9}{Y}$ $\frac{0}{M} \frac{8}{M} \frac{2}{D} \frac{7}{D} \frac{9}{Y}$ MUD ROTARY DAVE CREWS DNR Facility Well No. WI Unique Well No. Common Well Name Final Static Water Level Surface Elevation Borehole Dia. ~590 Feet MSL 638.45 Feet MSL MW-11 _6_ inches Boring Location Local Grid Location (if applicable) Lat 44° 03' 45" 759,232.52 2,616,001.54 EN, . State Plane . DΝ ΠE Long <u>87° 39' 35"</u> <u>SW 1/4 of NW 1/4 of Section 5 , T 18 N, R 24 E</u> N/A _Feet □S _ .Feet 🗆 W DNR County Code County Civil Town/City/or Village MANITOWOC _6 **MANITOWOC** SAMPLE SOIL PROPERTIES DESCRIPTION CLOUNTS (bpm) DIAGRAM STANDARD
PENETRATION
MOISTURE
CONTENT LIMIT SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR LIMIT LENGTH REC. (in) S GRAPHIC NUMBER PLASTIC EACH MAJOR UNIT PID/FID ပ LIQUID BLOW WELL S ٥. MEDIUM STIFF, DARK BROWN, ORGANIC SILT 0.5' 3 CEMENT 0 S-1 15 LOOSE, BROWN, SAND, SOME CLAY SC 5 NEAT 2 LOOSE, BROWN, SAND, SOME CLAY SC 3 3.0' 0 S-2 15 - 3 6 LOOSE, LIGHT BROWN, SAND, SOME SILT sm 8 (ENCOUNTERED BOULDER AT 4.0 FEET DURING NO SAMPLING) SAMPLE N/A S-3 **OBTAINED** 12 SLURRY 16 S-4 15 VERY DENSE, WND, SOME SILT sm 0 36 27 BENTONITE - 8 11 17 DENSE, BROWN, SAND, SOME SILT S-5 22 0 sm 20 29

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature

OHM Remediation Services Corp.

This Form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is separate offense, pursuant to ss 141.99 and 162.06, Wis. Stats.

Firm

Boring		ber	MW-1	1	·•····		, ,				2			
SAM								NOL		S	OIL P	ROPE	RTIES	3
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (fect)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	USCS (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	P 200
			_ _ 13											
S-6	18	17 19 36 32	15	VERY DENSE, LIGHT BROWN, SAND AND SILT, TRACE CLAY	sm				0					
			16					te slurry						
S-7	16	18 26 26 38	18	VERY DENSE, LIGHT BROWN, SAND AND SILT, TRACE CLAY	sm			BENTONITE	0					
			21											
S-8	16	18 26 28 24	23 	VERY DENSE, LIGHT BROWN, SAND AND SILT, TRACE CLAY	sm				0					
			25 26 27 27					BENTONITE PELLET SEAL						
S-9	16	11 22 34 43	28 	HARD, BROWN, CLAY AND SILT	CL-M				0	N/A	13.9%	18%	13%	94.2%
MW11			= 31 = 32					SAND PACK						

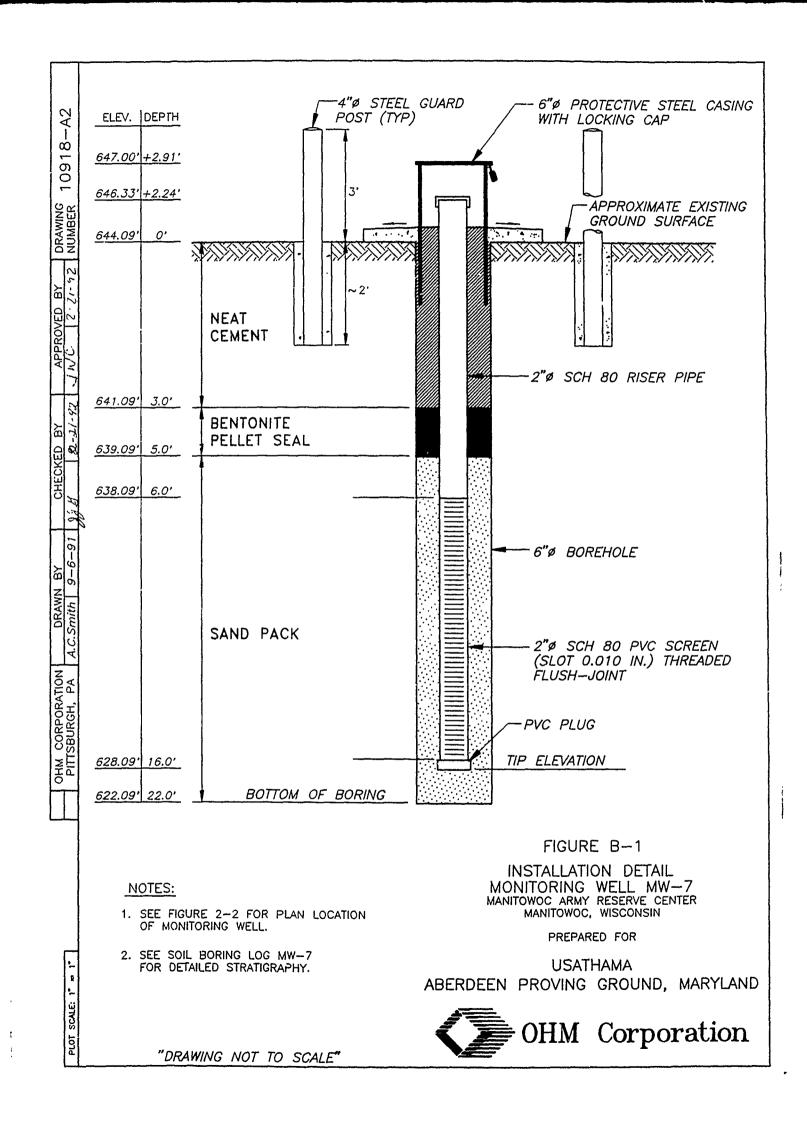
MW-11C

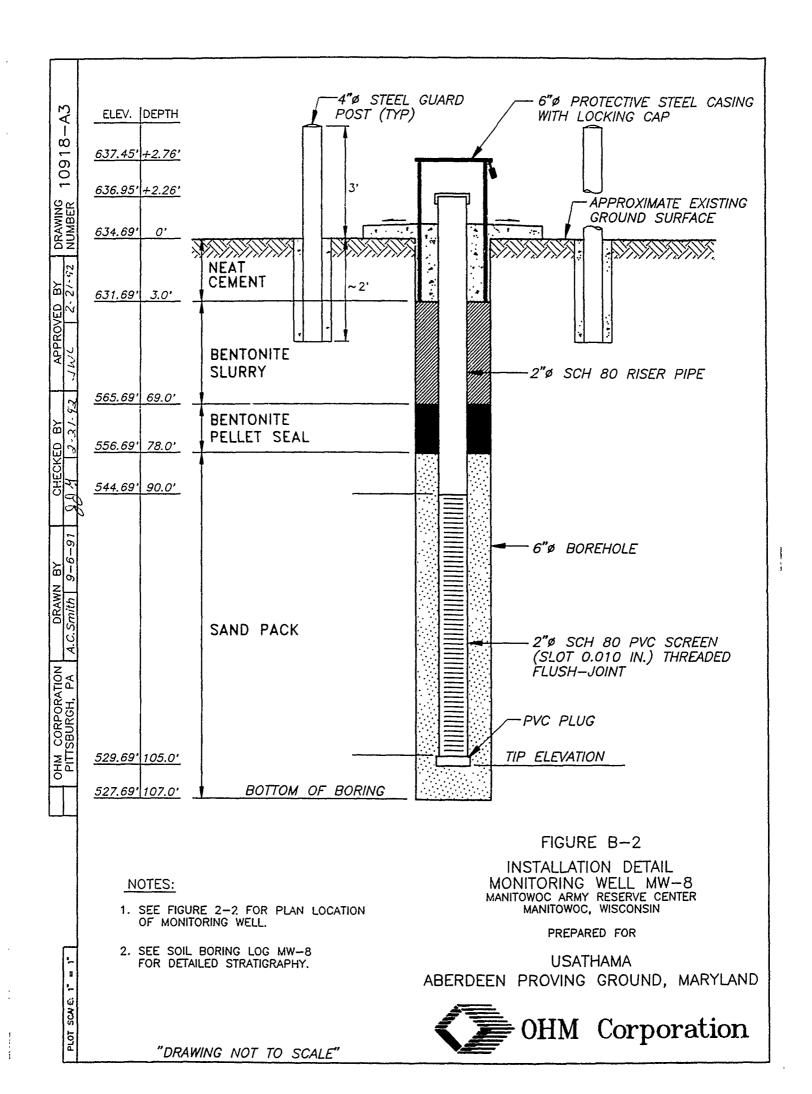
Boring		ber_	MW-1	11	-	-				Pag	e3	of.	4	·
SAM	PLE	S						NO.		s	OIL F	PROP	ERTIE	S.
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DEPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT	U S C S (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	P 200
			Ë ,,											
S-10	20	17 40 55 76	33 = 34 = 35	VERY DENSE, BROWN, SILTY, CLAYEY SAND, SOME GRAVEL	SC- SM				0	N/A	10.3%	N/A	N/A	13.2%
			36 											
S-11	16	25 35 32 38	39 	VERY DENSE, BROWN, SILTY, CLAYEY SAND, SOME GRAVEL	sc- sm				0					
			41 42 43					SAND PACK						
S-12	18	13 18 38 43		VERY DENSE, BROWN, COARSE SAND, SOME SILT	sm				0					
S-13	18	34 50 34 50	48	VERY DENSE, GRAY TO BROWN, COARSE SAND, SOME GRAVEL	эw				0					
			51 - 52											

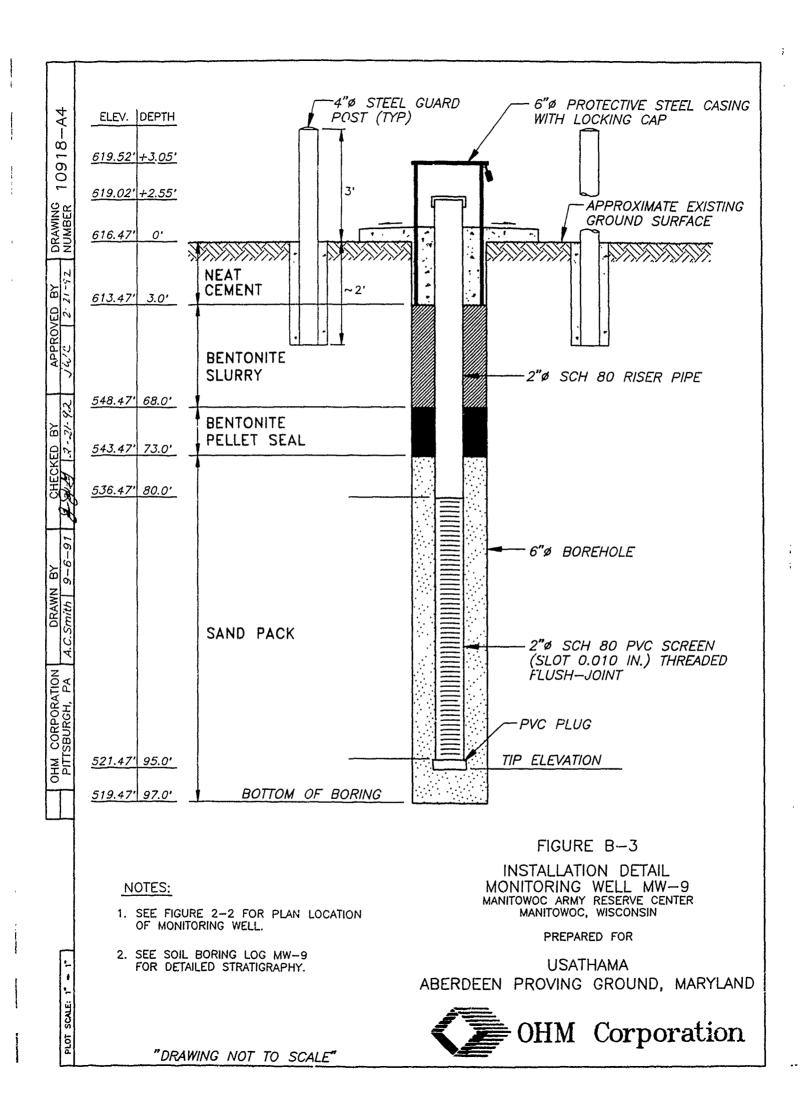
Boring	ı Num	nber _	MW-	11_							Daa	e <u>4</u>		4	
	IPLE	T				T			Z	Τ		OIL			-
NUMBER	LENGTH REC. (in)	BLOW CLOUNTS	DFPTH (feet)	SOIL/ROCK DESCRIPTION AND GEOLOGIC ORIGIN FOR EACH MAJOR UNIT		U S C S (1)	GRAPHIC LOG	WELL DIAGRAM	WELL DESCRIPTION	PID/FID (ppm)	STANDARD PENETRATION	MOISTURE CONTENT	F	PLASTIC LIMIT	P 200
			53) PACK						
S-14	18	70 44	= - 54	VERY DENSE, BROWN, WELL-GRADED, GRAVEL, SOME SILT AND SAND		gw- gm			SAND	0					
		67	55												
			<u>-</u> 56												
			57 - - - - - 58												
S-15	14	36 40 40 43	59 	VERY DENSE, BROWN, WELL-GRADED, GRAVEL, SOME SILT AND SAND		gw–				0					
			60						SCREEN						
			-61 - - -62						WELL SO						
			63												
S-16	14	24 34 26 23	64 64	VERY DENSE, BROWN, WELL-GRADED, GRAVEL, SOME SILT AND SAND		GW- GM				0	N/A	6.5%	N/A	N/A	10.0%
			65												
			66 - 67					- <u>-</u>							
		30	68												
S-17	16	17 24	69	HARD, BROWN, SILT	69.0'	ML			SAND	0	N/A	15.00	NI /A	NI /A	97 19
 			- 70						& &		''/^	.0.28		''/^	J, .7/6
				BOTTOM OF BORING 70.0' NOTE:											
			72	(1) JSCS CLASSIFICATION IN CAPITAL LETTERS INDICATES GEOTECHNICAL LABORATORY ANALYSIS											
MW-11D	<u> </u>	J	- /2	PUDOLATION I WINT (2)2											

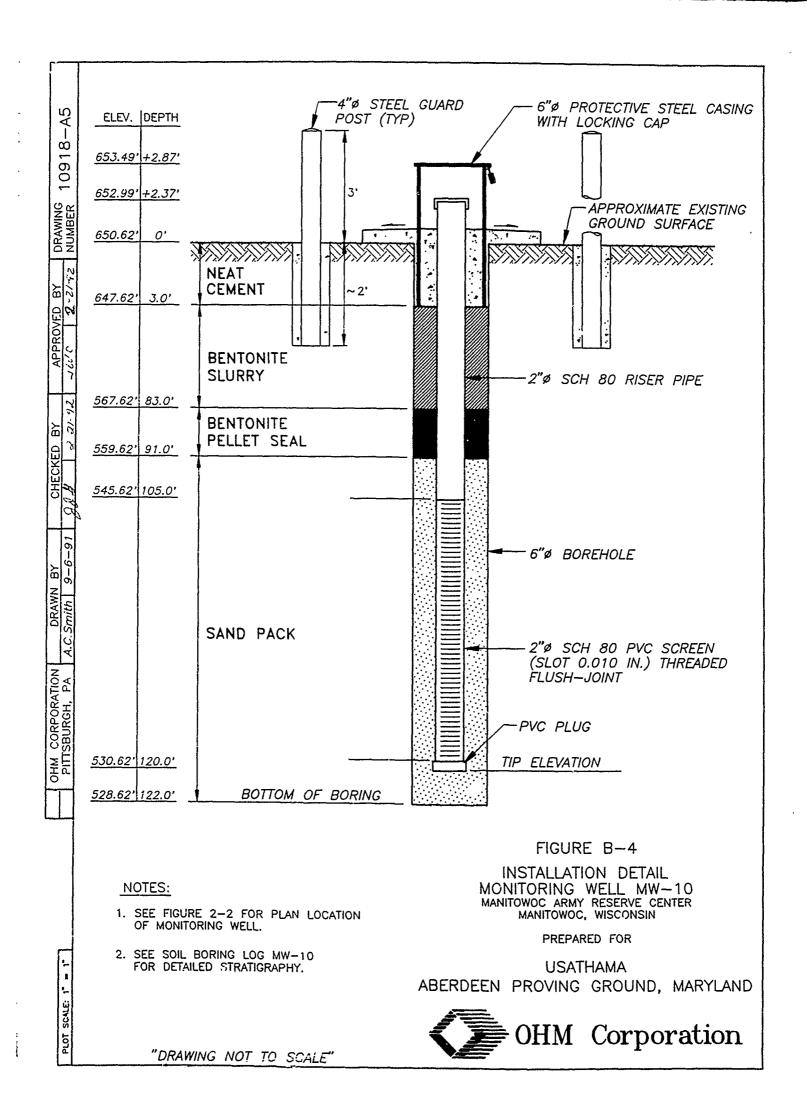
APPENDIX B

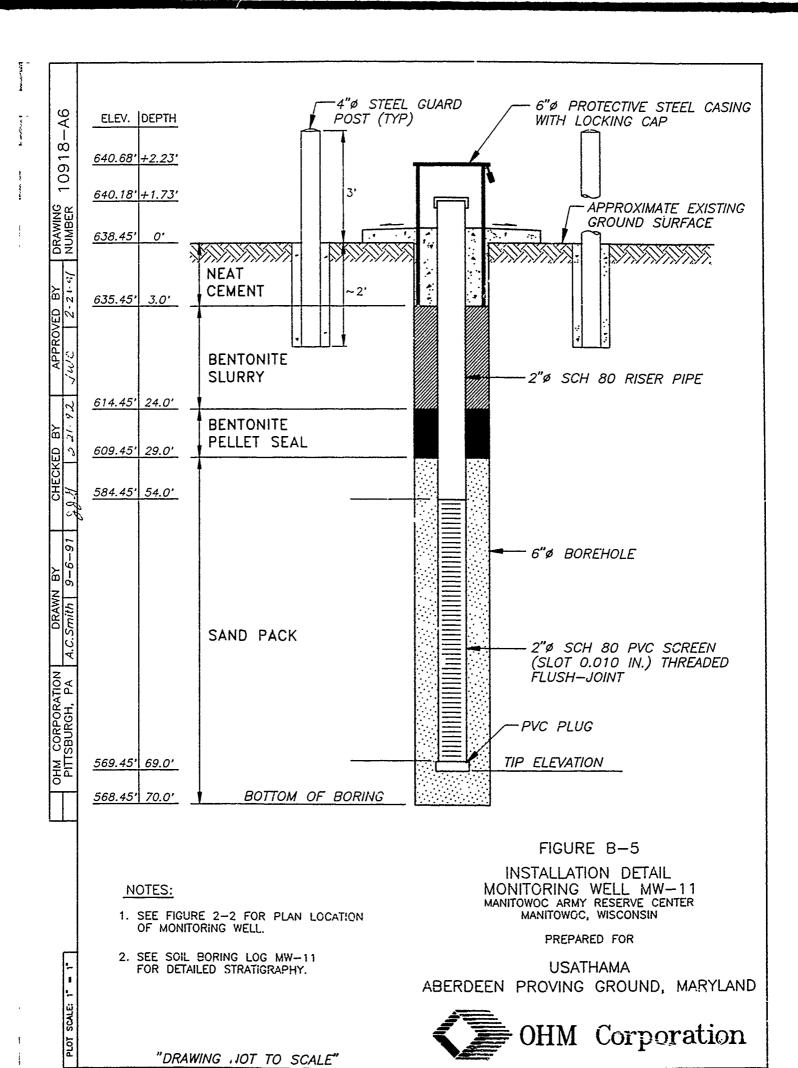
WELL CONSTRUCTION LOGS, WELL DEVELOPMENT DATA, AND OTHER FIELD DATA











	MONITORI	NG WELL	NUMBER							MW-7		
	DATE INS	TALLED.								8/13	/91	
	DATE DEV	ELOPED.								8/20	/91	
	STATIC W	ATER LE	VEL (BE	FORE DE	VELOP	MENT	?)	• • • • •			MEAN S L (MSL)	
	STATIC W	ATER LE	VEL (AF	TER DEV	ELOPM	ENT))	• • • • •		-629	MSL	
	FLUID LO	SS DURI	NG DRIL	LING					• • • • • • •	N/A		
	OUANTITY	OF WAT	ER IN W	ELL AND) ANNU	LUS.				4.5	gallons	S
(BOTTON DEP (FEET)	TH - STATIC W LEVEL (F	ATER) x 0. EET)	.163 GAL/FE	E E	AREA OF BOREHOLE (FT)	- AR		EPTH OF ANDPACK (FT)	x POROSITY 0.30	r x 7.4	8 GAL/FT	S) = STANDING VOLUME
(16	- 8) x	e 163	1 + [(0.20	-	0.02) x	8	x 0.30	×	7.48]	= 4.5 GALLONS
	Sami le R <u>amun</u>	COND	ECIFIC OUCTIVIT		<u>pH</u>		TEMPERATUR	RE	CUMULA GALLA <u>REMOV</u>	ONS	1	ELOPMENT WATER DMMENTS
	1		0,51		7.70		65.3			0		Brown
	2).31		7.69		65.1		3	.5		Brown
	3		0.31		7 81		64.2			.0		Brown
	4		0.33		7.84		63.9			.0		Brown
	5		0.33		7.88		63.7			.0		Milky
	6		0.31		7.90		63.5		11			Milky "Dry"
	TOTAL DE	PTH OF	WELL			·				.16 1	eet	•
	SCREEN L	ENGTH.								.10 1	eet	
	DEPTH TO	SEDIME	ENT (BEF	ORE DEV	VELOPM	1ENT)			.~15.	5 feet	
	DEPTH TO	SEDIME	ENT (AFT	ER DEVI	ELOPME	ENT)	• • • • • • • •			15.	9 feet	
	TYPE OF	DEVELO	PMENT ME	THOD						.Boti	com Bai	ler
	CAPACITY	OF BA	LER							.~0.3	3 gall	on
	LENGTH C	F CASI	NG STICK	C-UP					• • • • • •	.2.9	l feet	
	TYPICAL	BAILING	RATE	• • • • • •				• • • • •		.~1 g	;allon/	hour
	ESTIMATE	OF RE	CHARGE P	' 'E						.<0.	5 gallo	n/hour
	QUANTITY	OF WA	TER REMO	CAV	• • • • • ·					.11.) gallo	ns
:	TOTAL DE	EVELOPM	ENT TIME	ε				• • • •	· • • • • • • •	.4 h	ours	
	STANDING	WATER	TIMES E	TIVE WE	LL VOI	LUME	S			.22.	7 gallo	ns

	MONITORIN	NG WELL NUMBER				
	DATE INST	TALLED			8/15/9	1
	DATE DEVI	ELOPED			8/20/9	1
	STATIC WA	AIEK LEVEL (BE	FORE DEVELOPME	CN1)	582 M LEVEL	
	STATIC WA	ATER LEVEL (AF	TER DEVELOPME	NT)	572 M	SL
	FLUID LOS	SS DURING DAIL	LINC		30 ga	llons
	QU \NTITY	OF WATER IN W	ELL AND ANNUL	us	19.38	gallons
	•					
(BOTTOM DEP (FEET)	TH - STATIC W/ LEVEL (FI		EET] + [(AREA OF - BOREHOLE (FT ²)	- AREA OE MW) × DEPTH (FT ²) SANDF (FT		GAL/FT ³] = STANDING VOLUME
(105	- 53) x 0.163] + [(0.20	- 0.02) x 27	7 x 0.30 x 7	7.48] = 19.38 GALLONS
		SPECTFIC		TEMPERATURE	CUMULATIVE	DEVELOPMENT
	SAMPLE	CONDUCTIVII		o	GALLONS	WATER
	<u>NUMBER</u>	$(\mu \text{mho/cm})$ (x1	<u>000)</u> <u>pH</u>	(_F)	REMOVED	COMMENTS
	1	0.72	8.29	64.9	0	Murky Brown
	2	0.67	8.35	64.5	25	Brown
	3	0.58	8.22	64.O	35	Cloudy
	4	0.67	8.27	63.7	55	Milky
	5	0.66	8.29	63.4	62	Clear
	6	0.65	8.29	63.5	67	Clear
	7	0.66	8.29	63.4	70	Clear
	TOTAL DE	PTH OF WELL			105 f	eet
	SCREEN L	ENGTH		• • • • • • • • • • • • • • • • • • • •	15 fe	et
	DEPTH TO	SEDIMENT (BEI	FORE DEVELOPME	ENT)	104	feet
	DEPTH TO	SEDIMENT (AFT	TER DEVELOPMEN	IT)		5 feet
	TYPE OF	DEVELOPMENT MI	ETHOD		BK Pu	mp
	CAPACITY	OF PUMP			50 g	allons/hour
	LENGTH O	F CASING STICE	K-UP	• • • • • • • • • • • • • • • • • • • •	2.76	feet
	TYPICAL	PUMPING RATE.	· · · · · · · · · · · · · · · · · · ·		30 g	allons/hour
•	ESTIMATE	OF RECHARGE	RATE	• • • • • • • • • • • • • • • • • • • •	60 g	allons/hour
	QUANTITY	OF WATER REMO	OVED		70 ga	llons
Problems and	TOTAL DE	ELOPMENT TIM	E		3 hou	ırs
1	STANDING	WATER TIMES	FIVE WELL VOLU	JMES	96.90	gallons

		MONITORIN	NG WELL	NUMBER.							1	IW- 9		
		DATE INST	ralled.								8	8/22	/91	
		DATE DEVI	ELOPED.					· • • • •			8	8/28	/91	
		STATIC WA	ATER LE	VEL (BE	FORE DE	VELOPI	MENT).	• • • • •					MFAN L (MS	
		STATIC WA	ATER LE	VEL (AF	rer dev	ELOPM	ENT)				'	-580	MSL	
		FLUID LO	SS DURI	NG DRIL	LING							-20	gallo	ns
		QUANTITY	OF WAT	ER IN W	ELL AND	ANNU	LUS					19.4	8 gal	lons
[(80	TTOM DEP (FEET)	FH - STATIC W LEVEL (F	ATER) × 0. EET)	163 GAL/FE	8	REA OF OREHOLE (FT ²)	- AREA	OE MW) FT)	SANU	H OF x P PACK T)	OROSITY 0.30	x 7.	48 GAL/1	FT ³] = STANDING VOLUME
ť	(95	- 30) x	0.163	1 + [[0.20	. (0.02)	x 2	22 x	0.30	x	7.48]	≈ 19.48 GALLONS
		SAMPLE NUMBER	CO	SPECIFIONDUCTIV	ITY		<u>pH</u>	T	EMPER.	ATURE	GA	ULAT LLON MOVE	S	DEVELOPMENT WATER COMMENTS
		1		dings r			8.26		67.	3		0		Muddy
		2		ent fai		•	8.83		67.			25		Brown
		3	ndarbm	CHC LUL	Luic.		7.80		65.			50		Brown
		4					7.78		65.			75		Gray
		5					7.75		65.			100		Milky
		6					7.74		65.			125		Milky
		7					7.74		64.			150		Clear
		8					7.74		64.			175		Clear
		9					7.74		64.			200		Clear
		TOTAL DE	PTH OF	WELL								95 f	eet	
		SCREEN L	ENGTH									15 f	eet	
		DEPTH TO	SEDIME	NT (BEF	ORE DEV	ELOPM	ENT).					~93	feet	
		DEPTH TO	SEDIME	NT (AFT	ER DEVE	LOPME	NT)				. 	-94	feet	
		TYPE OF	DEVELOP	MENT ME	THOD						. 	BK I	Pump	
		CAPACITY	OF PUM	P								~50	gallo	ns/hour
		LENGTH O	F CASIN	g stick	-UP							3.05	feet	;
		TYPICAL	PUMPING	RATE								~30	gallo	ns/hour
i		ESTIMATE	OF REC	harge r	ATE		• • • • •					~20	gallo	ns/hour
		QUANTITY	OF WAT	ER REMO	VED							200	gallo	ons
ì		TOTAL DE	VELOPME	NT TIME	• • • • • •	• • • • •	• • • • •	• • • • •	• • • • •			~5 h	ours	
1		STANDING	WATER	TIMES F	IVE WEI	r nor	UMES.	• • • • •				97.4	40 gal	llons

	MONITORI	ING WELL NUMBER.			MW-10	
	DATE INS	STALLED			8/21/9	91
	DATE DEV	ELOPED			8/26/9	91
	STATIC W	ATER LEVEL (BEF	ORE DEVELOPMEN	NT)		IEAN SEA L (MSL)
						,
	STATIC W	ATER LEVEL (AFI	ER DEVELOPMEN	r)	580 M	ISL
	FLUID LO	SS DURING DRILL	ING			illons
	QUANTITY	OF WATER IN WE	CLL AND ANNULU	S	20.68	gallons
(BOTTOM DEF (FEET)	PTH - STATIC (LEVEL ()	WATER) x 0.163 GAL/FE FEET)	ET] + [(AREA OF - BOREHOLE (FT ²)	AREA OE MW) X DEPTH O (FT ²) SANDPAC (FT)		GAL/FT ³] = STANDING VOLUME
. (120	- 69	5) x 0.163] + [(0.20 -	0.02) x 29	x 0.30 x	7.48] = 20.68 GALLONS
	SAMPLE	SPECIFIC CONDUCTIVITY	7	TEMPERATURE o	CUMULATIVE GALLONS	DEVELOPMENT WATER
	NUMBER	(µmho/cm) (x10	<u>Hq</u> (00)	(_F)	REMOVED	COMMENTS
	1	0.84	7.79	67.0	0	Brown
	2	0.82	7.97	69.5	50	Brown
	3	0.81	7.83	68.9	100	Milky
	4	0 81	7.80	68.2	150	Clear
	5	0.81	7.80	68.2	200	Clear
	TOTAL DE	EPTH OF WELL	• • • • • • • • • • • • •		120 f	eet
	SCREEN I	LENGTH	• • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	15 fe	et
	DEPTH TO	SEDIMENT (BEFO	RE DEVELOPMEN	T)		feet
	DEPTH TO	SEDIMENT (AFT	ER DEVELOPMENT)		feet
	TYPE OF	DEVELOPMENT MET	гнор	• • • • • • • • • • • • • • • • • • • •	BK Pu	mp
	CAPACITY	OF PUMP	• • • • • • • • • • • • • • • • • • • •		50 ga	allons/hour
	LENGTH C	OF CASINC STICK	UP		2.87	feet
	TYPICAL	PUMPING RATE				allons/hour
	ESTIMATE	E OF RECHARGE RA	ATE		20 ga	allons/hour
	QUANTITY	Y OF WATER REMOV	/ED		200 g	allons
1	TOTAL DE	EVELOPMENT TIME			5 ho	urs
•	STANDING	G WATER TIMES F	IVE WELL VOLUM	ES	103.4	0 gallons

i .	MONITORIN	IG WELL	NUMBER.		• • • • •				MW-	l1	
	DATE INST	ALLED.						· • • • • • • •	8/2	7/91	
	DATE DEVE	LOPED.			• • • • •		· • • • • • • • • • • • • • • • • • • •	· • • • • • • •	8/25	9/91	
	STATIC WA	TER LE	VEL (BEI	ORE DE	VELOPI	MENT	?)	· • • • • • •		MEAN VEL (MS	
	STATIC WA	TER LE	VEL (AF	ER DEV	ELOPM!	ENT))		590	MSL	
	FLUID LOS	S DURI	NG DRILI	LING			. .		20	gallon	.s
										•	
	QUANTITY	OF WAT	ER IN WI	ELL AND	ANNU	LUS.			16.	44 gall	.ons
(BOTTOM DEP	TH - STATIC WA LEVEL (FE	TER) x 0.	163 GAL/FE	8	REA OF OREHOLE (FT ²)	- AR	EA OF MW) X	DEPTH OF SANDPACK (FT)	x POROSITY x 7 0.30	.48 GAL/F	T ³] = STANDING VOLUME
: (69	- 40)) x	0.163	1 + [(0.20	-	0.02) x	29	x 0.30 x	7.481	= 16.44 GALLONS
	SAMPLE	COND	ECIFIC UCTIVITY				TEMPERAT	TURE	CUMULATIV GALLONS		/ELOPMENT WATER
	NUMBER	(µmho/	em) (x10	00,	<u>рН</u>		<u>(F)</u>		REMOVED		OMMENTS
	1		1.04		7.84		64.3		0		Brown
	2		1.14		7.76		67.6		25		Cloudy
	3		0.78		7.75		61.8		50		Cloudy
	4 5		0.66 0.65		7.75		61.2		75 100		Milky
	6		0.66		7.76 7.77		61.6 62.0		100 110		Milky Clear
	7		0.65		7.77 7.77		64.0		150		Clear
	·										720
									69		
									15		
									[~] 67		
									~68		
									ВК	_	
									~50	_	s/hour
									2.2		
1									~30	_	-
İ									~20	-	
1									150	_	ns
1	TOTAL DEV	/ELOPME	NT TIME	• • • • • •	• • • • •	• • •	• • • • • • •	• • • • • •	5 h	ours	
	STANDING	WATER	TIMES F	EVE WEL	L VOL	UME	S		82 .	20 gal:	Lons

FIELD MEASUREMENT OF PRE~SAMPLING PARAMETERS OF GROUND WATER

TABLE B-1

FIELD MEASUREMENT OF PRE-SAMPLE
PARAMETERS OF GROUND WATER
FOLLOW-ON SITE INVESTIGATION
MANITOWOC ARMY RESERVE CENTER

MONITORING WELL NO.	DATE	TOTAL PURGE VOLUME (gal)	TEMPERATURE (OF)	CONDUCTIVITY (x100 ohm/cm)	<u>pH</u>
MW-7	11/14/91	11	48.8 49.9 47.3 46.6	7.12 6.90 7.25 7.11	7.70 7.80 8.29 8.10
MW-8	11/15/91	60	50.1 49.7 48.7	9.46 9.73 9.71	7.12 7.50 7.53
MW-9	11/15/91	96	48.7 48.8 48.9 48.5 48.5	11.64 12.08 12.28 12.50 12.62	7.55 7.55 7.54 7.55 7.54
MW-10	11/14/91	103	47.2 47.8 47.6 47.7 47.5 47.4	8.64 8.09 8.06 8.13 8.13	7.40 7.67 7.82 7.51 7.63 7.65
MW-11	11/14/91	66	48.0 47.6 47.4 47.4 47.5 47.3	10.55 10.68 10.67 10.69 10.71 10.60	7.49 7.50 7.46 7.47 7.47 7.48

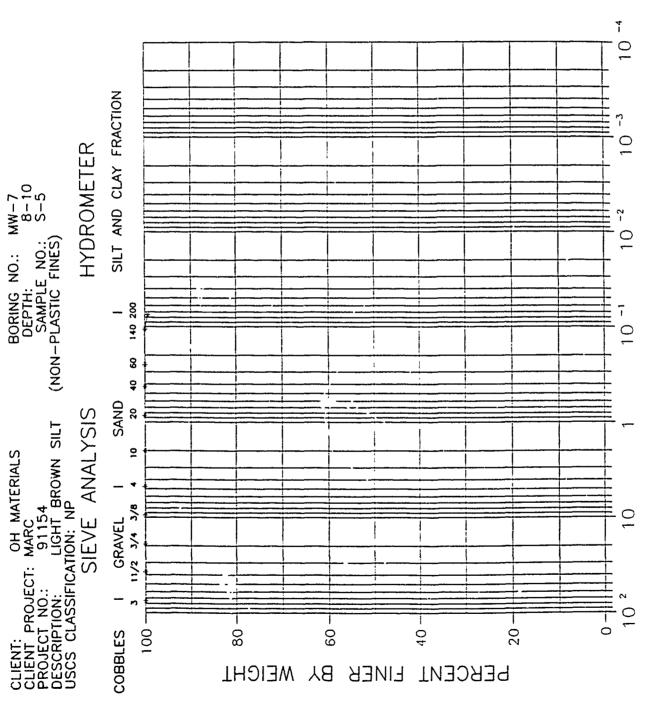
GROUND WATER LEVEL READINGS

TABLE B-2

GROUND WATER LEVEL READINGS FOLLOW-ON SITE INVESTIGATION MANITOWOC ARMY RESERVE CENTER NOVEMBER 14 AND 15, 1991

MONITORING WELL NO.	READING <u>(FEET)</u>	CORRESPONDING ELEVATION (FEET ABOVE MEAN SEA LEVEL)
MW-1A	21.52	630.84
MW-2A	21.70	630.37
MW-2B	63.40	588.83
MW-3	12.46	634.76
MW-4	16.02	634.89
MW-5	15.80	635.42
MW-6	16.49	636.23
MW-7	11.78	634.55
MW-8	54.29	582.66
MW-9	31.28	587.74
MW-10	65.94	587.05
MW-11	59.99	580.19

APPENDIX C
PHYSICAL SOIL TESTING RESULTS



PARTICLE DIAMETER IN MM



OH MATERIALS Client Project MARC

Tested By SVG Date 9-20-91 Checked By 700 Date 9 27 90

Project No. 91154
Boring No. MW-7
Depth(ft.) 8-10

Depth(ft.) 8-10 Sample No. S-5

Visual Description LIGHT BROWN SILT (NON-PLASTIC FINES)

Wt. of Total Sample(2ry) 182.95gm. Wt. of +#200 Sample 1.13gm. Wt. of -#200 Sample 181.82gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percen Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
#4	4.75	0.00	0.0	0.0	100.00
#10	2.00	0.00	0.0	0.0	100.00
#20	0.85	0.00	0.0	0.0	100.00
#40	0.425	0.00	0.0	0.0	100.00
#60	0.250	0.00	0.0	0.0	100.00
#140	0.106	0.05	0.0	0.0	99.97
#200	0.075	1.08	0.6	0.6	99.38
Pan	-	181.82	99.4	100.0	-

Water Content Tare No. 673 Wgt. Tare + WS.
Wgt. Tare + DS.
Wgt. Tare
Wgt. Of Water 290.18 256.07 73.12 34.11 Wgt. Of DS. 182.95

% Water 18.6



ATTERBERG LIMITS TEST

Client

OH MATERIALS

Tested By

TO DO

Date 09-24-91

Client Project

MARC

Checked By

Date 9-27-41

Project No.

91154

Boring No.

MW-7

Depth(ft.)

8-10

Sample No.

S-5

Soil Description

NON PLASTIC (-40)

LIQUID LIMIT

Tara Number

Wt. Tare & WS(gm.)

Wt. Tare & DS(gm.)

Wt. Water(gm.)

Wt. Tare(gm.)

Wt. DS(gm.)

Moisture Content(%)

NO. OF BLOWS

PLASTIC LIMIT

Tare Number

Wt. Tare & WS(gm.)

Wt. Tare & DS(gm.)

Wt. Water(gm.)

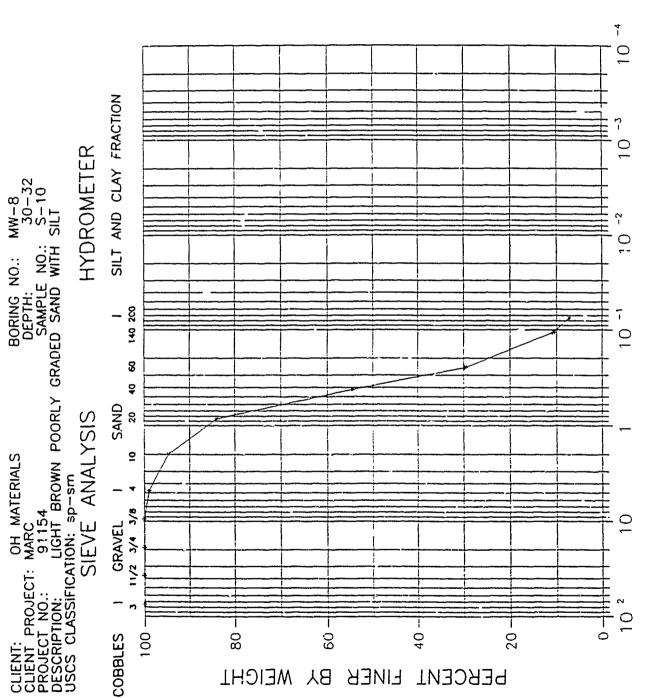
NON PLASTIC

Wt. Tare(gm.)

Wt. DS(gm.)

Moisture Content(%)





PARTICLE DIAMETER IN MM



Client Project OH MATERIALS Client Project MARC

Tested By SVG Date 9-20-91 Checked By J(1)11 Date 9 27 90

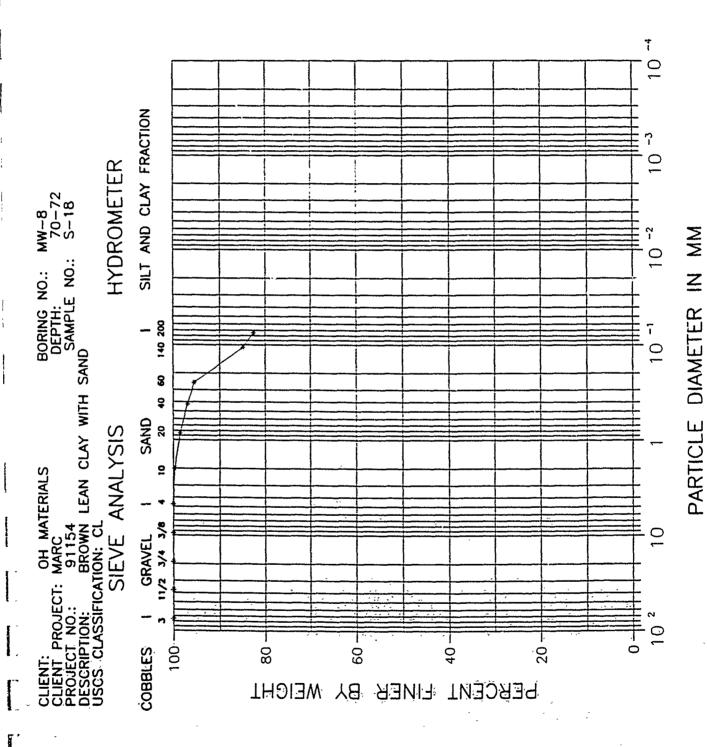
Project No. 91154
Boring No. MW-8
Depth(ft.) 30-32
Sample No. S-10

Visual Description LIGHT BROWN POORLY GRADED SAND WITH SILT

Wt. of Total Sample(dry) 208.19gm. Wt. of +#200 Sample 193.08gm. Wt. of -#200 Sample 15.11gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
#4	4.75	2.21	1.1	1.1	98.94
#10	2.00	8.77	4.2	5.3	94.73
#20	0.85	22.44	10.8	16.1	83.95
#40	0.425	61.20	29.4	45.4	54.55
#60	0.250	51.97	25.0	70.4	29.59
#140	0.106	39.33	18.9	89.3	10.70
#200	0.075	7.16	3.4	92.7	7.26
Pan	-	15.11	7.3	100.0	-

Water Content
Tare No. 675
Wgt. Tare + WS. 285.56
Wgt. Tare + DS. 281.96
Wgt. Tare 73.77
Wgt. Of Water 3.60
Wgt. Of DS. 208.19





Client OH MATERIALS

Tested By SVG Date 9-20-91 Checked By $f_{C,M}$ Date 9-27 9/

Client Project MARC
Project No. 91154
Boring No. MW-8
Depth(ft.) 70-72

Sample No. S-18 Visual Description BROWN LEAN CLAY WITH SAND

Wt. of Total Sample(dry) 107.13gm. Wt. of +#200 Sample 18.71gm. Wt. of -#200 Sample 88.42gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
311	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8" #4	9.50	0.00	0.0	0.0	100.00
#4	4.75	0.00	0.0	0.0	100.00
#10	2.00	0.32	0.3	0.3	99.70
#20	0.85	1.29	1.2	1.5	98.50
#40	0.425	1.70	1.6	3.1	96.91
#60	0.250	1.53	1.4	4.5	95.48
#140	0.106	11.32	10.6	15.1	84.92
#200	0.075	2.55	2.4	17.5	82.54
Pan	-	88.42	82.5	100.0	-

Water Content
Tare No. 783
Wgt. Tare + WS. 206.19
Wgt. Tare + DS. 192.90
Wgt. Tare 85.77
Wgt. Of Water 13.29
Wgt. Of DS. 107.13
% Water 12.4

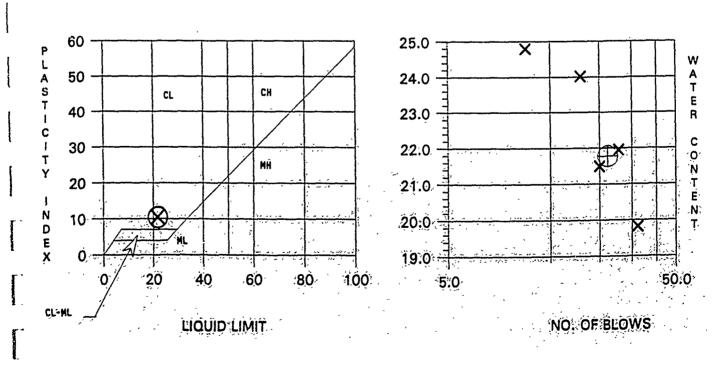


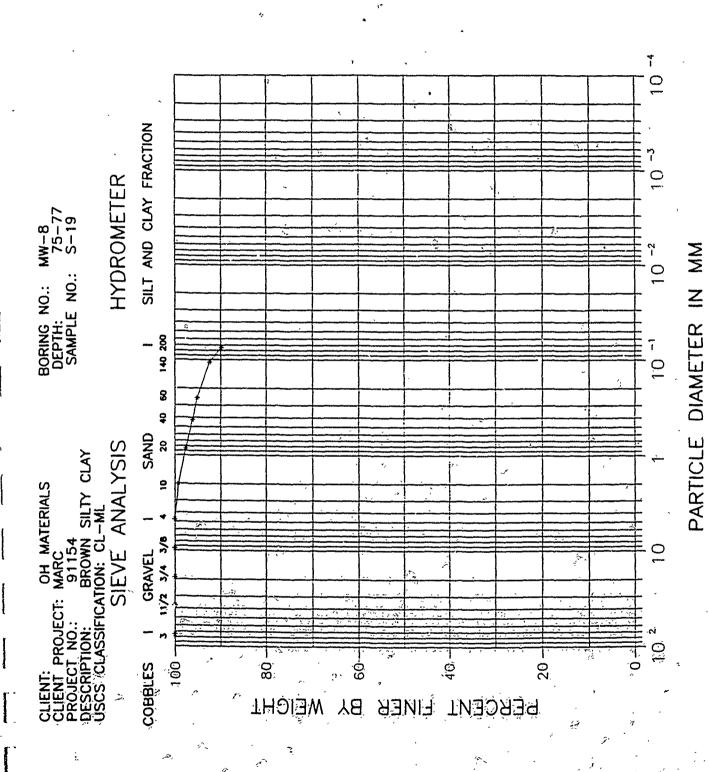
ATTERBERG LIMITS TEST

Client Client Project Project No. Boring No. Depth(ft.) Sample No.	OH MATERIALS MARC 91154 MW-8 70-72 S-18		Fested By Checked By	TO Sill-	Date Dáte	09-24-91 9 <i>-</i> 27-4/
Soil Description	BROWN LEA	N CLAY	(-	·40)		
LIQUID LIMIT Tare Number Wt. Tare & WS(gm.) Wt. Tare & DS(gm.) Wt. Water(gm.) Wt. Tare(gm.) Wt. DS(gm.) NO. OF BLOWS Moisture Content(%)	453 105.28 104.36 0.92 99.72 4.64 34 19.8	456 105.96 104.79 1.17 99.46 5.33 28 22.0	110 99.55 98.77 0.78 95.14 3.63 23 21.5	924 37.87 37.20 0.67 34.41 2.79 19	39.44 38.23 1.21 33.35 4.88	
PLASTIC LIMIT Tare Number Wt. Tare & WS(gm.) Wt. Tare & DS(gm.) Wt. Water(gm.) Wt. Tare(gm.) Wt. DS(gm.) Moisture Content(%)	813 41.09 40.58 0.51 36.56 4.02 12.7	806 42.15 41.67 0.48 37.05 4.62 10.4	659 38.56 38.04 0.52 33.27 4.77 10.9	Summary Liquid Lin Plastic Lir Plasticity USCS Syn	nit % mit % Index	22 11 10 CL

PLASTICITY CHART

FLOW CURVE







Client OH MATERIALS Client Project MARC

Tested By SYG Date 9-20-91 Checked By Jom Date 9 27 91

Project No. Boring No. 91154 8-WM Depth(ft.) 75-77 S-19 Sample No.

Visual Description BROWN SILTY CLAY

Wt. of Total Sample(dry) 120.38gm. Wt. of +#200 Sample Wt. of -#200 Sample 12.16gm. 108.22gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
3/8" #4	4.75	0.00	0.0	0.0	100.00
#10	2.00	0.90	0.7	0.7	99.25
#20	0.85	1.95	1.6	2.4	97.63
#40	0.425	1.81	1.5	3.9	96.13
#60	0.250	1.14	0.9	4.8	95.18
#140	0.106	3.28	2.7	7.5	92.46
#200	0.075	3.08	2.6	10.1	89.90
Pan	-	108.22	89.9	100.0	-

Water Content Tare No.
Wgt. Tare + WS.
Wgt. Tare + DS.
Wgt. Tare
Wgt. Of Water 729 225.35 207.00 86.62 18.35 Wgt. Of DS. 120,38 % Water

15.2

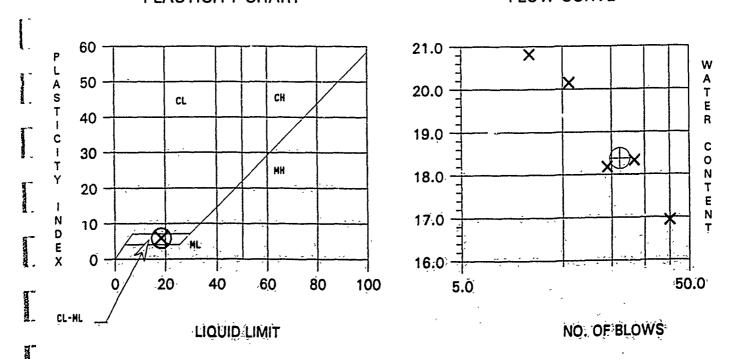


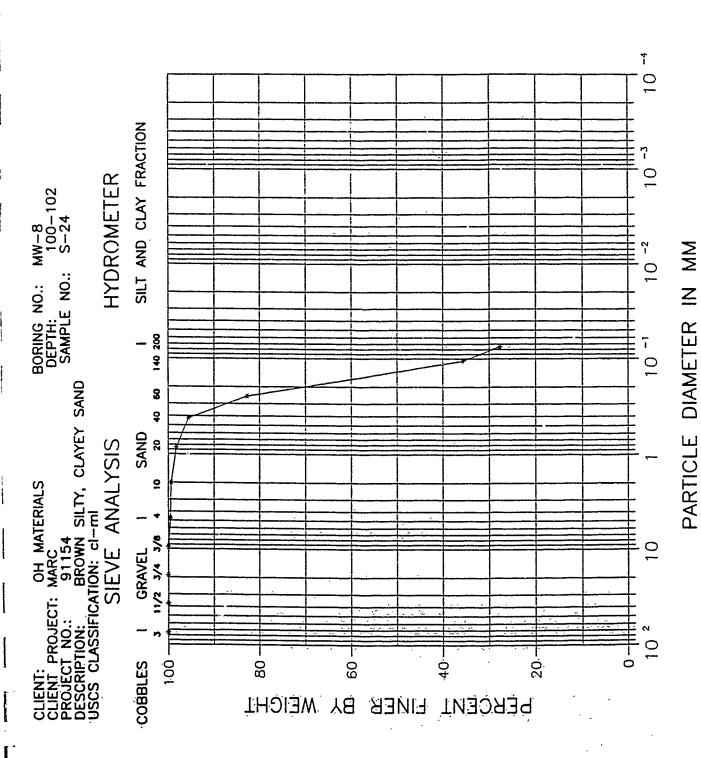
ATTERBERG LIMITS TEST

Appropriate of the Company of the Co	Client Client Project Project No Boring No. Depth(ft.) Sample No. Soil Description	OH MATERIALS MARC 91154 MW-8 75-77 S-19 BROWN SILT	Y CLAY	Tested By Checked By	-7.	ate ate	09-24-91 9-27-9}
(LIQUID LIMIT						
	Tare Number	1301	640	741	734	1902	
	Wt. Tare & WS(gm.)	106.65	43.76	37.04	40.63	43.00	
[Wt. Tare & DS(gm.)	106.13	42.99	36.58	40.08	42.23	
-	Wt. Water(gm.)	0.52	0.77	0.46	0.55	0.77	
	Wt. Tare(gm.)	103.06	38.79	34.05	37.35	38.53	
1	Wt. DS(gm.)	3.07	4.20	2.53	2.73	3.70	
1	NO. OF BLOWS	41	29	22	15	10	
	Moisture Content(%)	16.9	18.3	18.2	20.1	20.8	
{ .							
- [.	PLASTIC LIMIT						
	Tare Number	903	821	822	Summary		
1	Wt. Tare & WS(gm.)	38.09	35.01	41.45	Liquid Limit		18
1.	Wt. Tare & DS(gm.)	37.55	34.49	40.87	Plastic Limit	: %	13
	Wt. Water(gm.)	0.54	0.52	0.58	Plasticity Inc	dex	6
1	Wt. Tare(gm.)	33.36	30.35	36.09	USCS Symb	ool	CL-ML
1	Wt. DS(gm.)	4.19	4.14	4.78			
	Moisture Content(%)	12.9	12.6	12.1			
1							

PLASTICITY CHART

FLOW CURVE







Client OH MATERIALS Tested By SVG Date 9-20-91 Checked By 10,77 Date 9 27 9/

Client Project MARC Project No. Boring No.

91154 MW-8 100-102

Depth(ft.) 100-1 Sample No. S-24

Visual Description BROWN SILTY, CLAYEY SAND

Wt. of Total Sample(dry)
Wt. of +#200 Sample
Wt. of -#200 Sample

203.82gm. 147.48gm.

56.34gm.

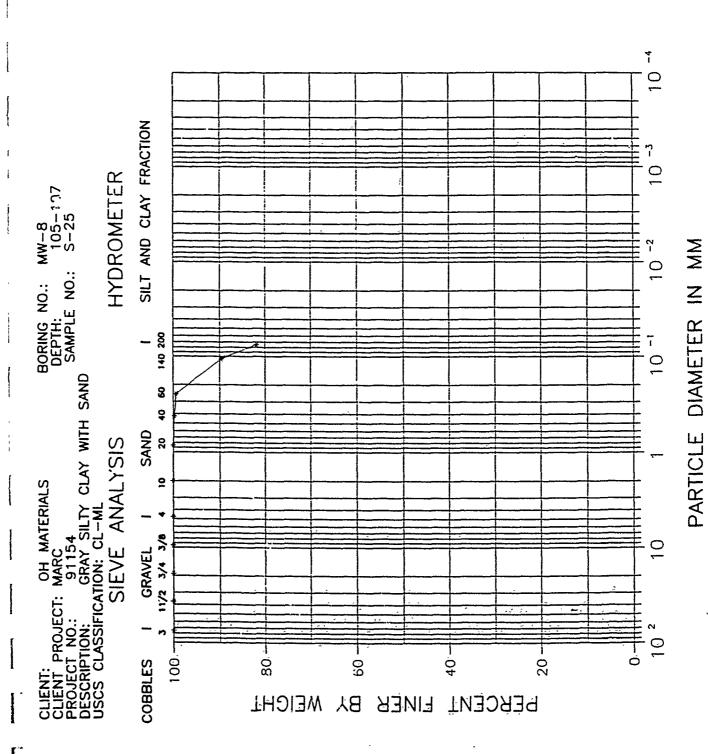
Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
#4	4.75	0.95	0.5	0.5	99.53
#10	2.00	0.33	0.2	0.6	99.37
#20	0.85	2.39	1.2	1.8	98.20
#40	0.425	5.36	2.6	4.4	95.57
#60	0.250	26.19	12.8	17.3	82.72
#140	0.106	95.75	47.0	64.3	35.74
#200	0.075	16.51	8.1	72.4	27.64
Pan	-	56.34	27.6	100.0	-

Water Content

Tare No. 731 Wgt. Tare + WS. Wgt. Tare + DS. Wgt. Tare Wgt. Of Water 325.25 288.28 84.46 36.97 Wgt. Of DS. 203.82

% Water

18.1





Client Project MARC

Tested By SVG Date 9-20-91 Checked By 4 cm Date 9-27.91

Project No. 91154
Boring No. MW-8
Depth(ft.) 105-107
Sample No. S-25

Visual Description GRAY SILTY CLAY WITH SAND

Wt. of Total Sample(dry) 112.14gm. Wt. of +#200 Sample 20.32gm. Wt. of -#200 Sample 91.82gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
#4	4.75	0.00	0.0	0.0	100.00
#10	2.00	0.00	0.0	0.0	100.00
#20	0.85	0.00	0.0	0.0	100.00
#40	0.425	0.22	0.2	0.2	99.80
#60	0.250	0.45	0.4	0.6	99.40
#140	0.106	10.88	9.7	10.3	89.70
#200	0.075	8.77	7.8	18.1	81.88
Pan	_	91.82	81.9	100.0	-

Water Content
Tare No. 784
Wgt. Tare + WS. 215.12
Wgt. Tare + DS. 197.50
Wgt. Tare 85.36
Wgt. Of Water 17.62
Wgt. Of DS. 112.14

* Water 15.7

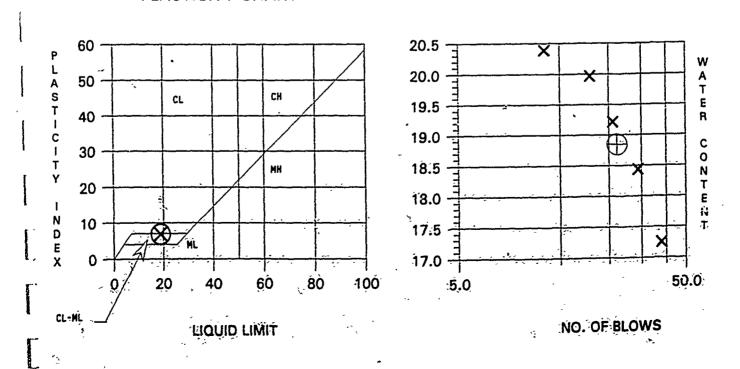


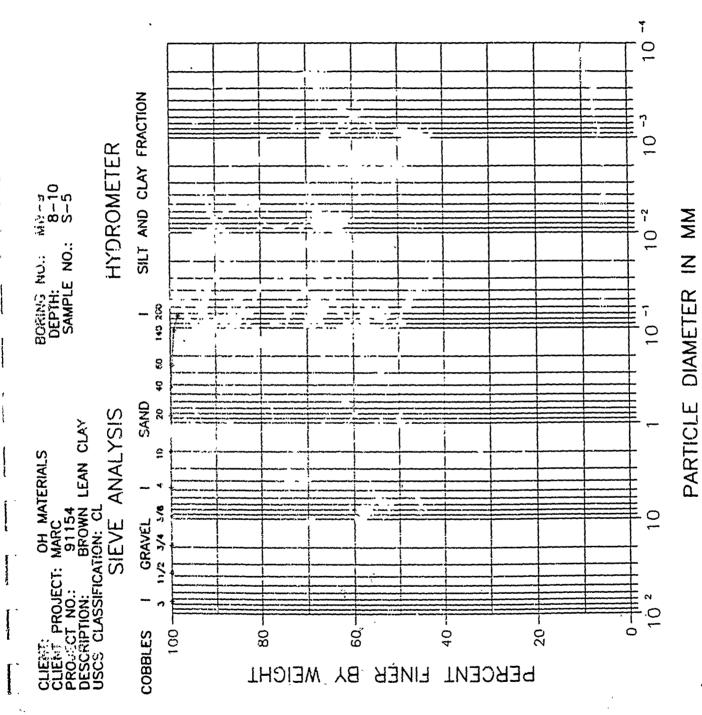
ATTERBÉRG LÌMÍTS TEST

	Client Client Project Project No. Boring No. Depth(ft.) Sample No. Soil Description	OH MATERIALS MARC 91154 MW-8 105-107 S-25 GRAYISH BRO	Cho	stéd By ecked By CLAY (-	MM Date SUC Date		09-25-91 9-27-aj
1	LIQUID LIMIT						
	Tare Number	717	631	788	746	918	
	Wt. Tare & WS(gm.)	42.11	41.23	42.05	43.37	36.00	
1	Wt. Tare & DS(gm.)	41.02	40.12	41.02	42.21	35.05	
1	Wt. Water(gm.)	1.09	1.11	1.03	1.16	0.95	
	Wt. Tare(gm.)	34.70	34.10	35.66	36.40	30.39	
	Wt. DS(gm.)	6.32	6.02	5.36	5.81	4.66	
ł	NO. OF BLOWS	39	31	24	19	12	
	Moisture Content(%)	17.2	18.4	19.2	20.0	20.4	
-	PLASTIC LIMIT Tare Number	. 118	442	93	Summary		
j	Wt. Tare & WS(gm.)	110.67	106.09	100.72	Liquid Limit %		19
l	Wt. Tare & DS(gm.)	110.00	105.45	100.06	Plastic Limit %		12
	Wt. Water(gm.)	0.67	0.64	0.66	Plasticity Index		7
	Wt. Tare(gm.)	104.42	99.98	94.71	USCS Symbol		CL-ML
İ	Wt. DS(gm.)	5.58	5.47	5.35			
	Moisture Content(%)	12.0	11.7	12.3		7	
f							

PLASTICITY CHART

FLOW CURVE





Colo alamia



Client OH MATERIALS

Tested By SVG Date 9-20-91 Checked By $\int_{C/M}$ Date 9.27.91

Client Project MARC
Project No. 91154
Boring No. MW-9
Depth(ft.) 8-10
Sample No. S-5

Visual Description BROWN LEAN CLAY

Wt. of Total Sample(dry) 129.12gm.
Wt. of +#200 Sample 2.18gm.
Wt. of -#200 Sample 126.94gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
# 4	4.75	0.00	0.0	0.0	100.00
#10	2.00	0.00	0.0	0.0	100.00
#20	0.85	0.08	0.1	0.1	99.94
#40	0.425	0.08	0.1	0.1	99.88
#60	0.250	0.24	0.2	0.3	99.69
#140	0.106	0.67	0.5	0.8	99.17
#200	0.075	1.11	0.9	1.7	98.31
Pan	-	126.94	98.3	100.0	-

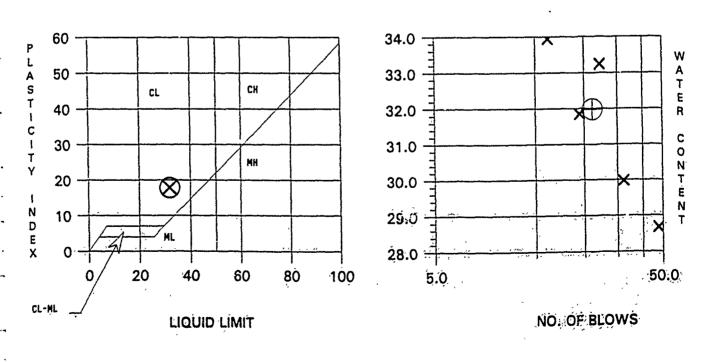
Water Content
Tare No. 677
Wgt. Tare + WS. 223.96
Wgt. Tare + DS. 203.80
Wgt. Tare 74 68
Wgt. Of Water 20.16
Wgt. Of DS. 129.12
% Water 15.6

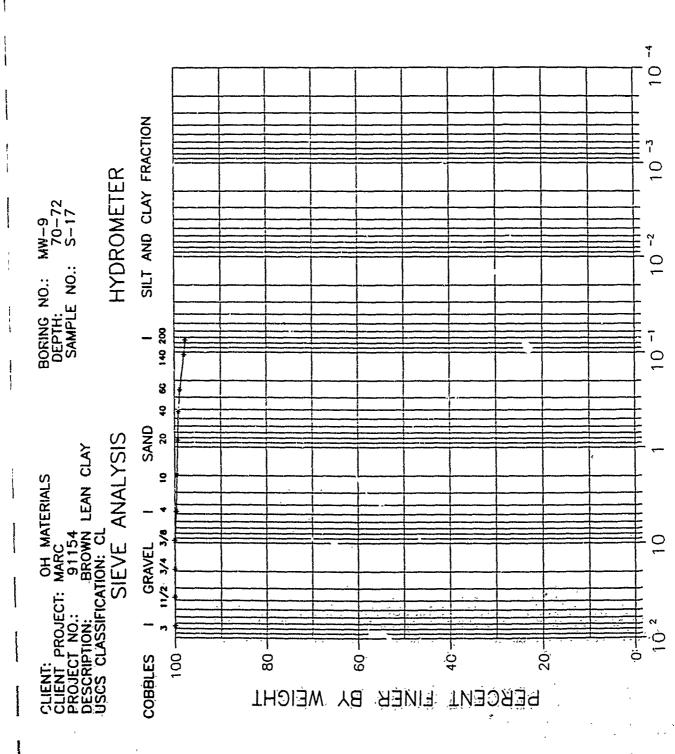


	Client Client Project Project No. Boring No. Depth(ft.) Sample No.	OH MATERIALS MARC 91154 MW-9 8-10 S-5 BROWN LEAR	VI C1 V.A	Tested By Checked By	TO ≲V & -40)	Date Date		09-25-91 9-27-91
	Soil Description	BROWN LEAD	VCLAT	\-	· -1 0/			
	LIQUID LIMIT							
	Tare Number	932	655	925	602		791	
	Wt. Tare & WS(gm.)	38.45	43.96	. 35.63	13.54		38.57	
	Wt. Tare & DS(gm.)	37.30	42.92	34.50	42.03		37.26	
	Wt. Water(gm.)	1.15	1.04	1.13	1.51		1.31	
	Wt. Tare(gm.)	33.29	39.45	31.10	37.29)	33.40	
	Wt. DS(gm.)	4.01	3.47	3.40	4.74	ļ.	3.86	
	NO OF BLOWS	48	34	27	22	2	16	
,	Moisture Content(%)	28.7	30.0	33.2	31.9)	33.9	
 	DI ACTIC LIMIT							
ŧ	PLASTIC LIMIT		604	789	Summary	•		
i	Tare Number	834	621	-	Summary			32
	Wt. Tare & WS(gm.)	37.50	40.53		Liquid Lir			
1	Wt. Tare & DS(gm.)	36.93	39.87		Plastic Li			14
	Wt. Water(gm.)	0.57	0.66		Plasticity			18
	Wt. Tare(gm.)	32.96	35.25	30.82	USCS Sy	mbol		CL
ì	Wt. DS(gm.)	3.97	4.62	3.82				
	Moisture Content(%)	14.4	14.3	13.9				

PLASTICITY CHART

FLOW CURVE





PARTICLE DIAMETER IN MM



Client OH MATERIALS

Tested By SVG Date 9-20-91 Checked By Jom Date 9-27 9/

Client Project MARC
Project No. 91154
Boring No. MW-9
Depth(ft.) 70-72
Sample No. S-17

Sample No. S-17 Visual Description BROWN LEAN CLAY

Wt. of Total Sample(dry) 131.53gm.
Wt. of +#200 Sample 3.19gm.
Wt. of -#200 Sample 128.34gm.

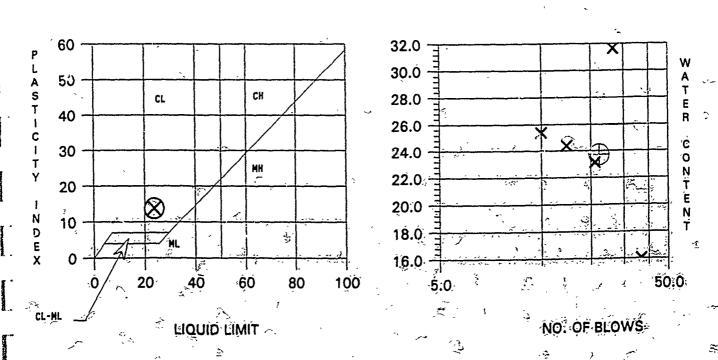
Sieve	Sieve Opening (mm)	Wt. of Soil 'stained 'stained	Percent Retained	Accumulated Percent Retained	Percent Finer
3" 1 1/2" 3/4" 3/8" #40 #20 #40 #140 #200 Pan	75.00 37.50 19.00 9.50 4.75 2.00 0.85 0.425 0.250 0.106 0.075	0.00 0.00 0.00 0.00 0.42 0.22 0.25 0.24 0.44 1.23 0.39 128.34	0.0 0.0 0.0 0.3 0.2 0.2 0.2 0.3 0.9 0.3	0.0 0.0 0.0 0.3 0.5 0.7 0.9 1.2 2.1 2.4	100.00 100.00 100.00 100.00 99.68 99.51 99.32 99.14 98.81 97.87 97.57

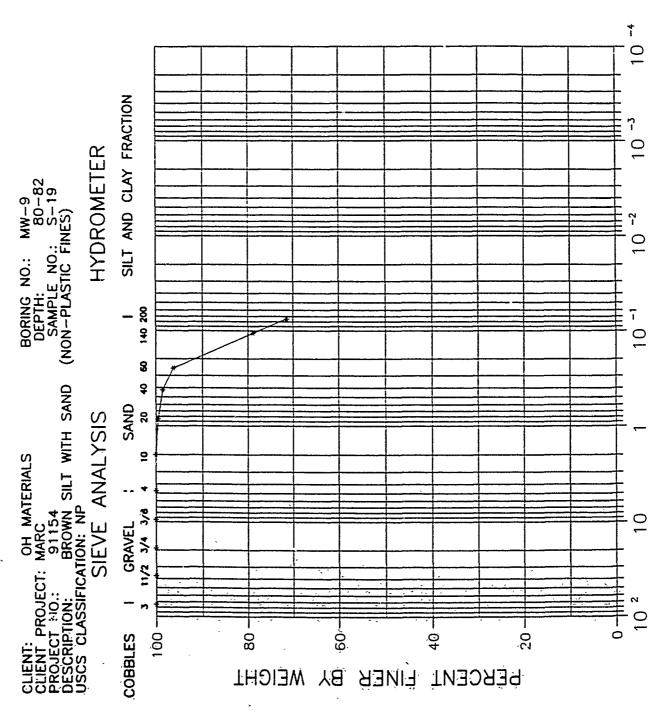


	Client Client Project Project No. Boring No. Depth(ft.) Sample No. Soil Description	OH MATERIALS MARC 91154 MW-9 70-72 S-17 BROWN LEA		Tested By Checked By	TO ∻v'6~ (-40)	Date Date	09-24-91 <i>9-27</i> -91
	LIQUID LIMIT						
	Tare Number	139	19	795	789		
	Wt. Tare & WS(gm.)	101.44	94.09	33.42	35.82		
	Wt. Tare & DS(gm.)	100.53	93.34	32.74	34.84		
	Wt. Water(gm.)	0.91	0.75	0.68	0.98		
	Wt. Tare(gm.)	94.85	90.97	29.80	30.82		
	Wt. DS(gm.)	5.68	2.37	2.94	4.02		
	NO. OF BLOWS	38	29	24	18		
	Moisture Content(%)	16.0	31.6	23.1	24.4	25.4	
	PLASTIC LIMIT						
	Tare Number	638	766	646	Summary		
	Wt. Tare & WS(gm.)	45.10	38.51	44.79	Liquid Lin	nit %	24
	Wt. Tare & DS(gm.)	44.54	38.09	44.36	Plastic Lit	nit %	10
	Wt. Water(gm.)	0.56	0.42	0.43	Plasticity	Index	14.
	Wt. Tare(gm.)	39.19	33.94	39.79	USCS Sy	mbol	CL
į	Wt. DS(gm.)	5.35	4.15	4.57			
1	Moisture Content(%)	10.5	10.1	9.4			

PLASTICITY CHART

FLOW CURVE





PARTICLE DIAMETER IN MM



Client Project MARC

Tested By SVG Date 9-20-91 Checked By Cm Date 9-27-9/

Project No. 91154
Boring No. MW-9
Depth(ft.) 80-82

Sample No. S-19 Visual Description BROWN SILT WITH SAND

(NON-PLASTIC FINES)

Wt. of Total Sample(dry) 145.01gm.
Wt. of +#200 Sample 41.49gm.
Wt. of -#200 Sample 103.52gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3" 1 /2" 3 /4" 3 /8" #44 #10 #20 #40 #60 #140 #200	75.00 37.50 19.00 9.50 4.75 2.00 0.85 0.425 0.250 0.106 0.075	0.00 0.00 0.00 0.00 0.00 0.67 1.56 3.23 25.10 10.93 103.52	0.0 0.0 0.0 0.0 0.0 0.5 1.1 2.2 17.3 7.5 71.4	0.0 0.0 0.0 0.0 0.0 0.5 1.5 3.8 21.1 28.6	100.00 100.00 100.00 100.00 100.00 99.54 98.46 96.23 78.93 71.39

Water Content

Tare No. 730
Wgt. Tare + Ws. 257.78
Wgt. Tare + Ds. 231.60
Wgt. Tare 86.59
Wgt. Of Water 26.18
Wgt. Of Ds. 145.01

% Water



Client OH MATERIALS Tested By TO Date 09-24-91
Client Project MAPC Checked By SUC Date 4-27-61/
Boring No. MW-9

Depth(ft.) 80-82 Sample No. S-19

Soil Description NON PLASTIC (-40)

LIQUID LIMIT

Tare Number

Wt. Tare & WS(gm.)

Wt. Tare & DS(gm.)

Wt. Water(gm.)

Wt. Tare(gm.)

Wt. DS(gm.)

Moisture Content(%)

NO. OF BLOWS

PLASTIC LIMIT

Tare Number

Wt. Tare & WS(gm.)

Wt. Tare & DS(gm.)

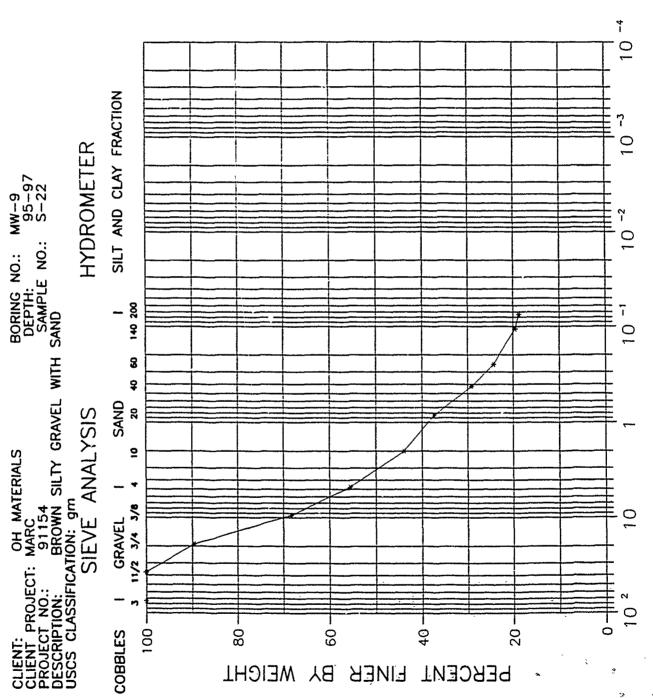
Wt. Water(gm.)

Wt. Tare(gm.)

Wt. DS(gm.)

Moisture Content(%)

NON PLASTIC



PARTICLE DIAMETER IN MM



Client OH MATERIALS

Client Project MARC Project No. 91154

Boring No. MW-9 Depth(ft.) 95-97

S-22

Sample No. S-22 Visual Description BROWN SILTY GRAVEL WITH SAND

Wt. of Dry Split Sample Wt. of +#200 Sample Wt. of -#200 Sample

253.45gm.

Wt. of Grand Total

Tested By SVG Date 9-27-91 Checked By Date 9-27-91

255

200.44gm. 53.01gm.

J Factor

0.896

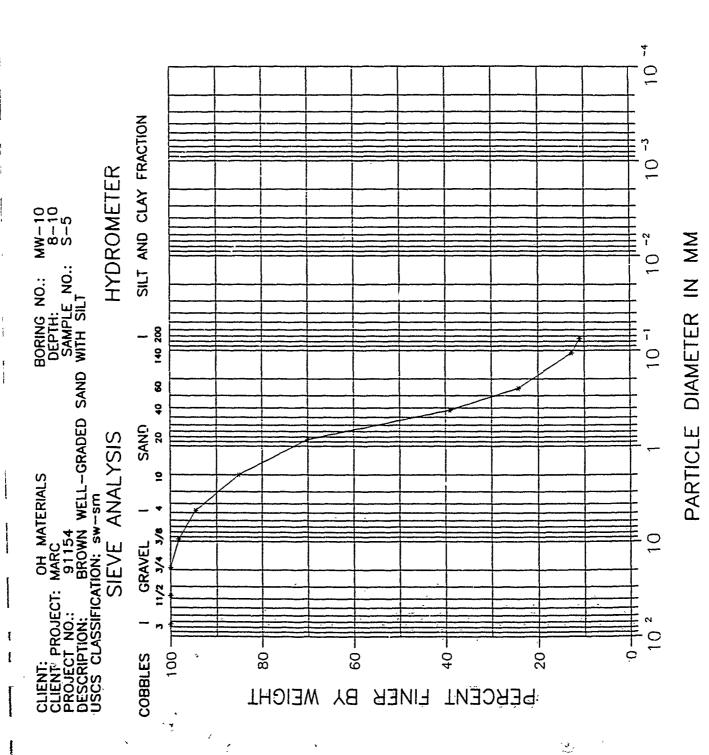
Sieve	Sieve Opening (mm)	Wt of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer	Final Percent Finer
311	75.00	0.00	0.00	0.00	100.0	100.0
1 1/2"	37.50	0.00	0.00	0.00	100.0	100.0
3/4"	19.00	26.51	10.38	10.38	89.6	89.6
3/8" #4	9.50	60.33	23.80	23.80	76.2	68.3
#4	4.75	35.99	14.20	38.00	62.0	55.6
#10	2.00	32.92	12.99	50.99	49.0	43.9
#20	0.85	18.29	7.22	58.21	41.8	37.5
#40	0.425	23.53	9.28	67.49	32.5	29.1
#60	0.250	13.71	5.41	72.90	27.1	24.3
#140	0.106	13.33	5.26	78.16	21.8	19.6
#200	0.075	2.34	0.92	79.08	20.9	18.7
Pan		53.01	20.92	100.0	_	-

TARE NO. 700 WGT. TARE +WS. WGT. TARE +DS. 349.36 329.50 WGT. OF TARE
WGT. OF WATER
WGT. OF DS 76.05 19.86 253.45

TOTAL WET WGT.-3/4 SIEVE 246.8

TOTAL DRY WGT.-3/4 SIEVE 228.9

% WATER





Client OH MATERIALS

Tested By SVG Date 9-20-91 Checked By Jcm Date 9.27-9/

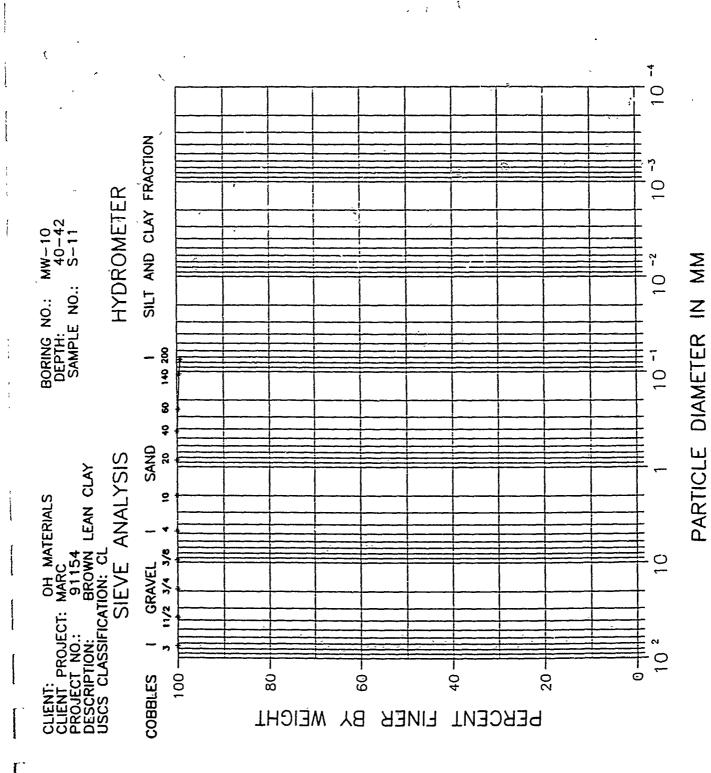
Client Project MARC
Project No. 91154
Boring No. MW-10
Depth(ft.) 8-10
Sample No. S-5

Sample No. S-5 Visual Description BROWN WELL-GRADED SAND WITH SILT

Wt. of Total Sample(dry) 168.57gm.
Wt. of +#200 Sample 149.99gm.
Wt. of --#200 Sample 18.58gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Pércent Retained	Percent Finer
311	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	3.04	1.8	1.8	98.20
3/8 " #4	4.75	6.11	3.6	5.4	94.57
#10	2.00	15.91	9.4	14.9	85.13
#20	0.85	25.36	15.0	29.9	70.09
#40	0.425	52.30	31.0	60.9	39.06
#60	0.250	24.99	14.8	75.8	24.24
#140	0.106	19.21	11.4	87.2	12.84
#200	0.075	3.07	1.8	89.0	11.02
Pan		18.58	11.0	100.0	-

Water Content
Tare No. 726
Wgt. Tare + Ws. 266.03
Wgt. Tare + Ds. 254.53
Wgt. Tare 85.96
Wgt. Of Water 11.50
Wgt. Of DS. 168.57





Client Project OH MATERIALS MARC

Tested By SVG Date 9-20-91 Checked By Cm Date 9-27-91

Project No.
Boring No. 91154 MW-10 Depth(ft.)

40-42 S-11 Sample No.

Visual Description BROWN LEAN CLAY

Wt. of Total Sample(dry)
Wt. of +#200 Sample
Wt. of -#200 Sample

96.67gm. 0.76gm.

95.91gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
#4	4.75	0.00	0.0	0.0	100.00
#1 0	2.00	0.00	0.0	0.0	100.00
#20	0.85	0.00	0.0	0.0	100.00
#40	0.425	0.00	0.0	0.0	100.00
# 60	0.250	0.20	0.2	0.2	99.79
#140	0.106	0.29	0.3	0.5	99.49
#200	0.075	0.27	0.3	0.8	99.21
Pan	-	95.91	99.2	100.0	-

Water Content Tare No.
Wgt. Tare + WS.
Wgt. Tare + DS.
Wgt. Tare
Wgt. Of Water 725 202.20 183.61 86.94 18.59 Wgt. Of DS. 96.67

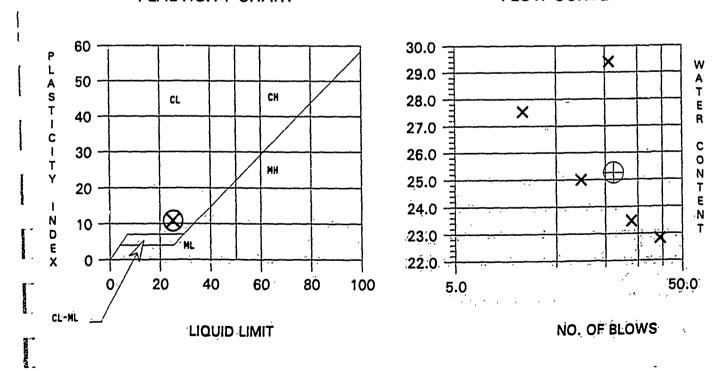
% Water 19.2

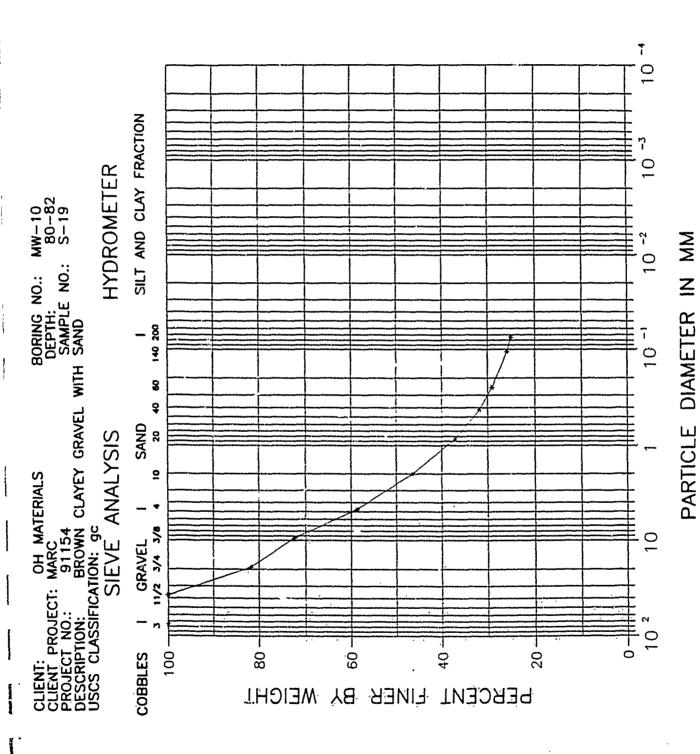


Client Client Project Project No. Boring No. Depth(ft.) Sample No. Soil Description	OH MATERIALS MARC 91154 MW-10 40-42 S-11 BROWN LEAR	C	ested By Checked By (-	1	Oate Oate	09-25-91 <i>9-</i> Z7-9 (
LIQUID LIMIT						
Tare Number	757	908	761	716	810	
Wt. Tare & WS(gm.)	42.20	39.42	41.10	40.41	43.22	
Wt. Tare & DS(gm.)	40.73	38.08	39.98	39.00	41.75	
Wt. Water(gm.)	1.47	1.34	1.12	1.41	1.47	
Wt. Tare(gm.)	34.29	32.37	36.17	33.36	36.41	
Wt. DS(gm.)	6.44	5.71	3.81	5.64	5.34	
NO. OF BLOWS	40	30	24	18	10	
Moisture Content(%)	22.8	23.5	29.4	25.0	27.5	
PLASTIC LIMIT	r					
Tare Number	1013	90	829	Summary		
Wt. Tare & WS(gm.)	96.25	107.23	38.05	Liquid Limi	t %	25
Wt. Tare & DS(gm.)	95.48	106.43	37.25	Plastic Lim	it %	14
Wt. Water(gra.)	0.77	0.80	0.80	Plasticity In	ndex	11
Wt. Tare(gm.)	90.19	100.94	31.63	USCS Sym	bol	CL
Wt. DS(gm.)	5.29	5.49	5.62			
Moisture Content(%)	14.6	14.6	14.2			

PLASTICITY CHART

FLOW CURVE







OH MATERIALS Client

Tested By SVG Date 9-20-91 Checked By Qom Date 9.27-91

Client Project MARC Project No. 91154

91154

Boring No. Depth(ft.)

MW-10

80-82

Sample No. S-19 Visual Description BROWN CLAYEY GRAVEL WITH SAND

Wt. of Dry Split Sample Wt. of +#200 Sample Wt. of -#200 Sample

302.97gm.

Wt. of Grand Total

307

210.23gm. 92.74gm.

J Factor

0.818

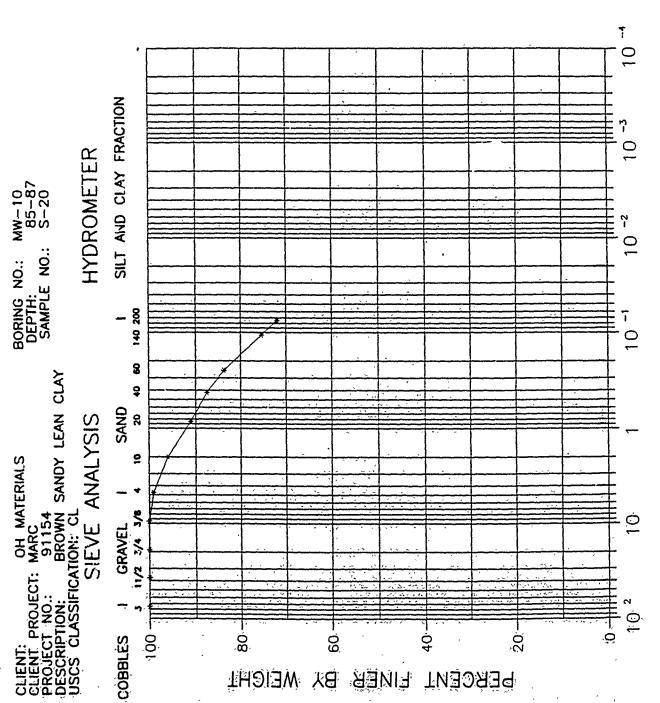
Sieve	Sieve Opening (mm)	Wt of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer	Final Percent Finer
3"	75.00	0.00	0.00	0.00	100.0	100.0
1 1/2"	37.50	0.00	0.00	0.00	100.0	100.0
3/4"	19.00	55.95	18.22	18.22	81.8	81.8
3/8"	9.50	34.55	11.40	11.40	88.6	72.5
3/8" #4	4.75	50.88	16.79	28.20	71.8	58.7
#10	2.00	45.54	15.03	43.23	56.8	46.4
#20	0.85	34.64	11.43	54.66	45.3	37.1
#40	0.425	19.46	6.42	61.09	38.9	31.8
#60	0.250	10.19	3.36	64.45	35.6	29.1
#140	0.106	11.86	3.91	68.36	31.6	25.9
#200	0.075	3.11	1.03	69.39	30.6	25.0
Pan	-	92.74	30.61	100.0	-	

TARE NO. 672 WGT. TARE +WS.
WGT. TARE +DS.
WGT. OF TARE
WGT. OF WATER 401.26 376.85 73.88 24.41 WGT. OF DS 302.97

TOTAL WET WGT.-3/4 SIEVE 271.4

TOTAL DRY WGT.-3/4 SIEVE 251.2

% WATER



PARTICLE DIAMETER IN MM

1



Client Client Project MARC

OH MATERIALS

Tested By SVG Date 9-20-91 Checked By J Cypy Date 9-27-91

Project No.
Boring No.
Depth(ft.)

91154

MW-10

85-87 S-20

Sample No. S-20 Visual Description BROWN SANDY LEAN CLAY

117.95gm.

33.10gm.

Wt. of Total Sample(dry)
Wt. of +#200 Sample
Wt. of -#200 Sample

84.85gm.

cent Accumulated Percent
tained Percent Finer Retained
0.0 0.0 100.00
0.0 0.0 100.00
0.0 0.0 100.00
0.0 0.0 100.00
0.9 99.08
3.1 4.0 95.98
4.9 8.9 91.11
3.6 12.5 87.50
3.7 16.2 83.76
3.4 24.6 75.37
3.4 28.1 71.94
1.9 100.0 -

Water Content Water Content
Tare No.
Wgt. Tare + Ws.
Wgt. Tare + Ds.
Wgt. Tare
Wgt. Of Water
Wgt. Of DS. K-15 207.10 192.10 74.15 15.00 117.95

% Water

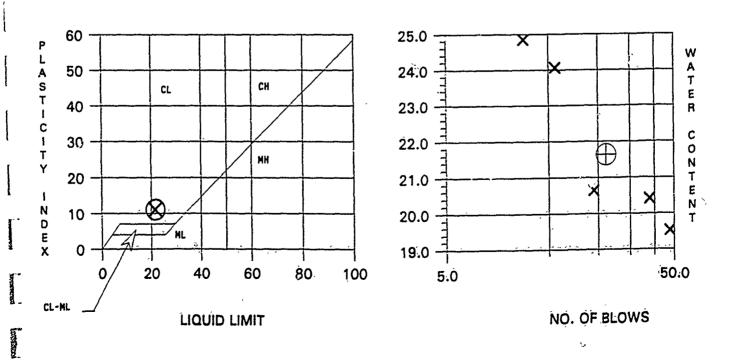
Cotechnics

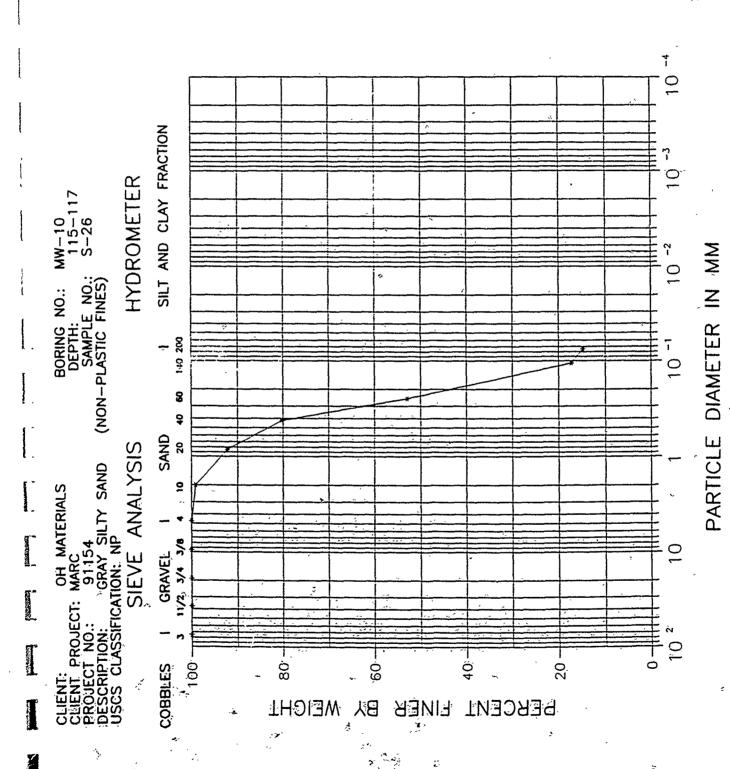
ATTERBERG LIMITS TEST

Client	OH MATERIALS		Tested By	TO	Date	09-23-91
Client Project	MARC		Checked By	500	Date	9-27-91
Project No.	91154					
Boring No.	MW-10					
Depth(ft.)	85-87					
Sample No.	S-20					
Soil Description	BROWN LEA	N CLAY	(-	-40)		
LIQUID LIMIT						
Tare Number	55	1309	1306	441	439	
Wt. Tare & WS(gm.)	111.81	106.55	105.94	102.42	103.68	
Wt. Tare & DS(gm.)	110.97	105.86	105.43	101.65	102.85	
Wt. Water(gm.)	0.84	0.69	0.51	0.77	0.83	
Wt. Tare(gm.)	106.67	102.48	102.96	98.45	99.51	
Wt. DS(gm.)	4.30	3.38	2.47	3.20	3.34	
NO. OF BLOWS	48	39	22	15	11	
Moisture Content(%)	19.5	20.4	20.6	24.1	24.9	
PLASTIC LIMIT			•			
Tare Number	759	800	809	Summary		
Wt. Tare & WS(gm.)	41.45	46.61	39.15	Liquid Lin	nit %	22
Wt. Tare & DS(gm.)	40.98	46.11	38.64	Plastic Li	nit %	11
Wt. Water(gm.)	0.47	0.50	0.51	Plasticity	Index	11
Wt. Tare(gm.)	36.47	41.30	34.04	USCS Sy	mbol	CL
Wt. DS(gm.)	4.51	4.81	4.60			
Moisture Content(%)	10.4	10.4	11.1			

PLASTICITY CHART

FLOW CURVE







Client OH MATERIALS Tested By SVG Date 9-20-91 Checked By Om Date 9-27-9/ Client Project MARC Project No. 91154 MW-10 Boring No. Depth(ft.) 115-117

Sample No. S-26
Visual Description GRAY SILTY SAND (NON-PLASTIC FINES)

Wt. of Total Sample(dry) 240.69gm. 205.06gm. Wt. of +#200 Sample Wt. of -#200 Sample 35.63gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3" 1 1/2" 3/4" 3/8" #4 #10 #20 #40 #60 #140 #200 Pan	75.00 37.50 19.00 9.50 4.75 2.00 0.85 0.425 0.250 0.106 0.075	0.00 0.00 0.00 0.00 0.00 2.25 16.26 28.91 65.74 85.81 6.09 35.63	0.0 0.0 0.0 0.0 0.9 6.8 12.0 27.3 35.7 2.5	0.0 0.0 0.0 0.0 0.0 0.9 7.7 19.7 47.0 82.7 85.2	100.00 100.00 100.00 100.00 100.00 99.07 92.31 80.30 52.99 17.33 14.80

Water Content Tare No. Wgt. Tare + Ws. Wgt. Tare + Ds. Wgt. Tare Wgt. Of Water Wgt. Of Ds. 353.38 314.56 73.87 38.82 240.69

% Water



Client

OH MATERIALS

Tested.By

TO Date 09-24-91

Client Project

MARC

Checked By

SVL Date 9-27-91

Project No.

91154

Boring No.

MW-10

Depth(ft.)

115-117

Sample No.

S-26

Soil Description

NON PLASTIC (-40)

LIQUID LIMIT

Tare Number

Wt. Tare & WS(gm.)

Wt. Tare & DS(gm.)

Wt. Water(gm.)

Wt. Tare(gm.)

Wt. DS(gm.)

Moisture Content(%)

NO. OF BLOWS

PLASTIC LIMIT

Tare Number

Wt. Tare & WS(gm.)

Wt. Tare & DS(gm.)

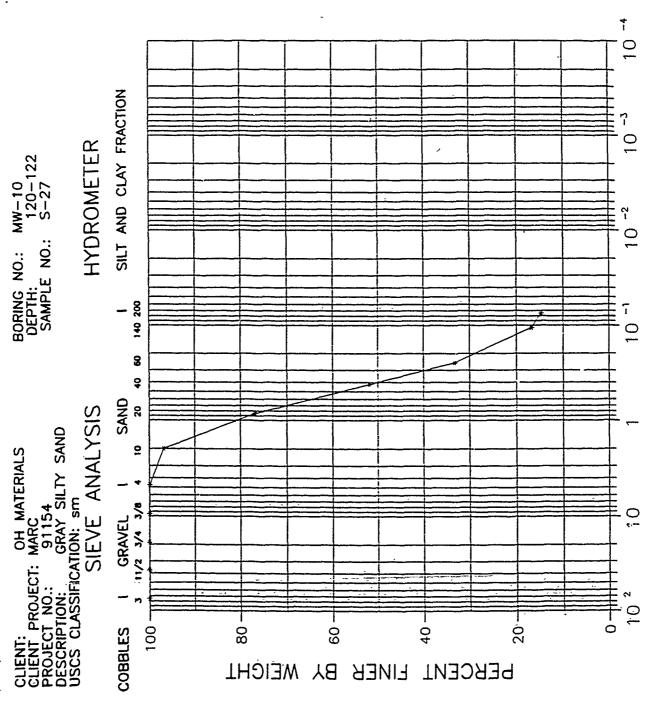
Wt. Water(gm.)

NON PLASTIC

Wt. Tare(gm.)

Wt. DS(gm.)

Moisture Content(%)



PARTICLE DIAMETER IN MM



Client Project MARC

Tested By SVG Date 9-20-91 Checked By Join Date 9-27-91

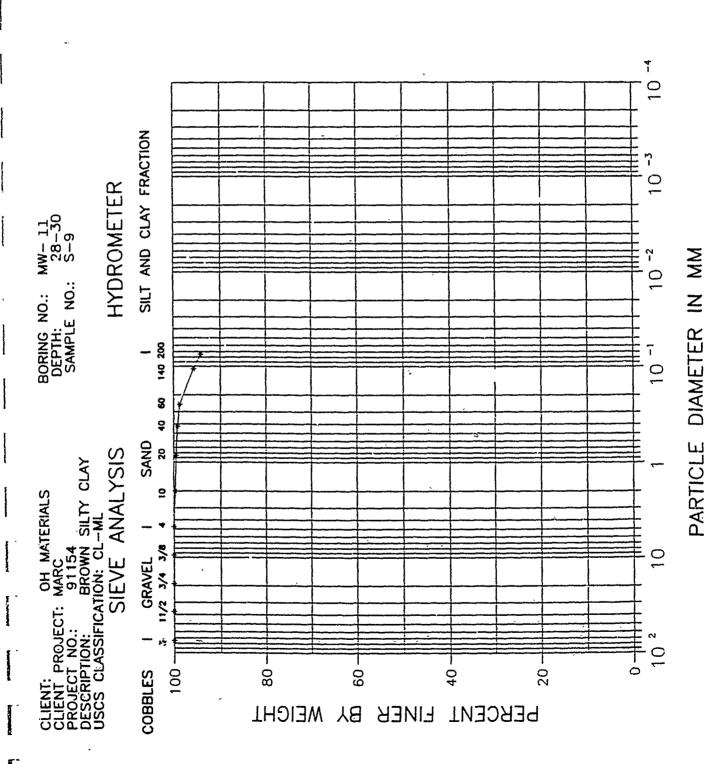
Project No. 91154
Boring No. MW-10
Depth(ft.) 120-122
Sample No. S-27

Sample No. S-27 Visual Description GRAY SILTY SAND

Wt. of Total Sample(dry) 259.25gm. Wt. of +#200 Sample 220.98gm. Wt. of -#200 Sample 38.27gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
#4	4.75	0.25	0.1	0.1	99.90
#10	2.00	8.06	3.1	3.2	96.79
#20	0.85	51.70	19.9	23.1	76.85
#40	0.425	64.54	24.9	48.0	51.96
# 60	0.250	48.65	18.8	66.8	33.19
#140	0.106	42.39	16.4	83.2	16.84
#200	0.075	5.39	2.1	85.2	14.76
Pan	-	38.27	14.8	100.0	-

Water Content
Tare No. 782
Wgt. Tare + WS. 379.45
Wgt. Tare + DS. 344.90
Wgt. Tare 85.65
Wgt. Of Water 34.55
Wgt. Of DS. 259.25
% Water 13.3





Client OH MATERIALS

Tested By SVG Date 9-20-91 Checked By Jcm Date 9-27 91

Client Project MARC
Project No. 91154
Boring No. MW-11
Depth(ft.) 28-30

Sample No. S-9
Visual Description BROWN SILTY CLAY

Wt. of Total Sample(dry) 83.22gm.
Wt. of +#200 Sample 4.82gm.
Wt. of -#200 Sample 78.40gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
3/8" #4	4.75	0.00	0.0	0.0	100.00
#10	2.00	0.24	0.3	0.3	99.71
#20	0.85	0.16	0.2	0.5	99.52
#40	0.425	0.26	0.3	0.8	99.21
#60	0.250	0.41	0.5	1.3	98.71
#140	0.106	2.48	3.0	4.3	95.73
#200	0.075	1.27	1.5	5.8	94.21
Pan	-	78.40	94.2	100.0	-

Water Content
Tare No. 727
Wgt. Tare + WS. 180.42
Wgt. Tare + DS. 168.83
Wgt. Tare 85.61
Wgt. Of Water 11.59
Wgt. Of DS. 83.22
% Water 13.9

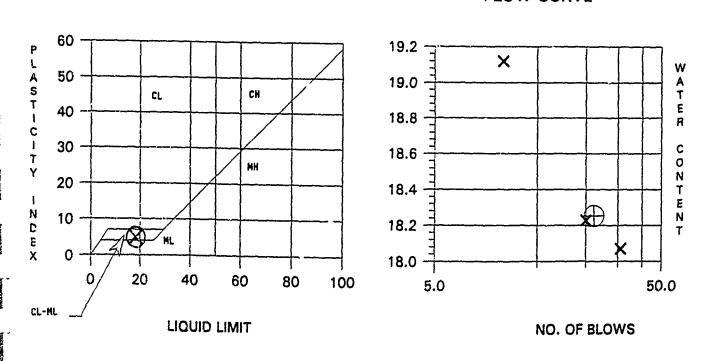
ectechnics

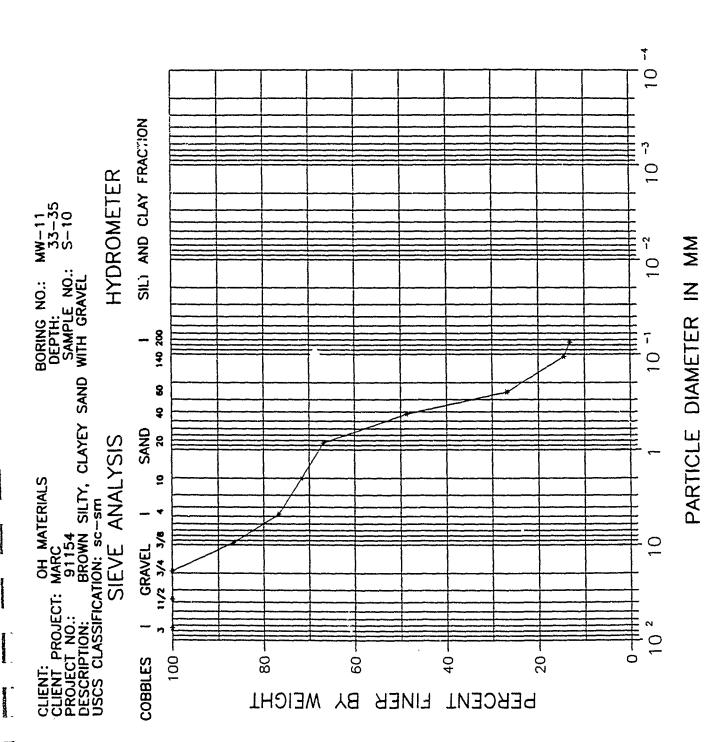
ATTERBERG LIMITS TEST

Client Client Project Project No. Boring No. Depth(ft.) Sample No.	OH MATERIALS MARC 91154 MW-11 28-30 S-9		Tested By Checked By	TO _\$\langle_	Date Date	09-25-91 <i>9-27-</i> 4)
Soil Description	BROWN SILT	Y CLAY		(-40)		
LIQUID LIMIT						
Tare Number	801	749	794			
Wt. Tare & WS(gm.)	37.39	39.11	38.76			
Wt. Tare & DS(gm.)	36.81	38.37				
Wt. Water(gm.)	0.58	0.74				
Wt. Tare(gm.)	33.60	34.31	35.52			
Wt. DS(gm.)	3.21	4.06	2.72			
NO. OF BLOWS	33	23				
Moisture Content(%)	18.1	18.2	19.1			
PLASTIC LIMIT						
Tare Number	814	826	760	Summar	v	
Wt. Tare & WS(gm.)	33.95	37.22				18
Wt. Tare & DS(gm.)	33.23	36.61	40.67			13
Wt. Water(gm.)	0.72	0.61	0.60			5
Wt. Tare(gm.)	28.01	32.11		•		CL-ML
Wt. DS(gm.)	5.22	4.50			,	···
Moisture Content(%)	13.8	13.6				

PLASTICITY CHART

FLOW CURVE







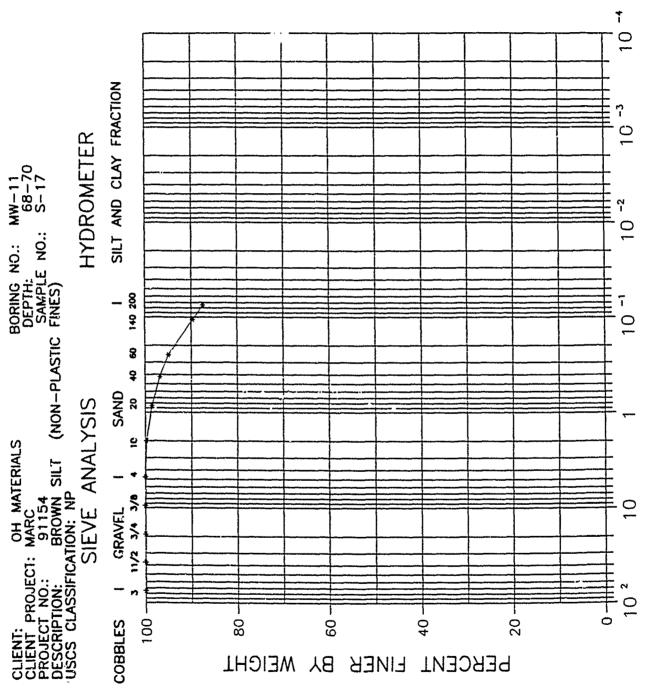
Client Project MARC OH MATERIALS Tested By SVG Date 9-20-91 Checked By Jom Date 9 27-91

Project No. 91154
Boring No. MW-11
Depth(ft.) 33-35
Sample No. S-10
Visual Description BROWN SILTY, CLAYEY SAND WITH GRAVEL

Wt. of Total Sample(dry)
Wt. of +#200 Sample
Wt. of -#200 Sample 248.24gm. 215.50gm. 32.74gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	ა.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8" #4	9.50	33.14	13.3	13.3	86.65
#4	4.75	24.91	10.0	23.4	76.62
#10	2.00	12.32	5.0	28.3	71.65
#20	0.85	11.85	4.8	33.1	66.88
#40	0.425	45.15	18.2	51.3	48.69
#60	0,250	54.42	21.9	73.2	26.77
#140	0.106	30.42	12.3	85.5	14.51
#200	0.075	3.29	1.3	86.8	13.19
Pan	-	32.74	13.2	100.0	•

Water Content	
Tare No.	786
Wgt. Tare + WS.	359.82
Wgt. Tare + DS.	334.14
Wgt. Tare	85.90
Wgt. Of Water	25.68
Wgt. Of DS.	248.24
% Water	10.3



PARTICLE DIAMETER IN MM



OH MATERIALS

Tested By SVG Date 9-20-91 Checked By J.C.M Date 9-27-91

Client OH MACClient Project MARC
Project No. 91154
Boring No. MW-11
Depth(ft.) 68-70 91154

MW-11

Depth(ft.) 68-70
Sample No. S-17
Visual Description BROWN SILT (NON-PLASTIC FINES)

Wt. of Total Sample(dry) Wt. of +#200 Sample Wt. of -#200 Sample

155.28gm. 19.54gm. 135.74gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	0.00	0.0	0.0	100.00
3/8" #4	4.75	0.00	0.0	0.0	100.00
#10	2.00	0.36	0.2	0.2	99.77
#20	0.85	1.85	1.2	1.4	98.58
#40	0.425	2.70	1.7	3.2	96.84
# 60	0.250	2.92	1.9	5.0	94.96
#140	0.106	8.16	5.3	10.3	89.70
#200	0.075	3.55	2.3	12.6	87.42
Pan	••	135.74	87.4	100.0	***

Water Content

Tare No. 674 Wgt. Tare + WS.
Wgt. Tare + DS.
Wgt. Tare
Wgt. Of Water
Wgt. Of DS. 253.90 230.26 74.98 23.64 155.28

% Water



Client

OH MATERIALS

Tested By Checked By TO

Date 09-24-91

Client Project

MARC

SVL

Date 9-27-9/

Project No.

91154

Boring No.

MW-11

Depth(ft.)

68-70

Sample No.

S-17

Soil Description

NON PLASTIC (-40)

LIQUID LIMIT

Tare Number

Wt. Tare & WS(gm.)

Wt. Tare & DS(gm.)

Wt. Water(gm.)

Wt. Tare(gm.)

Wt. DS(gm.)

Moisture Content(%)

NO. OF BLOWS

PLASTIC LIMIT

Tare Number

Wt. Tare & WS(gm.)

Wt. Tare & DS(gm.)

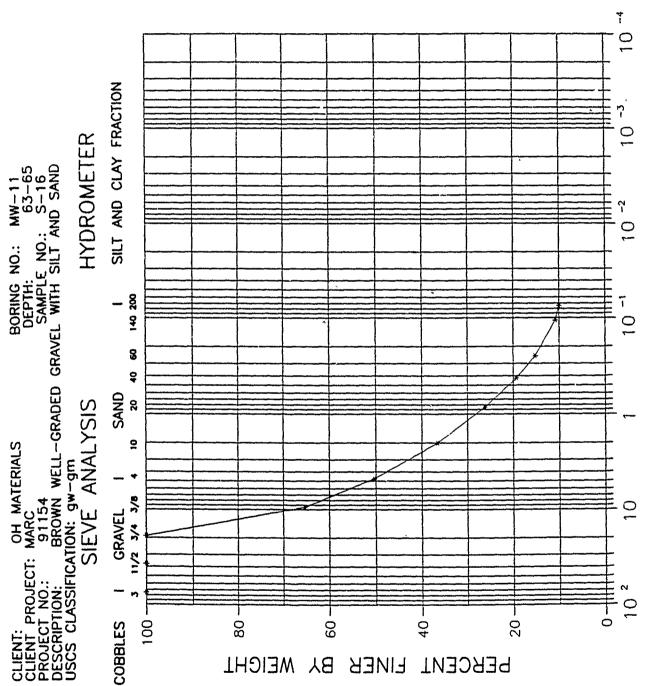
Wt. Water(gm.)

Wt. Tare(gm.)

Wt. DS(gm.)

Moisture Content(%)

NON PLASTIC



PARTICLE DIAMETER IN MM



Client OH MATERIALS

ATERIALS Tested By SVG Date 9-20-91 Checked By Jem Date 9-27 9/

Client Project MARC
Project No. 91154
Boring No. MW-11
Depth(ft.) 63-65
Sample No. S-16

Visual Description BROWN WELL-GRADED GRAVEL WITH SILT AND SAND

Wt. of Total Sample(dry) 230.59gm.
Wt. of +#200 Sample 207.47gm.
Wt. of -#200 Sample 23.12gm.

Sie ve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
3"	75.00	0.00	0.0	0.0	100.00
1 1/2"	37.50	0.00	0.0	0.0	100.00
3/4"	19.00	0.00	0.0	0.0	100.00
3/8"	9.50	79.88	34.6	34.6	65.36
#4	4.75	34.53	15.0	49.6	50.38
#10	2.00	32.01	13.9	63.5	36.50
#20	0.85	23.69	10.3	73.8	26.23
#40	0.425	15.98	6.9	80.7	19.30
#60	0.250	9.43	4.1	84.8	15.21
#140	0.106	10.08	4.4	89.2	10.84
#200	0.075	1.87	0.8	90.0	10.03
Pan	-	23.12	10.0	100.0	

 Water Content

 Tare No.
 GEO

 Wgt. Tare + Ws.
 330.22

 Wgt. Tare + Ds.
 315.19

 Wgt. Tare
 84.60

 Wgt. Of Water
 15.03

 Wgt. Of Ds.
 230.59

% Water 6.5

APPENDIX D ANALYTICAL RESULTS

IRDMIS DATA ELEMENT LEGEND

```
CQC
         = Chemical Quality Control
CSO
         = Chemical Soil
         = Chemical Sediment
CSE
         = Boolean Measurement
BOOL
Unc Mant = Uncorrected Mantissa
Unc Exp = Uncorrected Exponent
Dil Mant = Dilution Mantissa
Dil Exp = Dilution Exponent
Moist
         = Moisture
FC
         = Flagging Code
QC
         = Quality Control
S
         = Standard Matrix Spike (QC test code)
         = Method Blank (QC rest code)
T
         = Trip Blank (QC test code)
P
         = Results less than Certified Reporting Limit (CRL)
           but greater than criteria of detection (COD) 1
         = Rinse Blank (QC test code)
         = Field Blank (QC test code)
```

 1 Criteria of detection = 1/2 CRL.

```
Page - 1 Date - 11/18/91
 Instl Lab Lot No Meth No Units Meas Analyst Class Prime Contr
 MW PC DHC LP01 UGG LJH N OH
Sample:
Samp Anal No: 001
                                      File: CQC
                                                         Site Type:
                         File:
Field Samp No:
                                                         Samp Date:
                             Field Samp No: Samp Date: Samp Depth: 0.0 Samp Tech:
      Site ID:
 Samp Program:
                         Samp Depth: 0.0 Samp Prep Date: 09/09/91 Anal Date: 09/10/91
 Lab Samp No:
 Base Closure: N
                       Delivery Order No:
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 C6H6 LT 1.20 0
MEC6H5 LT 6.50 -1
TXYLEN LT 4.94 0
                                                            M 0.00 0
M 0.00 0
M 0.00 0
Sample:
                        File: CQC Site Type:
Field Samp No: Samp Date: //
Samp Depth: 0.0 Samp Tech:
Samp Prep Date: 09/09/91 Anal Date: 09/10/91
 Samp Anal No: 002
      Site ID:
 Samp Program:
 Lab Samp No:
 Base Closure: N Delivery Order No:
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 1.54 0
1.93 0
9.80 0
                                                             S 2.00 0
S 2.00 0
S 9.70 0
                                                             S 2.00
S 9.70
  MEC6H5
  TXYLEN
Sample:
 Samp Anal No: 003
Site ID:
Samp Program:
Lab Samp No:
                        File: CQC Site Type:
Field Samp No: Samp Date: //
Samp Depth: 0.0 Samp Tech:
Samp Prep Date: 09/09/91 Anal Date: 09/10/91
 Base Closure: N Delivery Order No:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 9.91 0
1.07 1
4.79 1
                                                             S 1.00
                1.07
                                                             S
                                                                 1.01
  MEC6H5
                 4.79
                                                             S 4.51
  TXYLEN
Sample:
 Samp Anal No: 004 File: CSO Site Type: BORE
Site ID: SB1 Field Samp No: Samp Date: 08/28/91
Samp Program: RAS Samp Depth: 0.0 Samp Tech: G
Lab Samp No: 30855.2 Samp Prep Date: 09/09/91 Anal Date: 09/10/91
Base Closure: N Delivery Order No:
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
  C6H6 LT 1.20 0
                                                   11.6
```

1

MEC6H5 LT 6.50 -1

11.6

* - Indicates that the data is either in error or has not been validated

/91

```
Lot - Instl: MW Lab: PC Lot No: DHC page - 2 date - 11/18/91
Sample - Sample Analysis No: 004
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 TXYLEN LT 4.94 0 11.6
Sample:
Samp Anal No: 005 File: CSO Site Type: BORE
Site ID: SB2 Field Samp No: Samp Date: 08/28/91
Samp Program: RAS Samp Depth: 0.0 Samp Tech: G
Lab Samp No: 30856.0 Samp Prep Date: 09/09/91 Anal Date: 09/10/91
 Base Closure: N Delivery Order No:
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 C6H6 LT 1.20 0
                                              17.1
 MEC6H5 LT 6.50 -1
TXYLEN LT 4.94 0
                         -1
                                              17.1
                                              17.1
Sample:
Samp Anal No: 006 File: CSO Site Type: BORE
Site ID: SB3 Field Samp No: Samp Date: 08/28/91
Samp Program: RAS Samp Depth: 0.0 Samp Tech: G
Lab Samp No: 30857.9 Samp Prep Date: 09/09/91 Anal Date: 09/10/91
Base Closure: N Delivery Order No:
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 C6H6 LT 1.20 0
MEC6H5 LT 6.50 -1
TXYLEN LT 4.94 0
                                              25.6
                                              25.6
                                              25.6
Sample:
                                  File: CQC Site Type:
 Samp Anal No: 007
                      File: CQC Samp Date:
Samp Depth: 0.0 Samp Tech:
    Site ID:
 Samp Program:
 Lab Samp No:
Base Closure: N
                         Samp Prep Date: 09/09/91 Anal Date: 09/10/91
                     Delivery Order No:
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 9.82 0
                                                          1.00
                                                                  1
                                                     s
  MEC6H5
                1.04
                           1
                                                      S
                                                          1.01
                 4.72
                                                           4.51
```

^{* -} Indicates that the data is in error or that it has not been validated

Group checking process
Installation: MW Lab: PC Lot: DHC

11/18/91 17:14:32

Map file \irmap\MWCOORDB.DBF does not exist Map file \irmap\MWCCORDB.NTX does not exist Map file \irmap\MWLSMP.DBF does not exist Map file \irmap\MWLSMP.NTX does not exist

Quality Control Acceptance - Certification Level C1

				rd Matrix	c QC	
Test	Blan	k	Low S	pike	High	Spike
Name	Required	Found	Requi <i>r</i> ed	Found	Required	Found
C6H6	1	1	1	1	2	2
MEC6H5	1	1	1	1	2	2
TXYLEN	1	1	1	1	2	2

QC Test parameters as determined from Lot data:

Test Name	Low Spike Mantissa	Concentration Exponent	High Spike Mantissa	Concentration Exponent
C6H6	2.00	0	1.00	1
MEC6H5	2.00	0	1.01	1
TXYLEN	9.70	0	4.51	1

Data in the lot - Installation: MW Lab: PC Lot: DHC contains errors even though record check is correct.

Completion time - 17:14:34

Lot: Instl La	b Lot 1	No Meth N	o Units M	eas Analy		age - Prime Cont	1 Date -	- 11/18/9
MW PC	DGA	LG03	UGG	LJH	N	ОН	_	
Sample:								
	e ID:	001		File d Samp No	:		Date:	/ /
Samp Pro	n No:			amp Depth Prep Date		•	Tech: Date: 0	9/10/91
Base Clo	sure:	N		Order No		<i></i>	Date: 0	3/10/31
Analysis:	o Bool	Loc Mant	ling Fyn	Dil Mant	Dil Evn M	loist FC QC	COC Want	OC Evn
Test Nam		One Mane	one Exp	DII Mant	DII EXP M	OTSC LC OC	. QC Mant	OC EXP
111TCE	LT	8.10	0			M	0.00	0
112TCE	LT	7.00	0			M	0.00	0
11DCE	LT	8.50	0			M	0.00	0
11DCLE	LT	2.90	0			M	0.00	0
12DCE	LT	3.30	ů O			М	0.00	0
12DCLE 12DCLP	LT LT	3.00 5.90	0 0			M	0.00	0
C2H3CL	LT	9.20	-1			M M	0.00 0.00	0 0
CCL4	LT	1.70	0			M	0.00	0
CH2CL2	LT	3.60	ŏ			M	0.00	0
CHCL3	LT	2.90	Ö			M	0.00	Ö
TCLEE	LT	4.10	0			M	0.00	Ö
TCLTFE	LT	7.20	0			M	0.00	0
TRCLE	LT	2.60	0			M	0.00	0
Sample:	3 11						_	
Samp Ana		002	ri al	File			Type:	, ,
Samp Pro	e ID:			d Samp No		_	Date:	/ /
Lab Sam				Samp Depth Prep Date			Tech: Date: 0	3/10/91
Base Clo		N		Order No		or Allar	Date. C	3/10/31
Analysis:								
Test Nam	e Bool	Unc Mant	Unc Exp	Dil Mant	Dil Exp M	loist FC QC	QC Mant	QC Exp
111TCE		1.83	1			S	1.49	1
112TCE		1.55	1			S	1.50	1
11DCE		1.50	1			S	1.50	1
11DCLE	LT	2.90	0			S	0.00	0
12DCE		1.08	1			S	8.38	0
12DCLE		7.47	0			S	7.50	0
12DCLP	LT	5.90	0			S	0.00	0
C2H3CL	LT	9.20	-1			S	0.00	0
CCL4	LT	1.70	0			S	0.00	0
CH2CL2	LT	3.60	0			S	0.00	0
CHCL3 TCLEE	LT	2.90	0			S	0.00	0
TCLTFE	LT	8.20 7.20	0 0			S S	7.62 0.00	0 0
TRCLE	111	9.76	0			S	7.62	0
11/01/11		J • / G	0			3	/ • UZ	J

^{* -} Indicates that the data is either in error or has not been validated

Lot

page - 2 date - 11/18/91

- Instl: MW Lab: PC Lot No: DGA

* - Indicates that the data is either in error or has not been validated

- Instl: MW Lab: PC Lot No: DGA

Sample: File: CSO Site Type: BORE Samp Anal No: 005 Site ID: SB2 0.0 ~'a1 Field Samp No: Samp Date: 08/28/91 Samp Tech: G Samp Program: RAS Samp Depth: Lab Samp No: 30856.0 Samp Prep Date: 09/09/91 Anal Date: 09/10/91

Base Closure: N Delivery Order No:

Analysis:

_	Test N	lame	Bool	Unc	Mant	Unc	Exp	Dil	Mant	Dil	Exp	Moist	FC	QC	QC	Mant	QC	Exp	
	111170	Œ	LT	8.	.10		0					17.1				,			
	112TC	Œ	LT	7	.00		0					17.1				•			
	11DCE	S	LT	8	.50		0					17.1			•	•			
	11DCI	Œ	LT	2	.90		0					17.1				•			
	12DCE	3	\mathtt{LT}	3	.30		0					17.1			,	•			
	12DCI	LE	${f LT}$	3	.00		0					17.1				•			
	12DCI	LP	LT	5	.90		0					17.1				•			
	C2H30	CL	\mathtt{LT}	9	.20	-	-1					17.1				•			
	CCL4		LT	1	.70		0					17.1				•			
	CH2CI	L 2	LT	3	.60		0					17.1				•			
	CHCL	3	LT	2	.90		0					17.1				•			
	TCLE	Ξ	LT	4	.10		0					17.1				•			
	TCLTI	FE	LT	7	.20		0					17.1				•			
	TRCLI	Ε	LT	2	.60		0					17.1				•			

Sample:

File: CSO Site Type: BORE Samp Anal No: 006 Site ID: SB3 Field Samp No: 0.0 Samp Date: 08/28/91 Samp Program: RAS Samp Depth: Samp Tech: G Samp Program: RAS Samp Depth: 0.0

Lab Samp No: 30857.9 Samp Prep Date: 09/09/91

Anal Date: 09/10/91

Base Closure: N Delivery Order No:

sis:																	
Name	Bool	Unc	Mant	Unc	Exp	Dil	Mant	Dil	Exp	Moist	FC	QC	QC	Mant	QC	Exp	
TCE	LT	8.	.10		0					25.6				•			
TCE	LT	7.	.00		0					25.6				,			
CE	\mathtt{LT}	8.	.50		0					25.6				•			
CLE	LT	2.	. 90		0					25.6				•			
CE	LT	3 .	.30		0					25.6				•			
CLE	LT	3.	.00		0					25.6				•			
CLP	LT	5	.90		0					25.6				•			
I3CL	LT	9	. 20	•	-1					25.6							
.4	LT	1.	.70		0					25.6				•			
CL2	LT	3	.60		0					25.6							
L3	LT	2	.90		0					25.6							
ÆE	LT	4	.10		0					25.6				•			
TFE	LT	7	.20		0					25.6							
CLE	LT	2	.60		0					25.6				•			
	Name TCE TCE CLE CLE CLE CLE CLP C3CL 4 CL2 L3 LEE TFE	Name Bool TCE LT TCE LT CE LT CLE LT CLE LT CLE LT CLE LT CLP LT CLP LT CL2 LT CL2 LT CL2 LT CL2 LT CL3 LT CL2 LT CL3 LT CL4 LT CL5 LT CL5 LT CL5 LT CL5 LT CL7 LT CL7 LT CL7 LT CL7 LT CL7 LT CL7 LT	Name Bool Unc TCE LT 8. TCE LT 7. CE LT 8. CLE LT 3. CLE LT 3. CLE LT 3. CLP LT 5. 3CL LT 9. 4 LT 1. CL2 LT 3. LL3 LT 2. EE LT 4. TFE LT 7.	Name Bool Unc Mant TCE LT 8.10 TCE LT 7.00 CE LT 8.50 CLE LT 2.90 CE LT 3.30 CLE LT 3.00 CLP LT 5.90 CLP LT 5.90 CL2 LT 1.70 CL2 LT 3.60 CL3 LT 2.90 CL2 LT 3.60 CL3 LT 4.10 CTFE LT 7.20	Name Bool Unc Mant Unc TCE LT 8.10 TCE LT 7.00 CE LT 8.50 CLE LT 2.90 CE LT 3.30 CLE LT 3.00 CLP LT 5.90 CLP LT 5.90 CLP LT 5.90 CL2 LT 1.70 CL2 LT 3.60 CL3 LT 2.90 CE LT 3.60 CL5 LT 3.60 CL5 LT 3.60 CL7 T 7.20	Name Bool Unc Mant Unc Exp TCE LT 8.10 0 TCE LT 7.00 0 CE LT 8.50 0 CLE LT 2.90 0 CE LT 3.30 0 CLE LT 3.00 0 CLP LT 5.90 0 CLP LT 5.90 0 CLP LT 1.70 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL3 LT 2.90 0 CL2 LT 3.60 0 CL5 LT 7.20 0	Name Bool Unc Mant Unc Exp Dil TCE LT 8.10 0 TCE LT 7.00 0 CE LT 8.50 0 CLE LT 2.90 0 CE LT 3.30 0 CLE LT 3.00 0 CLP LT 5.90 0 CLP LT 5.90 0 CLP LT 1.70 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL3 LT 2.90 0 CL5 LT 3.60 0 CL5 LT 3.60 0 CL7 T.7.20 0	Name Bool Unc Mant Unc Exp Dil Mant TCE LT 8.10 0 TCE LT 7.00 0 CE LT 8.50 0 CLE LT 2.90 0 CE LT 3.30 0 CLE LT 3.00 0 CLP LT 5.90 0 CLP LT 5.90 0 CLP LT 1.70 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL3 LT 2.90 0 CL2 LT 3.60 0 CL5 LT 7.20 0	Name Bool Unc Mant Unc Exp Dil Mant Dil TCE LT 8.10 0 TCE LT 7.00 0 CE LT 8.50 0 CLE LT 2.90 0 CE LT 3.30 0 CLE LT 3.00 0 CLP LT 5.90 0 CLP LT 5.90 0 CL2 LT 1.70 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL2 LT 3.60 0 CL3 LT 2.90 0 CL5 LT 3.60 0 CL5 LT 3.60 0 CL7 T.7 0 0 CL8 LT 7.20 0	Name Bool Unc Mant Unc Exp Dil Mant Dil Exp TCE LT 8.10 0 TCE LT 7.00 0 CE LT 8.50 0 CLE LT 2.90 0 CE LT 3.30 0 CLE LT 3.00 0 CLP LT 5.90 0 3CL LT 9.20 -1 4 LT 1.70 0 CL2 LT 3.60 0 CL3 LT 2.90 0 TES LT 4.10 0 TFE LT 7.20 0	Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist TCE LT 8.10 0 25.6 TCE LT 7.00 0 25.6 CE LT 8.50 0 25.6 CLE LT 2.90 0 25.6 CE LT 3.30 0 25.6 CLE LT 3.00 0 25.6 CLP LT 5.90 0 25.6 3CL LT 9.20 -1 25.6 4 LT 1.70 0 25.6 CL2 LT 3.60 0 25.6 CL2 LT 3.60 0 25.6 EE LT 4.10 0 25.6 TFE LT 7.20 0 25.6	Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC TCE LT 8.10 0 25.6	Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC TCE LT 8.10 0 25.6	Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC TCE LT 8.10 0 25.6 <	Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant TCE LT 8.10 0 25.6 . <td>Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC TCE LT 8.10 0 25.6 .<!--</td--><td>Name Bool Unc Mant Dil Mant Dil Exp Moist FC QC QC Mant QC Exp TCE LT 8.10 0 25.6 .</td></td>	Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC TCE LT 8.10 0 25.6 . </td <td>Name Bool Unc Mant Dil Mant Dil Exp Moist FC QC QC Mant QC Exp TCE LT 8.10 0 25.6 .</td>	Name Bool Unc Mant Dil Mant Dil Exp Moist FC QC QC Mant QC Exp TCE LT 8.10 0 25.6 .

^{* -} Indicates that the data is either in error or has not been validated

- Instl: MW Lab: PC Lot No: DGA page - 4 date - 11/18/91 Lot

Sample:

Site Type: Samp Date: Samp Anal No: 007 File: CQC Site ID: Field Samp No: Samp Program: Samp Depth: 0.0

Samp Tech: Anal Date: 09/10/91 Samp Prep Date: 09/09/91 Lab Samp No: Base Closure: N

Delivery Order No:

Analysis:

Test Name	Bool	Unc Mant	Unc Exp	Dil Mant	Dil Exp	Moist	FC	QC	QC Mant	QC Exp
111TCE		4.78	1			•		S	4.00	1
112TCE		4.41	1			•		S	4.00	1
11DCE		3.98	1			•		S	3.99	1
11DCLE	${f LT}$	2.90	0					S	0.00	0
12DCE		2.44	1			•		S	1.99	1
12DCLE		2.06	1			•		S	2.00	1
12DCLP	LT	5.90	0					S	0.00	0
C2H3CL	LT	9.20	-1					S	0.00	0
CCL4	LT	1.70	0					S	0.00	0
CH2CL2	LT	3.60	0					S	0.00	0
CHCL3	LT	2.90	0					S	0.00	0
TCLEE		4.94	1			•		S	3.98	1
TCLTFE	LT	7.20	0					S	0.00	0
TRCLE		2.51	1			•	X	S	2.00	1

^{* -} Indicates that the data is in error or that it has not been validated

Group checking process
Installation: MW Lab: PC Lot: DGA

11/18/91 17:14:28

Map file \irmap\MWCOORDB.DBF does not exist Map file \irmap\MWCOORDB.NTX does not exist Map file \irmap\MWLSMP.DBF does not exist Map file \irmap\MWLSMP.NTX does not exist

Quality Control Acceptance - Certification Level C1

			Standa	rd Matrix	. QC	
Test	Blan	k	Low S			Spike
Name	Required	Found	Required	Found	Required	Found
111TCE	1	1	1	1	2	2
112TCE	1	1	1.	1 (2	2
11DCE	1	1	1	1	2	2
12DCE	1	1	1	1	2	2
12DCLE	1	1] 1	1	2	2
TCLEE	1	1	1	1.	2	2
TRCLE	1	1	1	1	2	2

QC Test parameters as determined from Lot data:

Test Name	Low Spike (Mantissa	Concentration Exponent	High Spike Mantissa	Concentration Exponent
111TCE	1.49	1	4.00	1
112TCE	1.50	1	4.00	1
11DCE	1.50	1	3.99	1
12DCE	8.38	0	1.99	1
12DCLE	7.50	0	2.00	1
TCLEE	7.62	0	3.98	1
TRCLE	7.62	0	2.00	1

Data in the lot - Installation: MW Lab: PC Lot: DGA contains errors even though record check is correct.

Completion time - 17:14:32

Lot: Inst! Lab Lot N	lo Meth No	Units Meas	Analyst		1 Date	- 11/18.
MW PC FLS	UP01	UGL	LJH	N	OH	
Sample: Samp Anal No: Site Th: Samp Frooten: Lab Samp No: Base Closure:	001 N	Field Sa Jamo Sano Prop Jalivery Oro	File; amo No: Depth: Date: der No:	(0\10\&1 COC	Site Type: Samp Date: Samp Tech: Anal Date: 1	/ / .0/10/9J
Analysis: Test Name Loci C6H6 MEC6H5 TXYLEN	₽.0E 1.04	- <u>i</u>	Man: Dil	Екр Моіві 	S 1.00 8 2.00 9 1.50	0 0
Sample: Samp Anal No: Site ID: Samp Program: Lab Samp No: Base Closure:		Samp Sanp Prei	Deoth: Date:		Sits Type: Samo Date: Samo Tech: Anal Date:	/ / 10/10/91
Analysis: Test Name Pool C6H6 MEC6H5	4.16 9.50	0	Mant Dil	Exo Moist	FD GC GC Man S 5.00 S 1.00 S 7.50	0
TXYLEN Sample: Samp Anal No: Site ID: Samp Frogram: Lab Samp No: Base Closure:	003	Field S	amp No:		Site Type: Samp Date:	/ /
Analysis: Test Name Bool		Unc Exp Dil				t QC Exp
C6H6 LT PMEC6H5 LT TXYLEN LT			order design value from the control of the control		M 0.00 M 0.00 M 0.00	0
Sample: Samp Anal No: Site ID: Samp Program: Lab Samp No: Base Closure:	004 MARC RAS J4890\2	Field S Samp Saco Pra			Site Type: Samp Date: Samp Tech: Ana: Date:	09/26/91
Analysis: Test Name Bool	Unc Mant	Unc Exp Dil	Mant Di	1 Exp Moist	FC GC QC Mar	nt QC Exp
C6H6 LT MEC6H5 LT					T 0.00 T 0.00	

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Lot - Instl: MW Lab: FC Lot No: F'S page - 2 date - 11/18
 Sample - Sample Analysis No: 004
 Analysis:
  Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
  TXYLEN LT 8.28 C
                                                      T 0.00 0
 Sample:
  Samp Anal No: 005

Site ID: MARC

Field Samp No: MW-2B

Samp Date: 09/26/91

Samp Program: RAS

Samp Depth: 80.0

Samp Tech: G

Lab Samp No: J4891.0

Samp Prep Date: 10/10/91

Anal Date: 10/10/91
  Samp Amal No: 005
  Base Closure: N Delivery Order No:
 Analysta:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
  CéHé LT
                4.10
                       -1
  MECSHE LT
                8.70
                        -1
  TXYLEN LT 8.28
                         Ö
Sample:
 Samp Anal No: 006
 Samp Anal No: 006

Site ID: MARC

Field Samp No: MW-1A

Samp Program: RAS

Lab Samp No: J4877.5

Samp Prep Date: 10/10/91

Base Closure: N

Delivery Order No:
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 C5H6 LT 4.10 -1
MEC6H5 LT 8.70 -1
TYYLEN LT 8.28 0
Sample:
Site ID: MARC Field Samp No: MW-CA
                                                  Site Type: WELL
Lab Samp No: 34878.3 Samp Prep Date: 10/10/91
Base Closure: N Delivery Order No:
                                                  Samp Date: 09/26/91
                                                  Samp Tach: G
                                                  Anal Date: 10/10/91
Analysis:
Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 C6H6
          LT
               4.10
              8.70
9.29
 MEC6H5
          LT
                        -1
 TXYLEN LT
```

 \star - Indicates that the data is either in error or has not been validated

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Lot - Instl: MW Lab: FC Lot No: FLS
                                                           page - 3 date - 11/18
  Sample:
   Samp Anal No: 008
  Site ID: MARC Field Samp No: MW-3 Samp Date: 09/26/91
Samp Program: RAS Samp Depth: 16.0 Samp Tech: 6
Lab Samp No: 34879.1 Samp Prep Date: 10/10/91 Anal Date: 10/10/91
Base Closure: N Delivery Order No:
                                               File: CGW
  Analysis:
  Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
   C6H6 LT 4.10
MEC6H5 LT 8.70
TXYLEN LT 8.28
                                   <del>-</del> :
                                   - 1
 Sample:
  Samo Anal No: 000
  Samc Aral No: 009 File: CGW Site Type: WELL Site ID: MARC Field Samp No: MW-4 Samp Date: 09/26/91 Samp Program: RAS Samp Depth: 18.0 Samp Tech: 3 Lab Samp No: 74880.5 Samp Free Date: 10/10/91 Anal Date: 10/10/91 Base Closure: N Delivery Order No:
 Analysis:
  Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
   C6H6 LT 4.10 -1
MEC6H5 LT 8.70 -1
TXYLEN LT 8.28 0
Sample:
 Samp Anal No: 010 File: CGW Site Type: WELL Site ID: MARC Field Samp No: MW-5 Samp Date: 09/26/91 Samp Program: RAS Samp Depth: 25.0 Samp Tech: GLab Samp No: 34881.0 Samp Pres Date: 10/10/91 Anal Date: 10/10/91
 Base Closure: V Delivery Order No:
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
 C6H6
              LT 4.10
                               -1
  MEC6H5 LT 8.70
                                -1
  TXYLEN LT 8.28
                                 0
Sample:
 Samp Anal No: O11 File: CGW Site Type: WELL Site ID: MARC Field Samp No: MW-6 Samp Date: O9/26/91 Samp Program: RAS Samp Depth: O.0 Samp Tech: GLab Samp No: 34882.1 Samp Prep Date: 10/10/91 Anal Date: 10/10/91
 Samp Anal No: 011
 Base Closure: N Delivery Order No:
Analysis:
Test Name Bool Unc Mant Unc Emp Dil Mant Dil Emp Moist FC QC 70 Mant 90 Exp
 C6.46
             LT
                    4.10 -1
           LT
 MEC5H5
                    8.70
                                 -1
  TXYLEN
             LT
                    8.18
* - Indicates that the data is either in error or has not been validated
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* - Indicates that the data is either in error or has not been validated

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Lot - Instl. MW Lab: FC Lot No: FLS
                                                                                                Dage - 5 date - 11/1'
Sample:
 Samp Anal No: 016 File: 039 Site Type: WELL Site ID: MAFC Field Samp No: MW: 11 Samp Date: 09/26/91 Samp Program: RAS Samp Depth: 75.0 Samp Tech: 3
  Samp Anal No: 016
  Samp Program: RAB Samp Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: 75.0 Samp Tech: Depth: Depth: Depth: 75.0 Samp Tech: Depth: Depth: Pent. Depth: Pent. Depth: Pent. Depth: Depth: Pent. Depth: Pent. Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: Depth: D
  Base Cubsure: N Delivery Order No:
Analysis:
  Test Name Bool Und Mant Und Exp Dil Mant Dil Exp Moist FD QD DO Mant QC Exp
   06H6 1T 4.10 -1
   MEDAH: LT 8.70 -1
TKYLEN LT 8.28 0
Sample:
 Samp Anal No: D17 File: CGW Site Type: F5::

Site ID: FIELDBLAN: Field Samp No: Samp Date: 09/22/91
Samp Program RAS Samp Depth: 0.0 Samp Tech: 6
Lab Samp No: 34888.0 Samp Prep Date: 10/10/91 Anal Date: 10/10/91
  Base Closure: N Delivery Order No:
Analysis:
  Test Name Bool Und Mant Und Exp Dil Mant Dil Exp Moist FD QD CO Mant CD Exp
  LT 4.10 -1
LT 8.70 -1
LT 8.28 0
    C6H6
                                                                                                                           0.00
   MEC6H5
                                                                                                                   F
                                                                                                                        0.00 0
0.00 0
   TXYLEN LT
                                                                                                                   Œ
Sample:
     amp Anal No: 018 File: CGW Site Type: RNSW
Site ID: DIWATER Field Samp No: Samp Date: 09/06/91
amp Program: RAS Samp Depth: 0.0 Samp Yean: G
  Samp Anal No: 018
  Samo Program: RAS
  Samb Program: KHS Samp Depth: 0.0 Samb Prep Date: 10/10/91 Anal Este: 10/10/91
  Base Closure: N Delivery Order No.
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
  LT
                                 4.10
                                                    <u>-1</u>
                                                                                                                                            • • •
                                                                                                                   R 0,00
                                            -1
0
   MEC6H5 LT 8.70
                                                                                                                   R 0.00
                                                                                                                                             O
   TXYLEN LT 8.28
                                                                                                                   F
                                                                                                                        0.00
Sample:
 Samo Anal No: 019
                                                                       File: CCC
                                                                                                          Site Type:
     Site ID:
                                                    Field Samp No:
                                                                                                           Samo Dato:
 Samo Program:
                                                       Samo Deuth:
                                                                                                           Samo Tach:
 Lab Samp No:
                                                      Samo Prep Date: 10/10/91 Anal Date: 10/10/91
 Base Closure: N
                                            Delivery Order To:
Analysia:
 Test Name Book Und Mant Und Edb 671 Andt Dil Exp Maiot F2 00 00 Fant C1 5-p
  C646
                                 4.41 0
                                                                                                                   9 -.00 C
   MECSHE .
                                 1.01
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                                                                                                                   P 1.00
                                  7.84
   TXYLEN
                                                                                                                        7.50
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* - Indicates that the data is in error or that it has not been validated

Page -1 Date - 11/18/91 Instl Lab Lot No Meth No Units Meas Analyst Class Prime Contr -LJH UGL N OH GEO UG03 PC Sample: File: CQC Site Type: Samp Anal No: 001 Field Samp No: Samp Date: Site ID: 0.0 Samp Depth: Samp Tech: Samp Program: 09/11/91 Anal Date: 09/11/91 Samp Prep Date: Lab Samp No: Delivery Order No: Base Closure: N Analysis: Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp 0 0.00 0 M 111TCE LT 1.00 M 0.00 0 LT 1.00 0 112TCE M 0.00 0 1.00 0 LT 11DCE 7.80 -1 M 0.00 0 LT 11DCLE 5.00 -1 M 0.00 O LT12DCE 0 M 0.00 LT 5.00 -1 12DCLE O 0 M 0.00 12DCLP LT 1.00 0 0.00 C2H3CL LT 1.90 0 M 0.00 0 LT 1.30 0 M CCL4 0.00 3.20 0 M CH2CL2 LT -1 0.00 7.20 M LT CHCL3 0.00 0 0 M LT 1.00 TCLEE Ω 0.00 LT 1.00 0 M TCLTFE 5.00 0.00 TRCLE LT Sample: Samp Anal No: File: CQC Site Type: 002 Field Samp No: Samp Date: Site ID: 0.0 Samp Tech: Samp Depth: Samp Program: Samp Prep Date: 09/11/91 09/11/91 Anal Date: Lab Samp No: Base Closure: N Delivery Order No: Analysis: Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp 2.27 S 2.00 0 111TCE 2.00 0 S 1.90 0 112TCE 0 2.00 11DCE 1.33 0 0 LT 7.80 -1 0.00 11DCLE 0 1.01 0 1.00 12DCE 1.00 S 6.90 -1 12DCLE 0.00 S 12DCLP LT 1.00 0 0.00 S 1.90 0 C2H3CL LT 0 LT 1.30 S 0.00 0 CCL4 3.20 0 0.00 LT 0 S CH2CL2 0 CHCL3 LT 7.20 -1 S 0.00 0 0 S 2.00 2.33 TCLEE 0 0.00 LT 1.00 0 S TCLTFE 1.00 TRCLE 1.24 0

1/1'

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^{* -} Indicates that the data is either in error or has not been validated

Lot - Instl:	MW Lab:	PC Lot No	: GEQ	page	- 2	date - 11/18/91
Sample: Samp Anal No:	003		File:	CQC	Site Typ	De:
Site ID:		Field :			Samp Dat	
Samp Program:			p Depth:		Samp Ted	
Lab Samp No:			ep Date:	09/11/91	Anal Dat	te: 09/11/91
Base Closure:	N	Delivery O	rder No:			
2						
Analysis:	IIna Hank	IIna Euro Di	l Mant Di	1 The Maint	TG 00 0	7 Wash 00 Table
Test Name Bool	. one mane	One Exp DI.	I Mant Di	.I EXP MOIST	FC QC QC	mant QC Exp
111TCE	9.58	0	_		S	1.00 1
112TCE	1.09	ĭ	•			1.00
11DCE	8.05	0	•			1.00 1
11DCLE LT	7.80	-1	,			0.00
12DCE	5.51	Ō				5.00 0
12DCLE	4.54	Ö				5.00 0
12DCLP LT	1.00	Ö	•			0.00
C2H3CL LT	1.90	Ö	•			0.00
CCL4 LT	1.30	0				0.00
CH2CL2 LT	3.20	Ö	•			0.00
CHCL3 LT	7.20	-1	•			0.00
TCLEE	1.00	ī	•			1.00 1
TCLTFE LT	1.00	0	•			0.00
TRCLE	5.74	Ö	•			5.00 0
			-			
Sample:						
Samp Anal No:	004		File:	CSO	Site Ty	pe: TRIP
Site ID:	TRIPBLAN	K Field	Samp No:		Samp Da	
Samp Program:	RAS	Sam	p Depth:	0.0	Samp Te	- · · · · · · · · · · · · · · · · · · ·
Lab Samp No:	30858.7	Samp Pr	ep Date:	09/11/91	Anal Da	
Base Closure:	N	Delivery O	rder No:			
Analysis:			_			
Test Name Bool	L Unc Mant	Unc Exp Di	l Mant Di	il Exp Moist	FC QC Q	C Mant QC Exp
111MOD IM		^				
111TCE LT	1.00	0	•			0.00
112TCE LT	1.00	0	•			0.00 0
11DCE LT	1.00	0	•			0.00 0
11DCLE LT	7.80	-1	•			0.00 0
12DCE LT	5.00	-1	•			0.00 0
12DCLE LT	5.00	-1	•			0.00 0
12DCLP LT	1.00	0	•			0.00 0
C2H3CL LT	1.90	0	•			0.00 0
CCL4 LT	1.30	0	•			0.00
CH2CL2 LT	3.20	0	•			0.00 0
CHCL3 LT	7.20	-1	•			0.00 0
TCLTFE LT	1.00 1.00	0	•			0.00 0
TRCLE LT	5.00	0 -1	•			0.00 0 0.00 0
INCLE LI	5.00	-T	•		T	0.00 0

* - Indicates that the data is either in error or has not been validated

TRCLE

5.98

- Instl: MW Lab: PC Lot No: GEQ page - 3 date - 11/18/93 Sample: Samp Anal No: 005 File: CQC Site Type: Field Samp No: Site ID: Samp Date: / / Samp Depth: 0.0 Samp Program: Samp Tech: Lab Samp No: Samp Prep Date: 09/11/91 Anal Date: 09/11/91 Base Closure: N Delivery Order No: Analysis: Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp ,我们也是我们的,我们也是一种的,我们也是我们的,我们就是我们的,我们就是我们的,我们也没有的,我们也没有的。 我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的 111TCE 9.58 0 S 1.00 1 1.14 112TCE 1 1.00 S 1 8.93 0 11DCE S 1.00 1 11DCLE LT 7.80 -1 S 0.00 0 5.76 12DCE 0 S 5.00 0 12DCLE 4.69 0 S 5.00 0 12DCLP LT1.00 0 S 0.00 0 C2H3CL LT 1.90 0 S 0.00 0 CCL4 LT1.30 0 S 0 0.00 LTCH2CL2 3.20 0 S 0.00 0 LT CHCL3 7.20 -1 S 0.00 0 TCLEE 1.04 1 S 1.00 1 TCLTFE LT 1.00 0 S 0.00 0

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^{* -} Indicates that the data is in error or that it has not been validated

Group checking process
Installation: MW Lab: PC Lot: GEQ

/9:

11/18/91 17:14:34

Map file \irmap\MWCOORDB.DBF does not exist Map file \irmap\MWCOORDB.NTX does not exist Map file \irmap\MWLSMP.DBF does not exist Map file \irmap\MWLSMP.NTX does not exist

Quality Control Acceptance - Certification Level C1

Standard Matrix QC

Test	Blan	k	Low S	pike	High Spike		
Name	Required	Found	Required	Found	Required	Found	
111TCE	1	1	1	1	2	2	
112TCE	1	1.	1	1	2	2	
11DCE	1	1	1	1	2	2	
12DCE	1	1	1	1	2	2	
12DCLE	1	1] 1	1	2	2	
TCLEE	1	1	1	1	2	2	
TRCLE	1	1] 1	1	2	2	

QC Test parameters as determined from Lot data:

Test Name	Low Spike Mantissa	Concentration Exponent	High Spike Mantissa	Concentration Exponent
111TCE	2.00	0	1.00	1
112TCE	2.00	0	1.00	1
11DCE	2.00	0	1.00	1
12DCE	1.00	0	5.00	0
12DCLE	1.00	0	5.00	0
TCLEE	2.00	0	1.00	1
TRCLE	1.00	0	5.00	0

Data in the lot - Installation: MW Lab: PC Lot: GEQ contains errors even though record check is correct.

Completion time - 17:14:38

Lot: Insti l	_ab	Lot N	lo Me	th No	Unit	s M	leas	Analy			Page -				ate ·	- 11	/19
MW F	-C	GEW		NB02	IJ	GL		LJH	Î	N		ЮΗ					
Sample:								- ,		~~~		~		· -	_		
Samp Ar	nal ite		001		=	151	d 5a	Fil∈ amp No	:	COC				Type Date		7	,
Samp Pr					•			Depth					•	Tech		•	
Lab Sa						mp	F'rec	Date	:	10/10	191					0/10	/91
Base C:	lası	ire:	N		Deliv	ery	Orc	ler No	:								
Analysis	s:																
Test Na	ន៣៩	Bool	Unc	Mant	Unc E	in p	Dil	Mant	Dil	Ξχρ	Moist	FO	CC	ΩC	Mant	DC	35
111728	=	~ ~ ~	2.	17	(s	2.	00 00		
11270	=		1.	98	Ç)							S	2.	00		Ç
11DCE				74	- 1							Ŀ,	S		00		9
11DCL	E	LT		80	- <u>1</u>								S		00		O C
12DCE 12DCL	_		8.		<u>1</u>								S		00 00		(()
12DCL		LT	6.	00	~ <u>1</u>								5		00		o o
COHOC		LT		9Q	(S		00		ō
		LT		30	Ċ								S		00		Q.
CHICL			Ξ.	20	Ç)							5	0.	00		0
CHCLI		LT	7.		-1								S		00		0
TCLEE				79	Q						٥.		S		00		0
TCLTF		LT		00	Ç								S		00		0
TRCLE			ช.	43	- 1	•							S	1.	.00		O
Sample:																	
Samp A			002		_			File		CBC				Type		,	,
		ID:			F			amp No						Date		/	/
Samp Pi Lab S	_				ς.			Depti Date		10716	0/91			Tech		0/10	0/91
Base C	•		M				– .	der No		10/1		יוור	C1 2	De ce		V, _	• / . =
Analysi: Test N		Bool	Unc	Mant	Line E	Exm	Dil	Mant	ກາໄ	l Ern	Moist	FC	nσ	. QC	Mant	. QC	Exp
			u-														
11170				66	C								5		.00		1
112TC				05	<u>:</u>								S		.00		1
11DCE 11DCL		LT		90 80	() :								s s		.00 .00		1
12DCE		L 1		15	-)							S		.00		Õ
12DCL				10		.,)							S		.00		Ô
12DCL		LT		00)							S		.00		O.
C2H3C		LT		90	Ç)							S		.00		0
CCL4		<u>L</u> T		3.4	(S		.00		0
CH2CL		L.T		20	(_							S		.00		0
CHCLI		LT		20	- :	_							S		.00 .00		0
TOLEE				(0) (0)	(S S		.00		Ó
TROLE		- '		4)							S		.00		Õ

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Site Type: WELL

Site Type: WELL

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File: CGW

File: CGW

Field Samp No: MW-1A Samp Date: 09/26/91 Samp Depth: 20.0 Samp Tech: G

Field Samp No: MW-1A

Samp Program: RAS Samp Depth: 20.0 Samp Tech: 5 Lab Samp No: 34877.5 Samp Prep Date: 10/10/91 Anal Date: 10/10/91

Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp

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Lab Samp No: 34891.v Samp Prep Date: 10/10/91 Anal Date: 10/10/91

Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp

Field Samp No: MW-2B Samp Date: 09/26/91 Samp Depth: 80.0 Samp Tech: G

Base Closure: N Delivery Order No:

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1.00 1.00 1.00

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1.00 1.90

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Base Closure: N Delivery Order No:

1.00 1.00 1.00 7.80

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1.00

1.90

1.30

3.20

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5.00

LT 3.20 LT 7.20 LT 1.00 LT 1.00 LT 5.00

5.00

Sample:

Analysis:

111TCE

110TCE

LIDCE

11DCLE

12DCE

12DCLE

12DCLP

COHUCL

CCL4

CH2CL2

CHCL3 TCLEE

TCLTFE

TRCLE

Sample:

Analysis:

11DCE

11DCLE

12DCE

12DCLE

12DCLP

CZHJCL

CCL4

CHCL3

TCLEE

TROLE

111TCE LT

112TCE LT

CH2CL2 LT

TCLTFE LT

Samp Anal No:* 005

Samp Program: RAS

Site ID: MARC

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Samp Anal No:* 006

Site ID: MARC Samp Program: RAS

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^{* -} Indicates that the data is either in error or has not been validated

Lot - Instl: MW Lab: PC Lot No: GEW page - 5 date - 11/19

Indicates that the data is either in error or has not been validated

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LT 1.30

LT 1.00

LT 5.00

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CH2CL2 LT 3.20

CHCLI LT 7.20

CCL4

TCLEE

TROLE

TCLTFE LT

1.00

1.90

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Sample: File: CGW Site Type: WELL Samp Anal No:* 011 Field Samp No: MW-6 Field Samp No: MW-6 Samp Date: 09/26/91 Samp Depth: 0.0 Samp Tech: G Site ID: MARC Samp Program: RAS Samp Program: RAS Samp Depth: 0.0 Samp Tech: G Lab Samp No: I4882.1 Samp Prep Date: 10/10/91 Anal Date: 10/10/91 Base Closure: N Delivery Order No: Analysis: Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp 0 111TCE LT 1.00 112TCE LT 0 1.00 O LT 1.00 11DCE 7.80 11DCLE LT -1 12DCE_ 5.00 LT -1 12DCLE 5.00 LT -1 12DCI_F

Sample:

CZHJCL

CH2CL2

CHCL3 TCLEE

TCLTFE

TRCLE

CCL4

Site ID: MARC Field Samp No: MW-7 Samp Date: 09/26/71
Samp Program: RAS Samp Depth: 83.0 Samp Tech: G
Lab Samp No: 34883.0 Samp Prep Date: 10/10/91
Base Closure: N Delivery Order No:

Analysis:

Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp 111TCE LT 1.00 0 112TCE LT 1.00 O LT 11DCE 1.00 0 11DCLE LT 7.80 -- 1 LT 12DCE 5.00 -1 LT 5.00 12DCLE -1 12DCLP LT 1.00 LT 1.90 C2H3CL LT CCL4 1.30 LT CH2CL2 3.20 LT CHCL3 7.20 1.00 LT TCLEE TCLTFE LT 1.00 LT 5.00 TRCLE -1.

^{* -} Indicates that the data is either in error or has not been valicated

Lot - Instl: MW Lab: PC Lot No: GEW

page - 7 date - 11/19

* - Indicates that the data is either in error or has not been validated

Lot - insti	.: MW Lau:	LC FOL MO: GEM	haña	- 6 date - 11/1/
Sample: Samp Anal No: Site ID: Samp Program: Lab Samp No: Base Closure:	RAS	Field Samp No: Samp Depth:	MW-10 0.0	Site Type: WELL Samp Date: 09/26/91 Samp Tech: G Anal Date: 10/10/91
		Unc Exp Dil Mant Di	•	FC QC QC Mant QC Exp
111TCE LT 112TCE LT 11DCE LT 11DCE LT 11DCLE LT 12DCLE LT 12DCLP LT C2H3CL LT CCL4 LT CH2CL2 LT TCLFE LT TCLFE LT TRCLE LT	1.00 1.00 7.80 5.00 5.00 1.00 1.70 1.30 7.20 7.20 1.00	o o		
Samp Program: Lab Samp No: Base Closure: Analysis:	: RAS : 34887.2 : N	Delivery Order No:	MW-11 75.0 10/10/91	Site Type: WELL Samp Date: 09/26/91 Samp Tech: G Anal Date: 10/10/91 FC QC QC Mant QC Exp
	T 1.00 T 1.00 T 1.00 T 7.80 T 5.00	0 0 0 0 -1 -1		•

Analysis: Test Name	Bool	Unc Mant	Unc Exp	Dil	Mant	Di1	Ехр	Moist	FC	ΩC	ac	Mant	QC	E::D
111TCE	LT	1.00	O									1		-
112TCE	LT	1.00	O									1		
11DCE	LT	1.00	0									,		
11DCLE	LT	7.80	-1									,		
12DCE	LT	5.00	-1									1		•
12DCLE	LT	5.00	-1									•		
12DCLF	LT	1.00	0											
C2H3CL	LT	1.90	Q								,	,		
CCL4	LT	1.30	0									•		
CH2CL1	LT	3.20	0									•		
CHCLI	LT	7.20	-1											
TCLEE	LT	1.00	0									•		
TCLTFE	LT	1.00	0											
TRCLE	LT	5.00	-1			•					•	•		

^{* -} Indicates that the data is either in error or has not been validates

Lot - Instl: MW Lab: PC Lot No: GEW

* - Indicates that the data is either in error or has not been validate.

page - 9 date - 11/19

Lot - Instl: MW Lab: PC Lot No: GEW page - 10 date - 11/15

Sample:

Samp Anal No: 019 File: CQC Site Type:
Site ID: Field Samp No: Samp Date: //
Samp Program: Samp Depth: Samp Tech:
Lab Samp No: Samp Prep Date: 10/10/91 Anal Date: 10/10/91
Base Closure: N Delivery Order No:

Analysis:

Test Name	Pool	Unc Mant	Unc Exp	Dil Mant	Dil Exp Moist	FC ΩC	OC Mant	QC Exp
111TCE		1.27	1			S	1.00	ī.
112TCE		1.15	1			ຣ	1.00	1
11DCE		9.14	Q			9	1.00	1
11DCLE	LT	7.80	-1			S	0.00	0
1 ZDCE		4.52	O			S	3.00	O.
12DCLE		4.57	Ö			S	5.00	Ċ.
12DCLP	LT	1.00	Ō			S	0.00	0
CIHICL	LT	1.90	Ŏ			S	0.00	O.
CCL4	LT	1.30	O			S	0.00	0
CH2CL2	LT	3.20	0			S	0.00	0
CHCLG	LT	7.20	-1			S	0.00	O
TCLEE		1.23	1			S	1.00	1
TCLTFE	LT	1.00	0			S	0.00	O
TRCLE		7.47	Q			S	5.00	O

^{* -} Indicates that the data is in error or that it has not been validated

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^{* -} Indicates that the data is either in error or has not been validated

Samp Anal No: 003 File: CQC Site Type:
Site ID: Field Samp No: Samp Date: / /
Samp Program: Samp Depth: Samp Tech:

Lab Samp No: Samp Frep Date: 11/26/91 Anal Date: 11/26/91

Base Closure: N Delivery Order No:

Analysis:

Test Name	Rool	Unc	Mant	Unc	Exp	Dil	Mant	Dil	Ехр	Moist	FC	QC	ac	Mant	QС	Ехр
111TCE		1	.15		1							S	1.	.00		1
112TCE		1	.02		1							S	1.	.00		1
11DCE		7	.57		Q.							S	1.	.00		1
11DCLE	LT	7	.80	-	-1							S	Ο.	,00		O
12DCE		5	.78		0							S	5.	.00		0
12DCLE		4	.50		O)							S	5.	.00		O
12DCLP	LT	1	.00		Ŏ							S	O.	.00		O
C2H3CL	LT	1	.90		i)							S	Ú,	.00		Q
CCL4	LT	1	.30		Φ							5	Ο,	.00		Q
CH2CL2	LT	3	.20		Q							S	Q.	.00		Q
CHCLS	LT	7	.20	-	-1							S	Q.	.00		O
TCLEE		1	.02		1							S	1	.00		1
TCLTFE	LT	1	.00		Q							S	()	.00		O
TRCLE		6	.24		Ŏ							S	5	.00		O

Sample:

Samp Anal No:* 004 File: CGW Site Type: WELL Site ID: MW-7 Field Samp No: Samp Date: 11/14/91 Samp Program: GGA Samp Depth: 0.0 Samp Tech: GLab Samp No: 40996.0 Samp Prep Date: 11/25/91 Anal Date: 11/26/91

Base Closure: N Delivery Order No:

Analysis:

Test Name	Bool	Unc Mant	Unc Exp	Dil	Mant	Dil	Ехр	Moist	FC	СC	QC	Mant	QС	Ежр
111TCE	LT	1.00	0								•			
112TCE	LT	1.00	0											
11DCE	LT	1.00	O											
11DCLE	LT	7.80	-1											
12DCE	LT	5.00	-1											
12DCLE	LT	5.00	-1											
12DCLP	LT	1.00	0											
C2H3CL	LT	1.90	O.											
CCL4	LT	1.30	O.											
CH2CL2	LT	3.20	O											
CHCL3	LT	7.20	-1											
TCLEE	LT	1.00	Q											
TCLTFE	LT	1.00	0											
TRCLE	LT	5.00	-1											

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page -

3 date - 01/07/92

- Instl: MW Lab: PC Lot No: GEZ

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- Instl: MW Lab: FC Lot No: GEZ
Lot
                                                 page -
                                                               4 date - 01/07/91 ;
Sample:
 Samp Anal No: * 007
                                       File: CGW
                                                          Site Type: WELL
                         Field Samp No: Samp Date: 1.
Samp Depth: 0.0 Samp Tech: G
 Site ID: MW-10 Field Samp No: Samp Date: 11/14/91
Samp Program: GGA Samp Depth: 0.0 Samp Tech: G
Lab Samp No: 40999.5 Samp Prep Date: 11/26/91 Anal Date: 11/26/91
Base Closure: N Delivery Order No:
Analysis:
 Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp
  111TCE LT 1.00
                             0
                 1.00
           LT
 112TCE
                             0
                1.00
  11DCE
           LT
                             - 0
                7.80
            LT
                            -1
  11DCLE
            LT 5.00
                            -1
  12DCE
           LT 5.00
  12DCLE
                             -1
           LT 1.00
 12DCLF
           LT 1.90
 C2H3CL
            LT 1.30
 CCL4
                            O.
            LT 3.20
  CH2CL2
                            O
  CHCLI
            LT 7.20
                            -1
  TCLEE
           LT
                 1.00
  TCLTFE
           LT 1.00
                            Ó
  TRCLE
           LT 5.00
Sample:
 Site ID: MW-11 Field Samp No:
Samp Program: GQA Samp Dootte
 Samp Anal No: # 008
                                      File: CGW Site Type:
                                                                      WELL
                                                         Samp Date: 11/14/91
                             Samp Depth: 0.0 Samp Tech: G
 Samp Program: Gun Samp Depth: 0.0 Samp Jech: G
Lab Samp No: 41000.4 Samp Prep Date: 11/25/9; Anal Date: 11/26/91
 Base Closure: N Delivery Order No:
Analysis:
Test Name Bool Unc Mant Unc Exp Dil Mant Dil E.o Moist FC QC QC Mant QC Exp
            LT
                 1.00
 111TCE
                             Ö
                1.00
 112TCE
           LT
                             Q
                1.00
  11DCE
            LT
                             0
  11DCLE
            LT
                  7.80
                            -1
                5.00
  12DCE
            LT
                            -1
                5.00
  12DCLE
            LT
                            -1
  12DCLF
            LT
                 1.00
                             O
  C2H3CL
            LT
                 1.90
                             0
            LT
  CCL4
                  1.30
 CH2CL2
            LT
                  3.20
  CHCL3
            LT
                  7.20
                            -1
 TCLEE
            LT
                 1.00
                             0
 TCLTFE
            LT
                  1.00
                             0
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Sample: Samp Anal Site Samp Progr Lab Samp Base Closu	ID: am: No:	009 DIWATER GQA 41001.2 N	9	Samp Frep	Depth Date	:	CGW 0. 11/26		San San	ub ub	Type: Date: Tech: Date:	G	 4/91 6/91
Analysis: Test Name	Bool	Unc Hant	Unc Exp	Dil	Mant	Dil	Ехр	Moist	FC	QC	: QC Mai	nt QC	Ехр
111TCE	LT	1.00	Q.							R	0.00		o
112TCE	LT	1.00	0							R	0.00		Ō
11DCE	LT	1.00	0							R	0.00		ō
11DCLE	LT	7.80	-1							R	0.00		ō
12DCE	LT	5.00	-1							R	0.00		ō
12DCLE	LT	5.00	-1							R	0.00		Õ
12DCLP	LT	1.00	Ō							R	0.00		Õ
C2H3CL	LT	1.90	Õ							R	0.00		ŏ
CCL4	LT	1.30	ŏ							R	0.00		ŏ
CH2CL2	LT	3.20	Ŏ							R	0.00		ŏ
CHCL3		7.20	-1										
	L 1	1.00	_1 O							R			0
TCLEE	LT	1.00	-							R			0
TCLTFE		1.00	0							R			0
TRCLE	LT	3.00	-1							R	0.00		0
Sample:													
	Ma.	010			File		CGW		e	L	T	TOTO	0
Samp final		TRIPBLAN	·	4 6-			CGW				Type:		
Site							<u>.</u> ,				Date:		4/91
Samp Froot		60A									Tech:		
Lab Samo		41002.0			Date		11/26	791	Ana	ā I	Date:	11/2	25/71
Base Closu	ir.e.;	N	Deliver	· Urd	ler Nc	1:							
^==1v====													
Analysis: Test Name	Ecc.)	line Mane	Une Eve	Dist	Mant	n.,	E	Massa	er.	00	י חר אי	-+ ac	· = v.c
Test Mame	DOO1	One near	One grap	17.1.1	116(11)	D 7 1		110125		UIL	. UC MA		
111TCE	LT	1.00	Ó							T	0.00		0
111,CE 112TCE	ĹŤ	1.00	o o							Ť	0.00		ŏ
1127CE	L.T	1.00	0								0.00		ő
	LT	7.80	-1							T			Ó
11DCLE	LT	7.80 5.00	-1 -1							T	0.00		
12DCE										T	0.00		0
12DCLE	LT	5.00	-1							T	0.00		0
12DCLP	LT	1.00	0							T	0.00		0
C2H3CL	LT	1.90	0							T	0.00		Q o
CCL4	LT	1.30	0							T	0.00		0
CH2CL2	LT	3.20	Q.							T	0.00		0
CHCL3	LT	7.20	-1							T	0.00		O
TCLEE	LT	1.00	O.							T	0.00		O
TCLTFE	LT	1.00	0							T	0.00		0

^{* -} Indicates that we data is either in error or has not been validated

Samp	le:
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Samp Anal No: 011	File:	COC	Site Type:	
Site ID:	Field Samp No:		Samp Date:	/ /
Samp Program:	Samp Depth:		Samp Tech:	
Lab Samp No:	Samp Frep Date:	11/26/91	Anal Date:	11/26/91

Lab Samp No: Samp Frep Date:
Base Closure: N Delivery Order No:

Analysis: Test Name	Bool	Unc	Mant 	Unc	Exp	Dil	Mant 	Dil	Ехр	Moist	FC	QC	QC	Mant	αc	ежр
111TCE		1	.11		1							S	1.	.00		1
112TCE		9	.80		0							S	1.	.00		1
11DCE		7	.4:		Ģ							S	1.	.00		1
11DCLE	LT	7	80	-	-1							S	0.	,00		Q.
12DCE		5	.59		Ģ.							S	5.	.00		0
12DCLE		4	.39		Q							S	5.	.00		0
1 I DOLF	LT	1	.00		Q							S	0.	.00		0
C2H3CL	LT	1	.90		Ò							S	Ο,	.00		0
CCLA	LT	1	.30		Q.							8	Ο.	.00		0
CHICLI	LT	3	.20		Ų.							S	0.	.00		0
CHCLJ	LT	7	.20		-1							3	Q.	.00		O
TCLEE		9	.91		Ŏ.							3	1.	.00		1
TCLTFE	LT	1	.00		Ŏ.							S	0.	.00		O
TROLE		6	.05		·)							S	5.	, QQ		O

^{* -} Indicates that the data is in error or that it has not been validated

The following sites have no map records:

WELL	MW-7	does	not	exist	for	sample	004
WELL	MW-8	does	not	exist	for	sample	005
WELL	MW-9	does	not	exist	for	sample	006
WELL	MW-10	does	not	exist	for	sample	007
WELL	MW-11	does	not	exist	for	sample	008

Quality Control Acceptance - Certification Level C1

					Stand	dard Matri	LX	QC	
Test	¦	Blan	k	;	Low	Spike	;	High	Spike
Name	1	Required	Found	;	Required	Found	;	Required	Found
	;			i		~~~~~	1		
111TCE	i	1	1	- (1	1	;	2	2
112TCE	;	1	1	i	1	1	;	2	2
11DCE	;	1	1	;	1	1	ì	2	2
12DCE	ł	1	1	ł	1	1	1	2	2
12DCLE	;	1	1	;	1	1	;	2	2
TCLEE	i	1	1	;	1	1	;	2	2
TRCLE	1	1	1	;	1	1	ł	2	2

QC Test parameters as determined from Lot data:

Test Name	;	Low Spile Mantissa	Concentration Exponent			Concentration Exponent
111TCE	;	2.00	Q	;	1,00	1
112TCE	1	2.00	O.	;	1.00	1
11DCE	1	2.00	0	;	1.00	1
12DCE	1	1.00	O.	;	5.00	٥
12DCLE	;	1.00	0	ŀ	5.00	O
TCLEE	;	2.30	Q	ţ	1.00	1
TRCLE	i	1.00	O	;	5.00	O

Data in the lot - Installation: MW Lab: PC Lot: GEZ has not record or group checked correctly.

Completion time - 11:38:32

MW	PC	FLT		UP01		UGL		LJF	ł	N		ОН				
Samole:																
Samp A			001					File mp No	::	COC						
-	ite	ID:				Fiel	d Sa Samon	na No Death):			Sam	р <u>]</u>	Date:	/	/
Samp F Lab S	_	No:			ξ	amp	Frec	Date (· •	11/26	/91	Ana	թ 1 1	Tech: Date:	11/2	5/91
Base C		re:	N		Deli	verv	Orc	ier No	3:							
	ane													QC Man		Ехв
 		LT	۵,	10		· 1							М	0.00		
MECSH	5	LT	8.	70	_	1								0.00		
TAAFE	N	i_ i	잗.	7 <u>4</u>		•••							[*]	0.00		Ď
Samole:												_				
Samp A			002			E. ~1	д с .	File No No	2:	CQC				Type: Date:	,	,
Samo P	ite 2005					_		-				_				
Lab S	-				9	amp	Fred) Date	9:	11/26	/91	Ana	1	Tecn: Date:	11/2	5/91
Base C	losu	re:	N		Deli	verv.	Orc	ier No	3:							
Analvsi																_
Test N	 ame	Bool		Mant 			D11	Mant 	D 1.1	Exp	Moist	FC 	QC 	QC Mar	t QC 	дхЗ
CáHá				.87	••	-1								17.00		
MECSH				.03		Q.							5	2.00		0
TXYLE	N		ì.	.39		1							S	1.50		1
Sample:																
មamp A e	nai ite		99					elid on oma		LUC				Type: Date:	,'	
පිකකට –ි						Ξ	amb	Deuti	·			Sam	D	Tech:		
Lab S	amo	No:			٤	മനക	Fre	o Opte	3;	li.Im	· 91	Ana	1	Date:	11/2	6/51
Base C	losu	ire.	N		Deli	.verv	Ord	der No) :							
Analvsi Test N		Rool	Unc	Mant	Unc	Exp	Dil	Mant	Dıl	Ехэ	Moist	FC	QC	QC Mar	it QC	Ехр
C6H6	5		1.			0								5.00 1.00		0
TXYLE				.42		1							5			1
Samole:																
Samo A	nal	No:	004 800~					File	:	CGW				Type:		
Samo F								amp No Dentl		٥	.n	Sam	מו	Date: Tech:	11/1	4 /71
Lab S	amp	No:	4099	96.0	9	gms	Fre	o Date	: :	11/28	/91	Ana	1	Date:	11/2	6/91
Base C	losu	ire:	N		Deli	very	/ Or	der No	o:							
	lame													GC Mar		Ехр
C6H6 MEC6H		L:	4	.10	-	- 1										

Tayle	Lot - Instl: Sample - Sample	MW Lab:	PC Lot No: FLT page - No: 004	- 2 date - 12/18/91
Sample: Samp Anal No: 005	Test Name Bool			
Samp Anal No: 005	TXYLEN LT	8.28	0	•
Test Name Bool Unc Mant Unc Eub Dil Mant Dil Exp Moist FC QC QC Mant QC Exp C6H6	Samp Anal No: Site ID: Samo Frogram: Lab Samo No:	60A 40997.9	Samp Depth: 0.0 Samp Prep Date: 11/25/91	Site Tvoe: WELL Samp Date: 11/14/91 Samp Tech: G Anal Date: 11/26/91
C6H6	Test Name Bool			
Samp Anal No: 006	C6H6 LT MEC6H5 LT	4.10 8.70	-1 -1	• • •
Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist F3 00 00 mant 00 Exp C6H6	Samp Anal No: Site ID: Samp Program: Lab Samp No:	GQA 40998.7	Samb Depth: 0.0 Samb Prep Date: 11/26/91	Samo Tech: G
C6H6 LT 4.10 -1 . MEC6H5 LT 5.70 -1 . TXYLEN LT 8.28 / . Bample: Bamp Anal No: 007	Test Name Bool		•	
Samp Anal No: 007 File: CGW Site Type: WELL Site ID: MW10 Field Samp No: Samp Date: 11/14/91 Samp Program: GGA Samp Depth: 0.0 Samp Tech: G Lab Samp No: 40999.5 Samp Prep Date: 11/26/91 Anal Date: 11/26/91	C6H6 LT	4.10	-1	· · ·
Analysis:	Samp Anal No: Site ID: Samp Program: Lab Samp No: Base Closure: Analysis:	MW10 GGA 40999.5 N	Field Same No: Same Depth: 0.0 Same Pree Date: 11/26/91 Delivery Order No:	Samo Date: 11/14/91 Samo Tech: G Anal Date: 11/26/91
Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp		~~~~~~		
C6H6 LT 4.10 -1 . MEC6H5 LT 8.70 -1 . TXYLEN LT 8.28 0 .	MEC6H5 LT	8.70	-1	•

Sample: Samp Anal No: Site ID: Samp Program: Lab Samp No: Base Closure:	GQA 41000.4	File: CGW Field Samp No: Samp Depth: 0.0 Samp Prep Date: 11/26/91 Delivery Order No:	Samp Tech: G
Analysis: Test Name Boo:	Unc Mant	Unc Exp Dil Mant Dil Exp Moist	FC QC QC Mant QC Exp
C6H6 LT MEC6H5 LT TXYLEN LT	8.70	-1	•
Site ID: Samp Program: Lab Samp No:	DIWATER GQA 41001.2		
Analysis: Test Name Boo	Unc Mant	Unc Ern Dil Mant Dil Exp Moist	FC GC GC Mant GC Exp
C6H6 LT MEC6H5 LT TXYLEN LT	4.10 8.70 8.28	- <u>1</u>	R 0.00 0 R 0.00 0 6 0.00 0
Site ID: Samp Program: Lab Samp No:	TRIPBLAN 994 41002.0	Damo Depths 2.0	Samo Date: 11/14/91
Analysis: Test Nam- Boo	l Unc Mant	Unc Exp Dil Mant Dil Exp Moist	FC GC GC Mant GC Exp
C6H6 LT MEC6H5 LT TXYLEN LT	4.10 8.70 8.28	-1 -1 O	T 0.00 0 T 0.00 0 T 0.00 0
Sample: Samp Anal No: Site ID: Samp Program: Lab Samp No: Base Closure:		Field Samo No:	Site Type: Samp Date: / / Samp Tech: Anal Date: 11/26/91
Analysis: Test Name Boo	l Unc Mant	Unc Exp Dil Mant Dil Exp Moist	FC QC QC Mant QC Exp
C6H6 MEC6H5 TXYLEN	4.01 1.01 7.31	O 1 1	\$ 5.00 0 \$ 1.00 1 \$ 7.50 1

* - Indicates that the data is in error or that it has not been validated

Lot: Inst! Lab Lot!	No Meth No	Unito Meas Analys		- 1 Date - 11/18/ ^c e Contr
MW PC FLS	UF01	UGL L.JH	V!	OH
Sample: Samp Anal Do: Sity In: Samp Program: Lab Samp No: Base Closure:		Field Samo No:		Site Typo: Samp Date: / Samp Tech: Anal Date: 10/10/9/
		Unc E o Dii Mart D		FC 30 70 Mant CC E.o
CAMA MECAMS TXYLEN	9.06 1.84 1.36	4.1		S 1.00 0 S 2.00 0 S 1.50 1
Samole: Samo Anal No: Site ID: Samo Program: Lab Samo No: Base Closure:	002 N	File: Field Samo No: Samo Deoth: Sano Prec Date: Delivery Order No:	CQC 10/10/91	Site Type: Samc Date: / / Samc Tech: Anal Gate: 10/10/91
		Unc Exp Dil Mant D		FC GC GC Mant GC Exp
C6H6 MEC6H5	4.15	o o		S 5.00 0 S 1.00 1 S 7.50 1
Sample: Samp Anal No: Sita ID: Samp Program: Lab Samp No: Base Closure:		File: Field Samp No: Samp Pepth: Samp Prep Date: Delivery Order No:		Site Type: Samp Date: / / Samp Tech: Anal Date: 10/10/91
Analysis: Test Name Bool	Unc Mant	Unc Exp Dil Mant D		t FC QC QC Mant QC Exp
C6H6 LT ; MEC6H5 LT TXYLEN LT	4.10 8.70 8.28	-1 -1 -0		M 0.00 0 M 0.00 0 M 0.00 0
Samp Program: Lab Samo No:	MARC RAS J4890.2	Field Samo Not Bamb Depth:	0.0 10 10/91	Site Type: TRIP Samp Date: 09/26/91 Samp Tech: G And Date: 10/10 91
Analysis: Fest Name Bool	Unc Mant	Unc Exp Dil Mant D	i: Exp Moist	t FC GC GC Mant GC Exp
C6H6 LT MEC6H5 LT	4,10 8.70	~1 ~ <u>1</u>		T 0.20 0 T 0.00 C

April 1

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Lot - Instl: MW La Sample - Sample Analys	-	- 2 date - 11/18/'
	ent Unc Exp Dil Ment Dil Exp Moist	
TYYLEN LT 8.28	e e	T 0.00 (
Sample: Samp Anal No: 005 Site ID: MARC Samp Program: RAS Lab Samp No: 04891. Fase Closure: N	File: CGW Field Samp No: MW-2B Samp Depth: 80.0 0 Samp Prep Date: 10/10/91 Delizer\ Order No:	Site Type: WELL Samp Date: 09/26/91 Samp Tech: G Apal Date: 10/10/91
Abalyste: Tast Name Bool Und Ma	nt Unc Cxp Pil Mant Dil Exp Moist	FO OC OC Mant OC Exp
DAHS LT 4.10 MEDSH5 LT 8.70 TXYLEN LT 8.28) - <u>1</u>) - <u>1</u>	•
Samp Program: RAS Lab Samp No: 34877.	File: CGW Field Samo No: MW-1A Samo Depth: 30.0 5 Samp Preo Date: 10/10/91 Delivery Order No:	Site Type: WELL Samp Date: 09/26/91 Samp Tech: G Anal Date: 10/10/91
Analysis: Test Name Bool Unc Ma	ant Unc Exp Dil Mant Dil Exp Meist	FC GC GC Mant GC Exp
C5H6 LT 4.10 MEC6H5 LT 8.70 TYYLEN LT 8.28	-1	•
Sample: Samp Anal No: 007 Site ID: MARC Samp Program: RAS Lab Samp No: 34878. Base Closure: N	.3 Samp Prep Date: 10/10/91	•
	ant Unc Exc Dil Mant Dil E.ºo Moist	
C6H6 LT 4.10 MEC6H5 LT 8.70 TXYLEN LT 8.28) -1	•

* - Indicates that the data is either in error or has not been validated

Lot - Instl:	MW Lab:	10 Lot Nor FLS	page	- 3 dat	e - 11/18.
Samo Procham: Lab Samo No:	RAS 14879.1	File: Field Samp No: Samp Depth: Samp Prep Date: Delivery Order No:	16.0	Samp Tech:	(3
		Unc Exp Dil Mant Dil			
CAMA LT MECAME LT TXYLEY LT	4.10 8.70	-: -1		•	
Samo Program: Lab Samo No:	RAS 14880.5	File: Field Samp No: Samp Depth: Samp Prep Date: Delivery Order No:	18.0	Samp Taco:	3
		Unc Exp Dil Mant Di		FC QC QC Mar	nt OC Ero
C6H6 LT MEC6H5 LT TXYLEN LT	4.10 8.70	-1	,	•	
Sample: Samp Anal No: Site ID: Samp Program: Lab Samp Ho: Base Closure:	14881 1	File: Field Samo No: Samo Depth: Samo Pre: Date: Delivery Order No	26W MW-5 25.0 10/10/91	Site Type: Samp Late: Samp Tech: Anal Date:	WELL 09/26:91 G 10/10/91
Ana'\sis: Test Name Bool	. Unc Mant	Unc Exp Dil Mant Ci	•		nt QC Exc
C6H6 LT MEC6H5 LT TXYLEN LT	8.70	-1 -1	~~~~		
Samp Program: Lab Samp No:	MARC RAB T4881 1	Field Samp Mo: Field Samp Mo: Samp Depth. Samp Prep Date: Delivery O dan No:	MW-6 0.0	Samp Tach:	09/24/91 6
		. Unc Exp Dai Mar. Di			
C6H: LT MEC5H5 LT TXYLEN LT	4.10 8.70	-1 -1			
(2) y ham han (2	<u> </u>	•		•	

* - Indicates that the data is either in error or has not been validated

Lot - Instl:	MW Lab:	PC Let No: FLS	bade	- 4 da	te - 11/12.
Samo Mongram: Lab Samo No:	PA3 T488T.0	File: Field Samo No: Samo Depth: Samo Pren Date: De very Order No:	16.0	Samp lech:	Lo
Analysis: Test Name Pool	Unt Ment	Unc Ero Dil Mant Di	l Eko Moist	FC QC OC Ma	rt QC E p
CEHE LT MECEHE LT TXYLEU LT	4.10 3.70	-: -1		* 11	
Site ID: Samp Frighem: Lat Samp No:	MARC RAS 34884 8	File: Fiel: Samp No: Samo Death: Samo Prep Date: Deliver: Order No:	MW-8 90.0	Samo Date: Samo Toth:	07/26/51 3
		Unc Elp Dil Mant Di			
C6H6 LT MEC6H5 LT TXYLEN LT	4.10 8.70	- <u>i</u> -1		•	
Site ID: Samo Procram: Lab Sano No:	MAFC RAS 34885.6	File: Field Samp No: Samp Depth: Samp Prec Date: Delivery Ordan No:	MW-9 90.0	Samo Date:	09/26/91
Analysis: Test Name Gool	. Unc Mant	Unc Exp Dil Hant Di	.l Exp Moist	: FC QC QC Ma	ant QC Exp
C6H6 LT MEC6H5 LT TXYLEN LT	8.70	-1 -1			
ეგრი მხიუნგი:	RAS	Field Samo Not	MW-10 0.0	Samo Tein:	09725711 6
Amal.sic: Test Mama Ecol	Unt Ment	Unt E = F.1 Mar. To	il Elh Marsi	t 10 00 00 M	ent 60 Tal
CLH4 IT MEDAHS IT TXYLEN LT	4,10 8,70 8,28	<u>1</u> - <u>1</u> 		•	

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Lot - Insti	MW Lab:	PC Lotin: FLS	page	5 da+	e - 11/18
Bamp Frooran: Lob Camp Mo:	R41 M4687.1	File: Field Bamp No: Samp Depth: Bamp Frop Dete: Delivery Order No:	 ;, o	Same Date: Same Tech:	WELL 09, 26/91 10:16/91
CAHA LT MEGSHI LT	4.10			FC 9C 00 Man	et on Turn
Site ID: Samp Program Lab Samp Mo:	FIELDPLAN FAS TARES.C	File: Pield Same No: Same Nacth: Same Pres Date: Delsvery Order No:	·	Samn Datt: Sam: Techr	60/02/7. V
		Urc Exp Dil Mant Di			nc
C6H6 LT MEC6H5 LT TXYLEN LT		-1		F 0.000 F 0.000 F 0.000	
Samb Program: Lab Samb No:	DIWATER RAS I4889.9	File: Field Bamb No: Sitt lector: Simp Piel Date: Deliver: Lider No:	0.0	Samo Date: Samo (son:	9N5W 09/76/71 6 10/10/91
Analysis: Test Name Bool	Unc Mant	Und Exp Dil Mant Di	l Ero Moist	FC GC QC Mai	nt 00 Exp
C6H6 LT MEC6H5 LT TXYLEN LT	8.70	-1		R 0.00 R 0.00 R 0.00	O
Pample: Samp Anal No: Site 1D: Samp Program: Lab Samp No: Same Closure:		File. Field Sarp Not Sann Neith Samt Ples Datov Dellery Order Not		Site Type: Samo Datk: Samo Poor: Anal Data:	; /
		Arms Top of the Control of the Contr	N R o Monda		4 m a 1 m and and and and and and and and and and
TXYLEN	7.84	<u>.</u> :		1,01 7 7 71	;

A reflectables that the Paterna or that is as not user value to:

Lot: Instl Lab		No Meth No		1eas Ana	llyst	Class	Page -			L Date	- 11	/19/
		UGO3		L	JH	Ν		ОН				
Sample: Samp Anal	No:	601		Fi	lle:	CQC		Sit	e ;	√pe:		
C : 4 -	750-		Fie	d Samo	No •			Sam	n Í	late:	<i>;</i>	1
Samo Progi	ram: No:		Samo	Samp Dep Prep Da	oth: ate:	10/10	791	Sam	1 1 1	lech: Date: 1	.0/10	791
Samp Prodi Lab Samp Base Closi	ure:	N	Delivery	/ Order	No:				-			
Analysis:												
Test Name	Bool	Unc Mant	Unc Exp	Dil Mar	t Di	1 Ехр	Moist	FC !	0C	QC Mant	- ac	E.:0
111TCE		2.13							s			α
112TCE		1.98	0						S			Ç
11DCE 11DCLE	, 7	9.74 7.80							5 5	2.00 0.00) 0
11DCLE 12DCE	L. I	7.80 8.32	-1						о S			ć
12DCLE		6.11	1						S			ò
12DCLF	LT	1.00	Ō						S			Ó
COHSCL	LT	1.90	Φ						S			O.
CCL4	LT	1.30	0						S			Q.
CH2CL2	LT	3.20	O						S			Q.
CHCL3	LT	7.20	-1						S			0
TCLEE TCLTFE		1.79	0 0				•		S	2.00 0.00		0
TROLE	l 1	8.43	-1						S			ő
111000		.	•						_			
Samole:	A 1	000		_	: 1	COC		C: 1		T		
Samp Anal Site		002	Fie	t. Id Samb	ile:	いなし				lype: Date:	/	/
Samp Prog				Samp De:							•	•
Lab Samp				Freo D							10/10	0/91
Base Clos		N	Deliver									
Analysis:												
Test Name	Bool	Unc Mant	Unc Exp	Dil Ma	nt Di	1 Exp	Moist	FC	QC	QC Man	t QC	Exp
111TCE		9.66	0						s	1.00		1
112TCE		1.05	1						S	1.00		1
11DCE		6.90	ō						S	1.00		1
11DCLE	LT	7.80	-1						S	0.00		Ó.
12DCE		5.15	O						S	5.00		0
12DCLE		4.10	Ō						S	5.00		0
12DCLF	LT	1.00	0						S	0.00		0
C2H3CL CCL4	<u>L</u> ፕ <u>/</u> ፕ	1.90 1.50	0 0						ກ ເກ	0.00		Ó
CH2CL2	LT	7.20	Ö						S	0.00		ō
CHCLI		7.20	-1						s	2.00		0
TCLEE		9.C3	0						3	1.00		1
TCLTFE	-T	1 00	9						S	0.00		•
TROLE		5 5-	Ō						S	5.00)

^{*} - Indicates that the data is either in corporate has not been validated

* - Indicates that the data is either in error or has not been validated

7.20

1.00

1.00 5.00 -1

LT

LT

LT

LT

CHCLI

TOLEE

TOLTFE

TRILE

Samo Prodram Lab Samo No	: MARC : RAS : J4891.0	File: CGW Site Type: WELL Field Samp No: MW-2B Samp Date: 09/26/91 Samp Depth: 80.0 Samp Tech: G Samp Frep Date: 10/10/91 Anal Date: 10/10/91 Delivery Order No:
		Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant OC Exp
111TCE L' 112TCE L' 11DCE L' 11DCLE L' 12DCLE L' 12DCLP L' C2H3CL L' CCL4 L' CH2CL2 L' TCLEE L' TCLTFE L' TROLE L'	1.00 1.00 1.00 7.80 5.00 1.00 1.00 1.70 7.20 1.00	0 0 0 -1 -1 -1 -1 0 0 0 0 0 -1 0
Lab Samp No:	MARC RAS 14877.5	
Analysis: Test Name Boo	ol Unc Mart	Und Exp Dil Mant Dil Exp Moist FC 88 88 Mant 88 Exp
	7.80 5.00 5.00 1.00 1.90	0 0 0 -1 -1 -1 -1 0 0 0

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Sam	ρì	e	:
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Site Type: WELL File: CGW Samp Anal No:* 007 Field Samp No: MW-ZA Site ID: MARC Samp Program: RAS Field Samp No: MW-2A Samp Date: 09/26/91 Samp Depth: 78.3 Samp Tech: G

Samp Program: RAS Samp Depth: 78.3 Samp Tech: 6
Lab Samp No: 34878.3 Samp Prep Date: 10/10/91 Anal Date: 10/10/91
Base Closure: N Delivery Order No:

Analysis:

Test Name	Bool	Unc Mant	Unc Exp	Dil	Mant	Dil	Exp	Moist	FC	ΩC	QC Mant	QC Exp
111TCE	LT	1.00	O								•	
112TCE	LT	1.00	O.								•	
11DCE	LT	1.00	O								•	
11DCLE	LT	7.80	-1								*	
12DCE	LT	5.00	-1									
12DCLE	LT	5.00	<u>-1</u>								•	
12DCLP	LT	1.00	Q								•	
C2H3CL	LT	1.90	0								•	
CCL4	LT	1.30	0									
CH2CL2	LT	7,20	O.								•	
CHCL3	LT	7.20	-1								•	
TCLEE	LT	1.00	0								•	
TOLTFE	LT	1.00	Ō								•	
TRCLE	LT	5.00	-1								•	

Sample:

Samp Anal No:* 008 File: CGW Site Type: WELL
Site ID: MARC Field Samp No: MW-T Samp Date: 09/26/91
Samp Program: RAS Samp Depth: 16.0 Samp Tech: G
Lab Samp No: 34879.1 Samp Prep Date: 10/10/91 Anal Date: 10/10/91

Sase Closure: N Delivery Order No:

Test Name	Bool	Unc Mant	Unc Exp	Dil	Mant	Dil	Exp	Moist	FC	ac	αC	Mant	QC	Exp
111TCE	LT	1.00	0											
112TCE	LT	1.00	0									•		
11DCE	LT	1.00	0											
11DCLE	LT	7.80	-1									•		
12DCE	LT	5.00	-1									•		
12DCLE	LT	5.00	-1									•		
12DCLP	LT	1.00	0											
C2H3CL	LT	1.90	0									•		
CCL4	LT	1.30	0									•		
CH3CT3	LT	3.20	0											
CHCLI	LT	7.20	-1									•		
TCLEE	LT	1.00	O									•		
TCLTFE	LT	1.00	Q.									•		
TROLE	<u>'</u> _T	5.00	-1									•		

st - Indicates that the data is either in error or has not been validated

Lot - Instl: MW Lab: PC Lot No: GEW

page - 5 date - 11/19/

r - Indicates that the data is either in error or has not been validated

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-1

C2H3CL

CCL4

TCLTFE

TROLE

CH2CL2 LT

LT

CHCL3 LT 7.20 TCLEE LT 1.00

LT

1.90

1.30

3.20

LT 1.00 LT 1.00

LT 5.00

Samp	le:
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Samp Anal No:* 011	File: CGW	Site Type: W	IELL
Cite ID: MARC	Field Samp No: MW-A	Samo Date: (19/74/91

Site ID: MARC Field Samp No: MW-6 Samp Date: 09/26/91
Samp Program: RAS Samp Depth: 0.0 Samp Tech: G
Lab Samp No: J4882.1 Samp Prep Date: 10/10/91 Anal Date: 10/10/91
Base Closure: N Delivery Order No:

Analysis:

Test Name	Bool	Unc Mant	Unc Exp	Dil Mant	Dil Exp	Moist	FC QC	QC Mant QC Exp	è
		~~~~~~	·						
111TCE	LT	1.00	0					•	
112TCE	LT	1.00	C						
LIDCE	LT	1.00	0					•	
11DCLE	LT	7.80	-1					•	
12DCE	LT	5.00	-1					•	
12DCLE	LT	5.00	-1					•	
12DCLP	LT	1.00	Q						
CZH3CL	LT	1.90	0					•	
CCL4	LT	1.30	O.					•	
CH2CL2	LT	3.20	0					•	
CHCL3	LT	7.20	-1					•	
TCLEE	LT	1.00	0					•	
TCLTFE	LT	1.00	0					•	
TRCLE	LT	5.00	-1					•	

## Sample:

Samp Anal No:* 012	File: CGW	Site Type:	WELL

Site ID: MARC Field Samp No: MW-7 Samp Date: 09/26/71
Samp Program: RAS Samp Depth: 83.0 Samp Tecn: G
Lab Samp No: 34883.0 Samp Prep Date: 10/10/91 Anal Date: 10/10/91
Base Closure: N Delivery Order No:

#### Analysis:

Test Name I	Bool Unc	Mant Unc	Exp	Dil Mant	Dil Exp	Moist	FC Q	, ΩC	Mant	ЗC	Exp
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	~ ~		~~~~~		 	 		
1	11TCE	LT	1.00	Q				
1	L12TCE	LT	1.00	Ó			•	
1	L1DCE	LT	1.00	0			•	
1	L1DCLE	LT	7.80	-1			•	
1	L2DCE	LT	5.00	-1			•	
1	L2DCLE	LT	5.00	-1			•	
1	L2DCLP	LT	1.00	O			•	
5	C2H3CL	LT	1.90	٥				
C	CCL4	LT	1.30	0			•	
C	CH2CL2	LT	3.20	0			•	
ε	CHCL3	LT	7.20	-1			•	
7	TCLEE	LT	1.00	ō.			•	
7	CLTFE	LT	1.00	O			•	
7	T CLE	LT	5.00	-1		•		

^{* -} Indicates that the data is either in error or has not born validated

S	am	D	1	6	:	

CGW Site Type: WELL File: Samp Anal No:* 013 Field Samp No: MV-8 Samp Depth: 84.8 09/26/91 Samp Date: Sate ID: MARC Samo Tech: G Samp Program: RAS 84.8

Samp Program: RAS Samp Depth: 84.8 Samp Tech: G Lab Samp No: 34884.8 Samp Prep Date: 10/10/91 Anal Date: 10/10/91 Base Closure: N Delivery Order No:

#### Analysis:

Test Name	Bool	Unc Mant	Unc Exp	Dil Mant	Dil Exp	Moist	FC G	IC ΩC Mant G	10 Exp
~~~~~					~~~~~				
111TCE	LT	1.00	0					•	
11DTCE	I_T	1.00	O.					•	
1 LDCE	LT	1.00	Ģ					•	
11DCLE	LT	7.80	-1					•	
12DCE	LT	5.00	-1					•	
12DCLE	ᆫᅮ	5.00	<i>i-</i> -					•	
12DCLP	LT	1.00	O.					•	
CCH3CL	LT	1.90	0						
CCL4	LT	1.30	0					•	
CH2CL2	LT	3.20	0					•	
CHCL3	LT	7.20	-1					•	
TCLEE	LT	1.00	O					•	
TCLTFE	LT	1.00	0					•	
TRCLE	LT	5.00	-1					•	

Sample:

File: CGW Site Type: WELL Samp Anal No:* 014 Field Samp No: MW-9 Samp Date: 09/26/91 Site ID: MARC 85.6 Samp Tech: G Samp Program: RAS Samp Depth:

Lab Samp No: 34895.6 Samp Prep Date: 10/10/91 Anal Date: 10/10/91

Base Closure: N Delivery Order No:

Analysis:

111100 4 7 22 22 2									
Test Name	Bool	Unc Man	t Unc Exp	Dil Mant	Dil Exp	Moist	FC 0	IC GC Mant	QC Exp
111TCE	LT	1.00	O					•	
112TCE	LT	1.00	0					•	
11DCE	LT	1.00	0					•	
11DCLE	LT	7.80	-1					•	
12DCE	LT	5.00	-1					•	
12DCLE	LT	5.00	-1					•	
12DCLP	LT	1.00	0					•	
C2H3CL	LT	1.90	0						
CCL4	LT	1.30	ø					•	
CH2CL2	LT	3.20	0						
CHCL3	LT	7.20	-1					•	
TCLEE	LT	1.00	O					•	
TCLTFE	LT	1.00	O					•	
TRCLE	LT.	5.00	-1						

^{* -} Indicates that the data is either in error or has not been validated

Samp	le:
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Samp Anal No:* 015 File: CGW Site Type: WSLL
Site ID: MARC Field Samp No: MW-10 Samp Date: 09/26/91
Samp Program: RAS Samp Depth: 0.0 Samp Tech: G
Lab Samp No: 34886.4 Samp Prep Date: 10/10/91 Anal Date: 10/10/91 File: CGW Site Type: WSLL Samp Anal No: * 015

Base Closure: N Delivery Order No:

Analysis:

Test Name	Bool	Unc Mant	Unc Exp	Dil Mant	Dil Exp	Moist	FC QC	QC Mant QC Exp
		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						
111TCE	LT	1.00	0					a
112TCE	LT	1.00	0					•
11DCE	LT	1.00	Q					•
11DCLE	LT	7.80	- <u>1</u>					•
12DCE	LT	5.00	-1					•
12DCLE	LT	5.00	-1					•
12DCLP	LT	1.00	Ō					•
CZHICL	LT	1.50	O.					•
CCL4	LT	1.30	O					•
CH2CL2	LT	3.20	0					•
CHCL3	LT	7.20	-1					•
TCLEE	LT	1.00	Q					•
TCLTFE	LT	1.00	0					•
TRCLE	LT	5.00	-1					•

#### Sample:

Samp Anal No:* 016 File: CGW Site Type: WELL Site ID: MARC Field Samp No: MW-11 Samp Date: 09/26/91 Samp Program: RAS Samp Depth: 75.0 Samp Fech: GLab Samp No: 34887.2 Samp Prep Date: 10/10/91 Anal Date: 10/10/91

Base Closure: N Delivery Order No:

#### Analysis:

Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant QC Exp

111TCE	LT	1.00	0			•
112TCE	LT	1.00	0			•
11DCE	LT	1.00	0			•
11DCLE	LT	7.80	-1			•
12DCE	LT	5.00	-1			•
12DCLE	LT	5.00	-1			•
12DCLP	LT	1.00	0			•
C2H3CL	LT	1.90	O			
CCL4	LT	1.30	2			
CH2CLI	LT	3.20	O.			•
CHCL.3	LT	7.20	-1			•
TCLEE	ĻT	1.00	0			•
TCLTFE	上T	1.00	Q			*
TROLE	!_T	5,00	-1			•

^{* -} Indicates that the data is either in error or has not been calibrates

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#### Analysis:

111TCE LT 1.00
112TCE LT 1.00
11DCE LT 1.00
11DCLE LT 7.80
12DCE LT 5.00
12DCLE LT 5.00
12DCLP LT 1.00
C2H3CL LT 1.90
CCL4 LT 1.30
CH2CL2 LT 3.20
CHCL3 7.21 O O 0 -1 -1 -1 Ó 0

Test Name Bool Unc Mant Unc Exp Dil Mant Dil Exp Moist FC QC QC Mant OC Exp

CHCL3 7.21
TCLEE LT 1.00
TCLTFE LT 1.00
TRCLE LT 5.00 0 Q.

^{* -} Indicates that the data is either in error or has not been validate.

Lot - Instl: MW Lab: PC Lot No: GEW page - 10 date - 11/19

Sample:

Samp Anal No: 019
Site ID:
Samp Program:
Lab Samp No:
Samp Prep Date:
Samp Prep Date:
N Delivery Order No:
Site Type:
Samp Date: / /
Samp Date: / /
Samp Tech:
Anal Date: 10/10/91

Analysis:

COLOUR A DETOR									
Test Name	Pool	Unc Mant	Unc Exp	Dil Mant	Dil Exp	Moist FC	QC	OC Mant	QC Exp
				**** **** **** **** ****					
111TCE		1,27	1				S	1.00	:
112TCE		1.15	1				S	1.00	1.
11DCE		9.14	୍				9	1.00	1
11DCLE	LT	7.80	-1				${f e}$	0.00	O
12DCE		5.52	Ö				3	3.00	O
12DCLE		4.57	0				5	5.00	Ç
12DCLF	LT	1.00	0				S	0,00	Q
COHOCL	LT	1.90	O				3	0.00	9
CCL4	LT	1.30	Q				S	0.00	Q
CH2CL2	LT	3.20	0				S	0.00	9
CHCL3	LT	7.20	-1				ຣ	0.00	Q
TCLEE		1.23	1				S	1.00	1
TCLTFE	LT	1.00	0				S	0.00	O
TRCLE		7.47	Q				S	5.00	O

^{*} - Indicates that the data is in error or that it has not been validated