Engineering Report
Vacuum Enhanced Recovery System
Aro Corporation Site,
Cheektowaga, New York

Ingersoll-Rand Company
Proj. No. AY000220.0004

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REPORT

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Certification

This is to certify that the Remedial Design was implemented, and construction activities were completed in accordance with the Remedial Design and RD/RA Work Plan, as approved by the NYSDEC.

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1.0 Introduction

ARCADIS Geraghty & Miller, Inc. and its engineering subcontractor, GM Consulting Engineers, P.C., have prepared this Engineering Report on behalf of the Ingersoll-Rand Company to document the construction and implementation of a remedial design at the Aro Corporation site in Cheektowaga, New York (Figure 1). In accordance with the remedial design/remedial action (RD/RA) Work Plan (Geraghty & Miller 1997), a vacuum enhanced recovery (VER) system (Figure 2) was installed at the site to recover chlorinated volatile organic compounds (VOCs) present in the dissolved, adsorbed and vapor phases in the subsurface at the site. As required by the Order on Consent for remediation of the site, this Engineering Report summarizes the construction activities associated with implementation of the RD/RA Work Plan and includes "as-built" Record Drawings for the VER system.

1.1 Site Location & Background

The Aro Corporation site is located on Broadway (Route 130) in the Town of Cheektowaga, Erie County, New York (see Figure 2). The property consists of the former Aro Corporation parcel and two parcels formerly owned by Richard J. Zydel located adjacent to and west of the Aro parcel. The area surrounding the site is zoned as light industrial/ residential. The site is an inactive hazardous waste disposal site and listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 915147. The site is designated as a Class "2" site.

The former Aro main facility building, which was demolished in December 1997, covered approximately 69,000 square feet of the property. The floor slab of the former main facility building was left in place and not demolished. A separate maintenance and storage building, approximately 4,800 square feet in size was not demolished, and is located south of the west side of the main facility building (Figure 2). Other property areas include a paved area north of the former main facility building, and a larger, paved parking lot area south of the former building. Areas south and west of the parking lot are open fields. The former Zydel properties included abandoned homes and a garage that were demolished in late November 1998.

A storm water drainage ditch flows southward along the east property boundary and westward along the southern property boundary. Another drainage ditch begins at a backfilled culvert on the south side of the parking lot. Surface water runoff within this ditch flows south to the west-flowing portion of the storm water drainage ditch located along the perimeter of the property. Surface water discharge occurs near the southwest corner.

A detailed history of the operations, manufacturing processes, and facility

changes at the site are provided in the following Remedial Investigation (RI) and Feasibility Study (FS) documents:

- Remedial Investigation Report, Aro Corporation-Life Support Division, December 1992, (Capsule1992).
- Revised Remedial Investigation Report, August 1993, (Capsule 1993a).
- Remedial Investigation Supplemental Report October 1993 (Capsule 1993b).
- Revised Remedial Investigation Report, May 1994 (Capsule 1994) and the Feasibility Study Report, May 1994 (Capsule 1994a).

1.2 Report Organization

This Engineering Report is organized into the following sections: Section 2.0 Subsurface Geologic Conditions, generally describes the site geology and the subsurface geologic data developed from the installation of recovery wells and monitoring wells; Section 3.0 Initial Soil and Groundwater Quality Conditions, summarizes the analytical results from the RI and baseline groundwater sampling event conducted prior to startup; Section 4.0 Extraction & Treatment, describes the VER system, VER technology and system components; Section 5.0 System Modifications, discusses the modifications to the Remedial Design implemented during system construction; Section 6.0 System O&M, describes the operation and maintenance associated with the VER system equipment and treatment systems; Section 7.0 Performance Monitoring, discusses the sampling and analysis programs for monitoring the effectiveness of the VER system; Section 8.0 Closure, describes the proposed criteria for system shutdown and associated closure activities; and Section 9.0 References, lists the documents used in the preparation of this report.

2.0 Subsurface Geologic Conditions

Based on past and recent drilling activities at the site, the overburden soil consists of two till layers identified as the upper and lower tills consisting of silt, clay, and varying grades of sand and gravel. Geologic cross sections were constructed using the new and existing subsurface data. The geologic cross section transects are shown on Figure 3 and the cross sections are included as Figures 4, 5, and 6. The upper till generally consists of brown stiff silty clay with varying amounts of sand and gravel. The lower till consists of very dense gray silt with varying amounts of sand, gravel, and weathered limestone in the central and western portions of the site. Based on previous drilling activities, a very dense fine to medium grain sand with some silt, gravel and clay is located in the eastern portion of the site. A culvert used for facility

stormwater and sanitary sewers cuts into the upper till at the edge of the parking lot south of the former main facility building (Figure 2). Depth to bedrock generally occurs at approximately 21 to 25 feet below land surface (bls) at the site.

Headspace readings of samples collected during the installation of the recovery and monitoring wells are included on the soil boring logs (Appendix A). The headspace readings ranged from 0 ppm from several depth intervals in several borings to 1,681 ppm at the 8 to 10 feet bls interval at Well MW-29.

During installation of recovery wells and monitoring wells for the VER system, sand seams/layers were encountered in several of the borings ranging from 2-inches thick in RW-4, RW-6, and RW-7 to 4-feet thick in MW-23. The sand seams/lenses consisted of fine to coarse sand with trace fine gravel and were encountered at depths ranging from 14 bls in MW-23 to 22 feet bls in RW-3. The highest headspace results for samples from borings RW-3, MW-23, and MW-25 corresponded with the sand seam intervals. The sand seams were encountered in soil borings located south and east of the maintenance and storage building. According to the soil boring logs of the previously installed wells, sand seams of this nature were not encountered in other areas of the site.

3.0 Initial Soil and Groundwater Quality Conditions

Soil and groundwater quality conditions at the site were characterized during the various phases of the remedial investigation (Capsule 1992, 1993a, 1993b and 1994b). The primary constituents of concern were TCE, DCE and vinyl chloride (VC).

Elevated levels of TCE, DCE and VC were found in certain areas of the subsurface soil at the site, primarily beneath the metal preparation room and the adjacent area near monitoring well MW-3, and the former shipping/loading area near monitoring well MW-13. Concentrations of TCE found in the subsurface soil ranged from 0.14 to 250 milligrams per kilogram (mg/Kg). The highest concentration of TCE was found at a depth of 20.7 feet, at monitoring well MW-3R, near the metal preparation room.

As in the soils, the primary constituents in groundwater were TCE, DCE and VC. The highest concentrations of TCE were found in monitoring wells MW-3 [1,100,000 micrograms per liter (ug/L)], MW-6 (100,000 ug/L), MW-11 (51,000 ug/L), and MW-13 (21,000 ug/L) (Capsule 1994b). The concentration of TCE found in samples taken from well points set in the bedding of the sewer beneath the parking lot were

above the 5 ug/L water quality criteria threshold.

A baseline groundwater sampling event was conducted by ARCADIS Geraghty & Miller in February/March 1998 to establish groundwater quality conditions prior to startup of the VER system. The results of this baseline sampling event are shown on Figure 7, along with previous analytical results from the RI in 1992 and 1993. Groundwater samples were collected from the 10 monitoring wells designated in the RD/RA Work Plan as part of establishing baseline groundwater quality conditions (see Table 3). TCE, DCE, and/or VC were detected in each of the 10 monitoring wells. The relative concentrations and occurrence of TCE, DCE, and VC are generally consistent with historical groundwater analytical results for the site. Comparison of the 1998 analytical results with analytical results for 1992 and 1993 indicates that concentrations of TCE have declined in monitoring wells located near the perimeter of the groundwater plume (Wells OW-101, MW-6, and MW-20) but have increased in monitoring wells located near the former metals preparation room area (Wells MW-3, MW-2).

4.0 Extraction & Treatment

The VER system at the Aro Corporation site is comprised of a network of ten recovery (extraction) wells for dual-extraction of liquid and vapor, a liquid ring pump system for vacuum application to the wells, an extracted liquid/vapor separation unit, a groundwater treatment system, and a vapor phase treatment system. The VER system is designed to recover chlorinated VOCs present in the dissolved, adsorbed, and vapor phases in the subsurface at the Site. The entire VER system is controlled automatically through the Main Control Panel (MCP), however, manual controls are included on the MCP.

The vacuum applied to the dual-extraction wells by the liquid ring pump (LRP) unit via the below grade vacuum process piping removes both the groundwater and subsurface vapor from the extraction wells. The LRP is similar to a conventional vacuum blower, but is able to generate much higher levels of vacuum through the use of a sealing fluid in the pump casing. At the Aro site the sealing fluid is oil, which is contained in a sealed, recirculating system that includes a reservoir and radiator to cool the oil on each pass through the system.

The recovered groundwater and vapor from the extraction wells are directed from a common manifold to the liquid/vapor separator where the liquid and vapor are separated. The groundwater is then transferred via a transfer pump and above-grade process piping, through a particulate filter, and into the groundwater treatment system. The groundwater treatment system consists of two Liquid Phase Granular Activated Carbon (LPGAC) treatment vessels. The LPGAC vessels are designed to remove dissolved VOCs

from the groundwater prior to discharge to an on-site sanitary sewer connection. VOC removal is required in order to meet the discharge permit parameters as outlined in the Buffalo Sewer Authority (BSA) discharge permit. The BSA system includes the sanitary sewer on-site to which the groundwater is discharged, and therefore BSA regulates the use of this sewer. A copy of the BSA discharge permit is included in Appendix B.

The separated vapor from the vapor/liquid separator is drawn through a particulate filter and into the LRP. The vapor stream is then directed from the LRP, along with the seal oil, into the seal oil reservoir. In the seal oil reservoir, the oil and vapor are separated and the vapor is directed to the vapor phase treatment system. The vapor phase treatment system consists of two stages. The first stage is conventional Vapor Phase Granular Activated Carbon (VPGAC) for removal of a major portion of the VOCs in the extracted vapor. The second phase of the vapor treatment is the specialized Caru-Sorb treatment, which is made up of a zeolite media impregnated with potassium permanganate. The Caru-Sorb treatment is designed to remove vinyl chloride (VC) from the vapor stream via oxidative destruction. This second stage is required since VC is poorly adsorbed by conventional VPGAC. Vapor phase treatment for VOC removal is required prior to discharge to the atmosphere by the New York State Department of Environmental Conservation (NYSDEC).

All of the VER system equipment is located in the former maintenance building at the site. A system layout showing the location of the extraction wells, the maintenance building, VER equipment, and the sanitary sewer is provided on Figure 2 and Drawing No. 3 of the Record Drawings which comprise Appendix C. A more detailed description of the VER technology is provided in the following section.

4.1 VER Technology

VER is a technology used for the removal of groundwater and adsorbed phase VOCs from soils with relatively low permeability in both the saturated and unsaturated subsurface zones. VER technology is based on the principle of applying a relatively high vacuum (20 to 30 inches of mercury [inches Hg]) to a recovery well to extract vapors, while simultaneously extracting groundwater using suction-lift effect associated with the vacuum application. Essentially, a VER system is a combination of a conventional pump and treat system, with a soil vapor extraction system. However, the effectiveness of a VER system, in terms of contaminant mass removal, is typically much greater than that of a conventional pump and treat and/or soil vapor extraction system operating alone. One reason for the increased effectiveness is that the application of a vacuum significantly increases the achievable groundwater pumping rates from the recovery wells (typically 2 to 4 times that of conventional pump & treat systems).

This results in greater zones of groundwater containment and capture as well as increased dewatering of the formation. A second reason for the increased effectiveness is that the vacuum volatilizes VOCs from the unsaturated zone and from the zones dewatered by the groundwater pumping system.

The increased pumping rate is achieved because the vacuum causes an increased pressure gradient at the recovery well (due to the negative pressure of the vacuum application). This increased pressure gradient is essentially equivalent to additional pumping drawdown in the well. For example, if drawdown due to pumping is 15 feet and the vacuum level in the well is equivalent to 15 feet of water column, then the effective pressure gradient would be 30 feet.

VOCs are volatilized from the soil matrix (adsorbed phase) because the VER system induces air flow through the unsaturated, and formerly saturated soils. Contaminants are volatilized into the air stream and are directed to the treatment system with the extracted vapor from the subsurface.

4.2 Recovery Wells/Monitoring Wells

As part of the installation of the VER system, nine additional recovery wells and eight additional monitoring wells were installed on-site. The wells were installed from October 16, 1997 to November 4, 1997. Locations of the monitoring wells and recovery wells are shown on Figure 3 and a summary of well construction details are included in Table 1.

The hollow-stem auger drilling method was utilized for the drilling of soil borings, and for the installation of the recovery wells and monitoring wells. Augers that measure 4¼-inches inside diameter (ID) and 6¼-inches ID were used to install two-inch monitoring wells and four-inch recovery wells, respectively.

Continuous soil samples were collected at each boring location using stainless steel split spoons. A representative soil sample from each split spoon was retained for headspace screening using a photoionization detector (PID). The samples were described and logged in the field by the supervisory hydrogeologist. Boring logs for the monitoring and recovery wells are included as Appendix A.

Upon drilling to the desired depth, the polyvinyl chloride (PVC) well materials were then lowered through the augers and set on 6-inches of clean #1 Morie silica sand at the base of the borehole. The monitoring wells are constructed of 2-inch diameter Schedule 40 PVC casing and 0.010-inch slotted screen. The recovery wells are constructed of 4-inch diameter Schedule 40 PVC casing and 0.10-slotted screen. Well screen intervals were selected by an ARCADIS Geraghty & Miller hydrogeologist, and are summarized in

Table 1. After temporarily capping the well pipe, clean #1 Morie silica sand was placed around the screen to a height of one foot above the top of the well screen. A one foot pelleted bentonite seal was placed on top of the sand pack and allowed to hydrate. During well installation, the augers were withdrawn to a level just above the sand pack while the seal hydrated. Cement was then placed on top of the bentonite seal and brought approximately one to two feet below grade. (The recovery wells were backfilled with soil cuttings from the boring in order to allow access to the recovery wells during the installation of the pitless adapters and underground piping.)

Once the monitoring wells were constructed, a locking protective steel casing or flushmount was set over each well and cemented into place to a depth of 2 feet bls. The recovery well casings were initially left above land surface so the underground piping, pitless adapters, drop tubes and wellheads could be installed at a later date. Once the VER system piping was installed and connected to the wells, a protective road-box was installed at each recovery well location. Recovery and monitoring well construction logs are included in Appendices D and E, respectively.

While installing the additional wells, ARCADIS Geraghty & Miller personnel discovered that existing monitoring well MW-10 was damaged. The protective flushmount roadbox was missing and the well was partially filled with surface debris (gravel). After conversations with Mr. Dave Jones of Ingersoll-Rand and Mr. Dave Locey of the NYSDEC, it was decided that well MW-10 should be replaced (MW-10R) and screened at a depth corresponding to that of the newly installed monitoring wells (5 – 17 feet bls).

Prior to installing MW-10R, well MW-10 was properly abandoned by overdrilling, removing the PVC well material, and grouting the borehole to grade with a cement-bentonite grout.

After all of the wells and system piping was completed, the tops of the drop tubes in each of the monitoring wells were surveyed to the nearest 0.01 foot (relative to mean sea level). The wells were surveyed by Licensed Land Surveyors, Paul Schreckengost and Associates of Jamestown, New York.

The drilling casings, rods, samplers, tools, rig, and augers that would come into contact (directly or indirectly) with the formation were steam cleaned on-site prior to set up for drilling. Steam cleaning protocols were also followed between boreholes (at a fixed decontamination pad) and before leaving the site at the end of the project. Equipment used to sample unconsolidated sediments (split spoon samplers) were decontaminated prior to each sample collection. The split spoon samplers were decontaminated using Micro™ solutions and distilled water in a bucket followed by a

distilled water rinse. The split spoons were then placed on a clean polyethylene sheet where they were reassembled.

4.3 Piping

Schedule 80 PVC piping is provided to transmit the vacuum and extract groundwater and vapors from the extraction wells. Individual vacuum pipelines have been provided for each extraction well, and are then consolidated into one vacuum manifold (also schedule 80 PVC) upon entering the building. Most of the other process piping also consists of schedule 80 PVC, including the groundwater and vapor discharge and treatment piping.

In order to protect the exterior vacuum piping from freezing and damage, the piping has been routed to the extraction wells in below grade piping trenches. Trenches were excavated in the locations shown on Drawing No. 3 of the Record Drawings (Appendix C). Initially, the existing asphalt (where present) in the trench areas was saw-cut, removed and stockpiled for disposal. The trenches were then excavated to a total depth of 4-feet 3-inches with a 2-foot width. Three inches of clean pipe bedding material were then placed in the base of the trenches for pipe bedding purposes. The piping was then deployed in the trench (in maximum 100 linear foot sections) and backfilling was initiated. Backfill consisted of surrounding the piping with additional bedding material, and placing a final 2-inch layer of bedding over the pipes. The balance of the trenches were then backfilled with excavated soil, placed and compacted in 12-inch lifts. Due to the time of year at which the construction was completed, no asphalt was available for repaving of the trenched areas. Paving will be completed during the summer of 1998. Additional trenching details are shown on Drawing No. 5 of the Record Drawings (Appendix C).

During trenching activities, several unmapped utilities were encountered include an 8-inch clay pipe trending north-south near RW-8. According to ARCADIS Geraghty & Miller personnel, the pipe appeared as though it ended approximately 3-4 feet north of the trench, and continued south toward the treatment building. The same size and type of piping was encountered during trenching into the treatment building (east side). This pipe was observed to be parallel to the east wall of the treatment building. A third 8-inch clay pipe was encountered in the trench from RW-5, between RW-4 and RW-7. This pipe was observed to be running east-west toward the drainage ditch.

During trenching activities from RW-2, a buried, vertical, 6-inch steel pipe was encountered. Sand and gravel was observed at the base of the excavation, but the former use of the pipe could not be determined.

During installation of the piping, two quality control checks were periodically made by the installation contractor. First, the contractor performed hydrostatic pressure testing on the

vacuum piping (testing performed as outlined in the construction specifications). In addition, material tests (soil compaction density) were performed on each lift of the trenching backfill material (also as outlined in the construction specifications). The inspection and testing reports from the piping installation are presented in Appendix F.

4.4 Vacuum Extraction System

As outlined, the VER system consists mainly of the LRP, the vapor/liquid separator, and the transfer pump, along with the controls and instrumentation. The VER system was provided as an integrated package on a single steel skid secured to the floor of the maintenance building. Details regarding the individual components of the VER system are outlined below and are included on the Process and Instrumentation Diagram (PID) which appears as Drawing No. 4 of the Record Drawings (Appendix C).

Liquid Ring Pump

One LRP (LRP-200) is utilized to induce a vacuum at the recovery wells. The LRP is connected to all ten recovery wells, as shown on Drawing No. 3 of the Record Drawings (Appendix C). The LRP system is Travaini Pumps USA, Dyna-Seal System Model TR0200V-1A-XP, which includes the LRP (Travaini Model TRV-65-300), driver (10 hp, 460 volt, 3 phase electric motor), and related equipment. The LRP is capable of providing approximately 200 actual cubic feet per minute (acfm) of air flow at approximately 20 inches Hg vacuum. The LRP provides vacuum to each recovery well at an average air flow rate of between 10 and 20 acfm at a vacuum level of 20 to 30 inches of Hg.

The Dyna-Seal system employs oil as the liquid ring pump seal fluid in a closed recirculation loop. The recirculation system for the LRP consists of an oil/air separator (KT-220 - also a reservoir), a coalescing discharge separator (to limit oil discharge in the vapor stream), recirculation piping, appurtenances, and an oil heat exchanger (radiator). Copies of the Material Safety Data Sheets (MSDSs) for the seal oil have been included in Appendix G.

The LRP operation is controlled via the MCP using a variety of system alarms. These alarms include high and low oil level in the seal oil reservoir (LAH-220 and LAL-220), high vapor discharge pressure (PSH-220), and high oil temperature (TAL-220). Activation of any of these alarms will result in a shut-down of the LRP.

Vapor/Liquid Separator

The vapor/liquid separator (KT-210) consist of a 30-gallon welded steel tank, with a flanged lid. As outlined, the level controls and alarms on the vapor/liquid separator include a low level switch (LSL-210), normal level switch (LSN-210), and a high level switch (LSH-210). A sight gauge (SG-210) is provided on the knockout tank to indicate water level. LSL-210

and the LSN-210 are used to control normal transfer pump operations. LSH-210 is used to shut down the LRP when an excessive amount of water accumulates in the knockout tank (indicating a transfer pump failure).

The liquid/vapor stream enters the vapor/liquid separator via a 3-inch diameter port located in the side of the tank. Prior to entering the tank, the water/vapor mixture is passed through a 4-inch diameter Y-strainer to collect large particulate matter. The vapor stream exiting the tank is passed through another filter, also to remove any particulate matter.

The liquid/vapor separator is also equipped with a drain valve and a manual drain pump in order to remove water from the tank in the event of a transfer pump failure.

Transfer Pump

The system transfer pump (P-210) is used to transfer liquids from the knockout tank to the liquid phase treatment equipment as shown on Drawing No. 4 of the Record Drawings. The transfer pump is a progressive cavity-type pump (Moyno Pumps Model No. M7037T) which is required to pump the water from the vapor/liquid separator while under full vacuum from the LRP. The transfer pump is driven by a 2 hp, 460 volt, 3 phase electric motor. The transfer pump is capable of pumping approximately 10 gallons per minute (gpm) at a discharge pressure of 100 pounds per square inch (psig).

As outlined, transfer pump operation is controlled by the low and normal level switches (LSL-210 and LSN-210) in the vapor/liquid separator. In addition, a high pressure alarm (PSH-210) is provided on the discharge side of the transfer pump, prior to the cartridge filters. When engaged, this alarm will shut-down both the transfer pump and LRP operation.

4.5 Liquid Phase Treatment & Discharge

Groundwater treatment equipment for the system consists of a cartridge-type particulate filter (F-401) two LPGAC treatment vessels (LPC-401 and LPC-402). The flowmeter is a turbine type meter present in the groundwater discharge line between the transfer pump and the cartridge filter. The flowrate measured by the flowmeter is displayed on a digital flow indicator/totalizer, and the flow total is also recorded on a circular chart recorder.

The cartridge filter is located between the transfer pump and the primary LPGAC vessel and is intended to remove any suspended solids present in the groundwater, in order to limit fouling of the carbon media.

The two LPGAC units are U.S. Filter Westates Carbon Products Model ASC-1200 with a activated carbon capacity of 1,000 pounds for each

vessel. The units operate at a maximum flow rate of 50 gpm at a pressure of 15 psig. Copies of the MSDSs for the activated carbon media have been included in Appendix G.

The vessels have been designed to be operated in series, with the groundwater being discharged to the primary vessel for treatment, and then passed through the secondary unit for "polishing". The two vessels have been installed with a valving manifold to allow for series, parallel or isolated operation of the LPGAC units (for flexibility). In addition, sample collection valves and individual pressure indicators are located on the inlet and discharge side of each of the vessels. A layout of the LPGAC vessels, the flow control valve system, the sample ports, and pressure indicators is included on Drawing No. 4 of the Record Drawings (Appendix C).

Following treatment, the groundwater is routed to an on-site sanitary sewer connection located in the former lavatory of the maintenance building. From this connection, the treated groundwater is discharged to the sanitary sewer located along the western side of the maintenance building.

4.6 Vapor Phase Treatment

The two VPGAC units are Westates Carbon Products Model VSC-2000 with an activated carbon capacity of 1,800 pounds. The units operate at a maximum flow rate of 500 acfm at a maximum inlet pressure of 15 psig.

As with the LPGAC vessels, the VPGAC vessels have been designed to be operated in a series with the extracted vapors being discharged to the primary vessel for treatment, and then passed through the secondary unit for "polishing". Similarly, the two VPGAC vessels have been installed with a valving manifold to allow for series, parallel or isolated operation of the units (for flexibility). Sample collection valves and pressure indicators are located on the inlet and discharge side of each of the vessels.

Following the two VPGAC units are the two Caru-Sorb units. These are Westates Carbon Products Model VSC-2000-4 with a Caru-Sorb media capacity of 2,000 pounds. The units operate at a maximum flow rate of 500 acfm at a maximum inlet pressure of 15 psig. Copies of the MSDSs for the activated carbon media have been included in Appendix H.

The Caru-Sorb units have been installed with a valving manifold identical to the VPGAC units to allow for series, parallel or isolated operation of the units (for flexibility). Similarly, sample collection valves and pressure indicators are located on the inlet and discharge side of each of the vessels.

Following treatment, the air stream is routed to a discharge stack on the exterior of the maintenance building.

No air permit is required by the NYSDEC.

5.0 System Modifications

During the installation of the remediation system, only two significant modifications were made to the system as presented in the RD phase. These two modifications were the following:

- Vacuum Piping Entrance to the Maintenance Building - The RD specified that the ten individual vacuum pipelines be installed vertically from the trenches along the outside of the maintenance building, and enter the building via holes in the building wall. This design also called for the installation of electric heat tracing and rigid insulation around the piping to protect from freezing. During the construction phase, it was decided to extend the below grade pipelines under the building foundation's footing, and then install the pipelines vertically into the building through a hole sawcut in the concrete floor. This change was endorsed for several reasons including: greater freeze protection, protection from exterior damage, and aesthetics. A detail outlining this piping detail is included on Drawing No. 5 of the Record Drawings.

- Flowmeter Chart Recorder - The RD called for the groundwater flow meter to be equipped with a totalizer to provide a flow total output. However, prior to construction, a circular chart recorder was added to provide a permanent record of the flow total on a weekly basis. This change was required by the conditions of the BSA sanitary sewer discharge permit.

6.0 System O&M

The vacuum enhanced recovery system is automated such that manned operation is not necessary on a continual basis. Routine inspection of the system and verification of the operating parameters will be performed on a daily (autodialer), weekly, and monthly basis. The system incorporates provisions for automatic shutdown and remote alarm condition annunciation should adverse operating conditions develop. If alarm conditions develop, the system will be inspected, the problem (if any) rectified , and the system will be restarted.

6.1 Extraction System Equipment

The extraction system equipment includes the MCP, the LRP, and the transfer pump. The MCP and other equipment will be checked either by inspection or via the remote monitoring system on a weekly basis to check for proper operation, system faults, and system alarms. A more detailed inspection will be performed on a monthly basis and this inspection will include the following items:

- System running status and alarms, if any,
- Vacuum levels at vapor/liquid separator and LRP,
- Seal oil level and seal oil temperature,
- Groundwater flow total,
- System extracted air flowrate,
- Differential pressure for vapor/liquid separator,
- Differential pressure for oil/vapor separator,
- Individual extraction well vacuums (at manifold and at wellhead),
- Cartridge filter inlet and outlet pressure,
- LPGAC inlet and outlet pressures,
- Inlet temperature to VPGAC vessels, and
- Inlet and outlet pressures at VPGAC and Caru-Sorb units.

6.2 Vapor Phase Treatment

The vapor phase treatment consists of the VPGAC and Caru-Sorb units. These units will be inspected on a monthly basis for potential leaks, proper positioning of the flow control valves, and inlet pressures. However, the main O&M task for the vapor phase treatment equipment will be potential media replacement. On a monthly basis, influent, effluent and mid-point vapor samples will be collected from the treatment system for both field and laboratory analysis (mid-point vapor samples for laboratory analysis will be collected as necessary to verify field monitoring results). Along with use in performance monitoring, these sampling results will be employed to determine if either the VPGAC or Caru-Sorb media has been spent. This condition would be indicated by elevated levels of VOCs passing through the primary treatment vessel (also known as breakthrough). If breakthrough is confirmed, the media from the primary vessel(s) will be replaced by the manufacturer. Following this replacement, the valving manifold will be adjusted to convert the former secondary unit to become the primary unit, and allow the newly replaced vessel to operate as the secondary unit.

6.3 Groundwater Treatment

The liquid phase treatment system consists of the flow monitoring and recording equipment, the cartridge filter and the LPGAC vessels. The flowmeter will be inspected on a weekly basis for proper operation, and the paper in the circular chart recorder will also be replaced at this time. Replacement of the cartridge filters will not occur at a prescribed interval, but instead will be

replaced when the inlet pressure increases.

The LPGAC units will be inspected on a monthly basis for potential leaks, proper positioning of the flow control valves, and inlet pressures. However, similarly to the vapor phase treatment equipment, the main O&M task for the LPGAC will be potential media replacement. On a monthly basis, influent, effluent and mid-point groundwater samples will be collected from the treatment system for laboratory analysis. These sampling results will be employed to determine if the primary LPGAC vessel has experienced breakthrough. If breakthrough is confirmed, the media from the primary vessel will be replaced by the manufacturer, and the flow will be reversed to convert the former secondary unit to become the primary unit, and allow the newly replaced vessel to operate as the secondary unit. The LPGAC units may also require backwashing to remove potential fouling or to regrade the media. This will be performed on an as-needed basis.

7.0 Performance Monitoring

7.1 Objectives of Monitoring

During operation of the remediation system at the site, various data will be collected and analyzed to evaluate the performance of the system. This performance monitoring is intended to achieve the following objectives:

- evaluate the system performance (in terms of VOC mass removal and groundwater remediation),
- evaluate performance of the groundwater and vapor phase treatment systems,
- determine if any modifications to the system are required to enhance the system performance, and
- ultimately determine when closure points have been achieved.

Details of the specific performance monitoring are outlined below.

7.2 Groundwater Discharge Sampling & Analysis

As outlined, the extracted groundwater is treated via two LPGAC units, and is then discharged to the on-site sanitary sewer. Following system start-up, groundwater samples will be collected at a minimum on a monthly basis from the influent to the treatment system, from a point between the two LPGAC units, and from the effluent of the treatment system (prior to discharging to the sewer). Each of the three samples will be analyzed for VOCs.

The purpose of the influent sample is to estimate the total VOC mass removal from the subsurface and to evaluate the relative changes in this mass removal rate over time based on the system operation. The mass removal estimate will be generated

using the influent sample analytical data and the groundwater flow totals.

It is expected that the VOC mass removal in the groundwater phase will decline throughout the project life, based on reducing the overall VOC source and diffusion controlled mass transfer in the dissolved phase. Therefore, the influent sampling data, along with the monitoring well sampling data (see Section 7.4) will be used to make any system adjustments (e.g. closing or opening extraction wells) thought to increase the efficiency of system operation.

The purpose of the mid-point sample is to evaluate possible breakthrough of the primary LPGAC vessel. As the carbon media in the primary vessel is spent due to VOC adsorption, eventually VOCs will begin to breakthrough. At this time, the mid-point sampling results should indicate the occurrence, and a media change-out can be performed.

Collection of the effluent samples serves two purposes for system performance monitoring. First, the results of the effluent sampling will indicate the efficiency of the overall VOC removal by the LPGAC system. Secondly, effluent sampling is required as part of the BSA permit to discharge.

7.3 Vapor Discharge Sampling & Analysis

As outlined, the extracted vapor stream is treated via two VPGAC units (to remove the predominant VOCs), followed by two Caru-Sorb units (for vinyl chloride removal), and is then discharged to the atmosphere. Following system start-up, extracted vapor samples will be collected, at a minimum, on a monthly basis from the influent to the treatment system and Caru-Sorb units, and from the effluent of the treatment system (prior to discharging to the atmosphere). Prior to sample collection, the vapor stream is field screened with a flame-ionization detector (FID) at the influent and effluent of the treatment system and between each VPGAC and Caru-Sorb vessel. Vapor samples are then collected at the influent and effluent locations and submitted for laboratory analysis of VOCs. A mid-point vapor sample will be collected as necessary to verify the FID screening results.

As with the extracted groundwater sampling, the purpose of the influent vapor sample is to estimate the total VOC mass removal from the subsurface, and to evaluate the relative changes in this mass removal rate over time as a result of the system operation. The mass removal estimate will be generated using the influent sample analytical data and the air flowrate estimates made at the time of sampling.

It is expected that the VOC mass removal in the vapor phase will first increase (as more formerly saturated sediments are made available for vapor extraction due to dewatering), and then

decline based on a reduction of the overall VOC source material available for removal. Therefore, the influent sampling data will be used to make any system adjustments (e.g. closing or opening extraction wells, adjusting air flowrates) thought to increase the efficiency of system operation.

Similar to the extracted groundwater sampling, the effluent vapor samples are collected in order to evaluate overall efficiency of the VPGAC and Caru-Sorb treatment units. The effluent sampling is also required to assure VOC discharges to the atmosphere remain within acceptable limits.

7.4 Groundwater Monitoring

As per the RD/RA work plan for the Aro Corporation Site, groundwater samples will be collected on a quarterly and semi-annual basis from site monitoring wells. Monitoring wells located adjacent to five of the recovery wells will be sampled quarterly. Monitoring wells located adjacent to each of the ten recovery wells will be sampled on a semi-annual basis. A summary of the groundwater sampling program is provided in Table 3. All samples collected from the monitoring wells will be submitted for analysis of VOCs using USEPA Method 8260. In addition to sampling for VOCs, biogeochemical sampling and analysis will be performed for the purpose of collecting the necessary data to evaluate natural attenuation processes in groundwater at the site.

The biogeochemical sampling will include low-flow purging of the wells using a submersible pump and a flow-through cell. The following biogeochemical parameters will be collected yearly for the first two years and bi-annually thereafter:

- Chlorinated VOCs – Using USEPA Method 8260.
- Field Parameters – Dissolved oxygen, specific conductance, temperature, oxidation reduction potential, and pH.
- Natural Attenuation Parameters – Total and dissolved iron and manganese; alkalinity; nitrate and nitrite; sulfate and sulfide; chloride; methane, ethene, ethane, and carbon dioxide; chemical and biochemical oxygen demand; total organic carbon (dissolved); and ammonia.

Prior to startup of the VER system, baseline groundwater sampling of the monitoring wells was conducted (see Section 4.0). The results of this sampling event will serve as a baseline for comparison with subsequent sampling results during the remedial program. Baseline groundwater analytical reports for 1998 are included in Appendix H.

7.5 Semi-Annual Monitoring Report

As stated in the RD/RA Work Plan, a report summarizing the extracted volumes of groundwater and soil

vapor, analytical data, and any problems incurred with the system will be prepared on a semi-annual basis. Maps illustrating groundwater flow and quality will be included in the report.

8.0 Closure

As discussed in the RD/RA Work Plan and subsequent correspondence with the NYSDEC, shutdown of the VER system will involve a review and evaluation of the compiled vapor and groundwater quality data. Contaminant concentrations of treatment system influent vapor and groundwater, along with results from the groundwater monitoring program, will be plotted versus time to evaluate decreasing trends. Because the treatment system influent represents the combined vapor and groundwater flows from ten recovery wells, the water-quality analytical results from the monitoring wells will provide data to be used to evaluate system effectiveness at specific areas (i.e., recovery well location and adjacent surrounding area) throughout the site. Therefore, the groundwater analytical data will be integrated into the elevation to develop criteria for system shutdown.

The VER system will proposed to be shut down when the monitoring data demonstrate that either of the following criteria are met:

a) Concentrations of site-specific groundwater parameters at all locations sampled quarterly during the water-quality monitoring program are less than the remedial action objectives (RAOs) specified in the Record of Decision (ROD) for three consecutive sampling events. This criterion assumes that parameter concentrations at all other locations sampled are below RAOs.

b) If during four consecutive quarterly groundwater sampling events the concentrations have declined to asymptotic levels and are above RAOs, the RAOs will be modified and the VER system will be shut down. In this case, the final RAOs will be less stringent than the proposed RAOs, but this will represent the minimum concentrations that can be achieved in a technically practicable manner.

Prior to system shutdown, a summary status report will be prepared and submitted to NYSDEC. The NYSDEC will consider allowing site remediation to be terminated if the following can be demonstrated:

- Any future residual groundwater and/or soil contamination will not pose an unacceptable risk to human health and the environment.

- The residual groundwater and/or soil contamination will be compatible with the anticipated future use of the site.

- A "zero slope" has been reached with regard to groundwater and soil quality improvement (i.e. continued treatment will not result in any noticeable decrease in the concentration of chemicals in the groundwater or soil).

Confirmatory soil sampling in the suspected source areas will also be performed at this time as part of closure activities. A proposed plan for confirmatory sampling will be submitted to NYSDEC following review of the estimated radius of influence of the recovery wells during system operation. The spacing of soil borings in the suspected source areas will be commensurate with the estimated radius of influence.

Post-closure groundwater monitoring, system decommissioning and site restoration activities will be conducted following system shutdown as described in the RD/RA Work Plan.

9.0 References

Capsule Environmental Engineering, Inc. 1994a. Feasibility Study Report. The Aro Corporation-Life Support Division. Buffalo, New York.

Capsule Environmental Engineering, Inc. 1994b. Revised Remedial Investigation Report. The Aro Corporation. Cheektowaga, New York.

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Capsule Environmental Engineering, Inc. 1992. Remedial Investigation Report. Aro Corporation-Life Support Division.

Geraghty & Miller, Inc. 1996. Vacuum Enhanced Recovery Pilot Test Report. Aro Facility, Cheektowaga, New York.

Geraghty & Miller, Inc. and GM Consulting Engineers, P.C. 1997. Remedial Design/Remedial Action Work Plan. Aro Corporation Site. Cheektowaga, New York.

NYSDEC. Division of Hazardous Waste Remediation. 1995. Record of Decision. Aro Corporation Site. Town of Cheektowaga, Erie County. Site Number 9-15-147.

NYSDEC. Division of Environmental Enforcement. 1997. RD/RA Order on Consent. Index #B9-0353-90-11.

TABLES

Table 1: Summary of Construction Details for Monitoring and Recovery Wells at the Aro Corporation/Ingersoll Rand Site, Cheektowaga, New York

Well Number	Year Installed	Total Well Depth	Depth of Screened Interval	Well Material	Datum Elevation	Ground Elevation	Comments
Monitoring Wells							
MW-1	1990	27.0	17.0 - 27.0	2-inch ID PVC	104.12	102.40	Extended riser
MW-2	1990	27.0	8.5 - 19.5	2-inch ID PVC	101.33	98.90	Extended riser
MW-3	1992	25.0	19.0 - 23.7	2-inch Stainless	100.2	99.00	Extended riser
MW-3R	1992	44.1	34.0 - 44.0	2-inch ID PVC	101.52	99.20	Extended riser
MW-4	1990	15.8	5.8 - 15.8	2-inch ID PVC	103.52	98.90	Extended riser
MW-4R	1992	44.1	33.0 - 43.0	2-inch ID PVC	100.98	98.90	Extended riser
MW-5	1990	23.0	13.0 - 23.0	2-inch ID PVC	103.31	99.70	Extended riser
MW-6	1990	15.0	5.0 - 15.0	2-inch ID PVC	98.50	98.70	Flush mount
MW-7	1991	19.0	14.0 - 19.0	2-inch ID PVC	102.16	97.80	Extended riser
MW-8	1991	17.0	7.0 - 17.0	2-inch ID PVC	99.49	97.00	Extended riser
MW-9	1991	23.5	18.5 - 23.5	2-inch ID PVC	100.29	98.20	Extended riser
MW-10R	1997	18.0	5.0 - 17.0	2-inch ID PVC	98.94	99.40	Flush mount
MW-11	1991	12.5	7.5 - 12.5	2-inch ID PVC	99.82	100.10	Flush mount
MW-13	1991	23.0	13.0 - 23.0	2-inch ID PVC	99.86	99.90	Flush mount
MW-14	1991	19.0	9.0 - 19.0	2-inch ID PVC	103.14	98.80	Extended riser
MW-14R	1992	43.4	30.7 - 40.7	2-inch ID PVC	101.80	99.70	Extended riser
MW-15	1992	25.2	20.0 - 25.0	2-inch ID PVC	103.16	100.70	Extended riser
MW-16	1992	21.2	16.3 - 21.1	2-inch ID PVC	99.70	97.30	Extended riser
MW-17	1992	24.3	19.0 - 24.0	2-inch ID PVC	99.92	100.30	Flush mount
MW-18	1992	23.1	15.9 - 23.1	2-inch ID PVC	98.56	98.50	Flush mount
MW-19	1992	21.2	14.4 - 21.2	2-inch ID PVC	100.52	98.10	Extended riser
MW-20	1992	22.8	13.0 - 23.0	2-inch ID PVC	101.70	99.50	Extended riser
MW-21	1993	14.0	4.0 - 14	2-inch ID PVC	100.34	97.00	Extended riser
MW-22	1997	20.0	5.0 - 20.0	2-inch ID PVC	101.39	99.60	Extended riser
MW-23	1997	17.0	5.0 - 17.0	2-inch ID PVC	100.25	97.70	Extended riser

All measurements in feet

G:/Aproject/Ingersoll/AY0220.004/Reports/Enginrpt/Tables/Table1

Table 1: Summary of Construction Details for Monitoring and Recovery Wells at the Aro Corporation/Ingersoll Rand Site, Cheektowaga, New York

Well Number	Year Installed	Total Well Depth	Depth of Screened Interval	Well Material	Datum Elevation	Ground Elevation	Comments
MW-24	1997	17.0	5.0 - 17.0	2-inch ID PVC	98.22	99.10	Flush mount
MW-25	1997	17.0	5.0 - 17.0	2-inch ID PVC	97.80	98.40	Flush mount
MW-26	1997	17.0	5.0 - 17.0	2-inch ID PVC	98.76	99.1	Flush mount
MW-27	1997	17.0	5.0 - 17.0	2-inch ID PVC	98.80	99.20	Flush mount
MW-28	1997	17.0	5.0 - 17.0	2-inch ID PVC	101.04	98.70	Extended riser
MW-29	1997	17.0	5.0 - 17.0	2-inch ID PVC	101.01	99.00	Extended riser
OW-101	1992	6.7	4.0 - 6.0	Stainless Steel	99.84	100.00	Flush mount
OW-102	1992	5.3	2.8 - 5.3	Stainless Steel	98.60	98.80	Flush mount
OW-103	1992	3.1	0.1 - 3.1	Stainless Steel	98.20	98.40	Flush mount
VEROW-1	1995	20.0	5.0 - 20.0	2-inch ID PVC	98.44	98.60	Flush mount
VEROW-2	1995	15.0	3.0 - 15.0	2-inch ID PVC	98.58	98.80	Flush mount
Recovery Wells							
RW-1	1995	20.0	5.0 - 20.0	4-inch ID PVC	98.20	98.60	Flush mount
RW-2	1997	21.0	6.0 - 21.0	4-inch ID PVC	98.60	98.90	Flush mount
RW-3	1997	21.0	6.0 - 21.0	4-inch ID PVC	99.44	99.70	Flush mount
RW-4	1997	21.0	6.0 - 21.0	4-inch ID PVC	100.12	100.20	Extended riser
RW-5	1997	17.0	6.0 - 17.0	4-inch ID PVC	99.10	99.20	Extended riser
RW-6	1997	21.0	6.0 - 21.0	4-inch ID PVC	98.18	98.00	Extended riser
RW-7	1997	21.0	6.0 - 21.0	4-inch ID PVC	99.02	99.20	Flush mount
RW-8	1997	20.5	5.5 - 20.5	4-inch ID PVC	98.88	98.90	Flush mount
RW-9	1997	23.0	8.0 - 23.0	4-inch ID PVC	101.16	101.30	Flush mount
RW-10	1997	23.0	8.0 - 23.0	4-inch ID PVC	101.12	101.20	Flush mount

All measurements in feet

Table 2. Schedule of Operation and Maintenance (O&M) Tasks, Aro Corporation Site, Cheektowaga, New York.

Tasks	Weekly	Monthly	Quarterly	Semi-Annual
Routine Monitoring[1]				
General System Inspection	x			
Total Volumes Recorded		x		
Ground Water				
Influent Sampling	x[1]	x		
Effluent Sampling	x[1]	x		
Between Carbon Units	x[1]			
Vapor Phase				
Influent Sampling				
Field Measurements[3]	x	x		
Laboratory Testing[2]		x	x	
Temperature Measurement	x	x	x	
Mid-Point Sampling				
Field Measurements[3]	x	x		
Laboratory Testing[4,2]		x	x	
Effluent Sampling				
Field Analysis[3]	x	x		
Laboratory Testing[2]		x	x	
Ground-Water Sampling of Site Wells			x	x
Surface Water Sampling				x
Water-Level Measurements			x	
Wellhead and Vacuum Measurement[1]	x			
Pump Vacuum Measurement[1]	x	x		
Reporting				x

Note 1 - These tasks may be decreased in frequency due to stable system operation.

Note 2 - Monthly for the first 3 months and quarterly thereafter.

Note 3 - Weekly for the remainder of the first three months.

Note 4 - Collection of a laboratory sample may be required pending result of field analysis.

Table 3. 1998 Groundwater Monitoring Schedule, Operation and Maintenance, Aro Corporation Site, Cheektowaga, New York

	First Quarter			Second Quarter			Third Quarter			Fourth Quarter		
Task Description	*January 199*	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*	*October*	*November*	*December*
Groundwater Monitoring		10 Wells Baseline event prior to start-up.				System Restart		5 Wells			10 Wells	

Well Locations

First Quarter - Wells MW-6, OW-101, MW-20, MW-2, MW-3, MW-26, MW-22, MW-23, MW-24, MW-29.
Third Quarter - Wells MW-6, OW-101, MW-20, MW-2, MW-3.
Fourth Quarter - Wells MW-6, OW-101, MW-20, MW-2, MW-3, MW-26, MW-22 MW-23, MW-24, MW-29.

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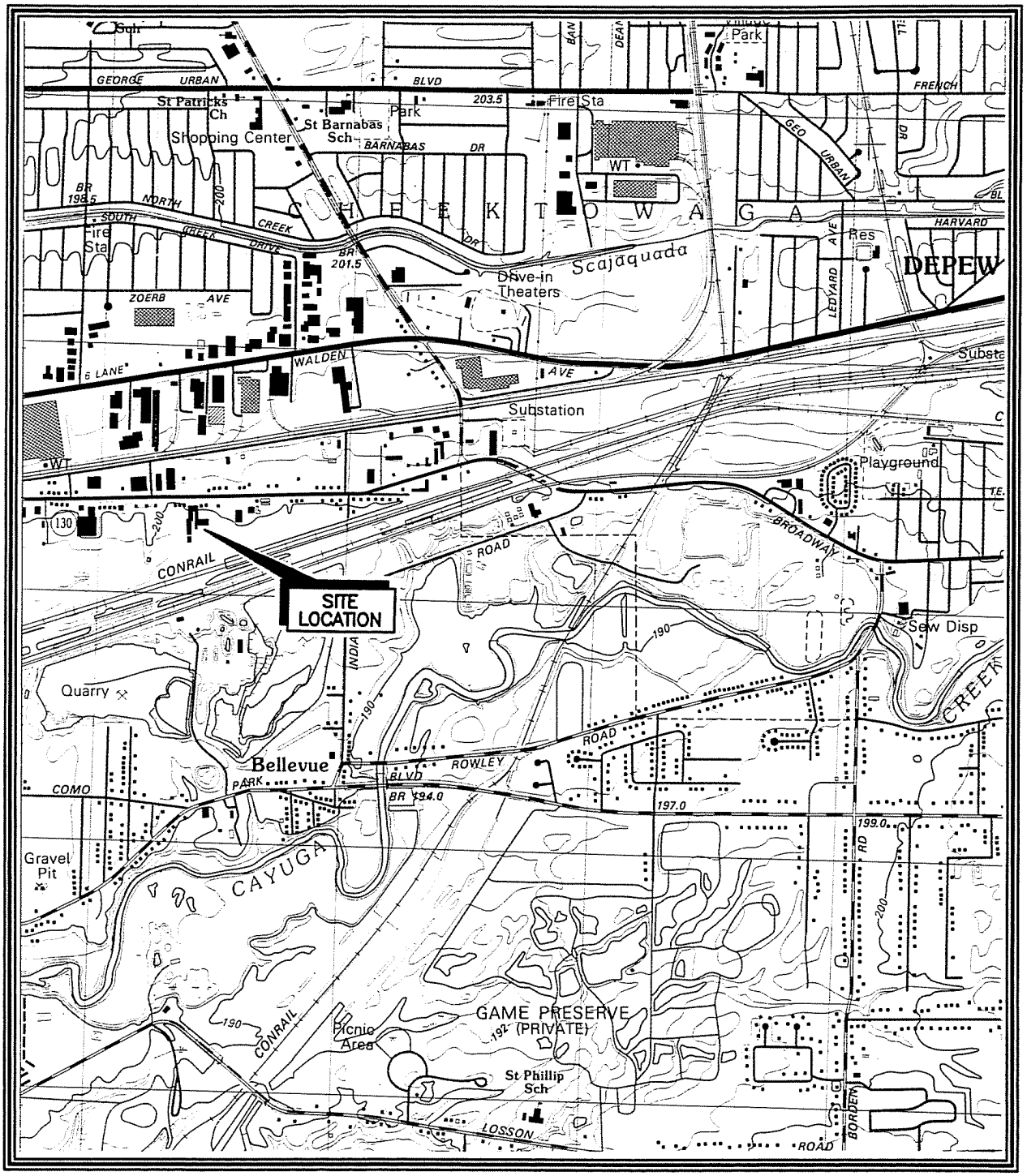
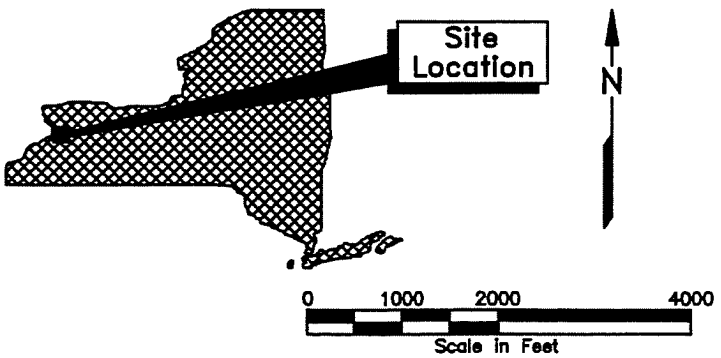
FIGURES



Reference: U.S. Geological Survey, 7.5 x 15 Minute Quadrangle, Lancaster, New York, 1982.



SITE LOCATION

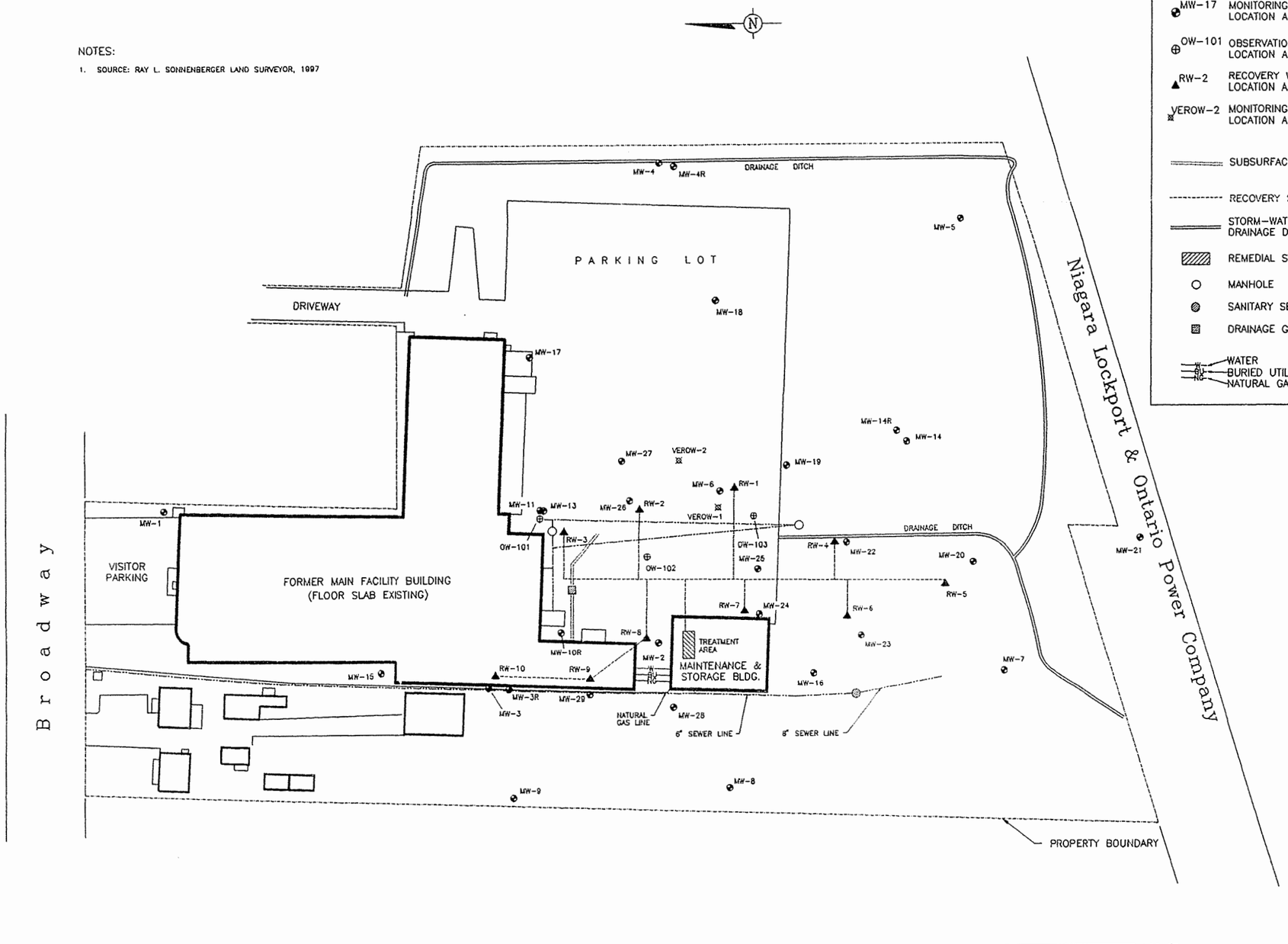
ARO CORPORATION SITE
3695 Broadway Street
Cheektowaga, New York

DRAWN: TAD/G266A	DATE: JUNE 1998	FIGURE 1
APP'D: CC		

ARCADIS GERAGHTY&MILLER

NOTES:

1. SOURCE: RAY L. SONNENBERGER LAND SURVEYOR, 1997



EXPLANATION

- MW-17 — MONITORING WELL LOCATION AND DESIGNATION
- OW-101 — OBSERVATION WELL LOCATION AND DESIGNATION
- RW-2 — RECOVERY WELL LOCATION AND DESIGNATION
- VEROW-2 — MONITORING WELL LOCATION AND DESIGNATION
- SUBSURFACE STORM-WATER
- RECOVERY SYSTEM TRENCH PIPING
- STORM-WATER/RUNOFF DRAINAGE DITCH
- REMEDIAL SYSTEM LOCATION
- MANHOLE
- SANITARY SEWER MANHOLE
- DRAINAGE GRATE
- W — WATER
- BU — BURIED UTILITIES
- NG — NATURAL GAS

NO.	DATE	REVISION DESCRIPTION	BY / CKD

ARCADIS GERAGHTY & MILLER

218 Washington Avenue Ext.
Albany, New York 12205
Tel: 518/452-7826 Fax: 518/452-4398

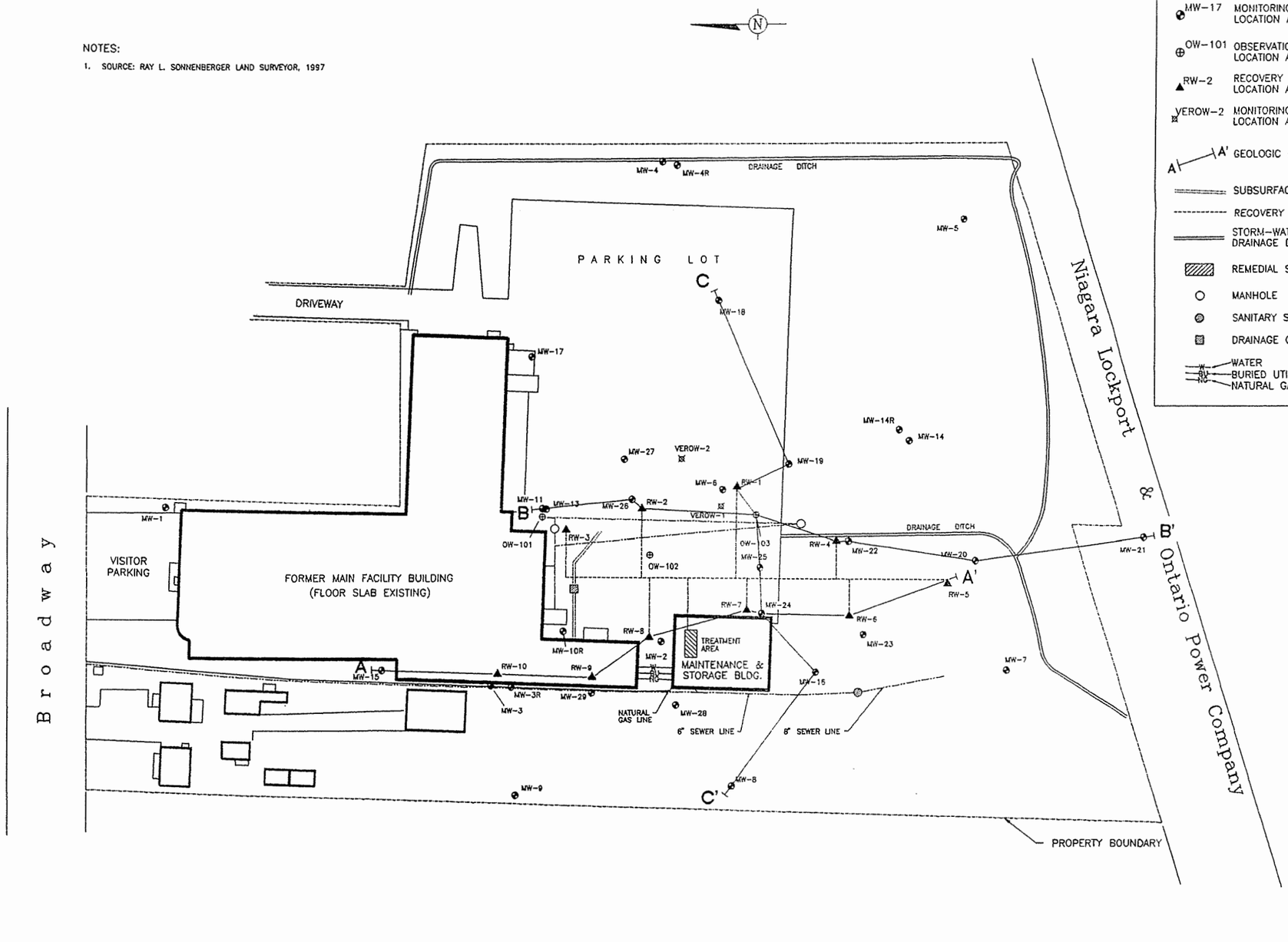
VER SYSTEM LAYOUT

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

PROJECT MANAGER M. SANFORD	DRAWING NUMBER G266C
CHECKED BY M. SANFORD	PROJECT NUMBER AY000220004000010
DRAWN BY TAD/FJF	FIGURE NUMBER 2
DATE DRAWN 5-5-98	

NOTES:

1. SOURCE: RAY L. SONNENBERGER LAND SURVEYOR, 1997



EXPLANATION

- MW-17 MONITORING WELL LOCATION AND DESIGNATION
- OW-101 OBSERVATION WELL LOCATION AND DESIGNATION
- RW-2 RECOVERY WELL LOCATION AND DESIGNATION
- VEROW-2 MONITORING WELL LOCATION AND DESIGNATION
- A A' GEOLOGIC CROSS-SECTION
- SUBSURFACE STORM-WATER
- RECOVERY SYSTEM TRENCH PIPING
- STORM-WATER/RUNOFF DRAINAGE DITCH
- REMEDIAL SYSTEM LOCATION
- MANHOLE
- SANITARY SEWER MANHOLE
- DRAINAGE GRATE
- W WATER
- E BURIED UTILITIES
- G NATURAL GAS

NO.	DATE	REVISION DESCRIPTION	BY / CKD

ARCADIS GERAGHTY & MILLER

215 Washington Avenue Ext.
Albany, New York 12206
Tel: 518/452-7826 Fax: 518/452-4398

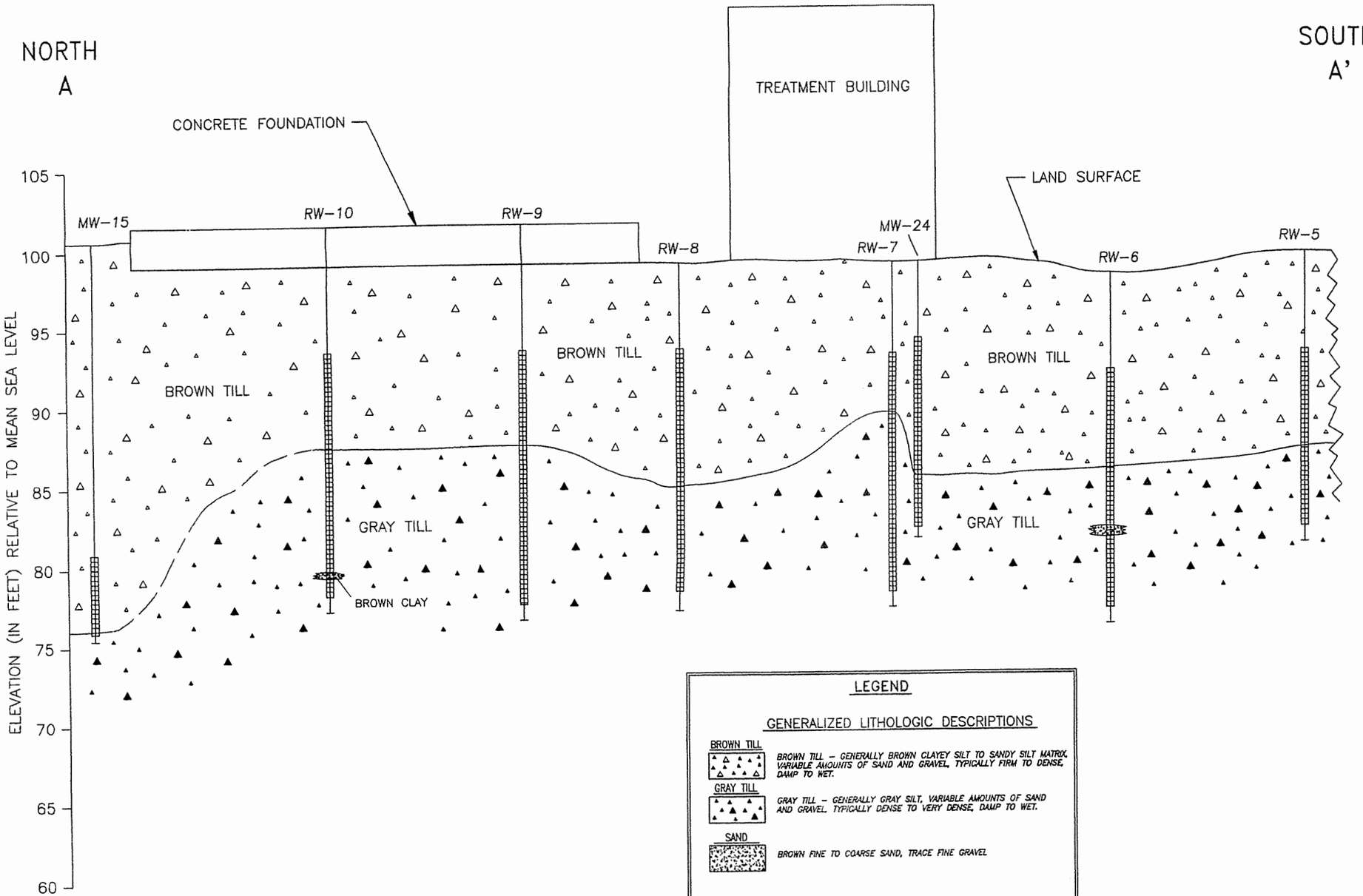
GEOLOGIC TRANSECTS

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

PROJECT MANAGER M. SANFORD	DRAWING NUMBER G285D
CHECKED BY M. SANFORD	PROJECT NUMBER AY000220004000010
DRAWN BY TAD/FJF	FIGURE NUMBER 3
DATE DRAWN 5-5-98	

NORTH
A

SOUTH
A'



LEGEND

GENERALIZED LITHOLOGIC DESCRIPTIONS

BROWN TILL — *BROWN TILL – GENERALLY BROWN CLAYEY SILT TO SANDY SILT MATRIX, VARIABLE AMOUNTS OF SAND AND GRAVEL, TYPICALLY FIRM TO DENSE, DAMP TO WET.*

GRAY TILL — *GRAY TILL – GENERALLY GRAY SILT, VARIABLE AMOUNTS OF SAND AND GRAVEL, TYPICALLY DENSE TO VERY DENSE, DAMP TO WET.*

SAND — *BROWN FINE TO COARSE SAND, TRACE FINE GRAVEL*

1" = 30'

VERTICAL EXAGGERATION = 6X

NO.	DATE	REVISION DESCRIPTION	BY / CKD

ARCADIS
GERAGHTY & MILLER

215 WASHINGTON AVE. EXTENSION
ALBANY, NY 12205
Tel: 518/452-7828 Fax: 518/452-4398

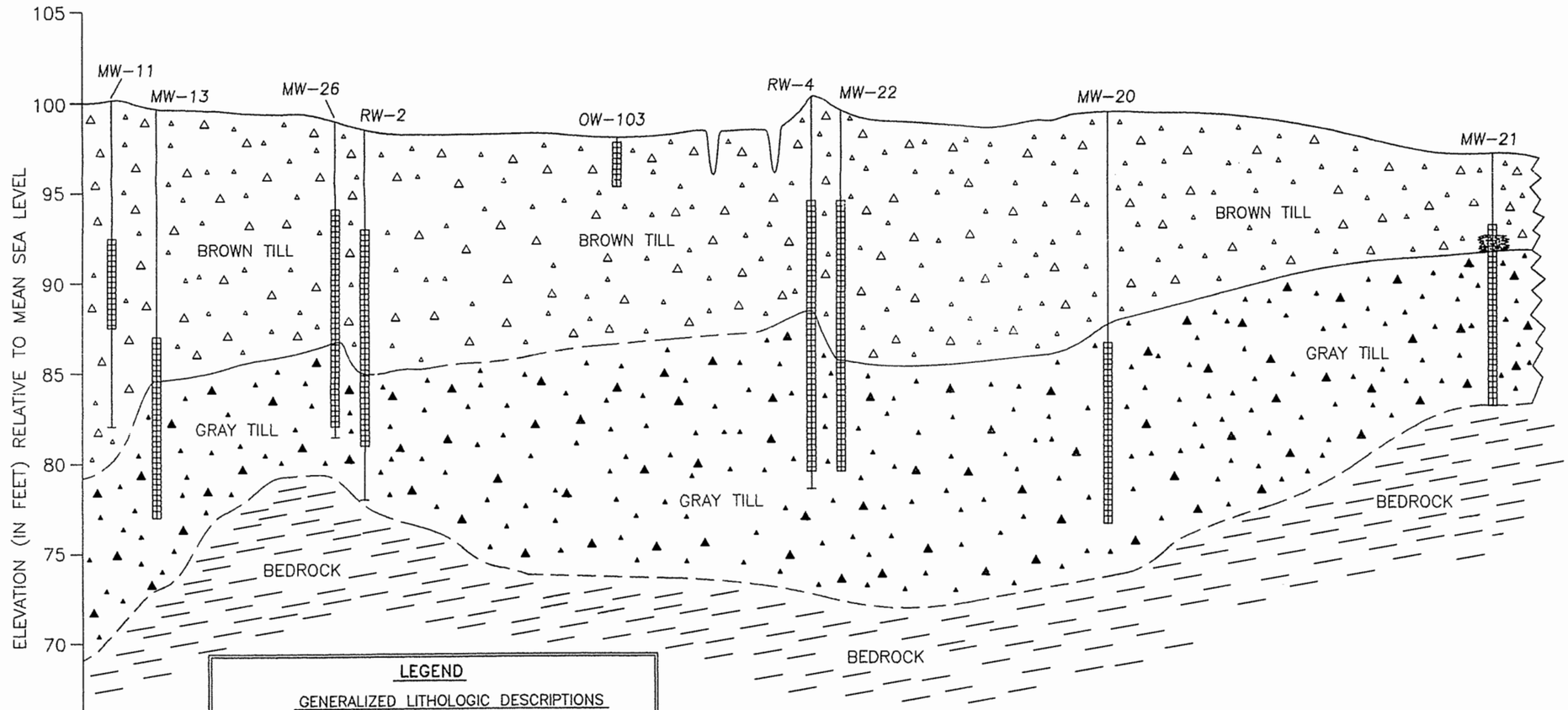
GEOLOGIC CROSS-SECTION A-A'

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

PROJECT MANAGER C. CARR	DRAWING NUMBER G266E
CHECKED BY C. CARR	PROJECT NUMBER AY0002200040010
DRAWN BY FJF/TAD	FIGURE NUMBER 4
DATE DRAWN 6-15-98	

NORTH
B

SOUTH
B'



LEGEND

GENERALIZED LITHOLOGIC DESCRIPTIONS

BROWN TILL — *BROWN TILL – GENERALLY BROWN CLAYEY SILT TO SANDY SILT MATRIX, VARIABLE AMOUNTS OF SAND AND GRAVEL, TYPICALLY FIRM TO DENSE, DAMP TO WET.*

GRAY TILL — *GRAY TILL – GENERALLY GRAY SILT, VARIABLE AMOUNTS OF SAND AND GRAVEL, TYPICALLY DENSE TO VERY DENSE, DAMP TO WET.*

SAND — *BROWN FINE TO COARSE SAND, TRACE FINE GRAVEL*

BEDROCK — *GRAY LIMESTONE BEDROCK*

1"=30'

VERTICAL EXAGGERATION = 6X

NO.	DATE	REVISION DESCRIPTION	BY / CKD

ARCADIS
GERAGHTY & MILLER

215 WASHINGTON AVE. EXTENSION
ALBANY, NY 12205
Tel: 518/452-7826 Fax: 518/452-4398

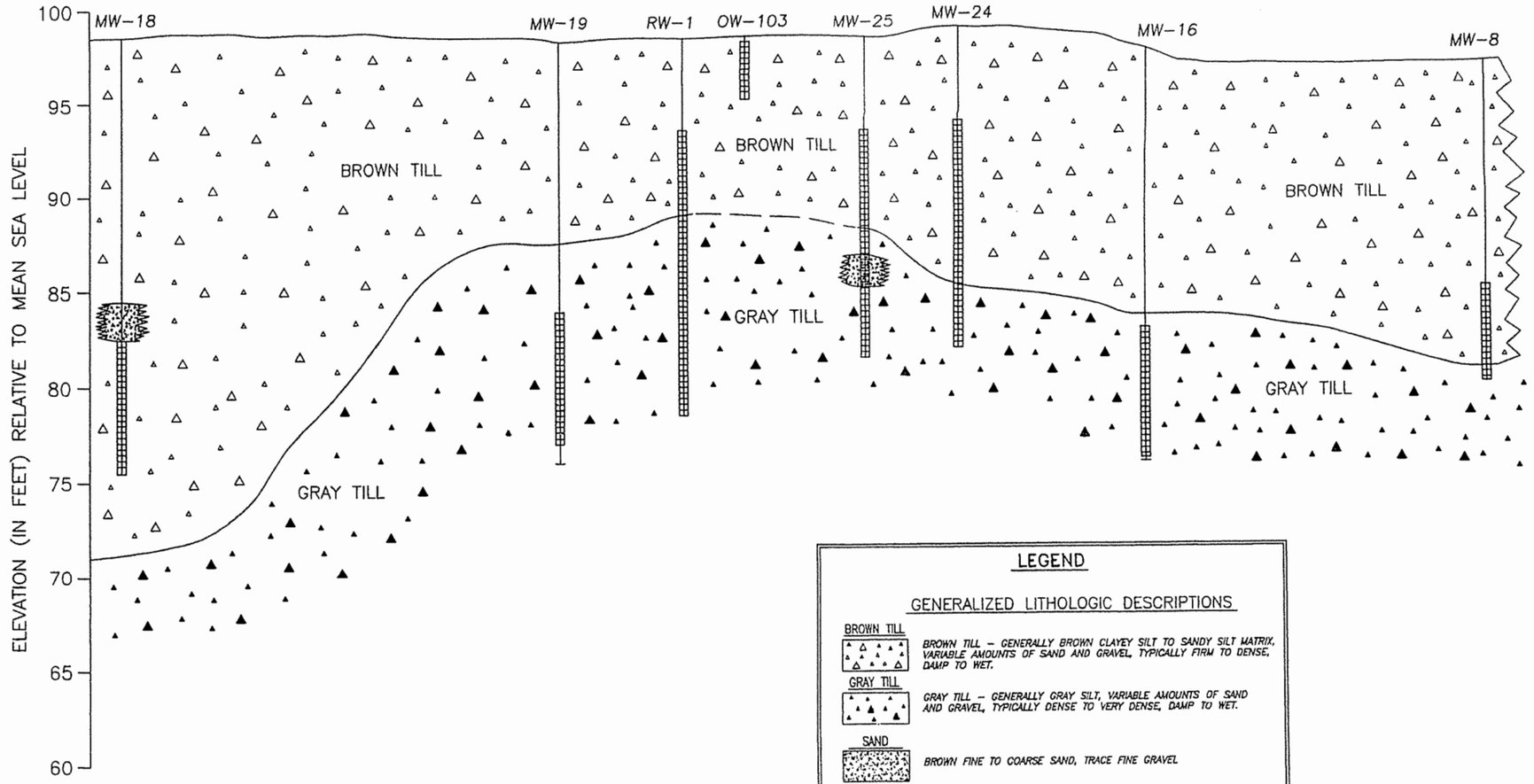
GEOLOGIC CROSS-SECTION B-B'

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

PROJECT MANAGER C. CARR	DRAWING NUMBER G286E
CHECKED BY C. CARR	PROJECT NUMBER AY0002200040010
DRAWN BY FJF/TAD	FIGURE NUMBER 5
DATE DRAWN 6-15-98	

EAST
C

WEST
C'



LEGEND

GENERALIZED LITHOLOGIC DESCRIPTIONS

BROWN TILL — *BROWN TILL – GENERALLY BROWN CLAYEY SILT TO SANDY SILT MATRIX, VARIABLE AMOUNTS OF SAND AND GRAVEL, TYPICALLY FIRM TO DENSE, DAMP TO WET.*

GRAY TILL — *GRAY TILL – GENERALLY GRAY SILT, VARIABLE AMOUNTS OF SAND AND GRAVEL, TYPICALLY DENSE TO VERY DENSE, DAMP TO WET.*

SAND — *BROWN FINE TO COARSE SAND, TRACE FINE GRAVEL*

1"=30'

VERTICAL EXAGGERATION = 6X

NO.	DATE	REVISION DESCRIPTION	BY / CKD

ARCADIS
GERAGHTY & MILLER
215 WASHINGTON AVE. EXTENSION
ALBANY, NY 12205
Tel: 518/452-7826 Fax: 518/452-4398

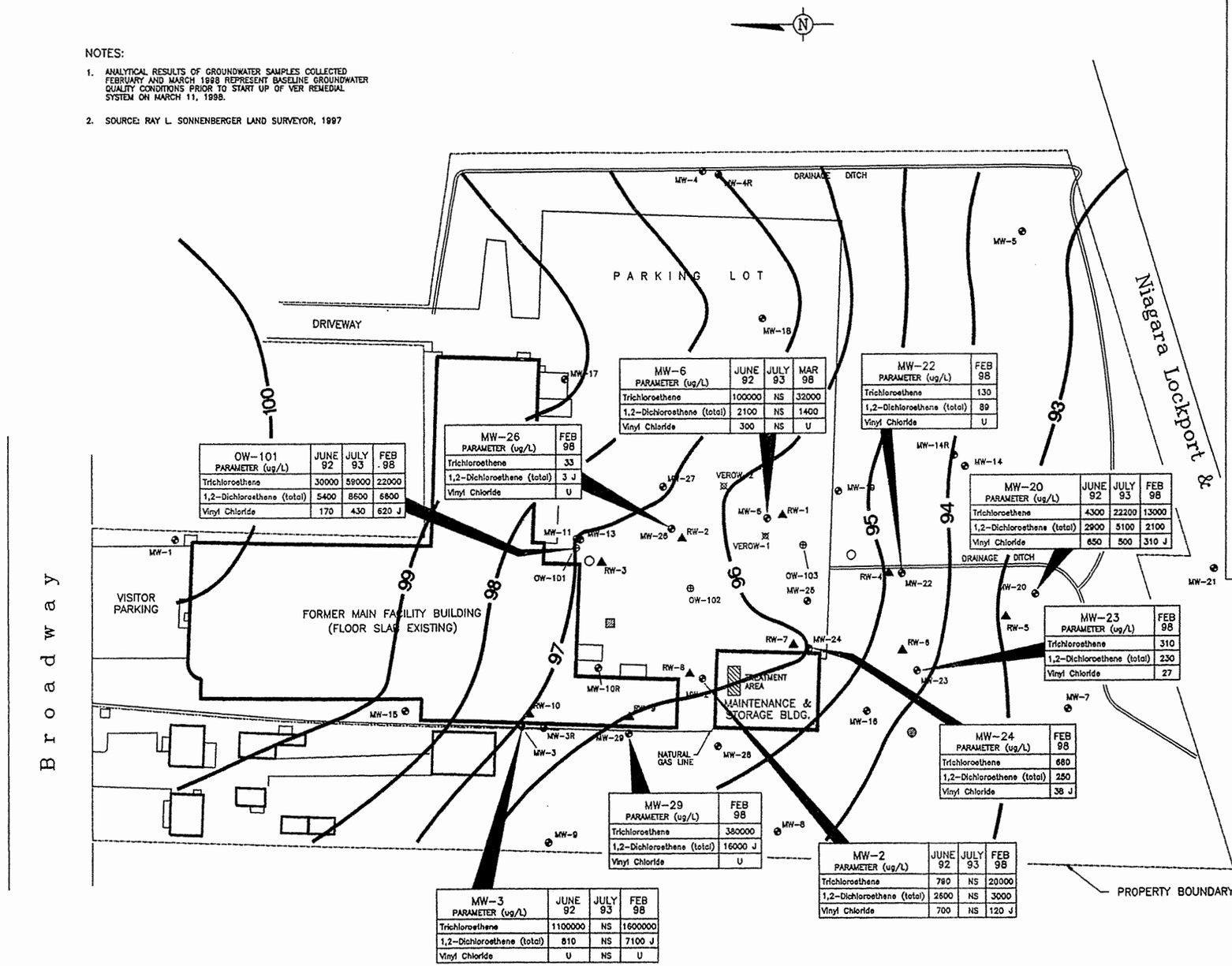
GEOLOGIC CROSS-SECTION C-C'

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

PROJECT MANAGER C. CARR	DRAWING NUMBER G2686
CHECKED BY C. CARR	PROJECT NUMBER AY000220000400010
DRAWN BY F.F/TAD	FIGURE NUMBER 6
DATE DRAWN 6-15-98	

NOTES:

1. ANALYTICAL RESULTS OF GROUNDWATER SAMPLES COLLECTED FEBRUARY AND MARCH 1998 REPRESENT BASELINE GROUNDWATER QUALITY CONDITIONS PRIOR TO START UP OF VER REMEDIAL SYSTEM ON MARCH 11, 1998.
2. SOURCE: RAY L. SONNENBERGER LAND SURVEYOR, 1997



OW-101 PARAMETER (ug/L)	JUNE 92	JULY 93	FEB 98
Trichloroethene	30000	59000	22000
1,2-Dichloroethene (total)	5400	8600	6800
Vinyl Chloride	170	430	620 J

MW-26 PARAMETER (ug/L)	FEB 98
Trichloroethene	33
1,2-Dichloroethene (total)	3 J
Vinyl Chloride	U

MW-6 PARAMETER (ug/L)	JUNE 92	JULY 93	MAR 98
Trichloroethene	100000	NS	32000
1,2-Dichloroethene (total)	2100	NS	1400
Vinyl Chloride	300	NS	U

MW-22 PARAMETER (ug/L)	FEB 98
Trichloroethene	130
1,2-Dichloroethene (total)	89
Vinyl Chloride	U

MW-20 PARAMETER (ug/L)	JUNE 92	JULY 93	FEB 98
Trichloroethene	4300	22200	13000
1,2-Dichloroethene (total)	2900	5100	2100
Vinyl Chloride	650	500	310 J

MW-23 PARAMETER (ug/L)	FEB 98
Trichloroethene	310
1,2-Dichloroethene (total)	230
Vinyl Chloride	27

MW-24 PARAMETER (ug/L)	FEB 98
Trichloroethene	680
1,2-Dichloroethene (total)	250
Vinyl Chloride	38 J

MW-29 PARAMETER (ug/L)	FEB 98
Trichloroethene	380000
1,2-Dichloroethene (total)	16000 J
Vinyl Chloride	U

MW-2 PARAMETER (ug/L)	JUNE 92	JULY 93	FEB 98
Trichloroethene	780	NS	20000
1,2-Dichloroethene (total)	2600	NS	3000
Vinyl Chloride	700	NS	120 J

MW-3 PARAMETER (ug/L)	JUNE 92	JULY 93	FEB 98
Trichloroethene	1100000	NS	1600000
1,2-Dichloroethene (total)	810	NS	7100 J
Vinyl Chloride	U	NS	U

EXPLANATION

- MW-17 — MONITORING WELL LOCATION AND DESIGNATION
- OW-101 — OBSERVATION WELL LOCATION AND DESIGNATION
- RW-2 — RECOVERY WELL LOCATION AND DESIGNATION
- VEROW-2 — MONITORING WELL LOCATION AND DESIGNATION

MONITORING WELL DESIGNATION

DATE OF GROUNDWATER SAMPLE

MW-3 PARAMETER (ug/L)	JUNE 92	JULY 93	FEB 98
Trichloroethene	1100000	14	1600000
1,2-Dichloroethene (total)	810	0.8	7100 J
Vinyl Chloride	–	–	U

CONCENTRATION OF CONSTITUTENT DETECTED IN GROUNDWATER (GIVEN IN MICROGRAMS PER LITER –EQUIVALENT TO PARTS PER BILLION (ppb))

CONSTITUTENT DETECTED IN GROUNDWATER

- U — ANALYZED FOR BUT NOT DETECTED
- J — ESTIMATED VALUE
- NS — NOT SAMPLED
- 98 — LINE OF EQUAL GROUNDWATER ELEVATION, IN FEET ABOVE MEAN SEA LEVEL. (MAY 28, 1998)
- STORM-WATER/RUNOFF DRAINAGE DITCH
- REMEDIAL SYSTEM LOCATION
- MANHOLE
- SANITARY SEWER MANHOLE
- DRAINAGE GRATE

NO.	DATE	REVISION DESCRIPTION	BY / CKD

ARCADIS GERAGHTY & MILLER
216 Washington Avenue Ext.
Albany, New York 12205
Tel: 518/452-7826 Fax: 518/452-4398

GROUNDWATER ANALYTICAL RESULTS

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

PROJECT MANAGER M. SANFORD	DRAWING NUMBER G266B
CHECKED BY M. SANFORD	PROJECT NUMBER AY000220004000I0
DRAWN BY TAD/FJF	FIGURE NUMBER 7
DATE DRAWN 12-15-98	

APPENDIX A

APPENDIX A

SOIL BORING LOGS

SAMPLE/CORE LOG

Boring/Well: RW-2 Project/No.: Aro Corp./AY000220.0004.00003 Page: 1 of 1

Location: Cheektowaga, NY Drilling Started: 10/28/97 Drilling Completed: 10/29/97

Total Depth Drilled: 22 feet Hole Diameter: 10 inches Type of Sample/ Coring Device: Split Spoon

Length and Diameter of Coring Device: 24 inches x 2 inches Sampling Interval: Continuous feet

Land-Surface Elevation: 98.9 feet [X] Surveyed [ ] Estimated Datum:

Drilling Fluid Used: None Drilling Method: Hollow Stem Auger

Drilling Contractor: SJB Services, Inc. Driller: Dale Helper: Frank

Prepared By: C. Carr Hammer Weight: 140-Auto Hammer Drop: 30 inches

OVM	Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0.6	0.0	2.0	8"	5,4,6	Asphalt-6"; Black silty CLAY, trace f-m sand and gravel.
19.9	2.0	4.0	1.5	6,4,6,7	Reddish-brown silty CLAY, trace f-m sand and gravel, gray
					silt mottles.
35.2	4.0	6.0	1.5	2,4,5,6	Same as 2-4' interval.
368.0	6.0	8.0	2.0	8,10,11,14	Same as 4-6' interval with gray vertical silt partings.
707.0	8.0	10.0	2.0	1,5,8,11	Same as 6-8' interval, strong odor.
217.0	10.0	12.0	2.0	2,6,10,13	Reddish-brown clayey SILT, trace f-m sand and gravel, orange
					stained vertical partings.
44.1	12.0	14.0	2.0	13,14,14,15	Same as 10-12' interval, except grayish brown.
56.7	14.0	16.0	1.5	8,35,45,50/4	Gray dense SILT and f-m SAND, trace f-m gravel, weathered
					limestone fragments.
8.1	16.0	18.0	2.0	6,30,50,50/2	Same as 14-16' interval with increasing weathered limestone.
4.1	18.0	20.0	1.0	15,30,50/2	Same as 16'18' interval with trace clay.
	20.0	22.0	1.0	40,50,100/2	Same as 18-20' interval, weathered limestone.
					Refusal @21' bls.

SAMPLE/CORE LOG

Boring/Well RW-3 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/27/97 Drilling Completed 10/30/97

Total Depth Drilled 22 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 99.7 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Dale Helper Frank

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)			Core Recovery	Time/Hydraulic Pressure or Blows per 6	
OVM	From	To	(feet)	inches	Sample/Core Description
0.0	0.0	2.0	8"	3,3,4	6" of asphalt and subbase; Black silty CLAY, trace f-m sand and gravel.
4.5	2.0	4.0	2.0	3,5,7,9	Reddish-brown silty CLAY, trace f-m sand and gravel.
15.3	4.0	6.0	2.0	7,7,8,9	Same as 2-4' interval with gray silt mottles.
8.1	6.0	8.0	2.0	6,8,11,12	Same as 4-6' interval with orange stained vertical silt partings.
2.7	8.0	10.0	2.0	1,5,8,12	Same as 6-8' interval.
0.0	10.0	12.0	2.0	1,6,8,12	Same as 8-10' interval.
0.0	12.0	14.0	2.0	13,16,16,16	Grayish-brown clayey SILT, trace f-m sand and f gravel.
0.0	14.0	16.0	1.5	1,3,6,6	Same as 12-14' interval.
11.6	16.0	18.0	1.5	9,9,12,14	Gray dense SILT and f-m SAND, trace clay and f-m gravel, chert@ 17.5' bls.
>500	18.0	20.0	2.0	1,9,10,6	Same as 16-18' interval with a 2" f-c sand and f gravel layer @ 19'bls.
>500	20.0	22.0	2.0	5,5,4,3	Gray SILT, f-m SAND and GRAVEL, weathered limestone, trace clay.

SAMPLE/CORE LOG

Boring/Well RW-4 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/22/97 Drilling Completed 10/23/97

Total Depth Drilled 22 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 100.2 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Randy Helper Dale

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

OVM	Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0.0	0.0	2.0	6"	2,4,3,4	Brown silty CLAY, some f-m sand and gravel.
0.0	2.0	4.0	4"	8,7,7,10	Same as 0-2' interval.
0.0	4.0	6.0	2.0	2,5,8,10	Reddish-brown silty CLAY, trace f-m sand and gravel, gray silt
					mottles, damp.
0.0	6.0	8.0	2.0	13,17,17,18	Same as 4-6' interval to 7' bls with gray silt seams @ ~6.5' and 7.0'.
					7-8': Reddish brown stiff clayey SILT, trace f-m sand and gravel
					(rounded).
0.0	8.0	10.0	2.0	1,4,7,8	Same as 7-8' interval.
72.8	10.0	12.0	2.0	2,6,8,10	Same as 8-10' interval with silt seams @ 10.5' and ~11.0' bls.
35.0	12.0	14.0	6"	80, 50/3"	Gray SILT and f-m SAND, some f-m gravel, trace clay.
9.8	14.0	16.0	2.0	4,38,46,50/4"	Same as 12-14' interval.
3.7	16.0	18.0	2.0	16,39,50	Same as 14-16' interval.
0.0	18.0	20.0	1.5	20,8,41,50/3"	Same as 16-18' interval with 2" f-c gray SAND @ 20' bls.
2.8	20.0	22.0	1.0	27,45,50/4"	Same as 18-20' interval.

SAMPLE/CORE LOG

Boring/Well RW-5 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/17/97 Drilling Completed 10/17/97

Total Depth Drilled 18 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 99.2 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used Potable Water Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Tony Helper Ken

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) OVM	From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0.0	0.0	2.0	5"	3,3,7,5	Brown topsoil, grass, f-m sand.
0.0	2.0	4.0	1.0	5,5,6,17	Reddish-brown stiff silty CLAY, trace f sand and gravel to 3.5' bls.
					3.5'-4.0': Stiff reddish-brown silty CLAY, trace f-m sand and f gravel.
3.8	4.0	6.0	1.0	20,23,31,28	Brown clayey SILT, trace f-m sand and gravel (moist), gray silt
					mottles.
99.3	6.0	8.0	6"	30,28,42,50	Same as 4-6' interval.
	8.0	10.0	NR	50/1"	Same as 6-8' interval.
2.4	10.0	12.0	1.5	40,38,42,35	Same as 8-10' interval.
3.6	12.0	14.0	6"	45,50/3"	Gray dense SILT and f-m SAND, trace clay and f-m gravel.
20.7	14.0	16.0	2.0	38,29,40,45	Same as 12-14' interval.
40.2	16.0	18.0	0.5	40,50/4"	Same as 14-16' interval with chert fragment in shoe. Weathered
					shale fragments in the shoe. Bedrock @ 17.3' bls.

SAMPLE/CORE LOG

Boring/Well RW-6 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/23/97 Drilling Completed 10/23/97

Total Depth Drilled 22 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 98.0 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Tony Helper Dale

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) OVM	From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0.0	0.0	2.0	3"	3,5,8,9	Brown silty CLAY, trace f-m sand and gravel.
0.0	2.0	4.0	2"	9,10,4,2	Same as 0-2' interval.
0.0	4.0	6.0	2.0	8,26,27,27	Reddish-orange silty CLAY, trace f-m sand and gravel, gray silt
					mottles.
0.0	6.0	8.0	2.0	27,28,28,40	Same as 4-6' interval, moist.
0.0	8.0	10.0	2.0	4,7,8,19	Brown silty CLAY, trace f-m sand and gravel, 6" f-c SAND seam
					from 8.5-9.0' bls.
0.0	10.0	12.0	1.0	7,28,50/3"	Brown clayey SILT, trace f-m sand and gravel.
0.0	12.0	14.0	4"	50/4"	Gray dense SILT and f-m SAND, some f-m gravel, trace clay,
					boulder or cobble.
0.0	14.0	16.0	6"	24,50/1"	Same as 12-14' interval, 2" gray f-c SAND seam from ~15.5-15.7'
					bls, pieces of limestone cobble in shoe.
12.4	16.0	18.0	10"	27, 50/4"	Gray dense SILT and f-m SAND, trace f-m gravel.
90.9	18.0	20.0	10"	18,50/4"	Same as 16-18' interval.
31.9	20.0	22.0	1.0	27,50/5"	Same as 18-20' interval with weathered limestone fragments and
					some chert bedrock.

SAMPLE/CORE LOG

Boring/Well RW-7 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/27/97 Drilling Completed 10/27/97

Total Depth Drilled 22 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 99.2 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Dale Helper Frank

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)			Core Recovery	Time/Hydraulic Pressure or Blows per 6	
OVM	From	To	(feet)	inches	Sample/Core Description
0.0	0.0	2.0	1.0	4,4	0-1': Asphalt.
					1-2': Black silty CLAY, trace f-m sand and gravel.
2.5	2.0	4.0	1.5	4,4,5,9	2-2.5': Same as 1-2' interval.
					2.5-4.0':Reddish-brown stiff silty CLAY, trace f-m sand and gravel,
					gray silt mottles, moist.
12.7	4.0	6.0	2.0	2,5,5,6	Same as 2.5-4' interval, moist.
12.7	6.0	8.0	2.0	4,5,10,10	Stiff reddish-brown clayey SILT, some f-m sand and gravel.
2.5	8.0	10.0	2.0	2,6,10,14	Same as 6'8' interval.
0.0	10.0	12.0	2.0	2,8,14,16	Grayish-brown clayey SILT, trace f-m sand and gravel.
0.0	12.0	14.0	2.0	15,15,17,16	Dense gray SILT and f-m SAND, trace clay and f-m gravel.
0.0	14.0	16.0	2.0	1,5,6,10	Same as 12-14' interval.
0.0	16.0	18.0	2.0	7,5,7,7	Same as 14-16' interval.
0.0	18.0	20.0	2.0	WOH/1.5,5	Same as 16-18' interval, some clay, wet.
2.8	20.0	22.0	5"	2,3,3,3	Same as 18-20' interval with 2" brown f-c SAND layer
					@ 20-20.5' bls, very wet.

SAMPLE/CORE LOG

Boring/Well RW-8 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/30/97 Drilling Completed 10/30/97

Total Depth Drilled 22 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 98.9 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Dale Helper Frank

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)					
OVM	From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
4.7	0.0	2.0	1.0	2,4,4	6" Asphalt and subbase. Black silty CLAY with some f-m sand and gravel, woody fibers, slight petroleum odor.
13.0	2.0	4.0	2.0	4,4,3,5	Reddish-brown silty CLAY, trace f-m sand and gravel, gray silt mottles.
112.0	4.0	6.0	2.0	8,4,7,8	Same as 2-4' interval with gray silt mottles and orange vertical silt partings.
97.0	6.0	8.0	2.0	11,11,12,12	Reddish-brown silty CLAY, trace f-m sand and gravel.
425.0	8.0	10.0	2.0	1,4,7,9	Same as 6-8' interval.
>1000	10.0	12.0	2.0	7,7,9,13	Same as 8-10' interval.
>1000	12.0	14.0	2.0	13,14,15,14	Same as 10-12' interval.
315.0	14.0	16.0	2.0	1,4,5,7	Grayish-brown clayey SILT, trace f-m sand and gravel.
334.0	16.0	18.0	2.0	6,7,9,18	Gray dense SILT and f-m SAND, trace f gravel and clay.
145.0	18.0	20.0	1.0	WOH/6",1,3,31	Soft wet gray SILT, f-m SAND and GRAVEL. trace clay to 19' bls.
					19-20': Same as 16-18' interval, weathered limestone.
246.3	20.0	22.0	4"	100/4"	Same as 19-20' interval, weathered limestone and refusal @ 20.5'.

SAMPLE/CORE LOG

Boring/Well RW-9 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 11/3/97 Drilling Completed 11/3/97

Total Depth Drilled 24 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 101.3 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Art Helper Dale

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)					
OVM	From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0.0	0.0	2.0	2"	6,8,6	6" concrete pad with rebar. Brown SILT, SAND and GRAVEL (FILL).
8.1	2.0	4.0	1"	7,6,5,7	Cocrete, SAND, SILT and GRAVEL, cobble in shoe.
273.0	4.0	6.0	1.0	2,3,5,8	Reddish-brown silty CLAY, trace f-m sand and gravel, gray silt
					mottles.
532.0	6.0	8.0	2.0	8,10,10,12	Same as 4-6' interval.
390.0	8.0	10.0	2.0	4,6,17,13	Same as 6-8' interval with orange stained vertical partings.
86.0	10.0	12.0	2.0	10,4,8,12	Same as 8-10' interval, no gray silt mottles.
22.7	12.0	14.0	2.0	17,20,21,21	Same as 10-12' interval.
2.5	14.0	16.0	2.0	9,10,12,15	Gray clayey SILT, some f-m sand and gravel.
5.0	16.0	18.0	2.0	10,12,17,19	Same as 14-16' interval.
12.5	18.0	20.0	2.0	2,4,6,7	Soft gray clayey SILT and SAND, trace f-m gravel, wet.
4.8	20.0	22.0	1.5	2,7,16,50/4"	Same as 18-20' interval to 21.0' bls. Gray dense SILT and
					f-m SAND, trace f gravel and weathered limestone from 21.0 to
					21.5' bls. Very dry. Refusal @ ~22'. Will auger two feet and attempt
					to collect 22-24' sample.
	22.0	24.0	0.5	50/4"	Same as 21-21.5' interval.

SAMPLE/CORE LOG

Boring/Well RW-10 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 11/4/97 Drilling Completed 11/4/97

Total Depth Drilled 24 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 101.3 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Art Helper Dale

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)			Core Recovery	Time/Hydraulic Pressure or Blows per 6	
OVM	From	To	(feet)	inches	Sample/Core Description
5.0	0.0	2.0	6"	4,7,10	6" of concrete and rebar; Brown SILT, SAND and GRAVEL (FILL).
.00.0	2.0	4.0	1.0	7,11,4,4	Black silty CLAY, trace f-m sand and gravel.
295.0	4.0	6.0	1.5	10,12,8,4	Reddish-brown silty CLAY, trace f-m sand and gravel, gray silt
					mottles.
360.0	6.0	8.0	2.0	12,16,16,19	Same as 4-6' interval (78.0 ppm in borehole).
25.4	8.0	10.0	2.0	6,12,19,21	Same as 6-8' interval, no silt mottles.
12.5	10.0	12.0	2.0	8,15,17,21	Same as 8-10' interval with orange stained vertical partings.
10.7	12.0	14.0	2.0	16,22,22,24	Same as 10-12' interval.
50.0	14.0	16.0	2.0	5,6,8,11	Gray clayey SILT, some f-m sand, trace f-m gravel.
24.2	16.0	18.0	2.0	10,11,14,15	Same as 14-16' interval.
10.6	18.0	20.0	2.0	3,4,5,7	Same as 16-18' interval.
0.0	20.0	22.0	2.0	2,5,5,6	Same as 18-20' interval.
0.0	22.0	24.0	1.5	12,36,50/3"	Brown clayey SILT, some f-m sand and gravel to 22.5'.
					Gray dense SILT and f-m SAND, wetahered limestone.

SAMPLE/CORE LOG

Boring/Well MW-22 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/16/97 Drilling Completed 10/16/97

Total Depth Drilled 20.5 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 99.6 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used Potable Water Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Anthony Helper Ken

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)			Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
OVM	From	To			
0.0	0.0	2.0	6"	3,3,3,4	Reddish-brown stiff silty CLAY, trace f-m sand and gravel, dry.
0.0	2.0	4.0	1.0	8,8,13,15	Same as 0-2' interval with f-c brown sand seam at ~2.5-2.7 bls,
					damp.
0.0	4.0	6.0	1.0	4,12,16,20	Same as 2-4' interval.
0.0	6.0	8.0	6"	12, 50/3"	Brown stiff clayey SILT, trace f sand and gravel.
0.0	8.0	10.0	1.0	8,30,50,50/3"	Same as 6-8' interval, gray silt mottles.
8.3	10.0	12.0	6"	30,50/4"	Same as 8-10' interval, wet.
2.7	12.0	14.0	3"	50/4"	Same as 10-12' interval, wet.
2.7	14.0	16.0	7"	40,50/4"	Gray dense SILT and f-m SAND, trace clay and f gravel.
3.0	16.0	18.0	2"	50/3"	Same as 14-16' interval.
2.8	18.0	20.0	3"	50/4"	Same as 16-18' interval.

SAMPLE/CORE LOG

Boring/Well MW-23 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/21/97 Drilling Completed 10/21/97

Total Depth Drilled 18 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 97.7 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used Potable Water Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Anthony Helper Ken

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)					
OVM	From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0.0	0.0	2.0	1.0	3,3,4,10	Brown stiff silty CLAY, trace f-m sand and clay, gray silt mottles.
0.0	2.0	4.0	1.5	4,8,10,15	Reddish-brown silty CLAY, stiff, trace f-m sand and gravel, gray
					silt mottles.
0.0	4.0	6.0	1.5	4,8,10,15	Same as 2-4' interval.
0.0	6.0	8.0	2.0	16,20,22,28	Same as 4-6' interval.
0.0	8.0	10.0	2.0	4,12,13,17	Reddish-brown clayey SILT, trace f-m sand and gravel.
17.5	10.0	12.0	2.0	8,8,10,13	Same as 8-10' interval to 11.5' bls.
					11.5-12' bls: gray plastic clayey SILT, trace f-m sand and gravel.
28.1	12.0	14.0	2.0	11,6,7,14	Same as 11.5-12' interval, brown f-m sand @ 14' bls.
121.2	14.0	16.0	2.0	3,8,11,13	Brown f-m SAND, clay lens @ 15' bls.
93.5	16.0	18.0	2.0	3,5,5,9	Same as 14-16' interval to 17' bls.
					17-18' bls: gray f-m SAND, some silt.

SAMPLE/CORE LOG

Boring/Well MW-24 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/21/97 Drilling Completed 10/21/97

Total Depth Drilled 18 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 99.1 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used Potable Water Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Anthony Helper Ken

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)			Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
OVM	From	To			
0.0	0.0	2.0	6"	3,3,3,3	6" Asphalt and gravel; brown silty CLAY, trace f-m sand, f gravel.
0.0	2.0	4.0	2.0	3,10,15,18	Stiff reddish-brown silty CLAY, trace f-m sand and gravel, gray silt
					mottles.
1.9	4.0	6.0	1.5	11,7,11,13	Same as 2-4' interval.
19.0	6.0	8.0	2.0	16,24,23,28	Same as 4-6' interval, damp.
3.8	8.0	10.0	2.0	4,9,19,22	Dense brown clayey SILT, trace f-m sand and gravel.
0.0	10.0	12.0	2.0	4,8,10,14	Same as 8-10' interval.
0.0	12.0	14.0	2.0	12,23,35,24	Same as 10-12' interval.
	14.0	16.0	NR	3,4,4,5	No Recovery.
0.0	16.0	18.0	2.0	7,10,10,10	Gray dense SILT and f-m SAND, trace clay and f-m gravel.

SAMPLE/CORE LOG

Boring/Well MW-25 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/24/97 Drilling Completed 10/24/97

Total Depth Drilled 17.5 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 98.4 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Anthony Helper Dale

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface) OVM	From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0.0	0.0	2.0	1.0	1,4,4,3	Black f-c SAND and GRAVEL, trace silt (FILL).
0.0	2.0	4.0	1.0	2,2,2,2	Same as 0-2' interval (FILL).
0.0	4.0	6.0	4"	1,1,2,4	Black f-m SAND, trace silt (FILL).
2.4	6.0	8.0	2.0	8,8,10,14	Same as 4-6' interval to 7' bls.
					7-8': Reddish-brown clayey SILT, stiff, trace f-m sand and gravel.
278.0	10.0	12.0	2.0	8,12,27,30	Gray dense SILT and f-m SAND, trace clay and f-m gravel to 11.5'.
					Brown f-c SAND from 11.5-12' bls.
408.0	12.0	14.0	1.0	38,50/3"	Brown f-c SAND from 12-13' bls; Gray dense SILT and f-m SAND,
					trace clay and f gravel with some weathered limestone fragments
					in shoe @ 14' bls.
4.0	14.0	16.0	8"	40,50/5"	Same as 12-14' interval.
10.4	16.0	18.0	4"	50/4"	Same as 14-16' interval.

SAMPLE/CORE LOG

Boring/Well MW-26 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/28/97 Drilling Completed 10/28/97

Total Depth Drilled 18 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 99.1 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Dale Helper Frank

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

OVM	Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0.0	0.0	2.0	1.0	12,5,4	Auger through 6" of asphalt; Black silty CLAY, trace f-m sand and gravel to 1.5' bls.
					1.5-2.0' bls: Reddish-brown silty CLAY, trace f-m sand and gravel.
0.7	2.0	4.0	1.5	4,5,7,11	Same as 1.5-2.0' interval with gray silt mottles.
0.0	4.0	6.0	2.0	5,7,7,10	Same as 2-4' interval with orange stained vertical silt partings.
0.7	6.0	8.0	2.0	5,13,12,12	Same as 4-6' interval.
0.0	8.0	10.0	2.0	4,4,11,12	Reddish-brown stiff clayey SILT, trace f-m gravel and clay.
0.0	10.0	12.0	2.0	2,6,11,12	Same as 8-10' interval with orange vertical silt partings.
2.8	12.0	14.0	2.0	16,16,15,17	Gray clayey SILT, trace f-m sand and gravel, orange vertical silt partings.
0.7	14.0	16.0	2.0	4,12,36,38	Same as 12-14' interval from 14-15' bls.
					15-16': Gray dense SILT and f-m SAND, trace f-m gravel and weathered limestone.
0.7	16.0	18.0	1.5	52,80,90,100/3"	Same as 15-16' interval with some weathered limestone.
					Refusal @ 17.5' bls.

SAMPLE/CORE LOG

Boring/Well MW-27 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/27/97 Drilling Completed 10/28/97

Total Depth Drilled 18 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 99.2 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Dale Helper Frank

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)			Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
OVM	From	To			
0.0	0.0	2.0	1.5	8,5,3	6" Asphalt; black silty CLAY, trace f-m sand and gravel to 1.5' bls.
					1.5-2.0': reddish-orange silty CLAY, trace f-m sand and gravel.
0.0	2.0	4.0	1.0	4,6,6,9	Same as 1.5-2.0' interval, gray silt mottles.
0.0	4.0	6.0	2.0	2,5,6,8	Same as 2-4' interval.
0.0	6.0	8.0	2.0	8,12,14,13	Reddish-orange clayey SILT, trace f-m sand and f gravel, vertical
					orange stained partings.
2.5	8.0	10.0	2.0	3,7,10,11	Same as 6-8' interval, with no partings.
4.2	10.0	12.0	2.0	3,8,14,16	Same as 8-10' interval with orange stained vertical partings.
0.0	12.0	14.0	2.0	16,18,18,24	Dense gray SILT and f-m SAND, trace f-m gravel and clay.
2.5	14.0	16.0	2.0	19,31,39,62	Same as 12-14' interval with weathered limestone fragments.
0.0	16.0	18.0	3"	50/3"	Same as 14-16' interval with weathered limestone fragments.

SAMPLE/CORE LOG

Boring/Well MW-28 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 10/31/97 Drilling Completed 10/31/97

Total Depth Drilled 18 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 98.7 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Dale Helper Frank

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)			Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
OVM	From	To			
	0.0	2.0	4"	5,4,3,2	Grass and brown silty CLAY and SAND, trace gravel, wet.
350.0	2.0	4.0	1.0	4,3,4,4	Reddish brown silty CLAY, trace f-m sand and gravel, gray silt
					mottles.
1483.0	4.0	6.0	2.0	2,4,7,8	Same as 2-4' interval with a f-c sand seam (1") @ 5' bls.
512.0	6.0	8.0	2.0	8,11,15,16	Same as 4-6' interval with orange stained vertical partings.
>500	8.0	10.0	2.0	2,8,9,14	Same as 6-8' interval.
350.0	10.0	12.0	2.0	3,8,13,17	Reddish-brown silty CLAY, trace f-m sand and gravel, orange
					stained vertical partings.
100.0	12.0	14.0	1.0	13,20,19,20	Grayish-brown clayey silt, some f-m sand and gravel, orange
					stained vertical partings.
175.0	14.0	16.0	2.0	1,3,5,6	Same as 12-14' interval.
100.0	16.0	18.0	2.0	6,9,12,12	Same as 14-16' interval.

SAMPLE/CORE LOG

Boring/Well MW-29 Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 11/3/97 Drilling Completed 11/3/97

Total Depth Drilled 18 feet Hole Diameter 8 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 99.0 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Art Helper Dale

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

Sample/Core Depth (feet below land surface)			Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
OVM	From	To			
0.0	0.0	2.0	3"	4,4,2,3	Gray f-m GRAVEL, trace f-m sand and silt.
2.1	2.0	4.0	1.0	4,4,3,5	Reddish-brown silty CLAY, trace f-m sand and gravel.
10.6	4.0	6.0	1.5	3,4,6,8	Same as 2-4' interval.
481.0	6.0	8.0	2.0	8,11,13,16	Same as 4-6' interval with orange stained vertical partings.
1681.0	8.0	10.0	2.0	4,8,13,21	Reddish-brown clayey SILT, some f-m sand and gravel.
1159.0	10.0	12.0	2.0	8,8,15,18	Same as 8-10' interval with orange stained vertical partings.
1310.0	12.0	14.0	2.0	18,18,20,20	Same as 10-12' interval.
60.7	14.0	16.0	1.5	15,16,17,16	Gray SILT and f-m SAND, trace f-m gravel and clay.
200.0	16.0	18.0	1.5	8,11,11,12	Same as 14-16' interval.

SAMPLE/CORE LOG

Boring/Well MW-10R Project/No. Aro Corp./AY000220.0004.00003 Page 1 of 1

Location Cheektowaga, NY Drilling Started 11/5/97 Drilling Completed 11/5/97

Total Depth Drilled 18 feet Hole Diameter 10 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 24 inches x 2 inches Sampling Interval Continuous feet

Land-Surface Elevation 99.4 feet [X] Surveyed [ ] Estimated Datum

Drilling Fluid Used None Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc. Driller Art Helper Dale

Prepared By C. Carr Hammer Weight 140-Auto Hammer Drop 30 inches

OVM	Sample/Core Depth (feet below land surface) From	To	Core Recovery (feet)	Time/Hydraulic Pressure or Blows per 6 inches	Sample/Core Description
0.0	0.0	2.0	2"	12,7,7	6" asphalt, SILT, SAND and GRAVEL.
0.0	2.0	4.0	1.5	6,7,7,5	Reddish-brown silty CLAY, trace f-m sand and gravel.
0.0	4.0	6.0	1.5	4,4,6,10	Same as 2-4' interval with gray silt mottling.
12.6	6.0	8.0	2.0	7,9,9,11	Same as 4-6' interval with vertical stained partings.
1.9	8.0	10.0	2.0	8,10,10,5	Same as 6-8' interval.
0.0	10.0	12.0	2.0	3,7,12,11	Same as 8-10' interval.
0.0	12.0	14.0	1.0	11,11,14,13	Grayish-brown clayey SILT, some f-m sand and gravel, orange
					stained vertical partings.
0.3	14.0	16.0	1.0	3,5,6,8	Same as 12-14' interval, no partings.
0.0	16.0	18.0	1.0	5,7,9,17	Same as 14-16' interval.

APPENDIX B

APPENDIX B

BSA PERMIT

BUFFALO SEWER AUTHORITY
WASTEWATER TREATMENT PLANT

Daniel Bentivogli
Plant Superintendent

Salvatore LoTempio
Asst. Plant Superintendent

January 23, 1998

RECEIVED
JAN 2 6 1998
INGERSOLL-RAND

Mr. David Jones
Ingersoll-Rand Company
114 Spencer Road
Cassopolis, Michigan 49031

CERTIFIED

Re: EC/BPDES Permit No. 98-01-E1017

Dear Mr. Jones:

Enclosed is your EC/BPDES Permit No. 98-01-E1017. This permit is jointly issued by the BSA and ECDEP for the remediation site located at 3695 Broadway, Cheektowaga, New York. No other waste may be discharged under this permit.

It is your responsibility to assure continual compliance with the terms, conditions and limits of this permit. The original permit and application must be maintained at the remediation site and must be available for inspection on demand.

Finally, as per our telephone discussion, a copy of the "BSA Sampling and Analytical Guidelines" is also enclosed. These guidelines must be strictly followed.

If you have any questions, please call me at 716-883-1820 Ext. 256.

Very truly yours,

James Caruso
Associate Chemist

James L. Kruszka
Legal Investigator
INDUSTRIAL WASTE SECTION

JLK:ks

cc: Leslie Sedita

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Foot of West Ferry Street • Buffalo, New York 14213-1799
Phone: 716-883-1820 • Fax: 716-883-3789

PART I: SPECIFIC CONDITIONS

A. DISCHARGE LIMITATIONS & MONITORING REQUIREMENTS

During the period beginning the effective date of this permit and lasting until the expiration date, discharge from the permitted facility outfall(s) (see attached map) shall be limited and monitored by the permittee as specified below:

Sample Point	Parameter	Discharge Limitations (mg/l except pH) Daily Maximum	Sampling Requirements Period	Type
001	pH	5.0 - 12.0 S.U.	1 day	Composite
	Total Extractable Hydrocarbons	100	1 day	Composite
	EPA Test Procedures 601 & 602	No Limit [1]	1 day	Grab [2]
	Total Daily Flow	20,000 gallons	Continuous	Meter Readings[3]

1. Limits for any pollutant found to exceed their method detection limit may be developed as monitoring data is received and reviewed by Buffalo Sewer Authority personnel.

2. A minimum of 4 grab samples must be collected at equally spaced intervals during the 8 hour period between 8:00 am and 4:00 pm. The grab samples for each day must be composited by a NYSDOH certified laboratory prior to analysis.

3. The discharge to the sanitary sewer shall be continuously measured using a combination flow rate/totalizing meter with daily chart recordings. The daily flow readings shall be summarized and submitted with each monitoring report.

PART I: SPECIFIC CONDITIONS

B. DISCHARGE MONITORING REPORTING REQUIREMENTS

During the period beginning the effective date of this permit and lasting until the expiration date, discharge monitoring results shall be summarized and reported by the permittee on the days specified below:

Sample Point	Parameter	Reporting Requirements	
		Initial Report	Subsequent Reports[1]
001	All	February 28, 1998	The last day of each month through February 28, 1999. Thereafter every January 31st, April 30th, July 31st and October 31st.

1. The Buffalo Sewer Authority and Erie County Department of Environment and Planning reserve the right to require monthly monitoring beyond February 28, 1999, if it is deemed necessary by either the Buffalo Sewer Authority or Erie County Department of Environment and Planning.

PART I: SPECIFIC CONDITIONS

C. SPECIAL REQUIREMENTS

All wastewater generated at this site must be treated using granular activated carbon, as described in the RD/RA Work Plan dated February 1997. A log book must be maintained for the maintenance of the granular activated carbon units. At a minimum, the log must show the date and time of all inspections, the date and time the carbon is replaced and any unusual conditions. Each entry must be initialed by the inspector.

Ingersoll - Rand Company must install and maintain a control manhole immediately downstream of the wastewater treatment system. The manhole must be sufficient to allow for wastewater flow monitoring and sampling. An existing manhole may be modified for this purpose, with prior approval from the Buffalo Sewer Authority and Erie County Department of Environment and Planning.

ERIE COUNTY/BUFFALO POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

PART II GENERAL CONDITIONS

A. MONITORING AND REPORTING

1. Local Limits

Except as otherwise specified in this permit, the permit holder shall comply with all specific prohibitions, limits on pollutants or pollutant parameters set forth in the Buffalo Sewer Authority Sewer Use Regulations, as amended from time to time, and such prohibitions, limits and parameters shall be deemed pretreatment standards for purposes of the Clean Water Act.

2. Definitions

Definitions of terms contained in this permit are as defined in the Rules and Regulations for Erie County Sewer Districts and the Buffalo Sewer Authority Sewer Use Regulations.

3. Discharge Sampling Analysis

All Wastewater discharge samples and analyses and flow measurements shall be representative of the volume and character of the monitored discharge. Methods employed for flow measurements and sample collections and analyses shall conform to the Buffalo Sewer Authority "Sampling Measurement and Analytical Guidelines Sheet".

4. Recording of Results

For each measurement or sample taken pursuant to the requirements of the permit, the permittee shall record the information as required in the "Sampling Measurement and Analytical Guidelines Sheet".

5. Additional Monitoring by Permittee

If the permittee monitors any pollutants at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified in 40CFR136 the results of such monitoring shall be

included in the calculation and reporting of values required under Part I,B. Such increased frequency shall also be indicated.

6. **Reporting**

All reports prepared in accordance with this Permit shall be submitted to:

Erie County Department of Environment and Planning
Division of Sewerage Management
Room 1034
95 Franklin Street
Buffalo, New York, 14202
Attention: Leslie Sedita

All self monitoring reports shall be prepared in accordance with the BSA "Sampling Measurement and Analytical Guidelines Sheet". These reporting requirements shall not relieve the permittee of any other reports which may be required by the N.Y.S.D.E.C. or the U.S.E.P.A.

B. PERMITTEE REQUIREMENTS

1. **Change in Discharge**

All discharges authorized herein shall be consistent with the terms and conditions of this permit and with the information contained in the EC/BPDES Permit Application on which basis this permit is granted. In the event of any facility expansions, production increases, process modifications or the installation, modification or repair of any pretreatment equipment which may result in new, different or increased discharges of pollutants, a new EC/BPDES Permit Application must be submitted prior to any change. Following receipt of an amended application, the BSA and Erie County may modify this permit to specify and limit any pollutants not previously limited. In the event that the proposed change will be covered under an applicable Categorical Standard, a Baseline Monitoring Report must be submitted at least ninety (90) days prior to any discharge.

2. **Records Retention**

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring

instrumentation shall be retained at this facility for a minimum of three (3) years, or longer if requested by the General Manager and/or the Sewer District Board.

3. **Notification of Slug, Accidental Discharge or Spill**

In the event that a slug, accidental discharge or any spill occurs at the facility for which this permit is issued, it is the responsibility of the permittee to immediately notify the Erie County Sewer District at 684-1234 and the B.S.A. Treatment Plant at 883-1820 or 853-2459 of the quantity and character of such discharge. If requested by the B.S.A., within five (5) days following all such discharges, the permittee shall submit a report describing the character and duration of the discharge, the cause of the discharge, and measures taken or that will be taken to prevent a recurrence of such discharge.

4. **Noncompliance Notification**

If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitation specified in this permit, the permittee or their assigns must verbally notify the Industrial Waste Section at 883-1820 within twenty-four (24) hours of becoming aware of the violation. The permittee shall provide the Erie County Division of Sewerage Management with the following information, in writing, within five (5) days of becoming aware of such condition:

a. a description of the discharge and cause of noncompliance and;

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

5. **Adverse Impact**

The permittee shall take all reasonable steps to minimize any adverse impact to the Buffalo and Erie County Sewerage System resulting from noncompliance with any discharge limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

6. **Waste Residuals**

Solids, sludges, filter backwash or other pollutants removed in the course of treatment or control of wastewaters and/or the treatment of intake waters, shall be disposed of in a manner such as to prevent any pollutant from such materials from entering the Buffalo or Erie County Sewer System.

7. Power Failures

In order to maintain compliance with the discharge limitations and prohibitions of this permit, the permittee shall provide an alternative power source sufficient to operate the wastewater control facilities; or, if such alternative power source is not provided the permittee shall halt, reduce or otherwise control production and/or controlled discharges upon the loss of power to the wastewater control facilities.

8. Treatment Upsets

a. Any industrial user which experiences an upset in operations that places it in a temporary state of noncompliance, which is not the result of operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation, shall inform the Industrial Waste Section immediately upon becoming aware of the upset. Where such information is given verbally, a written report shall be filed by the user within five (5) days. The report shall contain:

(i) A description of the upset, its cause(s) and impact on the discharger's compliance status.

(ii) The duration of noncompliance, including exact dates and times of noncompliance, and if the non-compliance is continuing, the time by which compliance is reasonably expected to be restored

(iii) All steps taken or planned to reduce, eliminate, and prevent recurrence of such an upset.

b. An industrial user which complies with the notification provisions of this Section in a timely manner shall have an affirmative defense to any enforcement action brought by the Industrial Waste Section and/or Erie County for any noncompliance of the limits in this permit, which arises out of violations attributable to and alleged to have occurred during the period of the documented and verified upset.

9. Treatment Bypasses

a. A bypass of the treatment system is prohibited unless the following conditions are met:

(i) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; or

(ii) There was no feasible alternative to the bypass, including the use of auxiliary treatment or retention of the wastewater; and

(iii) The industrial user properly notified the Industrial Waste Section as described in paragraph b. below.

b. Industrial users must provide immediate notice to the Industrial Waste Section upon delivery of an unanticipated bypass. If necessary, the Industrial Waste Section may require the industrial user to submit a written report explaining the cause(s), nature, and duration of the bypass, and the steps being taken to prevent it's recurrence.

c. An industrial user may allow a bypass to occur which does not cause pretreatment standards or requirements to be violated, but only if it is for essential maintenance to ensure efficient operation of the treatment system. Industrial users anticipating a bypass must submit notice to the Industrial Waste Section at least ten (10) days in advance. The Industrial Waste Section may only approve the anticipated bypass if the circumstances satisfy those set forth in paragraph a. above.

C. PERMITTEE RESPONSIBILITIES

1. Permit Availability

The originally signed permit must be available upon request at all times for review at the address stated on the first page of this permit.

2. Inspections

The permittee shall allow the representatives of the Buffalo Sewer Authority or Erie County Sewer District upon the presentation of credentials and during normal working hours or at any other reasonable times, to have access to and

copy any records required in this permit; and to sample any discharge of pollutants.

3. **Transfer of Ownership or Control**

In the event of any change in control or ownership of facilities for which this permit has been issued the permit shall become null and void. The succeeding owner shall submit a completed Erie County/Buffalo Sewer Authority permit application prior to discharge to the sewer system.

D. PERMITTEE LIABILITIES

1. **Permit Modification**

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to the following:

a. Violation of any terms or conditions of this permit,

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts,

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

2. **Imminent Danger**

In the event there exists an imminent danger to health or property, the permitter reserves the right to take immediate action to halt the permitted discharge to the sewerage works.

3. **Civil and Criminal Liability**

Nothing in this permit shall relieve the permittee from any requirements, liabilities, or penalties under provisions of the "Sewer Regulations for Erie County Sewer Districts", the "Sewer Regulations of the Buffalo Sewer Authority" or any Federal, State and/or local laws or regulations.

E. NATIONAL PRETREATMENT STANDARDS

If a pretreatment standard or prohibition (including any Schedule of Compliance specified in such pretreatment standard or prohibition) is established under Section 307 (b) of the Act for a pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with such pretreatment standard or prohibition.

F. PLANT CLOSURE

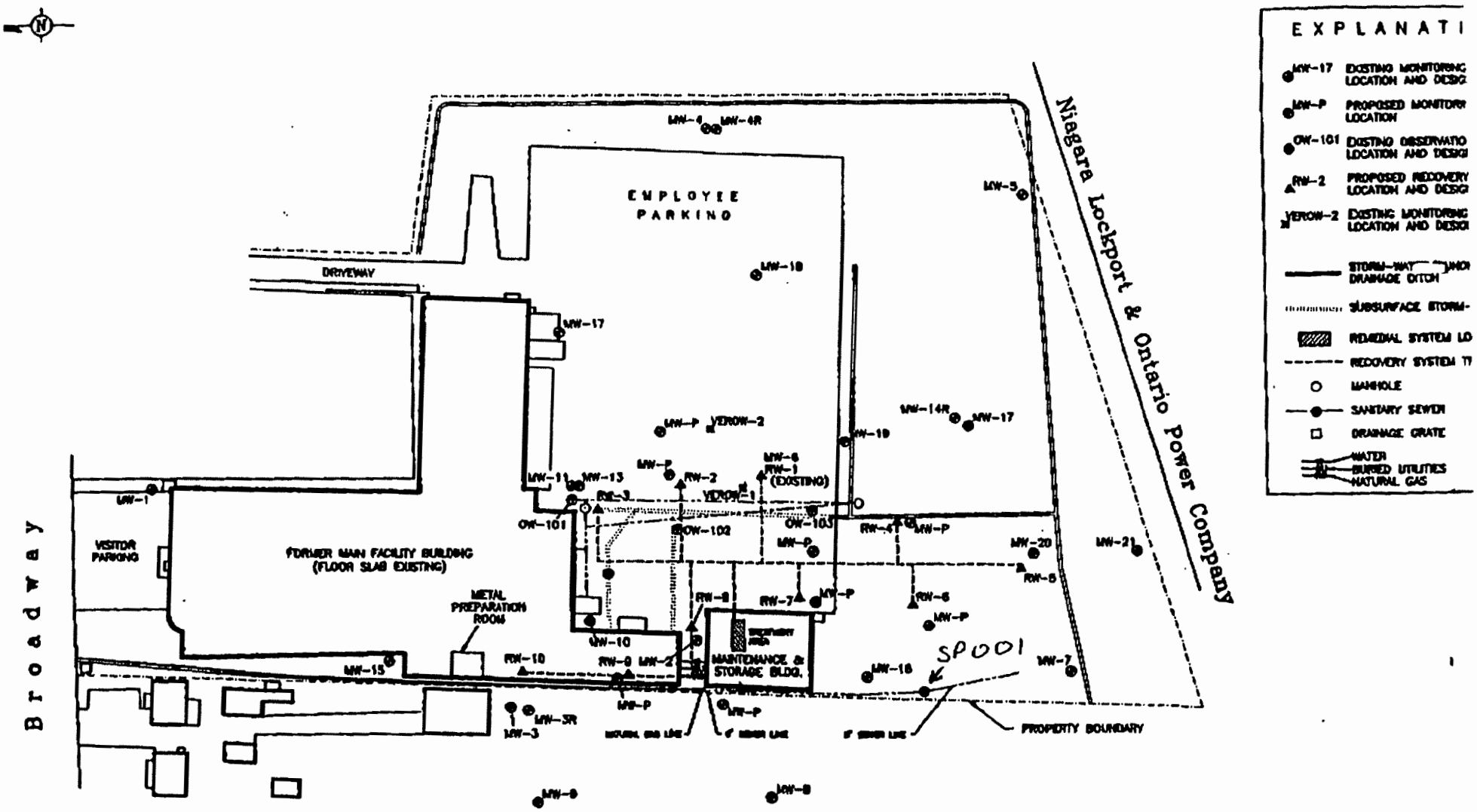
In the event of plant closure, the permittee is required to notify the Industrial Waste Section in writing as soon as an anticipated closure date is determined, but in no case later than five (5) days of the actual closure.

G. CONFIDENTIALITY

Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Buffalo Sewer Authority or Erie County Department of Environment and Planning, Division of Sewerage Management. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

H. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

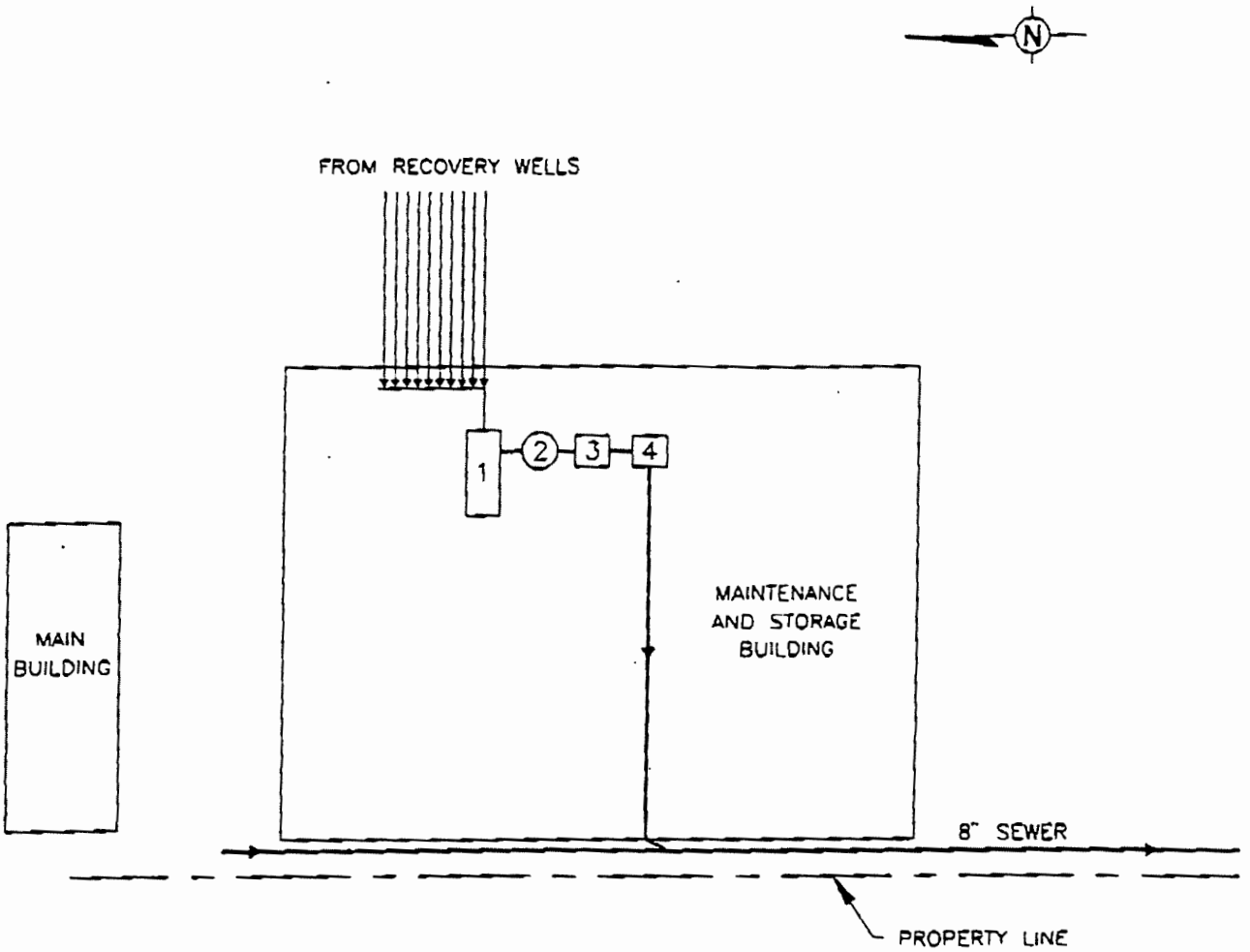


GERAGHTY & MILLER, INC.
Environmental Services
A Halliburton Company

SITE PLAN LAYOUT

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

SOURCE: GERAGHTY & MILLER ENVIRONMENTAL ENGINEERING, P.C., JUNE 1994



SCALE
0 20 FEET

DRAFTER: E. EAGLESION
APPROVED: G. NETUSCHIL
CHECKED: G. NETUSCHIL
DRAWING: RI-2
FILE NO.: RI-2
PRJCT NO.: AY0220.001
DWG DATE: 8-2-96

GERAGHTY & MILLER, INC.
Environmental Services

BUILDING LAYOUT

ARO CORPORATION SITE
CHEEKTOWAGA, N.Y.

FIGURE
2

BUFFALO SEWER AUTHORITY
SAMPLING MEASUREMENT AND ANALYTICAL GUIDELINES SHEET
(Revised 5/29/96)

A. *Flow Monitoring and Sampling*

1. Before commencement of any sampling or flow monitoring, the Industrial Waste Section (I.W.S.) shall be notified, in writing, at least seventy-two (72) hours in advance by the firm or designee. The I.W.S. will give a twenty-four (24) hour verbal notification to the firm or designee if split sampling will be required.

2. Sampling must be performed at the designated B.P.D.E.S. permit location.

3. All discharge lines from one (1) building, or all discharge lines from only one (1) single process, must be sampled during the same time period.

4. If a sample point receives flow from upstream roof drains and/or storm connections, sampling will not be acceptable during a precipitation day. If sampling was initiated before a storm and the storm is brief or near the end of sampling the I.W.S. must be contacted for approval to accept the sample collected for analysis.

5. If an auto-sampler is used, tubing must be at least 3/8" I.D. and the intake hose velocity must be at least 2.0 f.p.s. with a minimum lift of twenty (20) feet.

6. After the first day of sampling, the tubing must be cleaned with detergent or methanol and deionized water for each subsequent sampling day. Proper refrigeration and preservation of the sample must be maintained during the entire sampling period.

7. All sampling shall be taken at the highest velocity, greatest turbulence and center of flow.

8. All sampling must be done on normal work days. If there is a regulated process discharge after normal working hours, sampling must continue until there is no further discharge.

9. The discharge flow monitoring method must be approved by the B.S.A. prior to monitoring. Results and the method used to determine flow must be included with the report.

10. Any split samples with the B.S.A. that indicate an analytical discrepancy of greater than 20% may be grounds for disapproval of the monitoring report.

B. *Analytical*

1. The pH must be analyzed from the sample on site unless otherwise specified.

2. When the following parameters are required to be monitored for the Baseline Monitoring Report (BMR) and Compliance Monitoring Report (CMR) a minimum of four (4) grab samples must be collected for each parameter: pH, cyanides, total phenols, oil and grease, sulfide, and volatile organics. Grab samples must be taken over an equally spaced time period during a normal work day. The sample bottle(s) must be glass when oil & grease, total extractable hydrocarbons and/or organics are being tested. The method of sampling for all periodic permit monitoring requirements will be specified in the B.P.D.E.S. permit.

3. Only laboratories certified by the New York State Department of Health for the specific parameter will be allowed to conduct the appropriate analysis.

4. A chain of possession log sheet is required for the transporting and analysis of each sample. The log sheet signed by the lab director or designee must be included in the monitoring report. Blank copies of the log sheet will be available from the I.W.S. Office.

5. The handling, storage, preservation and analytical procedures for each parameter shall follow Environmental Protection Agency Guidelines established in 40 CFR Part 136 and as amended. This document is available for review at the Buffalo Sewer Authority, Industrial Waste Section, Wastewater Treatment Facility, Foot of West Ferry Street, Buffalo, New York, 14213; State Register, New York State Department of State, 162 Washington Avenue, Albany, New York, 12231 or can be obtained from Superintendent of Documents, U. S. Government Printing Office, Washington, D.C., 20402.

6. The BOD_5 determination has one special requirement - all samples must be seeded by a commercial BOD test seed, such as Polyseed. The contracted lab must include the Glucose-Glutamic acid standard results with each client's monitoring report.

7. The analytical report must include, for each analyte, the date when the analytical result was calculated and logged, and test method.

C. *Reporting*

1. A field log sheet is required for each sample point and for every day of sampling. All field log sheets must be submitted with the monitoring report. The log sheet must contain the following minimum information:

a. Identification of the sample point.
b. Date of each sample day.
c. If sampled manually: time and amount of each grab sample with the sampler's initials.
d. If auto-sampled: the type of sampler used; size and type of tubing; and sampling interval.
e. A record of all physical observations *(sight, smell, etc.)* of the discharge at start up, during inspections and changing of sample container.
f. A description of weather conditions for the entire sampling period.
g. The signature and the date signed by the sampling supervisor at the bottom of page.

2. A map must accompany the report showing the exact location with measured reference points for all sample locations and water meters.

3. Total Water Consumption shall be recorded for each day's sampling period using water meter readings. The method of determining water consumption must be explained in the report.

4. All violations must be verbally reported by the permittee to the B.S.A. within the business day that the contracted lab verbally reports the violation. The contracted lab is required to verbally report all violations to the permittee within one business day of becoming aware of the violation.

5. If any exemptions or modifications have to be made due to unique situations, the I.W.S. must be notified for approval prior to any changes. A written explanation of the approved change must accompany the monitoring report.

6. The submitted monitoring report shall include the following certification and must be signed by a B.S.A. approved signatory: *"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".*

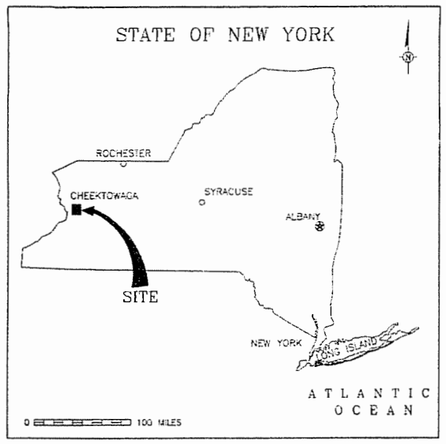
7. The complete report must be sent by the industry to the B.S.A. and not by the consultant or lab.

8. The results of each parameter tested must be in the same format as the permit limit *(concentration or mass)*.

APPENDIX C

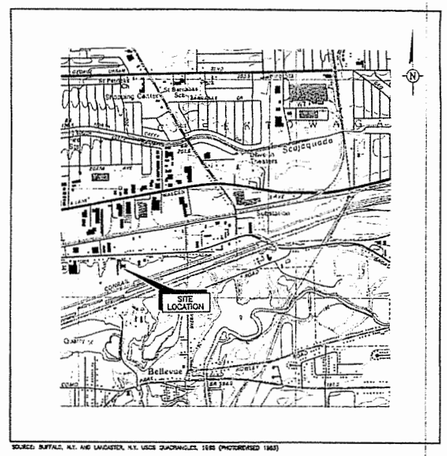
APPENDIX C

RECORD DRAWINGS



SITE VICINITY MAP

LIST OF DRAWINGS	
DRAWING NO.	DRAWING TITLE
1	TITLE DRAWING
2	GENERAL LEGEND
3	SITE PLAN
4	PROCESS & INSTRUMENTATION DIAGRAM
5	WELL CONSTRUCTION AND PIPING DETAILS



SOURCES: BUFFALO, N.Y. AND LANCASTER, N.Y. USGS QUADRANGLES, 1978 (PHOTOREVISED 1982)

SITE LOCATION MAP

DESIGN DRAWINGS

VACUUM ENHANCED RECOVERY SYSTEM

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

PREPARED FOR:
INGERSOLL-RAND CO.
200 CHESTNUT RIDGE ROAD
WOODCLIFF LAKE, NEW JERSEY 07675

PREPARED BY:
ARCADIS GERAGHTY & MILLER
AND GM CONSULTING ENGINEERS, P.C.
215 WASHINGTON AVENUE EXTENSION
ALBANY, NEW YORK 12205

STATE OF NEW YORK — ARNOLD S. VERNICK — No. 32333 — LICENSED PROFESSIONAL ENGINEER

G:\COMMON\ARCADIS\GM-ALBANY\ARO\CADD\COVER-S.DWG

1

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4	6/98	RECORD DRAWING	MW	DB
3	5/97	CONSTRUCTION DRAWING	GS	DS
2	2/97	90% DESIGN	GS	DS
1	6/96	30% DESIGN	GS	DS

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USE TO VERIFY FIGURE REPRODUCTION SCALE

ARCADIS GERAGHTY & MILLER
215 Washington Avenue Extension
Albany, New York 12205
Tel: 518/452-7826 Fax: 518/452-4398

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

TITLE DRAWING

DRAWN	DATE
	5/17/96

PROJECT MANAGER	DEPARTMENT MANAGER
M. SANFORD	F. LENZO
LEAD DESIGN PROF.	CHECKED
A. VERNICK	M. HANSEN
PROJECT NUMBER	DRAWING NUMBER
AY000022.0004	1

PROCESS EQUIPMENT LEGEND

- LOGIC CONNECTION
- ELECTRICAL SIGNAL
- TELEPHONE LINE
- EQUIPMENT BUILDING LIMITS
- EQUIPMENT/ENCLOSURE LIMITS
- BACKWASH
- PROCESS LINE
- AIR FLOW
- VAPOR
- FLOW DIRECTION
- CHECK VALVE
- GATE VALVE
- PRESSURE REGULATING VALVE
- DIAPHRAGM TYPE FLOW CONTROL VALVE
- SPRING LOADED BALL CHECK VALVE
- BALL VALVE (NORMALLY OPEN)
- BALL VALVE (NORMALLY CLOSED)
- BUTTERFLY VALVE
- SOLENOID VALVE
- GLOBE VALVE (NORMALLY OPEN)
- GLOBE VALVE (NORMALLY CLOSED)
- Y-TYPE STRAINER
- VENTURI (EDUCTOR)
- TURBINE METER
- PITOT TUBE
- FLANGED CONNECTION
- SAMPLE POINT
- UNION
- QUICK DISCONNECT
- PIPE MATERIAL DESIGNATION CHANGE (PVC / FRP)
- FLEXIBLE HOSE
- DUCT TRANSITION
- REDUCER (CONCENTRIC)
- REDUCER (ECCENTRIC)
- VACUUM BREAKER
- AIR RELEASE VALVE
- PRESSURE RELEASE VALVE
- PULSE ACCUMULATOR
- POINT OF LIQUID COLLECTION
- SILENCER
- SURGE SUPPRESSOR

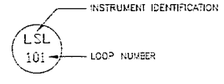
EQUIPMENT LEGEND

- MOTOR STARTER
- MOTOR
- PARTICULATE FILTER
- LIQUID RING PUMP
- PUMP
- EXTRACTION WELL
- LIQUID OR VAPOR TREATMENT VESSEL
- FAN

INSTRUMENT LEGEND

- INLINE INSTRUMENT
- ISOLATED INSTRUMENT CONNECTED TO PROCESS LINE
- INSTRUMENT CONNECTED TO PROCESS LINE
- INSTRUMENT FIELD MOUNTED
- INSTRUMENT PRIMARY PANEL MOUNTED
- INSTRUMENT, DUAL FUNCTION
- AUTODIALER
- PLC INTERLOCK
- CONTROL INTERLOCK
- ALARM/MESSAGE INDICATOR
- HAND SWITCH (HS)
- PUSH BUTTON (PB)
- SELECTOR SWITCH (SS)
  - 1-0-1 = (ON/OFF/ON)/3 POSITION
  - 1-0 = (ON/OFF)/2 POSITION
  - 0-1 = (OFF/ON)/2 POSITION
- INDICATOR LIGHT (I)
- LEVEL SWITCH (LS) ie. LSL (LEVEL SWITCH LOW)

INSTRUMENTATION NUMBERING SYSTEM



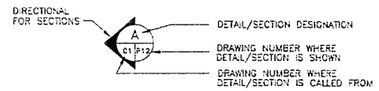
PROCESS ABBREVIATIONS

ATD	AUTOMATIC TELEPHONE DIALER
ARV	AIR RELEASE VALVE
ASP	AIR SAMPLE POINT
BFV	BUTTERFLY VALVE
BR	BRASS
BV	BALL VALVE
C	COPPER
CI	CAST IRON
CS	CARBON STEEL
CFM	CUBIC FEET PER MINUTE
CPLG	COUPLING
CV	CHECK VALVE
DNAPL	DENSE NON-AQUEOUS PHASE LIQUID
DPVE	DUAL PHASE VAPOR EXTRACTION
FC	FAIL CLOSED
FE	FLOW ELEMENT
FH	FLEXIBLE HOSE
FLL	FLOW LEVEL LOW
FO	FAIL OPEN
FQI	FLOW QUANTITY INDICATOR
FRL	AIR LINE FILTER, REGULATOR, LUBRICATOR
FRP	FIBERGLASS REINFORCED PLASTIC
GPM	GALLONS PER MINUTE
GLV	GLOBE VALVE
GV	GATE VALVE
HC	HOSE CONNECTION
HDPE	HIGH DENSITY POLYETHYLENE
LAL	LEVEL ALARM LOW
LAH	LEVEL ALARM HIGH
LSH	LEVEL SWITCH HIGH
LSN	LEVEL SWITCH NORMAL
LSP	LIQUID SAMPLING POINT
PLSA	PULSE ACCUMULATOR
PRV	PRESSURE RELEASE VALVE
PU	PVC UNION
PVC	POLY VINYL CHLORIDE
SCH	SCHEDULE
SNV	SOLENOID VALVE
SP	SAMPLE POINT
SS	STAINLESS STEEL
SVE	SOIL VAPOR EXTRACTION
TAL	TEMPERATURE ALARM LOW
TBV	TRANSPARENT BALL VALVE
TE	TEMPERATURE ELEMENT
VB	VACUUM BREAKER
VOC	VOLATILE ORGANIC COMPOUND(S)
VRV	VACUUM RELIEF VALVE
YST	Y-TYPE STRAINER

FLUID IDENTIFICATION ABBREVIATIONS

A	AIR
BA	BREATHING AIR
BW	BACKWASH WATER
C	CONDENSATE
CW	COOLING WATER
DW	DOMESTIC WATER
F	FUEL
FW	FILTERED WATER
GW	GROUND WATER
IA	INSTRUMENT AIR
PA	PLANT AIR
PS	PROCESS SEWER
PW	PROCESS WATER
RW	RAW WATER
SAN	SANITARY SEWER
S	SEWER
SH	STEAM-HIGH PRESSURE
SL	STEAM-LOW PRESSURE
SV	SOIL VAPOR
SS	STORM SEWER
TW	TREATED WATER
V	VENT
W	WATER
WW	WASTE WATER

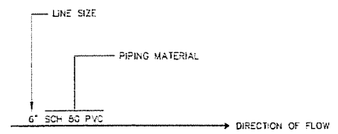
DETAIL/SECTION NOTATION



GENERAL ABBREVIATIONS

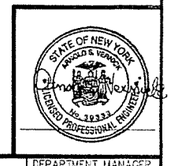
F.F. EL.	FINISHED FLOOR ELEVATION
F.G.	FINISHED GRADE
I.D.	INSIDE DIAMETER
INV. EL.	INVERT ELEVATION
N.T.S.	NOT TO SCALE
O.D.	OUTSIDE DIAMETER
T.O.C.	TOP OF CONCRETE
T.O.T.	TOP OF TANK
T.O.W.	TOP OF WALL
B.O.W.	BOTTOM OF WALL
MH	MANHOLE
DI	DROP INLET
CB	CATCH BASIN
PSI	POUNDS PER SQUARE INCH
WV	WATER VALVE
"	INCHES
'	FEET
ø	DIAMETER
W.C.	WATER COLUMN
VAC.	VACUUM

PIPE IDENTIFICATION



INSTRUMENT IDENTIFICATION

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	
D	USER'S CHOICE	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE	MOMENTARY			MIDDLE INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE RESTRICTION		
P	PRESSURE VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE TOTALIZE			
R	RADIATION		RECORD		
S	SPEED FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION MECHANICAL ANALYSIS			VALVE, DAMPER LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	



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ARCADIS GERAGHTY & MILLER
215 Washington Avenue Extension
Albany, New York 12205
Tel: 518/452-7826 Fax: 518/452-4398

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

GENERAL LEGEND

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
M. WASILEWSKI	5/17/96	M. SANFORD	F. LENZO
		LEAD DESIGN PROF. A. VERNICK	CHECKED M. HANSEN
		PROJECT NUMBER AY000022.0004	DRAWING NUMBER 2

G:\COMMON\MASTER\LEGEND\CADD\ARST_1.DWG

EXPLANATION

- MW-17 — MONITORING WELL LOCATION AND DESIGNATION
- OW-101 — OBSERVATION WELL LOCATION AND DESIGNATION
- RW-2 — RECOVERY WELL LOCATION AND DESIGNATION
- VERGW-2 — MONITORING WELL LOCATION AND DESIGNATION
- STORM-WATER/RUNOFF DRAINAGE DITCH
- SUBSURFACE STORM-WATER

0 — 50 FT

N

PARKING

DRIVEWAY

Niagara Lockport & Ontario Power Company

DRAINAGE DITCH

PARKING

FORMER MAIN FACILITY BUILDING
(FLOOR SLAB EXISTING)

MAINTENANCE & STORAGE BLDG.

REMEDIATION EQUIPMENT

Broadway

MW-1, MW-2, MW-2R, MW-3, MW-3R, MW-4, MW-4R, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, MW-14R, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-22, MW-23, MW-24, MW-25, MW-26, MW-27, MW-28, MW-29

OW-101, OW-102, OW-103

RW-1, RW-2, RW-3, RW-4, RW-5, RW-6, RW-7, RW-8, RW-9, RW-10

VERGW-1, VERGW-2

NATURAL GAS LINE

6" SEWER LINE (DECOMMISSIONED NORTH OF BUILDING)

8" SEWER LINE

TO BSA

PROPERTY BOUNDARY

SOURCE: RAY L. SONNENBERGER LAND SURVEYOR, 1997

ENGINEERING DESIGN: ALL PROFESSIONAL ENGINEERING SERVICES DEPICTED ON THIS DRAWING HAVE BEEN PERFORMED FOR ARCADIS GERAGHTY & MILLER, INC., BY GM CONSULTING ENGINEERS, P.C., A PROFESSIONAL CORPORATION QUALIFIED IN THE STATE OF NEW YORK.

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215 Washington Avenue Extension
Albany, New York 12205
Tel: 518/452-7826 Fax: 518/452-4398

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

SITE PLAN

DRAWN	DATE
M. WASILEWSKI	5/17/96

PROJECT MANAGER	DEPARTMENT MANAGER
M. SANFORD	F. LENZO
LEAD DESIGN PROF	CHECKED
A. VERNICK	M. HANSEN
PROJECT NUMBER	DRAWING NUMBER
AY000022.0004	3

STATE OF NEW YORK — HAROLD S. VERNICK — No. 39335 — LICENSED PROFESSIONAL ENGINEER

EQUIPMENT DESCRIPTIONS

LRP-200

LIQUID RING PUMP

MANUFACTURER: TRAVAINI PUMPS USA, INC.
MODEL NO.: DYNA-SEAL TRV 65-330
SEAL TYPE: OIL
RATING: 200 ACFM, 20 in. Hg VAC.
MOTOR RATINGS: 15 HP, 3 PHASE, 460 V

KT-210

VAPOR/ LIQUID SEPARATOR

MATERIAL: ASTM A36 PLATE STEEL
SIZE: 30 GALLON
VACUUM RATING: 29 IN. Hg
PRESSURE RATING: 14 PSIG

KT-220

OIL (COOLANT) RESERVOIR-OIL/VAPOR SEPARATOR

MATERIAL: ASTM A569 STEEL
SIZE: 4 GALLON
PRESSURE RATING: 14 PSIG

P-210

LIQUID PHASE TRANSFER PUMP
MANUFACTURER: MOYNO PUMPS, INC.
TYPE: PROGRESSIVE CAVITY
CAPACITY: 10 GPM, 100 PSIG
MOTOR: 1.5 HP, 3 PHASE, 460 V

LPC-401 AND LPC-402

LIQUID PHASE CARBON UNITS

MANUFACTURER: WESTATES CARBON PRODUCTS
MODEL NO.: AQUA-SCRUB ASC-1200
CAPACITY: 1,000 LBS LIQUID PHASE ACTIVATED CARBON
MAX. FLOW RATE: 50 GPM

VPC-403 AND VPC-404

VAPOR PHASE CARBON UNITS

MANUFACTURER: WESTATES CARBON PRODUCTS
MODEL NO.: VENT-SCRUB VSC-2000
CAPACITY: 1,800 LBS VAPOR PHASE ACTIVATED CARBON
MAX. FLOW RATE: 500 CFM

VPPP-405

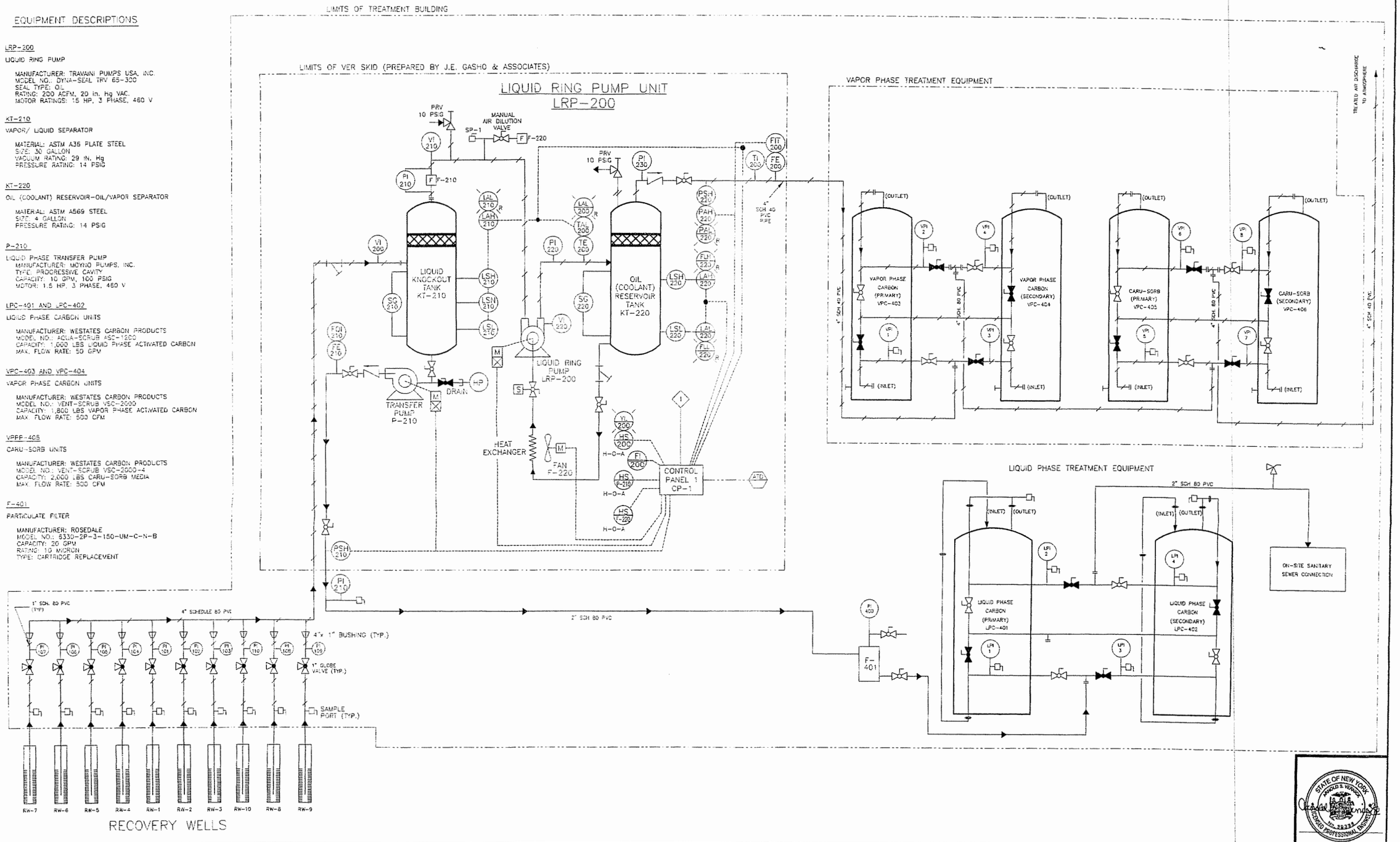
CARU-SORB UNITS

MANUFACTURER: WESTATES CARBON PRODUCTS
MODEL NO.: VENT-SCRUB VSC-2000-4
CAPACITY: 2,000 LBS CARU-SORB MEDIA
MAX. FLOW RATE: 500 CFM

F-401

PARTICULATE FILTER

MANUFACTURER: ROSEDALE
MODEL NO.: 6330-2P-3-150-UM-C-N-B
CAPACITY: 20 GPM
RATING: 10 MICRON
TYPE: CARTRIDGE REPLACEMENT



ENGINEERING DESIGN:
ALL PROFESSIONAL ENGINEERING SERVICES DEPICTED ON THIS DRAWING HAVE BEEN PERFORMED FOR ARCADIS GERAGHTY & MILLER, INC. BY GM CONSULTING ENGINEERS, P.C. A PROFESSIONAL CORPORATION QUALIFIED IN THE STATE OF NEW YORK.

NO.	DATE	REVISION DESCRIPTION	BY	CKD
4	6/98	RECORD DRAWING	MW	DB
3	5/97	CONSTRUCTION DRAWING	GS	DS
2	2/97	90% DESIGN	GS	DS
1	6/96	30% DESIGN	GS	DS

SCALE VERIFICATION
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.
USE TO VERIFY FIGURE REPRODUCTION SCALE

ARCADIS GERAGHTY & MILLER
215 Washington Avenue Extension
Albany, New York 12205
Tel: 518/452-7826 Fax: 518/452-4398

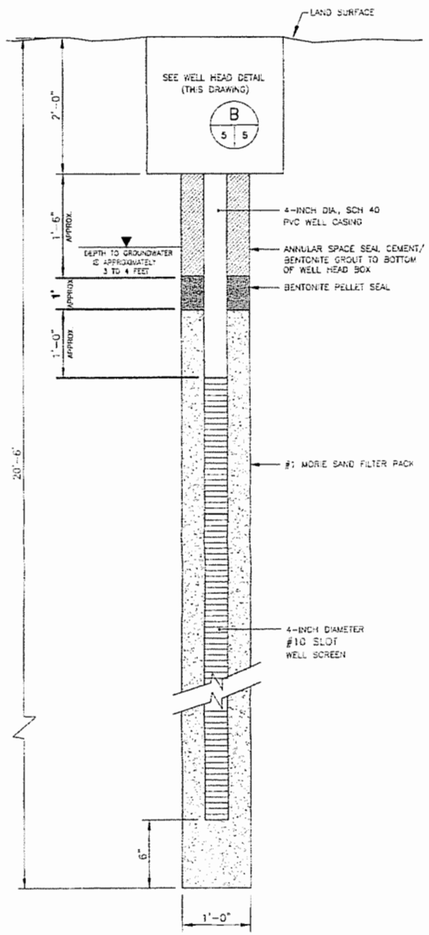
ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

PROCESS AND INSTRUMENTATION DIAGRAM

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
M. WASILEWSKI	5/17/96	M. SANFORD	F. LENZO
		LEAD DESIGN PROF. A. VERNICK	CHECKED M. HANSEN
		PROJECT NUMBER AY000022.0004	DRAWING NUMBER 4

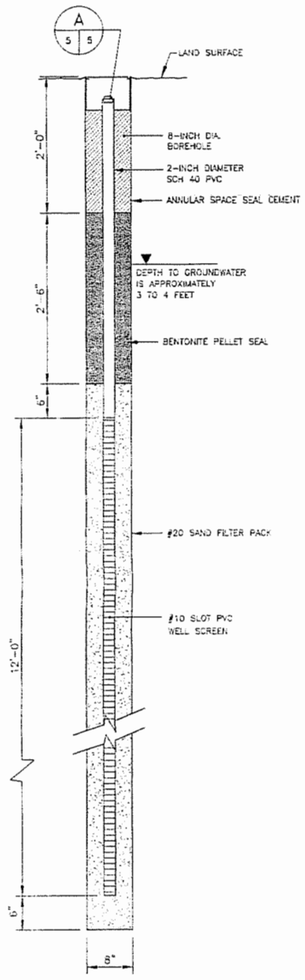
STATE OF NEW YORK ARNOLD B. VERNICK 20-12232 LICENSED PROFESSIONAL ENGINEER

A:\COMMON\MANUALS\P-ID\ARO\ARO-PID.DWG



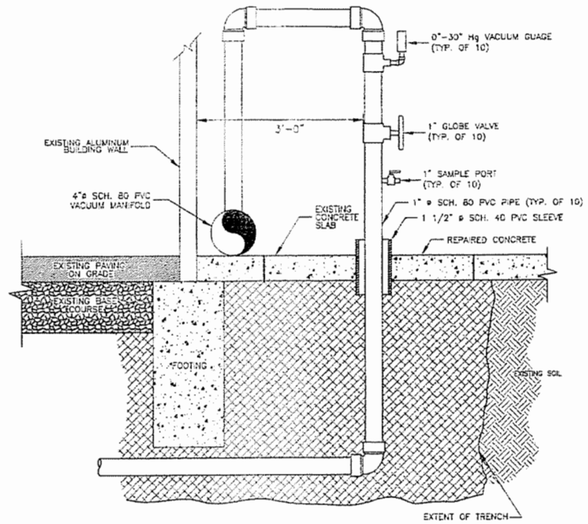
VER RECOVERY WELL CONSTRUCTION DETAIL 2 (3 5)

N.T.S.



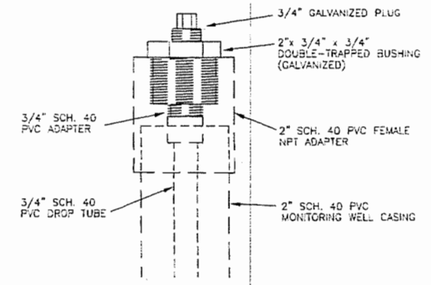
MONITORING WELL CONSTRUCTION DETAIL 5 (3 5)

N.T.S.



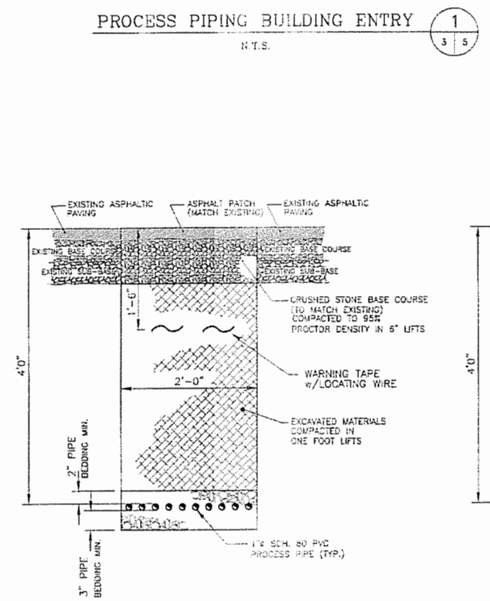
PROCESS PIPING BUILDING ENTRY 1 (3 5)

N.T.S.



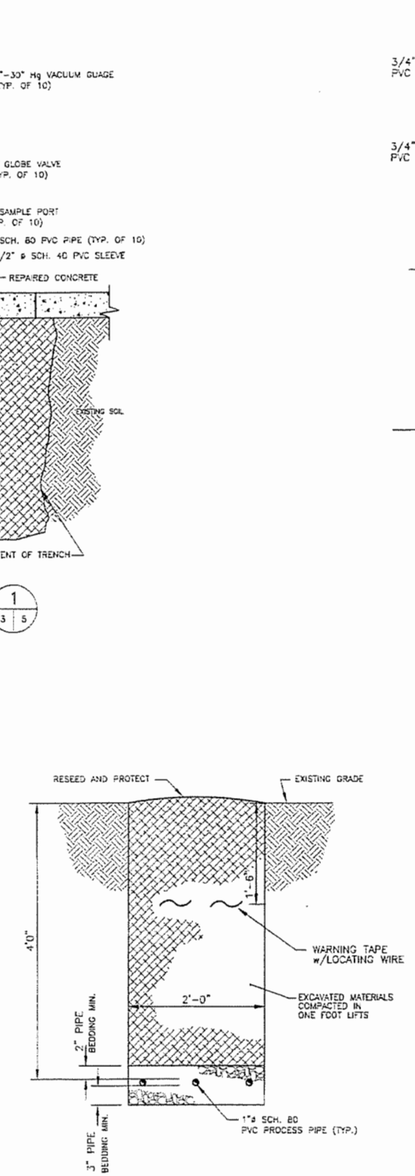
MONITORING WELL HEAD DETAIL A (5 5)

N.T.S



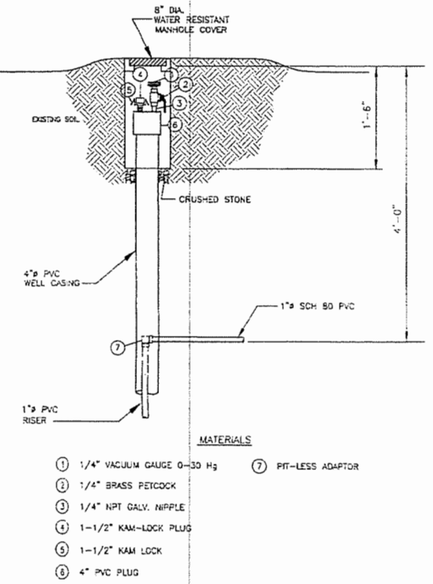
TYPICAL TRENCH CROSS SECTION PAVED AREA 3 (3 5)

SCALE: 1" = 1'-0"



TYPICAL TRENCH CROSS SECTION GRADED AREA 4 (3 5)

SCALE: 1" = 1'-0"



MATERIALS

1. 1/4" VACUUM GAUGE 0-30 Hg
2. 1/4" BRASS PETCOCK
3. 1/4" NPT GALV. NIPPLE
4. 1-1/2" KAM-LOCK PLUG
5. 1-1/2" KAM LOCK
6. 4" PVC PLUG
7. PIT-LESS ADAPTOR

SECTION

VER RECOVERY WELL HEAD DETAIL B (5 5)

SCALE: 1" = 1'-0"

STATE OF NEW YORK — ARNOLD B. VERNICK — LIC. NO. 72023 — LICENSED PROFESSIONAL ENGINEER

ENGINEERING DESIGN: ALL PROFESSIONAL ENGINEERING SERVICES DEPICTED ON THIS DRAWING HAVE BEEN PERFORMED FOR ARCADIS GERAGHTY & MILLER, INC. BY GM CONSULTING ENGINEERS, P.C. A PROFESSIONAL CORPORATION QUALIFIED IN THE STATE OF NEW YORK.

NO.	DATE	REVISION DESCRIPTION	BY / CKD
4	6/98	RECORD DRAWING	MW / DB
3	5/97	CONSTRUCTION DRAWING	GS / DS
2	2/97	90% DESIGN	GS / DS
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ARCADIS GERAGHTY & MILLER
215 Washington Avenue Extension
Albany, New York 12205
Tel: 518/452-7826 Fax: 518/452-4398

ARO CORPORATION SITE
CHEEKTOWAGA, NEW YORK

WELL CONSTRUCTION AND PIPING DETAILS

DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
M. WASILEWSKI	5/17/96	M. SANFORD	F. LENZO
		LEAD DESIGN PROF. A. VERNICK	CHECKED M. HANSEN
		PROJECT NUMBER AY000022.0004	DRAWING NUMBER 5

C:\AYOMMON\MIASSEN\L-R\ARO\CADD\ARO-WELL.DWG

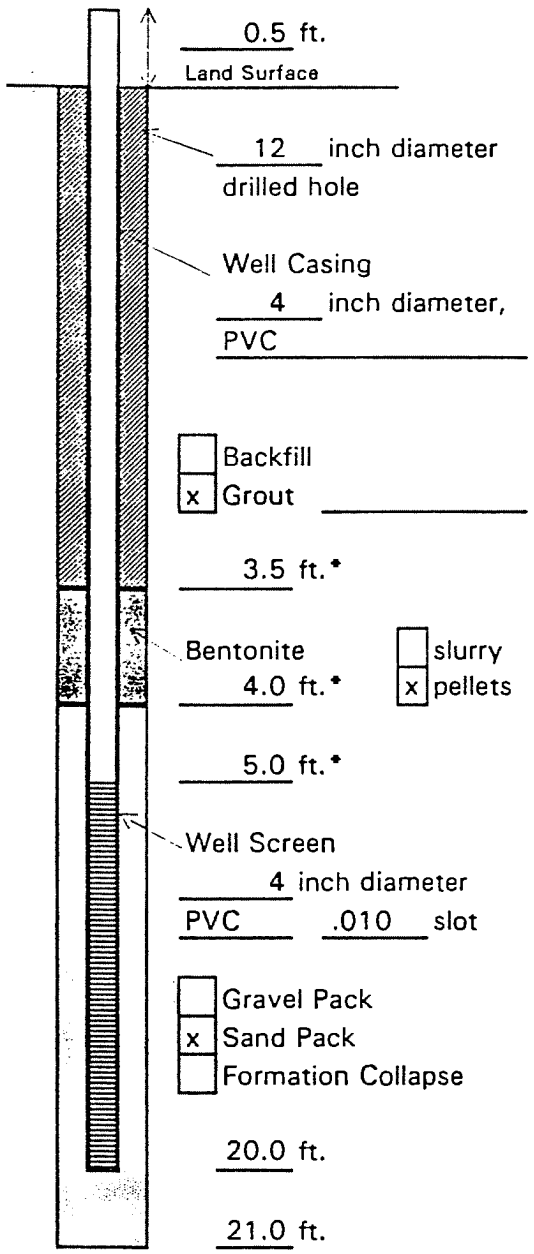
APPENDIX D

APPENDIX D

RECOVERY WELL CONSTRUCTION LOGS

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Ingersoll-Rand / Aro Well RW-1

Town/City Buffalo

County _____ State NY

Permit No. _____

Land-Surface Elevation
and Datum _____ feet ☐ Surveyed ☐ Estimated

Installation Date(s) September 26 - 27, 1995

Drilling Method Hollow Stem Auger

Drilling Contractor Buffalo Drilling

Drilling Fluid None

Development Technique(s) and Date(s)
Bailer, September 27, 1995

Fluid Loss During Drilling N/A gallons

Water Removed During Development 40 gallons

Static Depth to Water 6.9 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft.

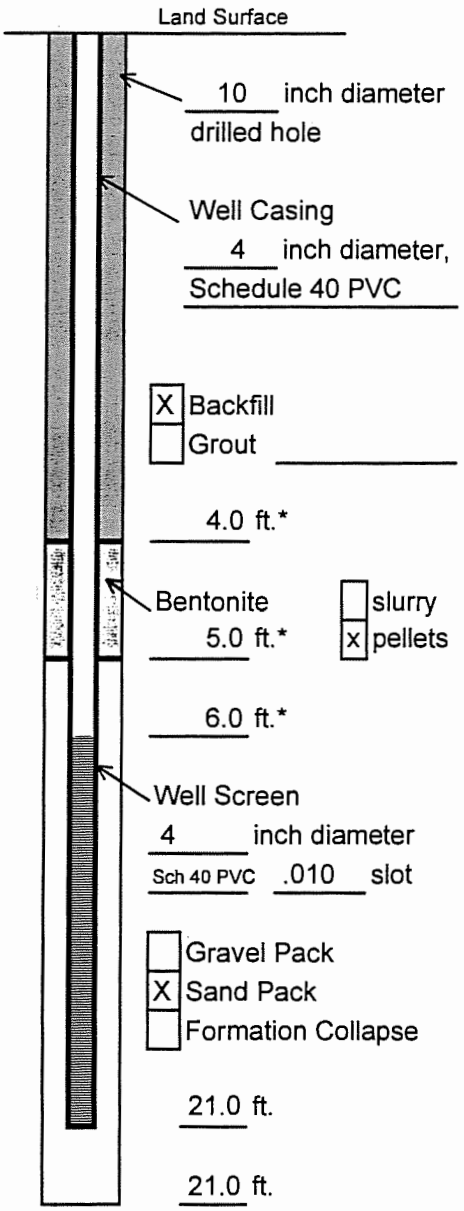
Well Purpose Recovery well for pilot test

Remarks _____

Prepared by Steve Kessel

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well RW-2

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 98.9 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 27-28, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Centrifugal Pump and Disposable Poly Tubing (11/3/97-11/5/97)

Fluid Loss During Drilling gallons

Water Removed During Development 100 gallons

Static Depth to Water 4.01 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date 10/30/97

Specific Capacity gpm/ft.

Well Purpose Recovery

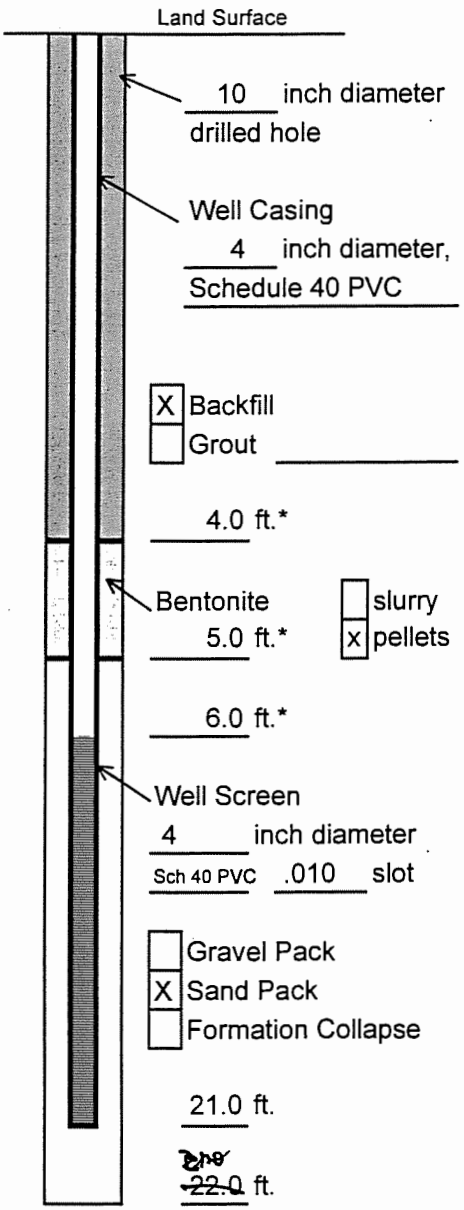
Remarks

Prepared by C. Carr

ARCADIS GERAGHTY & MILLER

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is Top of Well Casing Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well RW-3

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation and Datum 99.7 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 29-30, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Centrifugal Pump and Disposable Poly Tubing (11/3/97-11/17/97)

Fluid Loss During Drilling gallons

Water Removed During Development 270 gallons

Static Depth to Water 4.21 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date 11/3/97

Specific Capacity gpm/ft.

Well Purpose Recovery

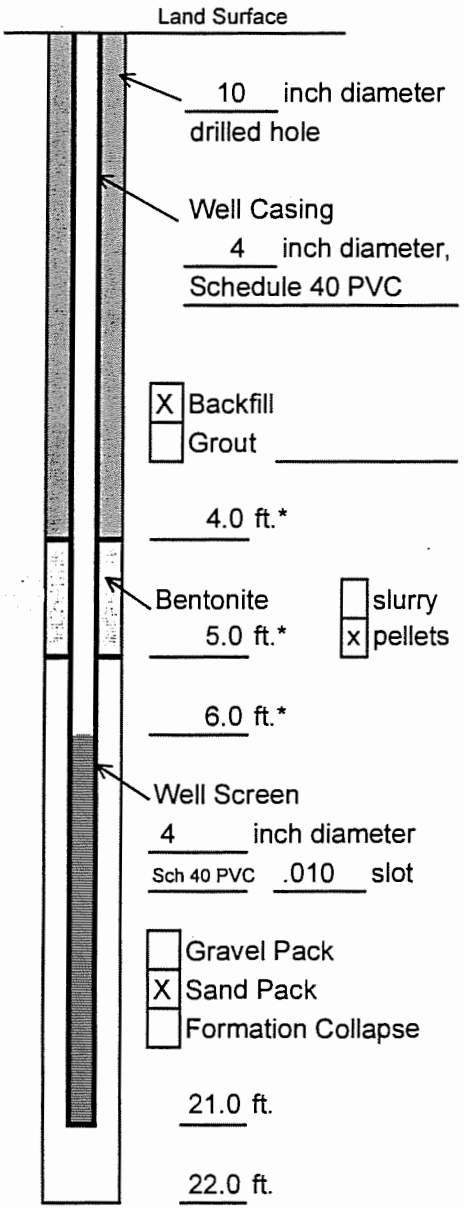
Remarks

Prepared by C. Carr

ARCADIS GERAGHTY & MILLER

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well RW-4

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 100.2 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 22-23, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Centrifugal Pump and Disposable Poly Tubing (10/30/97-11/5/97)

Fluid Loss During Drilling gallons

Water Removed During Development 107 gallons

Static Depth to Water 4.02 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date 10/30/97

Specific Capacity gpm/ft.

Well Purpose Recovery

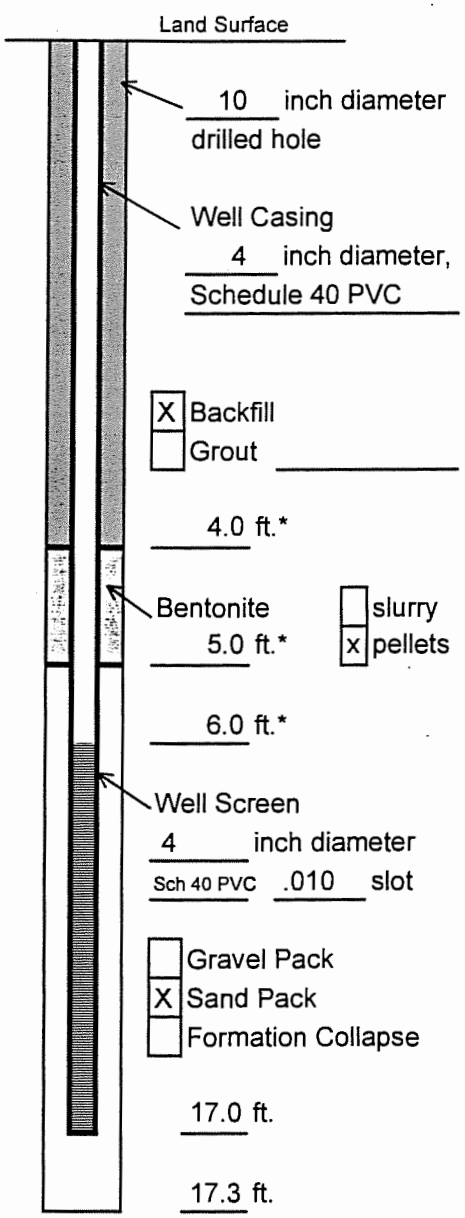
Remarks

Prepared by C. Carr

ARCADIS GERAGHTY & MILLER

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well RW-5

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 99.2 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 17-22, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid Potable Water

Development Technique(s) and Date(s)
Centrifugal Pump and Disposable Poly Tubing (10/30/97-11/6/97)

Fluid Loss During Drilling gallons

Water Removed During Development 290 gallons

Static Depth to Water 6.21 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date 10/30/97

Specific Capacity gpm/ft.

Well Purpose Recovery

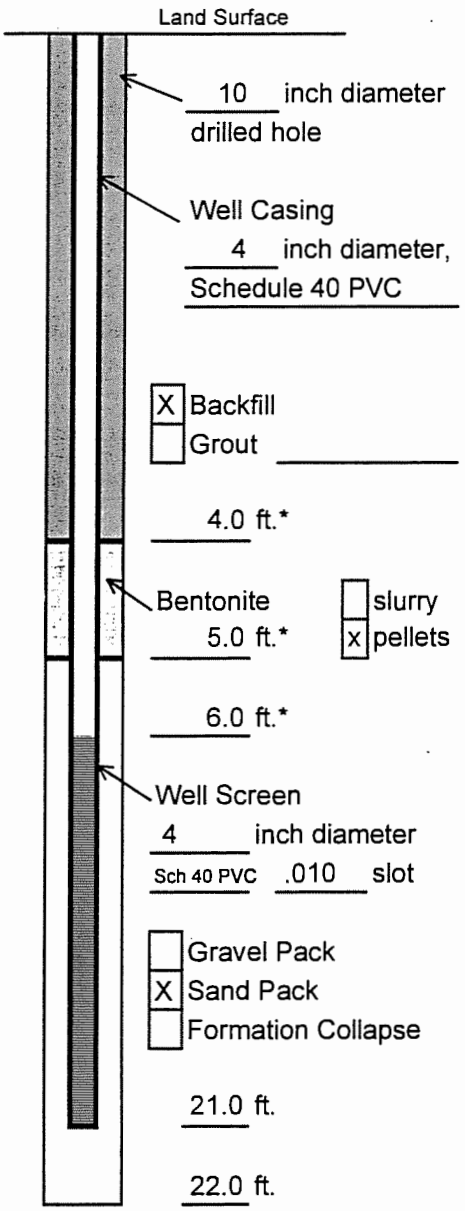
Remarks

Prepared by C. Carr

ARCADIS GERAGHTY & MILLER

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well RW-6

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 98.0 feet

X Surveyed
Estimated

Installation Date(s) October 23, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid Potable Water

Development Technique(s) and Date(s)
Centrifugal Pump and Disposable Poly Tubing (10/27/97-11/5/97)

Fluid Loss During Drilling gallons

Water Removed During Development 185 gallons

Static Depth to Water 6.12 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date 10/27/97

Specific Capacity gpm/ft.

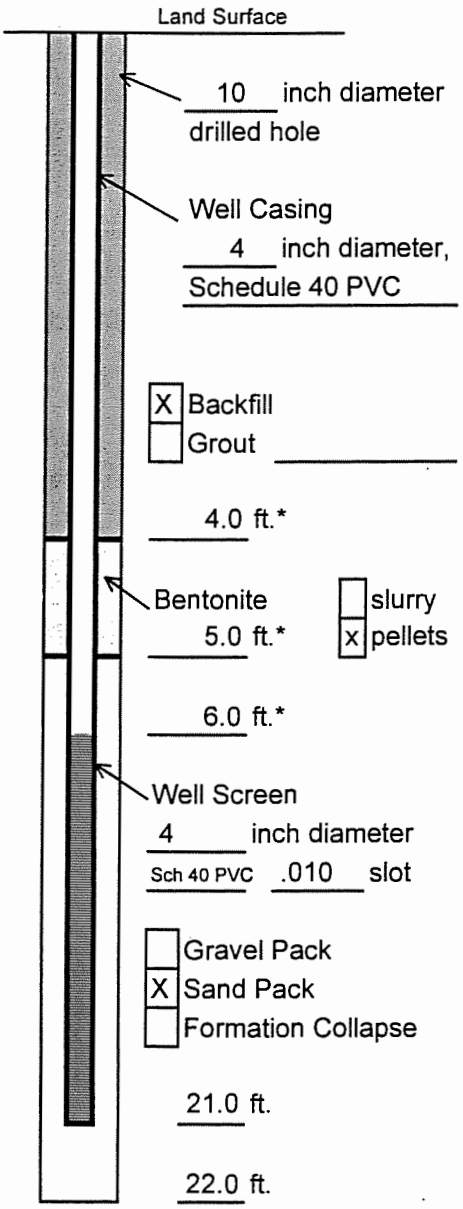
Well Purpose Recovery

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well RW-7

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 99.2 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 27, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid Potable Water

Development Technique(s) and Date(s)
Centrifugal Pump and Disposable Poly Tubing (10/30/97-11/5/97)

Fluid Loss During Drilling gallons

Water Removed During Development 105 gallons

Static Depth to Water 5.47 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date 10/30/97

Specific Capacity gpm/ft.

Well Purpose Recovery

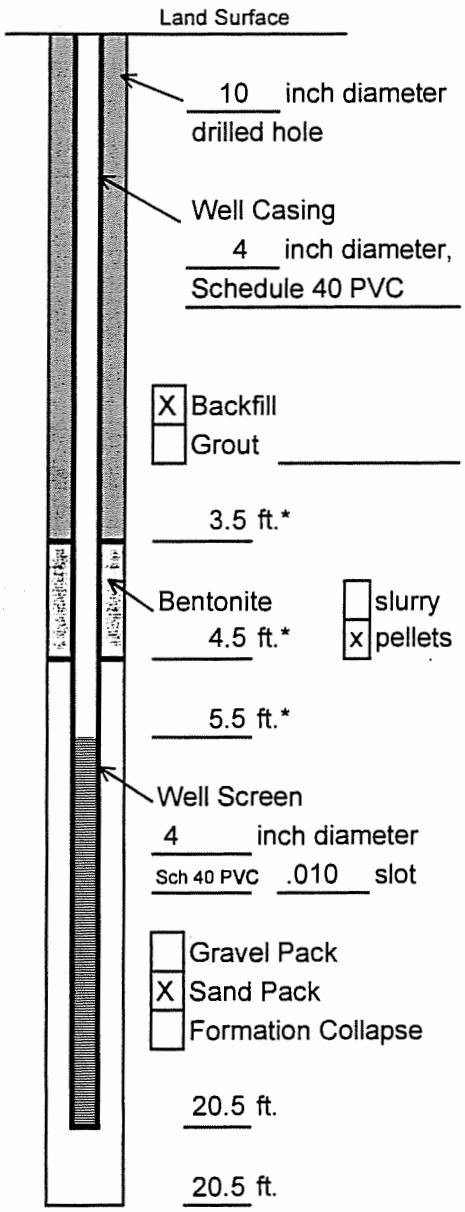
Remarks

Prepared by C. Carr

ARCADIS GERAGHTY & MILLER

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well RW-8

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 98.9 feet

X Surveyed
Estimated

Installation Date(s) October 30, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Centrifugal Pump and Disposable Poly Tubing (11/3/97-11/5/97)

Fluid Loss During Drilling gallons

Water Removed During Development 115 gallons

Static Depth to Water 3.95 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date 11/3/97

Specific Capacity gpm/ft.

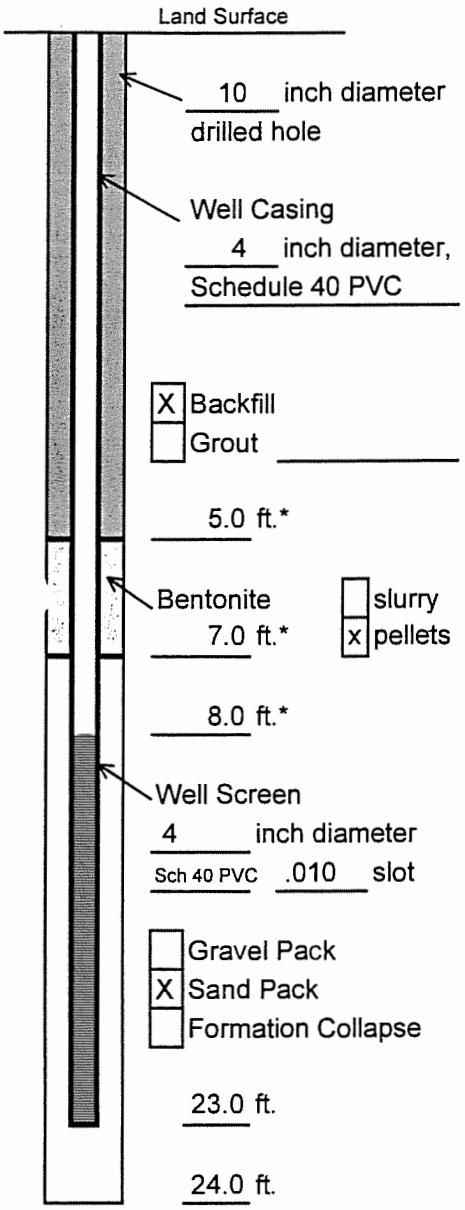
Well Purpose Recovery

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well RW-9

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 101.3 feet [X] Surveyed [ ] Estimated

Installation Date(s) November 3, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Centrifugal Pump and Disposable Poly Tubing (11/5/97)

Fluid Loss During Drilling _____ gallons

Water Removed During Development 70 gallons

Static Depth to Water 5.63 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date 11/5/97

Specific Capacity _____ gpm/ft.

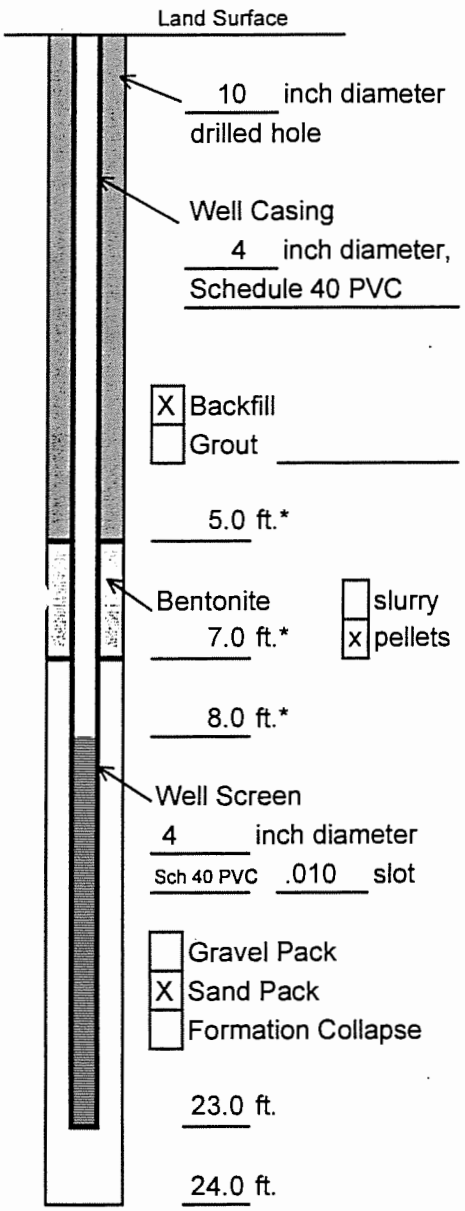
Well Purpose Recovery

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well RW-10

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 101.2 feet [X] Surveyed [ ] Estimated

Installation Date(s) November 4, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Centrifugal Pump and Disposable Poly Tubing (11/5/97-11/6/97)

Fluid Loss During Drilling _____ gallons

Water Removed During Development 30 gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft.

Well Purpose Recovery

Remarks

Prepared by C. Carr

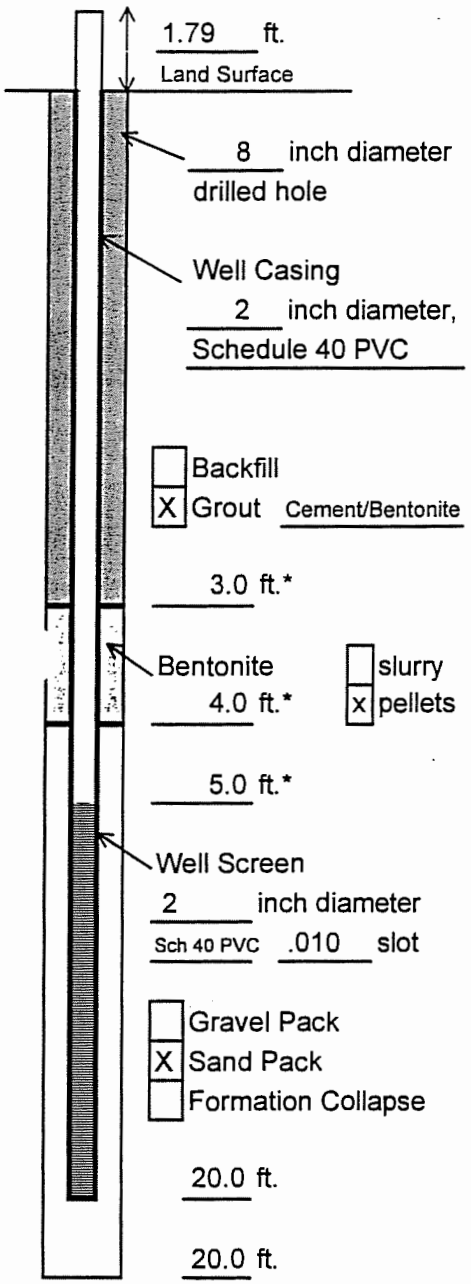
APPENDIX E

APPENDIX E

MONITORING WELL CONSTRUCTION LOGS

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is Top of Well Casing Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well MW-22

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation and Datum 99.6 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 16, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid Potable Water

Development Technique(s) and Date(s)

Bailing and Purging (10/20/97-11/3/97)

Fluid Loss During Drilling gallons

Water Removed During Development 48 gallons

Static Depth to Water 6.00 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date 10/20/97

Specific Capacity gpm/ft.

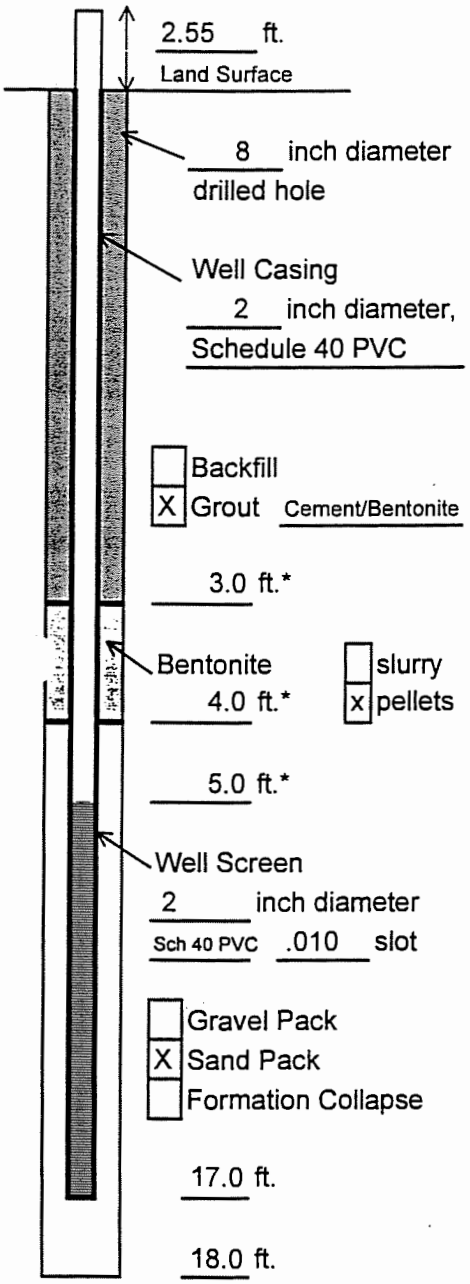
Well Purpose Monitoring

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well MW-23

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 97.7 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 21, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid Potable Water

Development Technique(s) and Date(s)
Bailing and Purging (10/23/97)

Fluid Loss During Drilling ____ gallons

Water Removed During Development 50 gallons

Static Depth to Water 7.25 feet below M.P.

Pumping Depth to Water ____ feet below M.P.

Pumping Duration ____ hours

Yield ____ gpm Date 10/23/97

Specific Capacity ____ gpm/ft.

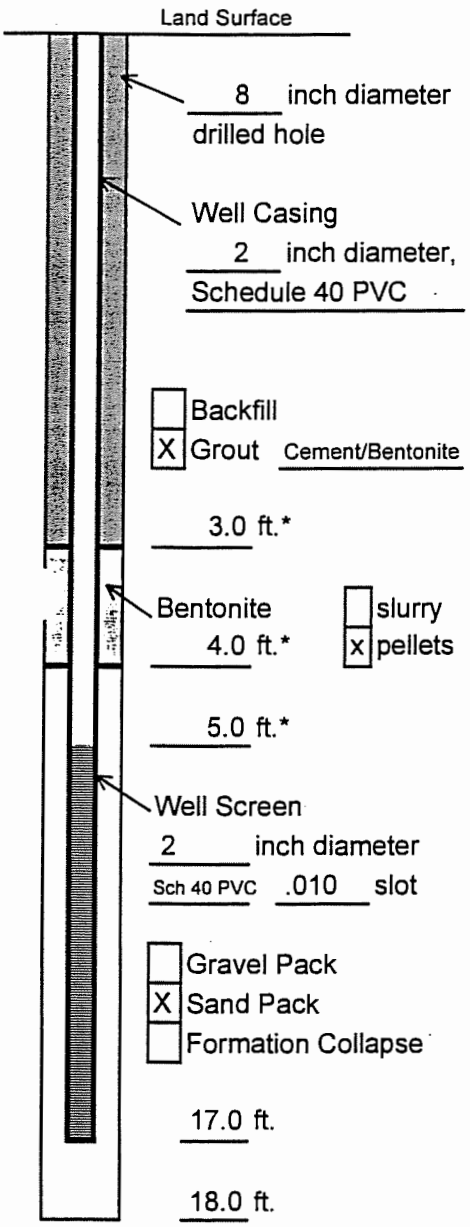
Well Purpose Monitoring

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well MW-24

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 99.1 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 21, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid Potable Water

Development Technique(s) and Date(s)

Fluid Loss During Drilling gallons

Water Removed During Development 50 gallons

Static Depth to Water 4.24 feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date 10/27/97

Specific Capacity gpm/ft.

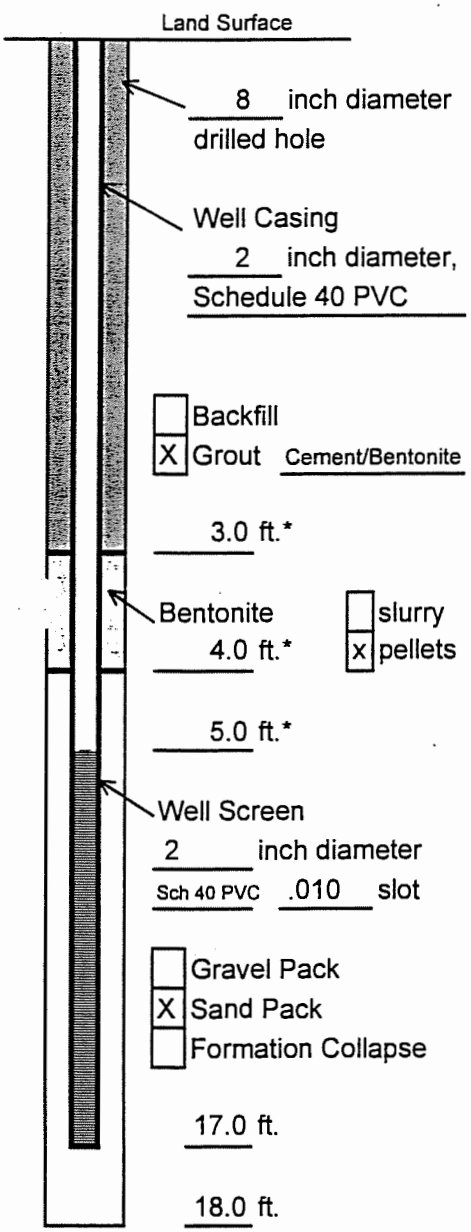
Well Purpose Monitoring

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well MW-25

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 98.4 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 24, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid Potable Water

Development Technique(s) and Date(s)
Bailing and Purging (10/30/97-12/9/97)

Fluid Loss During Drilling ____ gallons

Water Removed During Development 45 gallons

Static Depth to Water 3.91 feet below M.P.

Pumping Depth to Water ____ feet below M.P.

Pumping Duration ____ hours

Yield ____ gpm Date 10/30/97

Specific Capacity ____ gpm/ft.

Well Purpose Monitoring

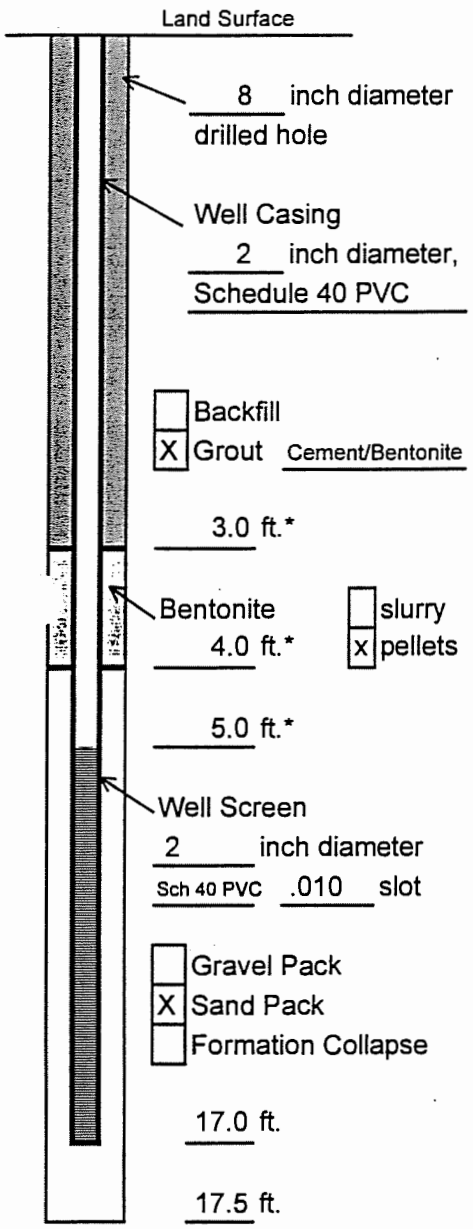
Remarks

Prepared by C. Carr

ARCADIS GERAGHTY & MILLER

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well MW-26

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 99.1 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 28, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Bailing and Purging (11/6/97)

Fluid Loss During Drilling _____ gallons

Water Removed During Development 15 gallons

Static Depth to Water 3.89 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date 11/5/97

Specific Capacity _____ gpm/ft.

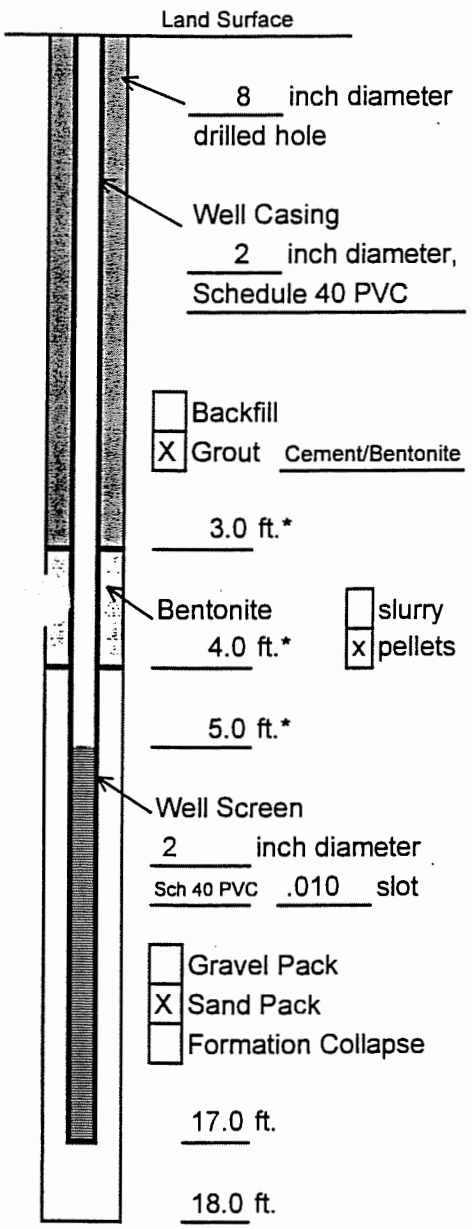
Well Purpose Monitoring

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well MW-27

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 99.2 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 27-28, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Bailing and Purging (11/6/97-12/12/97)

Fluid Loss During Drilling _____ gallons

Water Removed During Development 93 gallons

Static Depth to Water 4.00 feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date 11/5/97

Specific Capacity _____ gpm/ft.

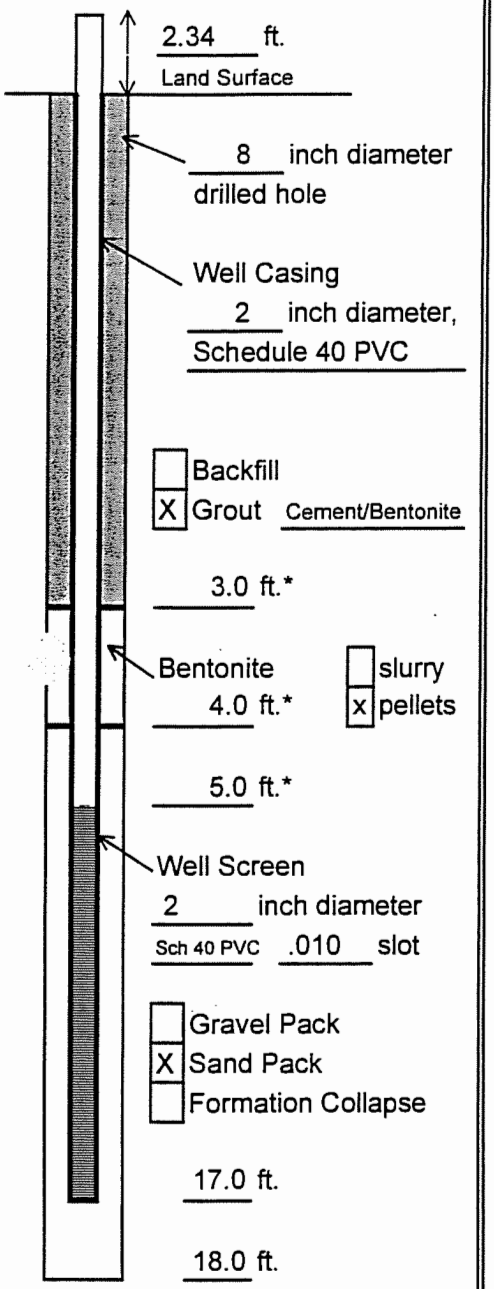
Well Purpose Monitoring

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well MW-28

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 98.7 feet [X] Surveyed [ ] Estimated

Installation Date(s) October 31, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Bailing and Purging (11/6/97-11/13/97)

Fluid Loss During Drilling _____ gallons

Water Removed During Development 25 gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft.

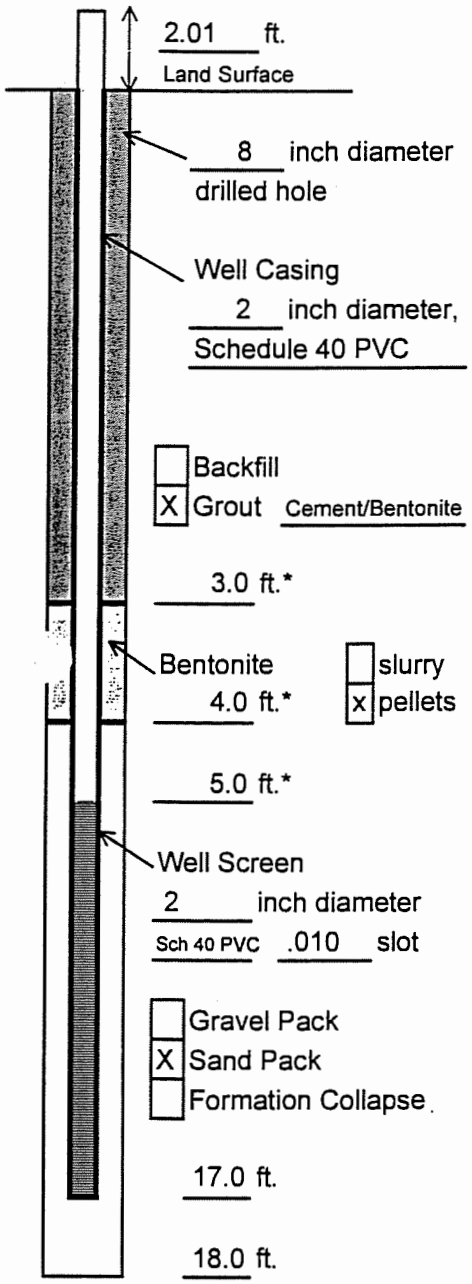
Well Purpose Monitoring

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well MW-29

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 99.0 feet [X] Surveyed [ ] Estimated

Installation Date(s) November 3, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)
Bailing and Purging (11/13/97-11/21/97)

Fluid Loss During Drilling gallons

Water Removed During Development 96 gallons

Static Depth to Water feet below M.P.

Pumping Depth to Water feet below M.P.

Pumping Duration hours

Yield gpm Date

Specific Capacity gpm/ft.

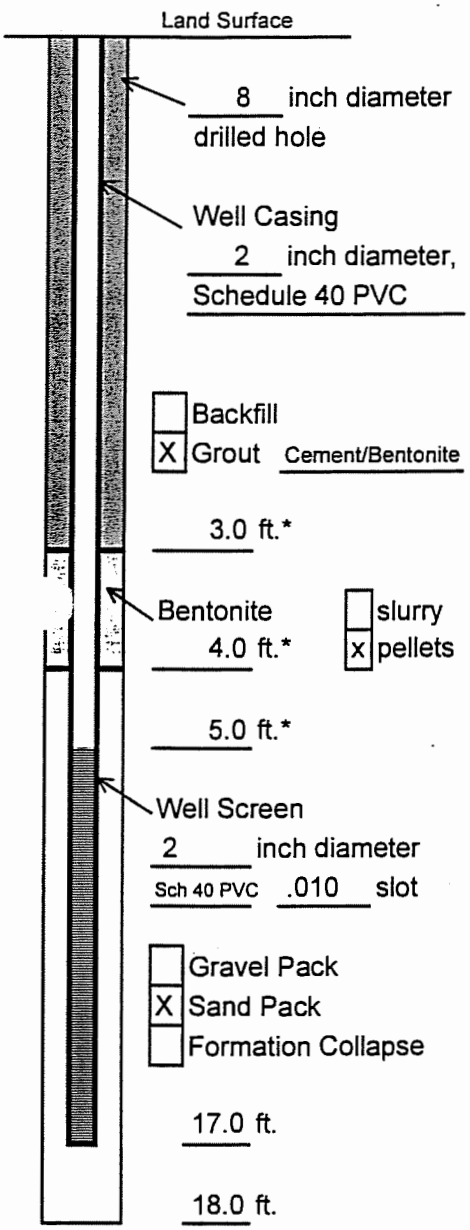
Well Purpose Monitoring

Remarks

Prepared by C. Carr

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

Depth Below Land Surface

Project Aro Corp/Ingersoll-Rand Well MW-10R

Town/City Cheektowaga

County Erie State NY

Permit No.

Land-Surface Elevation
and Datum 99.4 feet [X] Surveyed [ ] Estimated

Installation Date(s) November 5, 1997

Drilling Method Hollow Stem Auger

Drilling Contractor SJB Services, Inc.

Drilling Fluid None

Development Technique(s) and Date(s)

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft.

Well Purpose Monitoring (Replacement)

Remarks Replacement well for MW-10 which was damaged.

Prepared by C. Carr

ARCADIS GERAGHTY & MILLER

APPENDIX F

APPENDIX F

MATERIAL & PRESSURE TESTING REPORTS

SJB SERVICES, INC.

Contract Drilling and Testing

1951-1 Hamburg Turnpike
Buffalo, NY 14218
Phone: (716) 821-5911
Fax: (716) 821-0163

55 Oliver Street
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Phone: (518) 238-1145
Fax: (518) 238-1249

P.O. Box 416 • 208 Le Fevre Road
Stockertown, PA 18083
Phone: (610) 746-2670
Fax: (610) 746-2669

TOLL FREE: 1-800-821-5911

SITE REPORT

PROJECT : Aro Corp. LOCATION : Cheektowaga, N.Y.

CLIENT : Environmental Products & Services REPORT NO : S-1

CONTRACTOR : Environmental Products & Services PROJECT NO : SJB-T879

WEATHER : Cloudy 39 degrees DATE : November 20, 1997

OBSERVATIONS

This SJB Services Inc. Laboratory Manager was present at the above referenced field project to performed in-place density testing.

The contractor's intention for the day was to place and compact, ne foot lifts of on-site material for backfill of the pipe trench running north from recovery well RW-5. Tests were conducted on the lifts, with the Client and the Consultant's site representative being informed of the test results.

Due to the high moisture content of the on-site material being used, contractor was unable to achieve the ninety percent compaction effort required by the project specifications. After conferring with his office, the consultant's site representative waved the ninety percent requirement.

Refer to attached sheet for test results.

Technician : Paul Gregorczyk Time On Site : 11:00am to 4:30pm

Respectfully Submitted,
SJB Services, Inc.

SJB SERVICES, INC.
Contract Drilling and Testing

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Fax: (610) 746-2669

TOLL FREE: 1-800-821-5911

FIELD IN-PLACE DENSITY TEST REPORT

PROJECT : ARO CORP
LOCATION : CHEEKTOWAGA NY.
CLIENT : ENVIRONMENTAL PRODUCTS + SERVICES
REPORT NO : FDR-1
CONTRACTOR : ENVIRONMENTAL PRODUCTS + SERVICES
PROJECT NO : SJB-T879
WEATHER / TEMPERATURE : CLOUDY 39°F
DATE : NOVEMBER 20 1997

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
1	11-20	-3.0'	92.7	24.0	83.5	LTR-3	54' NORTH OF RW-5
2	11-20	-3.0'	99.4	22.5	89.5	LTR-3	RETEST OF #1
3	11-20	-2.0'	88.7	30.0	79.9	LTR-3	45' NORTH OF RW-5
4	11-20	-2.0'	89.1	29.0	80.3	LTR-3	5' NORTH OF RW-5
5	11-20	-2.0'	89.5	30.9	80.6	LTR-3	RETEST OF #3
6	11-20	-2.0'	94.3	28.1	85.0	LTR-3	RETEST OF #4
7	11-20	-1.0'	95.1	23.0	85.7	LTR-3	48' NORTH OF RW-5
8	11-20	-1.0'	101.7	18.4	91.6	LTR-3	3' NORTH OF RW-5

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTUR	MATERIAL TYPE AND SOURCE
LTR-1	131.6	9.0	BROWN/TAN FINES, SOME SAND, LITTLE GRAVEL : ARO CORP LOCATION RW-1
LTR-2	131.8	8.8	BROWN/TAN FINES, SOME SAND + GRAVEL : ARO CORP LOCATION RW-3
LTR-3	111.0	12.8	BLACK FINES + SAND, LITTLE GRAVEL : ARO CORP LOCATION RW-5

COMMENTS : 90% COMPACTION REQUIRED, TROXLER

TECHNICIAN : GREGORCZYK

TIME ON SITE : 11^00 Am - 4^30 pm

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

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Contract Drilling and Testing

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Fax: (610) 746-2669

TOLL FREE: 1-800-821-5911

SITE REPORT

PROJECT : AIRO Corp
LOCATION : CHEEKTOWAGA NY
CLIENT : ENVIRON. PRODUCTS + SERVICES
REPORT NO : S-1
CONTRACTOR : " " "
PROJECT NO : T-879
WEATHER / TEMPERATURE : CLOUDY 40's
DATE : 21 NOV 97

OBSERVATIONS :

THIS SJB SERVICES TECHNICIAN WAS PRESENT AT THE ABOVE REFERENCED FIELD PROJECT TO PERFORM IN-PLACE DENSITY TESTING

- IN-PLACE DENSITY TESTING WAS PERFORMED FOR THE TRENCH BETWEEN WELL #RW-6 AND RW-4

- REFER TO ATTACHED REPORT FOR TEST RESULTS AND LOCATIONS

TECHNICIAN : RODNEY SHEHAN
TIME ON SITE : 11 00 TO 2 30

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

SJB SERVICES, INC.
Contract Drilling and Testing

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Buffalo, NY 14218
Phone: (716) 821-5911
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TOLL FREE: 1-800-821-5911

FIELD IN-PLACE DENSITY TEST REPORT

PROJECT: ARO
LOCATION: Cheektowaga, NY.
CLIENT: ENVIRON PRODUCTS + SERVICES
REPORT NO: FDR-2
CONTRACTOR: " " "
PROJECT NO: T-879
WEATHER / TEMPERATURE: CLOUDY 40's
DATE: 21 NOV 97

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
							TRENCH FROM WELL* RW-6 TO RW-
1	11-21	LIFT #1	99.0	22.6	89.2	LTR-3	10' WEST OF WELL RW-6
2		↓	110.0	16.8	99.1		BETWEEN WELL RW-6 + RW-4
3		↓	96.8	23.4	87.3		10' EAST OF WELL RW-4
4		LIFT #2	103.9	19.8	93.6		10' EAST OF WELL RW-4
5		↓	98.3	21.4	88.6		BETWEEN WELL RW-6 + RW-4
6		↓	99.2	22.4	89.4		10' WEST OF WELL RW-6
7		LIFT #3	97.2	24.3	87.5		10' EAST OF WELL RW-4
8		↓	100.3	23.5	90.3		BETWEEN WELL RW-6 + RW-4
9		↓	95.7	25.3	86.2		10' WEST OF WELL RW-6

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
LTR-3	111.0	12.8	BLACK FINES + SAND - ORGANIC

COMMENTS: 90% COMP. REQUIRED / CLIENT OK'ED FAILED TESTS
TECHNICIAN: RODNEY SHEEHAN
TIME ON SITE: 1100 TO 230

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

SJB SERVICES, INC.
Contract Drilling and Testing

1951-1 Hamburg Turnpike
Buffalo, NY 14218
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TOLL FREE: 1-800-821-5911

SITE REPORT

PROJECT : ARO CORP. LOCATION : CHEEKTOWAGA, NY

CLIENT : ES AND B REPORT NO : S-3

CONTRACTOR : ES AMB PROJECT NO : T-879

WEATHER / : TEMPERATURE OVERCAST 40° DATE : 11-26-97

OBSERVATIONS : ON THIS DATE THIS SJB SERVICES TECHNICIAN WAS PRESENT AT THE ABOVE REFERENCED PROJECT to PERFORM IN PLACE DENSITY TEST ON MATERIAL BEING PLACED AND COMPACTED IN 1 FOOT LIFTS IN THE RW1 TRENCH.

A TROXLER, MODEL # 3430, NUCLEAR DENSITY GAUGE WAS EMPLOYED IN THE PERFORMANCE OF SAID TESTS

TEST RESULTS CAN BE FOUND ON THE ATTACHED REPORT.

THE RESULTS OF SAID TEST WERE APPROVED BY JEFF BONSTEEL OF GEOLABITY AND MILLER.

CHNICIAN : Richard J. Klosowski TIME ON SITE : 10:00 to 12:30

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

SJB SERVICES, INC.

Contract Drilling and Testing

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Phone: (716) 821-5911
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TOLL FREE: 1-800-821-5911

FIELD IN-PLACE DENSITY TEST REPORT

PROJECT : AEO Corp
LOCATION : CHEEK. TONAGA, NY.
CLIENT : A ES AND B
REPORT NO : FDR-3
CONTRACTOR : ES AND B
PROJECT NO : T-879
WEATHER / : TEMPERATURE : OVERCAST
DATE : 11-26-97

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
							RW 1
1	11/26	1ST LIFT	113.2	16.1	86.0	LTE-1	60' WEST OF RW 1
2			109.6	18.7	83.3		40' " " " 1
3			113.8	15.2	86.5		3' " " RW 1
4			115.4	14.3	87.7		RETEST OF #1 TEST
5		2ND LIFT	109.5	18.4	83.2		12' WEST OF RW 1

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
LTE-1	131.6	9.0	BROWN TAN FINES SOME SAND, LITTLE GRAVEL ON SITE MAT.

COMMENTS : TEST RESULTS APPROVED BY J. BONSTEEL OF C. BEAGHTY + MILLER

TECHNICIAN : Richard J. Klusiewicz

TIME ON SITE : 10:00 to 12:30

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

SJB SERVICES, INC.
Contract Drilling and Testing
1951-1 Hamburg Turnpike
Buffalo, NY 14218
Phone: (716) 821-5911
Fax: (716) 821-0163

SITE REPORT

PROJECT : Aro Corp. LOCATION : Cheektowaga, N.Y.

CLIENT : Environmental Products & Services REPORT NO : S-4

CONTRACTOR : Environmental Products & Services PROJECT NO : SJB-T879

WEATHER : Cloudy 37 degrees DATE : December 3, 1997

OBSERVATIONS

This SJB Services Inc. Laboratory Manager was present at the above referenced field project to performed in-place density testing.

The contractor's intention for the day was to place and compact, one foot lifts of on-site material for backfill of the pipe trench running west and south from recovery well RW-3. Tests were conducted on the lifts, with the Client and the Consultant's site representative being informed of the test results.

Due to the high moisture content of the on-site material being used, contractor was unable to achieve the ninety five percent compaction effort required by the project specifications. After conferring with the consultant's site representative the ninety five percent requirement was waived. After placement and testing of the second lift, the consultant's site representative waived testing for the third lift.

Refer to attached sheet for test results.

Technician : Paul Gregorczyk Time On Site : 11:00am to 1:30pm

Respectfully Submitted,
SJB Services, Inc.

SJB SERVICES, INC.

Contract Drilling and Testing

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Buffalo, NY 14218
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TOLL FREE: 1-800-821-5911

FIELD IN-PLACE DENSITY TEST REPORT

PROJECT : ARD CORP
LOCATION : CHEEKTOWAGA N.Y.
CLIENT : ENVIRONMENTAL PRODUCTS + SERVICES
REPORT NO : FDR-4
CONTRACTOR : ENVIRONMENTAL PRODUCTS + SERVICES
PROJECT NO : SJB-T879
WEATHER / : TEMPERATURE : PARTLY CLOUDY 37°F
DATE : DECEMBER 3, 1997

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
							PIPE TRENCH
1	12-3	1ST LIFT	114.5	15.5	86.9	LTR-2	45' WEST, 20' SOUTH OF RW-3
2	12-3	1ST LIFT	117.0	15.3	89.0	LTR-2	45' WEST, 55' SOUTH OF RW-3
3	12-3	1ST LIFT	114.7	16.0	87.0	LTR-2	27' WEST OF RW-3
4	12-3	2ND LIFT	114.5	13.8	86.9	LTR-2	45' WEST, 30' SOUTH OF RW-3
5	12-3	2ND LIFT	109.9	15.0	83.4	LTR-2	45' WEST, 50' SOUTH OF RW-3
6	12-3	2ND LIFT	109.4	15.0	83.0	LTR-2	29' WEST OF RW-3

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
LTR-2	131.8	8.8	ON-SITE BROWN-TAN FINES, SOME SAND + GRAVEL FROM RW-3 AREA

COMMENTS : 95% COMPACTION REQUIRED TROXLER 3430 (#23724) DIRECT TRANSMISSION

TECHNICIAN : GREGORCZYK

TIME ON SITE : 11:00 AM - 1:30 PM

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

SJB SERVICES, INC.

Contract Drilling and Testing

1951-1 Hamburg Turnpike
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TOLL FREE: 1-800-821-5911

SITE REPORT

PROJECT : ARO CORP

LOCATION : CHEEK.

CLIENT : ENVIRONMENTAL PRODUCTS & SERVICES

REPORT NO : S-5

CONTRACTOR : ENVIRONMENTAL PRODUCTS

PROJECT NO :

WEATHER / TEMPERATURE : CLOUDY 35°

DATE : 4 DEC 97

OBSERVATIONS :

THIS STB SERVICES TECHNICIAN WAS PRESENT AT THE ABOVE REFERENCED FIELD PROJECT TO PERFORM IN-PLACE DENSITY TESTING

- CONTRACTOR WAS NOT READY FOR TESTING WILL RETURN NEXT DAY FOR TESTING

TECHNICIAN : RODNEY SHEEHAN

TIME ON SITE : 3^00 TO 4^30

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

SJB SERVICES, INC.
Contract Drilling and Testing

1951-1 Hamburg Turnpike
Buffalo, NY 14218
Phone: (716) 821-5911
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Phone: (610) 746-2670
Fax: (610) 746-2669

TOLL FREE: 1-800-821-5911

SITE REPORT

PROJECT : ARO CORP
LOCATION : CHEEK.

CLIENT :
REPORT NO : S-6

CONTRACTOR : ENVIRONMENTAL PRODUCTS
PROJECT NO :

WEATHER / TEMPERATURE : CLOUDY 35°
DATE : 4 DEC 97

OBSERVATIONS :

THIS SJB SERVICES TECHNICIAN WAS PRESENT AT THE ABOVE REFERENCED FIELD PROJECT TO PERFORM IN-PLACE DENSITY TESTING

- CONTRACTOR WAS NOT READY FOR TESTING WILL RETURN LATER IN THE DAY

TECHNICIAN : RODNEY SHEEHAN
TIME ON SITE : 11:30 AM TO 12:30 PM

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

SJB SERVICES, INC.

Contract Drilling and Testing

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Buffalo, NY 14218
Phone: (716) 821-5911
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TOLL FREE: 1-800-821-5911

SITE REPORT

PROJECT : ARO CORP

LOCATION : CHEEK.

CLIENT : ENVIRONMENTAL PRODUCTS

REPORT NO : S-7

CONTRACTOR : ENVIRONMENTAL PRODUCTS

PROJECT NO :

WEATHER / TEMPERATURE : CLOUDY 33°

DATE : 5 DEC 97

OBSERVATIONS :

THIS SJB SERVICES TECHNICIAN WAS PRESENT AT THE ABOVE REFERENCED FIELD PROJECT TO PERFORM IN-PLACE DENSITY TESTING.

- IN-PLACE DENSITY TESTING WAS PERFORMED FOR A PIPE TRENCH BETWEEN WELL RW-9 AND RW-10.

- REFER TO ATTACHED REPORT FOR TEST LOCATIONS AND RESULTS

TECHNICIAN : RODNEY SHEEHAN

TIME ON SITE : 9:00 - 10:30

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

SJB SERVICES, INC.

Contract Drilling and Testing

1951-1 Hamburg Turnpike
Buffalo, NY 14218
Phone: (716) 821-5911
Fax: (716) 821-0163

55 Oliver Street
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Phone: (518) 238-1145
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P.O. Box 416 • 208 Le Fevre Road
Stockertown, PA 18083
Phone: (610) 746-2670
Fax: (610) 746-2669

TOLL FREE: 1-800-821-5911

FIELD IN-PLACE DENSITY TEST REPORT

PROJECT : ARO CORP LOCATION : CHEEK.

CLIENT : ENVIRONMENTAL PRODUCTS REPORT NO : FDR-5

CONTRACTOR : ENVIRONMENTAL PRODUCTS PROJECT NO : _____

WEATHER / TEMPERATURE : CLOUDY 33° DATE : 5 DEC. 97

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
							PIPE TRENCH
1	12-5	LIFT #1	117.4	14.8	89.1	LTR-2	(MIDDLE) BETWEEN WELL RW-9 + RW-10
2	↓	FINAL	125.0	11.4	94.8	↓	30' NORTH OF WELL RW-9
3		#1 LIFT	118.2	12.4	89.6		25' SOUTH OF WELL RW-10

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
LTR-2	131.8	8.8	BROWN-TAN FINES SOME SANDY GRAVEL

COMMENTS : 90% COMP. REQUIRED

TECHNICIAN : RODNEY SHEEHAN

TIME ON SITE : 900 TO 1030

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SITE REPORT

PROJECT : Aro Corp. LOCATION : Cheektowaga, N.Y.

CLIENT : Environmental Products & Services REPORT NO : S-8

CONTRACTOR : Environmental Products & Services PROJECT NO : SJB-T879

WEATHER : Cloudy 27 degrees DATE : December 10, 1997

OBSERVATIONS

This SJB Services Inc. Laboratory Manager was present at the above eferenced field project to performed in-place density testing.

Upon arrival to the site, contractor was in the process of placing and compacting on-site material for the pipe trenches running north and east from RW-8. Tests were conducted on the lift placed, with the Client and the Consultant's site representative being informed of the test results.

Refer to attached sheet for test results.

Technician : Paul Gregorczyk Time On Site : 10:30am to 1:00 am

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FIELD IN-PLACE DENSITY TEST REPORT

PROJECT : ARO CORP
LOCATION : CHEEKTOWAGA NY
CLIENT : ENVIRONMENTAL PRODUCTS + SERVICES
REPORT NO : FDR-6
CONTRACTOR : ENVIRONMENTAL PRODUCTS + SERVICES
PROJECT NO : SJB-T879
WEATHER / TEMPERATURE : CLOUDY 28°F
DATE : DECEMBER 10 1997

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
							PIPE TRENCH LINE
1	12-10	-1.0'	113.8	14.4	86.3	LTR-2	5' NORTH OF RW-8
2	12-10	-1.0'	105.8	16.4	80.3	LTR-2	15' EAST OF RW-8

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
LTR-8	131.8	8.8	ON-SITE BROWN FINES, SOME SAND + GRAVEL FROM RW-3 AREA

COMMENTS : TROXLER 3430 (23724) DIRECT TRANSMISSION
TECHNICIAN : GREGORCZYK
TIME ON SITE : 10 30 Am - 11 00 Am

RESPECTFULLY SUBMITTED,
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SITE REPORT

PROJECT : ARD CORP. LOCATION : CHEEK

CLIENT : ENVIROMENTAL PRODUCTS + SERVICES REPORT NO : S-9

CONTRACTOR : ENVIROMENTAL PRODUCTS & SERVICES PROJECT NO : T-879

WEATHER / TEMPERATURE : SUNNY 40' DATE : 12-16-97

OBSERVATIONS : ON THIS DATE THIS SJB SERVICES TECHNICIANS WAS PRESENT AT THE ABOVE REFERENCED PROJECT to PERFORM IN PLACE DENSITY TESTS ON MATERIAL PLACED IN THE MAIN TRENCH

A TROXLER, MODEL # 3430, WAS EMPLOYED IN THE PERFORMANCE OF SAID TESTS.

TEST RESULTS CAN BE FOUND ON THE ATTACHED REPORT.

TECHNICIAN : Richard F. Klosowski

TIME ON SITE : 11:00 to 1:30

RESPECTFULLY SUBMITTED,
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FIELD IN-PLACE DENSITY TEST REPORT

PROJECT : ARO
LOCATION : CHEEK.
CLIENT : ENVIROMENTAL PRODUCTS + SERVICES
REPORT NO : FDR-7
CONTRACTOR : ENVIROMENTAL PRODUCTS + SERVICES
PROJECT NO : T-879
WEATHER / : TEMPERATURE : SUNNY 40°
DATE : 12-16-97

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
							MAIN TRENCH
1	12/16	1ST LIFT	109.3	18.3	83.1	LTR1	15' EAST OF EXIST. BLDG.
2		2ND LIFT	115.2	13.2	87.6		18' " " " "

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
LTR1	131.6	9.0	ONSITE MATECIAL BROWN TAN FINE SOME SAND LITTLE GRAVEL

COMMENTS : TEST RESULT APPROVED BY J. BONSTEEL OF GERAGHTY & MILLER
TECHNICIAN : Richard J. Florentine
TIME ON SITE : 11:00 to 1:30

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

By

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SITE REPORT

PROJECT : Aro Corp. LOCATION : Cheektowaga, N.Y.

CLIENT : Environmental Products & Services REPORT NO : S-10

CONTRACTOR : Environmental Products & Services PROJECT NO : SJB-T879

WEATHER : Sunny 35 degrees DATE : December 15, 1997

OBSERVATIONS

This SJB Services Inc. Laboratory Manager was present at the above referenced field project to performed in-place density testing.

Upon arrival to the site, contractor was in the process of placing and compacting on-site material for the main pipe trench line. Tests were conducted on the lifts placed, with the Client and the Consultant's site representative being informed of the test results.

Refer to attached sheet for test results.

Technician : Paul Gregorczyk Time On Site : 1:30pm to 3:00 pm

Respectfully Submitted,
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FIELD IN-PLACE DENSITY TEST REPORT

PROJECT : ARO CORP
LOCATION : CHEEKTOWAGA NY
CLIENT : ENVIRONMENTAL PRODUCTS + SERVICES
REPORT NO : FDR-8
CONTRACTOR : ENVIRONMENTAL PRODUCTS + SERVICES
PROJECT NO : SJB-T879
WEATHER / : TEMPERATURE : SUNNY
DATE : DECEMBER 15 1997

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
							MAIN TRENCH LINE
1	12-15	1ST LIFT	112.0	17.7	85.0	LTR-2	11' NORTH OF RW-7 BRANCH OFF
2	12-15	2ND LIFT	112.3	17.1	85.2	LTR-2	9' NORTH OF RW-7 BRANCH OFF

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
LTR-2	131.8	8.8	ON-SITE BROWN FINES SOME SAND + GRAVEL FROM RW-3 AREA

COMMENTS : TROXLER 3430 (23724) DIRECT TRANSMISSION

TECHNICIAN : GREGORCZYK

TIME ON SITE : 1:30 PM - 3:00 PM

RESPECTFULLY SUBMITTED,
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SITE REPORT

PROJECT : ARO CORP

LOCATION : CHEEKTOWAGA, N.Y.

CLIENT : ENVIRONMENTAL PRODUCTS & SERVICES

REPORT NO : S-11

CONTRACTOR : ENV. PROD & SERV.

PROJECT NO : T-879

WEATHER / TEMPERATURE : PARTLY CLOUDY 34°F

DATE : TUE 9 DEC 97

OBSERVATIONS : THIS SJB SERVICES SENIOR ENGINEERING TECHNICIAN WAS AT THE ABOVE REF. PROJECT SITE DURING THE TIMES INDICATED BELOW. THE FOLLOWING WAS NOTED:

1.) TECHNICIAN WAS ON SITE TO PERFORM SOIL IN-PLACE DENSITY TESTING. TESTS WERE PERFORMED USING A TROXLER 3430 NUCLEAR DENSITY GUAGE (SER.NO. 23724). ALL TESTS WERE RECORDED ON THE ATTACHED FIELD IN-PLACE DENSITY TEST REPORT.

TECHNICIAN : DONALD A. WILSON

TIME ON SITE : 900 AM - 1000 AM

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

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FIELD IN-PLACE DENSITY TEST REPORT

PROJECT: ARO CORP LOCATION: CHEEKTOWAGA, NY

CLIENT: ENVIROUMENTAL PRODUCTS & SERVICES REPORT NO: FDR-9

CONTRACTOR: ENV. PROD & SERV. PROJECT NO: T-879

WEATHER/ TEMPERATURE: SUNNY DATE: TUE 9 DEC 97

Test No.	Date of Test	Depth or Elevation	In-place Density (pcf)	In-place Moisture (%)	% Compaction	Proctor Code	Location and Remarks
1	9 DEC	GRADE -33"	113.3	15.7	85.9	LTR 2	TRENCH BACKFILL 25' SE OF RW-9
2	"	-26"	114.7	15.3	87.0	"	" " 20' " " "

Proctor Code	Maximum Density (pcf)	Optimum Moisture (%)	Material Type and Source
LTR-2	131.8	8.8	ON-SITE BROWN/TAN FINES, SOME SAND + GRAVEL FROM RW-3 AREA

Comments: ALL TEST RESULTS OBSERVED BY * THE CLIENT AND A REP. FROM GERAGHTY & MILLER

Technician: DONALD A. WILSON

Time On Site: 900 AM - 1000 AM

Respectfully Submitted,
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SJB SERVICES, INC.
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SITE REPORT

PROJECT : ARO CORP — LOCATION : CHEEKTOWAGA, N.Y.

CLIENT : ENVIRONMENTAL PRODUCTS & SERVICES — REPORT NO : S-12

CONTRACTOR : ENV. PROD & SERV. — PROJECT NO : T-879

WEATHER / TEMPERATURE : PARTLY CLOUDY 34°F — DATE : FRI 12 DEC 97

OBSERVATIONS : THIS SJB SERVICES SÉNIOR ENGINEERING TECHNICIAN WAS AT THE ABOVE REF. PROJECT SITE DURING THE TIMES INDICATED BELOW. THE FOLLOWING WAS NOTED:

1.) TECHNICIAN WAS ON SITE TO PERFORM SOIL IN-PLACE DENSITY TESTING. TESTS WERE PERFORMED USING A TROXLER 3430 NUCLEAR DENSITY GUAGE (SER.NO. 23724). ALL TESTS WERE RECORDED ON THE ATTACHED FIELD IN-PLACE DENSITY TEST REPORT.

TECHNICIAN : DONALD A. WILSON — TIME ON SITE : 9⁰⁰ AM - 10³⁰ AM

RESPECTFULLY SUBMITTED,
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FIELD IN-PLACE DENSITY TEST REPORT

PROJECT : ARO CORP. LOCATION : CHEEKTOWAGA, NY

CLIENT : ENVIRONMENTAL PRODUCTS & SERVICES REPORT NO : FOR-10

CONTRACTOR : ENV. PROD & SERV PROJECT NO : T-879

WEATHER / : PARTLY CLOUDY DATE : FRI 12 DEC 97
TEMPERATURE

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
1	12 DEC	GRADE -2'-6"	114.6	15.8	86.9		80' W OF RW-2
2	"	-2'-6"	111.4	17.1	84.5		MAIN & W O.H DOOR
3	"	-0'-8"	114.4	13.4	86.8		MAIN - 25' N OF RW-2
	"	-0'-8"	112.0	17.7	85.0		5' S OF E O.H. DOOR

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
LTR-2	131.8	8.8	ON SITE BROWN/TAN FINES, SOME SAND + GRAVEL

COMMENTS : ALL TEST RESULTS OBSERVED OR REPORTED TO CLIENT AND A REP. FROM GERAGHTY & MILLER

TECHNICIAN : DONALD A. WILSON

TIME ON SITE : 900 AM - 1037 AM

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SITE REPORT

PROJECT : ARO CORP

LOCATION : CHEEKTOWAGA, N.Y.

CLIENT : ENVIRONMENTAL PRODUCTS & SERVICES

REPORT NO : S-13

CONTRACTOR : ENV. PROD & SERV.

PROJECT NO : T-879

WEATHER / : TEMPERATURE OVERCAST 30°F

DATE : THUR 11 DEC 97

OBSERVATIONS : THIS SJB SERVICES SÉNIOR ENGINEERING TECHNICIAN WAS AT THE ABOVE REF. PROJECT SITE DURING THE TIMES INDICATED BELOW. THE FOLLOWING WAS NOTED:

1.) TECHNICIAN WAS ON SITE TO PERFORM SOIL IN-PLACE DENSITY TESTING. TESTS WERE PERFORMED USING A TROXLER 3430 NUCLEAR DENSITY GUAGE (SER.NO. 23724). ALL TESTS WERE RECORDED ON THE ATTACHED FIELD IN-PLACE DENSITY TEST REPORT.

TECHNICIAN : DONALD A. WILSON

TIME ON SITE : 10³⁰ AM - 1³⁰ PM

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FIELD IN-PLACE DENSITY TEST REPORT

PROJECT : ARO CORP. LOCATION : CHEEKTOWAGA, NY

CLIENT : ENVIRONMENTAL PRODUCTS & SERVICES REPORT NO : FDR-11

CONTRACTOR : ENV. PROD & SERV PROJECT NO : T-879

WEATHER / TEMPERATURE : OVERCAST 30°F DATE : THUR 11 DEC 97

TEST NO.	DATE OF TEST	DEPTH OR ELEVATION	IN-PLACE DENSITY (pcf)	IN-PLACE MOISTURE	% COMPACTION	PROCTOR CODE	LOCATION AND REMARKS
1	"DEC	GRADE -2'-6"	116.4	14.8	88.3	LTR-2	2' W OF RW-2
2	"	"	112.5	16.4	85.4	"	25' W " "
3	"	-1'-3"	112.5	12.9	85.3	"	3' W " "
4	"	"	106.9	17.2	81.1	"	20' W " "
5	"	"	109.7	19.4	83.2	"	20' W (RETEST)

PROCTOR CODE	MAXIMUM DENSITY (pcf)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
LTR-2	131.8	8.8	ON SITE BROWN/TAN FINES, SOME SAND + GRAVEL

COMMENTS : ALL TEST RESULTS OBSERVED OR REPORTED TO CLIENT AND A REP. FROM GERAGHTY & MILLER

TECHNICIAN : DONALD A. WILSON

TIME ON SITE : 10^30 AM - 1^30 PM

RESPECTFULLY SUBMITTED,
SJB SERVICES, INC.

APPENDIX G

MSDS SHEETS

TRAVAINI PUMPS USA
Liquid Ring & Rotary Vane Vacuum Pumps and Systems

Material Safety Data Sheet

PRODUCT INFORMATION

TRAVAINI P/N #: 971-0022-A000
CHEMICAL NAME: HYDROTREATED, PARAFFINIC MINERAL OIL
CHEMICAL FAMILY: SEMI-SYNTHETIC HYDROCARBON
FORMULA: PROPRIETARY
CAS#: PROPRIETARY

COMPONENTS AND HAZARD STATEMENT

NOTE: This product is **NON-HAZARDOUS**. The product contains no known carcinogens. No special warning labels are required under OSHA 29 CFR 1910.1200.

SAFE HANDLING AND STORAGE

NOTE: Do not take internally. Avoid contact with skin, eyes, and clothing. Upon contact with skin, wash with soap and water. Flush eyes with water for 15 minutes and consult physician. Wash contaminated clothing before reuse.

NOTE: Keep container tightly sealed when not in use.

PHYSICAL DATA

APPEARANCE: CLEAR LIQUID, LIGHT AMBER TINT
BOILING POINT: >300°F
VAPOR PRESSURE: <0.01mmHg @ 20°C
SPECIFIC GRAVITY (WATER = 1): 0.87-0.89
VOLATILES, PERCENT BY VOLUME: 0%
ODOR: SLIGHT
SOLUBILITY IN WATER: INSOLUBLE
EVAPORATION RATE (BUTYL ACETATE = 1): NIL

FIRE AND EXPLOSION HAZARDS

FLASH POINT (BY CLEVELAND OPEN CUP): 375-500°F
FLAMMABLE LIMITS: NOT ESTABLISHED
AUTOIGNITION TEMPERATURE: NO DATA
HMIS RATINGS:
HEALTH: 0
FLAMMABILITY: 1
REACTIVITY: 0
NFPA RATINGS: NOT ESTABLISHED
EXTINGUISHING MEDIA: DRY CHEMICAL; CO_2 FOAM; WATER SPRAY
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

NOTE: Burning fluid may evolve irritating/noxious fumes. Firefighters should use NIOSH/MNSA-approved self-contained breathing apparatus. Use water to cool fire-exposed containers. Use water carefully near exposed liquid to avoid frothing and splashing of hot liquid.

REACTIVITY DATA

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR
INCOMPATIBLE MATERIALS: STRONG OXIDIZERS
CONDITIONS TO AVOID: EXCESSIVE HEAT
HAZARDOUS DECOMPOSITION PRODUCTS: ANALOGOUS COMPOUNDS EVOLVE CARBON MONOXIDE, CARBON DIOXIDE, AND OTHER UNIDENTIFIED FRAGMENTS WHEN BURNED. SEE SECTION 5.

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 5 MG/M^3 ACGIH FOR OIL MISTS
SITUATIONS TO AVOID: AVOID BREATHING OIL MISTS
FIRST AID PROCEDURES:
INGESTION: CONSULT PHYSICIAN AT ONCE. **DO NOT INDUCE VOMITING.** MAY CAUSE NAUSEA AND DIARRHEA.
INHALATION: PRODUCT IS NOT TOXIC BY INHALATION. IF OIL MIST IS INHALED, REMOVE TO FRESH AIR AND CONSULT PHYSICIAN.

NOTE: To the best of our knowledge the toxicity of this product had not been fully investigated. Analogous compounds are considered to be essentially non-toxic.

PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: USE IN WELL VENTILATED AREA
VENTILATION: LOCAL EXHAUST
PROTECTIVE GLOVES: NOT REQUIRED, BUT RECOMMENDED, ESPECIALLY FOR PROLONGED EXPOSURE.
EYE/FACE PROTECTION: GOGGLES

SPILL OR LEAK PROCEDURES

NOTE: In case of a spill, wear suitable protective equipment, especially goggles. Stop source of spill. Dike spill area. Use absorbent materials to soak up fluid (i.e. sand, sawdust, and commercially available materials). Wash spill area with large amounts of water. Properly dispose of all materials.

WASTE DISPOSAL METHODS

NOTE: Incinerate this product and all associated wastes in a licensed facility in accordance with Federal, state, and local regulations.

NOTE: The information in this material safety data sheet should be provided to all who use , handle, store, transport, or are otherwise exposed to this product. TRAVAINI PUMPS believes the information in this document to be reliable and up to date as of the date of publication, but makes no guarantee that it is.

C: MATERIAL SAFETY DATA SHEET FOR TRAVAINI, P/N 971-0022-A000
LE: 9710022.DOC
REV: 7/8/97

U.S. FILTER
WESTATES

MATERIAL SAFETY DATA SHEET

SECTION I

		Product Name:	ACTIVATED CARBON, CC SERIES, KG SERIES, KP SERIES
Manufacturer:	U.S. FILTER/WESTATES	MSDS:	100
	5375 South Boyle Ave.	CAS Number:	CAS 7440-44-0
	Los Angeles, California 90058	Date Prepared:	JUNE 25, 1997
Phone Number For Information:	(213) 722-7500	Prepared By:	MARGARET JEFFERSON
Emergency Phone Number:	(800) 659-1771	Note:	Black spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

SECTION II - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS - Chemical Name & Common Names (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	%	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED
ACTIVATED CARBON	100%	2.5mg/m^3	1.5mg/m^3	NONE
NON-HAZARDOUS INGREDIENTS				
TOTAL	100.			

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS

BOILING POINT: not applicable	SPECIFIC GRAVITY (H20 = 1): 0.25 - 0.60 g/cc
VAPOR PRESSURE (mm HG AND TEMPERATURE): zero	MELTING POINT: not applicable
VAPOR DENSITY (AIR = 1): not applicable	EVAPORATION RATE(_____ = 1): not applicable
SOLUBILITY IN WATER: Insoluble in water and solvents	WATER REACTIVE: non-reactive
APPEARANCE AND ODOR: Black granules without taste or odor	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT AND METHOD USED: N/A	Auto-Ignition Temperature: > 450°C ANSI/ASTM D 3468	Flammability Limits in Air % by Volume: N/A	LEL N/A	UEL N/A

EXTINGUISHER MEDIA: Water (fog or fine spray), carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES: Avoid procedures that may stir up dust clouds.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Avoid contact with strong oxidizers.

MATERIAL SAFETY DATA SHEET CC SERIES, KG SERIES, KP SERIES

SECTION V - REACTIVITY HAZARD DATA

STABILITY: Stable x Unstable ☐	CONDITIONS TO AVOID: Contact with strong oxidizers.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents	HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Dioxide Carbon Monoxide
Hazardous polymerization: May Occur ☐ Will not Occur x	CONDITIONS TO AVOID: not applicable

SECTION VI - HEALTH HAZARD DATA

PRIMARY ROUTES: Inhalation x Ingestion ☐ CARCINOGEN LISTED IN: NTP ☐ OSSA ☐ LARC☐ Monograph ☐ Not Listed x

HEALTH HAZARDS LD50 VALVES: not available ACUTE: not available CHRONIC: No effects from chronic exposure are known

EMERGENCY FIRST AID PROCEDURES: Seek medical assistance for further treatment, observation and support if necessary.

EYE CONTACT: Immediately flush with copious amounts of water. If redness, itching or a burning sensation develops, have eyes examined and treated by medical personnel.

SKIN CONTACT: Wash material off the skin with soap and water. If redness, itching or a burning sensation develops, get medical attention.

INHALATION: Remove victim to fresh air. If cough or other respiratory symptoms develop, consult medical personnel.

INGESTION: Give one or two glasses of water to drink. If gastrointestinal symptoms develop, consult medical personnel (Never give anything by mouth to an unconscious person).

SECTION VII CONTROL AND PROTECTIVE MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): Use MSA-NIOSH approved respirator for respirable dusts, mists and fumes.

PROTECTIVE GLOVES: Rubber latex.

EYE PROTECTION: Safety glasses with side shields. Contact lenses should not be worn when working with carbon.

VENTILATION TO BE USED: Local Exhaust x Mechanical (general) ☐ Special ☐ Other (specify) ☐

THER PROTECTIVE CLOTHING AND EQUIPMENT: NONE

.IYGIENIC WORK PRACTICES: Wash contacted skin areas after handling.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE/LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: Wear respiratory protection during clean up. Sweep up and recover or mix material with moist absorbent for dust control and pick-up and shovel into waste container. Use detergent in spill area after clean up and flush with plenty of water.

WASTE DISPOSAL METHODS: Dispose of virgin (unused) carbon (waste or spillage) per local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Activated carbon can be safely stored in any normal storage area, but away from direct heat.

OTHER PRECAUTIONS AND OR SPECIAL HAZARDS: An oxygen deficiency may be created when activated carbon is stored in an enclosed space/silo. Ventilate or wear self-contained breathing apparatus. Follow procedures for confined space entry.

NFPA Rating: Health 1 Flammability 1 Reactivity 0	HMIS Rating: Health 1 Flammability 1 Reactivity 0 Special ☐

MATERIAL SAFETY DATA SHEET

Hydrosil Spectrum
HS-600

Identity (Trade Name As Used On Label)

Hydrosil International Limited

Manufacturer

MSDS Number*

1180 St. Charles Street

Address

CAS Number*

Elgin, IL 60120

June 11, 1996

Date Prepared

1-800-PURPLE1 1-800-787-7531

William J. Waldschmidt

Phone Number (For Information)

Prepared By*

1-847-741-1600 1-847-741-1616

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Emergency Phone Number Telex*

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS – Chemical Name & Common Names (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	% *	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED
potassium permanganate (KMnO4)				
CAS # 7722-64-7	6-8%	5mg/m3	5mg/m3	None
All other components are not subject on				
the SARA 313				
William J. Waldschmidt, President				
Non-Hazardous Ingredients molecular sieve/moisture	92-9			
TOTAL	100			

SECTION 2 - PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling Point: N/A

Density: 58-62#/ft3

Vapor Pressure (mm Hg and Temperature): N/A

Melting Point: N/A

Vapor Density (Air = 1): N/A

Evaporation Rate (_____ = 1): N/A

Solubility in Water: KMnO4-yes, molecular sieve-no

Water Reactive: N/A

Appearance and Odor: Purple granules, odorless

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

Flash Point and Method Used: Noncombustible

Auto-Ignition Temperature: N/A

Flammability Limits in Air % by Volume: N/A

LEL: N/A

UEL: N/A

Extinguisher Media: N/A

Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

*Optional

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY — [XX] Stable [ ] Unstable
Conditions To Avoid: Protect containers against puncture and physical damage, keep in a dry area, avoid exposure to water

Incompatability (Materials to Avoid): None

Hazardous Decomposition Products: None

HAZARDOUS POLYMERIZATION — [ ] May Occur [XX] Will Not Occur
Conditions To Avoid: None

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY — [ ] Inhalation [ ] Ingestion [ ] Skin Absorption [XX] Not Hazardous

CARCINOGEN LISTED IN — [ ] NTP [ ] IARC Monograph [XX] Not Listed

HEALTH HAZARDS
Acute: May be irritating to body tissu upon contact
Chronic: None

Signs and Symptoms of Exposure: May stain body tissue

Medical Conditions Generally Aggravated by Exposure: Open wounds, burns and mucous membranes

EMERGENCY FIRST AID PROCEDURES – Seek medical assistance for further treatment, observation and support if necessary.

Eye Contact: Immediately flush with large amounts of water for 15 minutes

Skin Contact: Immediately flush with soap and water

Inhalation: Leave contaminated area

Ingestion: Drink several glasses of water or milk. Seek medical attention

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (Specify Type): Treat as low level nuisance dust, Use NIOSH/MSA #TC-21C-132

Protective Gloves: Rubber or plastic gloves

Eye Protection: Safety glasses

VENTILATION TO BE USED — [ ] Local Exhaust [XX] Mechanical (general) [ ] Special [ ] Other (specify)

Other Protective Clothing and Equipment: Regular work clothing

Hygienic Work Practices: Wash hands before eating. Wash contaminated clothing.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE / LEAK PROCEDURES

Steps to be Taken If Material Is Spilled Or Released: Sweep up granules and dispose of in accordance with local, state, and federal regulations.

Waste Disposal Methods: Reduce potassium permanganate with hypo (10% sodium thiosulfate) solution and deposit in permitted landfill.

Precautions to be Taken in Handling and Storage: Protect containers against physical damage. Store in a cool dry area in closed containers.

Other Precautions and/or Special Hazards: Avoid exposure to water and contaminated air, otherwise the media is rendered useless

NFPA Rating* Health ____ Flammability ____ Reactivity ____ Special ____

HMIS Rating* Health ____ Flammability ____ Reactivity ____ Personal Protection ____

*Optional

MATERIAL SAFETY DATA SHEET

Hydrosil Spectrum
HS-600
Identity (Trade Name As Used On Label)

Hydrosil International Limited
Manufacturer

MSDS Number*

1180 St. Charles Street
Address

CAS Number*

Elgin, IL 60120

June 11, 1996
Date Prepared

1-800-PURPLE1 1-800-787-7531

William J. Waldschmidt
Prepared By*

Phone Number (For Information)

1-847-741-1600 1-847-741-1615

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Emergency Phone Number Telex*

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS – Chemical Name & Common Names (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	% *	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED
potassium permanganate (KMnO4) CAS # 7722-64-7	6-8%	5mg/m3	5mg/m3	None
All other components are not subject on the SARA 313				
William J. Waldschmidt, President				
Non-Hazardous Ingredients molecular sieve/moisture	92-9			
TOTAL	100			

SECTION 2 - PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling Point N/A

Density 58-62#/ft3

Vapor Pressure (mm Hg and Temperature) N/A

Melting Point N/A

Vapor Density (Air = 1) N/A

Evaporation Rate (_____ = 1) N/A

Solubility in Water KMnO4-yes, molecular sieve-no

Water Reactive N/A

Appearance and Odor Purple granules, odorless

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

Flash Point and Method Used Noncombustible

Auto-Ignition Temperature N/A

Flammability Limits in Air % by Volume N/A

LEL N/A

UEL N/A

Extinguisher Media N/A

Special Fire Fighting Procedures None

Unusual Fire and Explosion Hazards None

*Optional

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY XX Stable ☐ Unstable	Conditions To Avoid	Protect containers against puncture and physical damage, keep in a dry area, avoid exposure to water
Incompatability (Materials to Avoid)		None
Hazardous Decomposition Products		None
HAZARDOUS POLYMERIZATION ☐ May Occur XX Will Not Occur	Conditions To Avoid	None

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY	☐ Inhalation	☐ Ingestion	CARCINOGEN LISTED IN	☐ NTP	☐ OSHA
	☐ Skin Absorption	XX Not Hazardous		☐ IARC Monograph	XX Not Listed
HEALTH HAZARDS	Acute	May be irritating to body tissu upon contact			
	Chronic	None			
Signs and Symptoms of Exposure		May stain body tissue			
Medical Conditions Generally Aggravated by Exposure		Open wounds, burns and mucous membranes			

EMERGENCY FIRST AID PROCEDURES - Seek medical assistance for further treatment, observation and support if necessary.

Eye Contact	Immediately flush with large amounts of water for 15 minutes
Skin Contact	Immediately flush with soap and water
Inhalation	Leave contaminated area
Ingestion	Drink several glasses of water or milk. Seek medical attention

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (Specify Type)	Treat as low level nuisance dust, Use NIOSH/MSA #TC-21C-132		
Protective Gloves	Rubber or plastic gloves	Eye Protection	Safety glasses
VENTILATION TO BE USED	☐ Local Exhaust	XX Mechanical (general)	☐ Special
	☐ Other (specify)		
Other Protective Clothing and Equipment	Regular work clothing		
Hygienic Work Practices	Wash hands before eating. Wash contaminated clothing.		

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE / LEAK PROCEDURES

Steps to be Taken if Material is Spilled Or Released	Sweep up granules and dispose of in accordance with local, state, and federal regulations.
Waste Disposal Methods	Reduce potassium permanganate with hypo (10% sodium thiosulfate) solution and deposit in permitted landfill.
Precautions to be Taken in Handling and Storage	Protect containers against physical damage. Store in a cool dry area in closed containers.
Other Precautions and/or Special Hazards	Avoid exposure to water and contaminated air, otherwise the media is rendered useless

NFPA Rating*	Health ____	Flammability ____	Reactivity ____	Special ____	HMIS Rating*	Health ____	Flammability ____	Reactivity ____	Personal Protection ____

*Optional

U.S. FILTER

WESTATES

MATERIAL SAFETY DATA SHEET

SECTION I

	Product Name: ACTIVATED CARBON, CC SERIES, KG SERIES, KP SERIES
Manufacturer: U.S. FILTER/WESTATES	MSDS: 100
5375 South Boyle Ave.	CAS Number: CAS 7440-44-0
Los Angeles, California 90058	Date Prepared: JUNE 25, 1997
Phone Number For Information: (213) 722-7500	Prepared By: MARGARET JEFFERSON
Emergency Phone Number: (800) 659-1771	Note: Black spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

SECTION II - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS - Chemical Name & Common Names (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	%	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED
ACTIVATED CARBON	100%	2.5mg/m^3	1.5mg/m^3	NONE
NON-HAZARDOUS INGREDIENTS				
TOTAL	100			

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS

BOILING POINT: not applicable	SPECIFIC GRAVITY (H20 = 1): 0.25 - 0.60 g/cc
VAPOR PRESSURE (mm HG AND TEMPERATURE): zero	MELTING POINT: not applicable
VAPOR DENSITY (AIR = 1): not applicable	EVAPORATION RATE(_____ = 1): not applicable
SOLUBILITY IN WATER: Insoluble in water and solvents	WATER REACTIVE: non-reactive
APPEARANCE AND ODOR: Black granules without taste or odor	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT AND METHOD USED: N/A	Auto-Ignition Temperature: > 450°C ANSI/ASTM D 3468	Flammability Limits in Air % by Volume: N/A	LEL N/A	UEL N/A

EXTINGUISHER MEDIA: Water (fog or fine spray), carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES: Avoid procedures that may stir up dust clouds.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Avoid contact with strong oxidizers.

MATERIAL SAFETY DATA SHEET CC SERIES, KG SERIES, KP SERIES

SECTION V - REACTIVITY HAZARD DATA

STABILITY: Stable x Unstable ☐	CONDITIONS TO AVOID: Contact with strong oxidizers.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents	HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Dioxide Carbon Monoxide
Hazardous polymerization: May Occur ☐ Will not Occur x	CONDITIONS TO AVOID: not applicable

SECTION VI - HEALTH HAZARD DATA

PRIMARY ROUTES: Inhalation x Ingestion ☐ CARCINOGEN LISTED IN: NTP ☐ OSSA ☐ LARC☐ Monograph ☐ Not Listed x

HEALTH HAZARDS LD50 VALVES: not available ACUTE: not available CHRONIC: No effects from chronic exposure are known

EMERGENCY FIRST AID PROCEDURES: Seek medical assistance for further treatment, observation and support if necessary.

EYE CONTACT: Immediately flush with copious amounts of water. If redness, itching or a burning sensation develops, have eyes examined and treated by medical personnel.

SKIN CONTACT: Wash material off the skin with soap and water. If redness, itching or a burning sensation develops, get medical attention.

INHALATION: Remove victim to fresh air. If cough or other respiratory symptoms develop, consult medical personnel.

INGESTION: Give one or two glasses of water to drink. If gastrointestinal symptoms develop, consult medical personnel (Never give anything by mouth to an unconscious person).

SECTION VII CONTROL AND PROTECTIVE MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE): Use MSA-NIOSH approved respirator for respirable dusts, mists and fumes.

PROTECTIVE GLOVES: Rubber latex.

EYE PROTECTION: Safety glasses with side shields. Contact lenses should not be worn when working with carbon.

VENTILATION TO BE USED: Local Exhaust x Mechanical (general) ☐ Special ☐ Other (specify) ☐

OTHER PROTECTIVE CLOTHING AND EQUIPMENT: NONE

HYGIENIC WORK PRACTICES: Wash contacted skin areas after handling.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE/LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: Wear respiratory protection during clean up. Sweep up and recover or mix material with moist absorbent for dust control and pick-up and shovel into waste container. Use detergent in spill area after clean up and flush with plenty of water.

WASTE DISPOSAL METHODS: Dispose of virgin (unused) carbon (waste or spillage) per local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Activated carbon can be safely stored in any normal storage area, but away from direct heat.

OTHER PRECAUTIONS AND OR SPECIAL HAZARDS: An oxygen deficiency may be created when activated carbon is stored in an enclosed space/silo. Ventilate or wear self-contained breathing apparatus. Follow procedures for confined space entry.

NFPA Rating: Health 1 Flammability 1 Reactivity 0	HMIS Rating: Health 1 Flammability 1 Reactivity 0 Special ☐

APPENDIX H

American Environmental Network
200 Monroe Turnpike • Monroe, CT 06468 • (203) 261-4458 • Fax (203) 268-5346

February 27, 1998

Mr. Marc Sanford
INGERSOLL RAND
Geraghty & Miller
215 Washington Ave Ext.
Albany, NY 12205

Dear Mr. Sanford :

Please find enclosed the analytical results of 22 sample(s) received at our laboratory on February 4-6, 1998. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

IEA Report #7098-0259A	
Project ID: ARO CORP.	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 261-4458 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Jeffrey C. Curran
Laboratory Manager

JCC

7098-0259A
INGERSOLL RAND

Case Narrative

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. Ferrous iron reported as misc-cc rep 1, and dissolved ferric iron done by calculation and reported as misc-cc rep 2. TOCD reported as two replicates, rep 1 is total TOCD and rep 2 is dissolved TOCD. No analytical problems were encountered.

Analyte	Method	Reference
Ferrous Iron	3500-Fe	2
Alkalinity	310.1	1
Ammonia	350.1	1
BOD5	405.1	1
Chloride	325.2	1
COD	410.4	1
Fluoride	340.2	1
Nitrate/Nitrite	353.2	1
Sulfate	375.2	1
Sulfide	376.1	1
TOCD	415.1	1

References:

1. Methods of Chemical Analysis of Water and Wastes, EPA 600, 1983.
2. Standard Methods for the Examination of Water and Wastewater. 18th edition, 1992.

Metals - ICAP metals were determined by ICP using a JA61 simultaneous ICAP using the USEPA 200.7 SOW.

No problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

IEC's are electronically employed by the JA61 ICAP. However, the ICSA is utilized as a monitoring device to detect any additional adjustments that may be required. These modifications are calculated and applied manually. They are so noted in the raw data.

Volatile Organics - Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 8260A. The instrumentation used was a Tekmar Dynamic Headspace Concentrator interfaced with a Hewlett-Packard Model 5972A GC/MS/DS.

The "L" flag on the form 6A's designate that linear regression was used for quantitation for that compound, due to the %RSD being 15% or greater. The form

1A's reflect the true concentration calculated with linear regression. The quant reports may not agree with form 1A's, due to software limitations. All results for compounds with "L" flags should be taken from either tabulated results or form 1A's.

The following samples were analyzed at dilutions due to high target compound concentrations:

MW-23	1:10
MW-24	1:5
MW-20	1:100
MW-2	1:250
MW-22	1:2
MW-3	1:10000
MW-29	1:5000
OW-101	1:200

No problems were encountered.

Miscellaneous GC - Subcontracted to Microseeps and will be sent at a later date.

TABLE VO-1.0
7098-0259A
INGERSOLL RAND
TCL VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	Method Blank	MW-23	MW-23 MS	Quant. Limits with no Dilution
Lab Sample I.D.	VBLKE4	980259A-10	980259A-10MS	
Method Blank I.D.	VBLKE4	VBLKE4	VBLKE4	
Quant. Factor	1.00	2.00	2.00	
Chloromethane	U	U	U	10
Bromomethane	U	U	U	10
Vinyl Chloride	U	27	24	10
Chloroethane	U	U	U	10
Methylene Chloride	.5J	1JB	2JB	5.0
Acetone	U	U	U	10
Carbon Disulfide	U	U	U	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	2J	90X	5.0
1,1-Dichloroethane	U	U	U	5.0
1,2-Dichloroethene (total)	U	230	210	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	U	U	U	10
1,1,1-Trichloroethane	U	U	U	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
1,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	U	310	380X	5.0
Dibromochloromethane	U	U	U	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	100X	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	U	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	U	U	10
Tetrachloroethene	U	U	.8J	5.0
Toluene	U	1J	98X	5.0
1,1,2,2-Tetrachloroethane	U	U	U	5.0
Chlorobenzene	U	U	92X	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received		02/05/98	02/05/98	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	02/06/98	02/06/98	02/06/98	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.1
7098-0259A
INGERSOLL RAND
TCL VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	MW-23 MSD	TB 020498		Quant. Limits with no Dilution
Lab Sample I.D.	980259A-10 MSD	980259A-12		
Method Blank I.D.	VBLKE4	VBLKE4		
Quant. Factor	2.00	1.00		
Chloromethane	U	U		10
Bromomethane	U	U		10
Vinyl Chloride	26	U		10
Chloroethane	U	U		10
Methylene Chloride	1JB	.5JB		5.0
Acetone	U	U		10
Carbon Disulfide	U	U		5.0
Vinyl Acetate	U	U		10
1,1-Dichloroethene	95X	U		5.0
1,1-Dichloroethane	U	U		5.0
1,2-Dichloroethene (total)	220	U		5.0
Chloroform	U	U		5.0
1,2-Dichloroethane	U	U		5.0
2-Butanone	U	U		10
1,1,1-Trichloroethane	U	U		5.0
Carbon Tetrachloride	U	U		5.0
Bromodichloromethane	U	U		5.0
1,2-Dichloropropane	U	U		5.0
cis-1,3-Dichloropropene	U	U		5.0
Trichloroethene	390X	U		5.0
Dibromochloromethane	U	U		5.0
1,1,2-Trichloroethane	U	U		5.0
Benzene	100X	U		5.0
trans-1,3-Dichloropropene	U	U		5.0
Bromoform	U	U		5.0
4-Methyl-2-Pentanone	U	U		10
2-Hexanone	U	U		10
Tetrachloroethene	.6J	U		5.0
Toluene	99X	U		5.0
1,1,2,2-Tetrachloroethane	U	U		5.0
Chlorobenzene	92X	U		5.0
Ethylbenzene	U	U		5.0
Styrene	U	U		5.0
Xylene (total)	U	U		5.0
Date Received	02/05/98	02/05/98		
Date Extracted	N/A	N/A		
Date Analyzed	02/06/98	02/06/98		

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.2
7098-0259A
INGERSOLL RAND
TCL VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	Method Blank	MW-24		Quant. Limits with no Dilution
Lab Sample I.D.	VBLKE5	980259A-08		
Method Blank I.D.	VBLKE5	VBLKE5		
Quant. Factor	1.00	5.00		
Chloromethane	U	U		10
Bromomethane	U	U		10
Vinyl Chloride	U	38J		10
Chloroethane	U	U		10
Methylene Chloride	U	4J		5.0
Acetone	U	U		10
Carbon Disulfide	U	2J		5.0
Vinyl Acetate	U	U		10
1,1-Dichloroethene	U	3J		5.0
1,1-Dichloroethane	U	U		5.0
1,2-Dichloroethene (total)	U	250		5.0
Chloroform	U	1J		5.0
1,2-Dichloroethane	U	U		5.0
2-Butanone	U	U		10
1,1,1-Trichloroethane	U	1J		5.0
Carbon Tetrachloride	U	U		5.0
Bromodichloromethane	U	U		5.0
1,2-Dichloropropane	U	U		5.0
cis-1,3-Dichloropropene	U	U		5.0
Trichloroethene	U	680		5.0
Dibromochloromethane	U	U		5.0
1,1,2-Trichloroethane	U	U		5.0
Benzene	U	U		5.0
trans-1,3-Dichloropropene	U	U		5.0
Bromoform	U	U		5.0
4-Methyl-2-Pentanone	U	U		10
2-Hexanone	U	U		10
Tetrachloroethene	U	6J		5.0
Toluene	U	2J		5.0
1,1,2,2-Tetrachloroethane	U	U		5.0
Chlorobenzene	U	U		5.0
Ethylbenzene	U	U		5.0
Styrene	U	U		5.0
Xylene (total)	U	U		5.0
Date Received		02/05/98		
Date Extracted	N/A	N/A		
Date Analyzed	02/09/98	02/09/98		

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.3
7098-0259A
INGERSOLL RAND
TCL VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	Method Blank	MW-20	MW-2	Quant. Limits with no Dilution
Lab Sample I.D.	VBLKE6	980259A-07	980259A-09	
Method Blank I.D.	VBLKE6	VBLKE6	VBLKE6	
Quant. Factor	1.00	100.	250.	
Chloromethane	U	U	U	10
Bromomethane	U	U	U	10
Vinyl Chloride	U	310J	120J	10
Chloroethane	U	U	U	10
Methylene Chloride	U	40J	100J	5.0
Acetone	U	U	U	10
Carbon Disulfide	U	U	U	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	U	U	5.0
1,1-Dichloroethane	U	U	U	5.0
1,2-Dichloroethene (total)	U	2100	3000	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	U	U	U	10
1,1,1-Trichloroethane	U	U	U	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	U	13000	20000	5.0
Dibromochloromethane	U	U	U	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	U	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	U	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	30J	U	10
Tetrachloroethene	U	U	U	5.0
Toluene	U	U	U	5.0
1,1,2,2-Tetrachloroethane	U	U	U	5.0
Chlorobenzene	U	U	U	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received		02/05/98	02/05/98	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	02/10/98	02/10/98	02/10/98	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.4
7098-0259A
INGERSOLL RAND
TCL VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	MW-22	TB 020598	MW-3	Quant. Limits with no Dilution
Lab Sample I.D.	980259A-11	980259A-13	980259A-14	
Method Blank I.D.	VBLKE6	VBLKE6	VBLKE6	
Quant. Factor	2.00	1.00	10000	
Chloromethane	U	U	U	10
Bromomethane	U	U	1400J	10
Vinyl Chloride	U	U	U	10
Chloroethane	U	U	U	10
Methylene Chloride	1J	U	U	5.0
Acetone	17J	U	U	10
Carbon Disulfide	U	U	U	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	U	U	5.0
1,1-Dichloroethane	U	U	U	5.0
1,2-Dichloroethene (total)	89	U	7100J	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	52	U	U	10
1,1,1-Trichloroethane	U	U	U	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
1,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	130	U	1600000	5.0
Dibromochloromethane	U	U	U	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	U	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	U	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	U	U	10
Tetrachloroethene	U	U	U	5.0
Toluene	U	U	U	5.0
1,1,2,2-Tetrachloroethane	U	U	U	5.0
Chlorobenzene	U	U	U	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received	02/05/98	02/06/98	02/06/98	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	02/10/98	02/10/98	02/10/98	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.5
7098-0259A
INGERSOLL RAND
TCL VOLATILE ORGANICS

Aqueous

All value are ug/L.

Client Sample I.D.	MW-29	OW-101	MW-26	Quant. Limits with no Dilution
Lab Sample I.D.	980259A-15	980259A-16	980259A-17	
Method Blank I.D.	VBLKE6	VBLKE6	VBLKE6	
Quant. Factor	5000	200.	1.00	
Chloromethane	U	U	U	10
Bromomethane	U	U	U	10
Vinyl Chloride	U	620J	U	10
Chloroethane	U	U	U	10
Methylene Chloride	1900J	180J	U	5.0
Acetone	U	U	U	10
Carbon Disulfide	U	U	U	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	U	U	5.0
1,1-Dichloroethane	U	U	U	5.0
1,2-Dichloroethene (total)	16000J	6600	3J	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	U	U	2J	10
1,1,1-Trichloroethane	U	U	U	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
1,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	380000	22000	33	5.0
Dibromochloromethane	U	U	U	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	U	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	U	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	U	U	10
Tetrachloroethene	U	U	U	5.0
Toluene	U	U	U	5.0
1,1,2,2-Tetrachloroethane	U	U	U	5.0
Chlorobenzene	U	U	U	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received	02/06/98	02/06/98	02/06/98	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	02/10/98	02/10/98	02/10/98	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.6
7098-0259A
INGERSOLL RAND
TCL VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	DUP-1			
Lab Sample I.D.	980259A-18			Quant. Limits with no Dilution
Method Blank I.D.	VBLKE6			
Quant. Factor	1.00			
Chloromethane	U			10
Bromomethane	U			10
Vinyl Chloride	U			10
Chloroethane	U			10
Methylene Chloride	U			5.0
Acetone	U			10
Carbon Disulfide	U			5.0
Vinyl Acetate	U			10
1,1-Dichloroethene	U			5.0
1,1-Dichloroethane	U			5.0
1,2-Dichloroethene (total)	4J			5.0
Chloroform	U			5.0
1,2-Dichloroethane	U			5.0
2-Butanone	.5J			10
1,1,1-Trichloroethane	U			5.0
Carbon Tetrachloride	U			5.0
Bromodichloromethane	U			5.0
1,2-Dichloropropane	U			5.0
cis-1,3-Dichloropropene	U			5.0
Trichloroethene	39			5.0
Dibromochloromethane	U			5.0
1,1,2-Trichloroethane	U			5.0
Benzene	U			5.0
trans-1,3-Dichloropropene	U			5.0
Bromoform	U			5.0
4-Methyl-2-Pentanone	U			10
2-Hexanone	U			10
Tetrachloroethene	U			5.0
Toluene	U			5.0
1,1,2,2-Tetrachloroethane	U			5.0
Chlorobenzene	U			5.0
Ethylbenzene	U			5.0
Styrene	U			5.0
Xylene (total)	U			5.0
Date Received	02/06/98			
Date Extracted	N/A			
Date Analyzed	02/10/98			

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 0259A SAS No.: _____ SDG No.: A0259

	EPA SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
01	VBLKE4	99	99	94		0
02	TB 020498	106	105	102		0
03	MW-23	100	101	98		0
04	MW-23MS	104	102	101		0
05	MW-23MSD	106	101	103		0
06	VBLKE5	107	109	105		0
07	MW-24	109	111	112		0
08	VBLKE6	105	106	105		0
09	TB 020598	92	93	96		0
10	MW-20	91	94	98		0
11	MW-2	103	102	104		0
12	MW-22	102	106	106		0
13	MW-3	104	104	105		0
14	MW-29	101	104	106		0
15	DUP-1	97	100	102		0
16	OW-101	100	100	104		0
17	MW-26	102	102	106		0
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		QC LIMITS
SMC1 (TOL)	= Toluene-d8	(88-110)
SMC2 (BFB)	= Bromofluorobenzene	(86-115)
SMC3 (DCE)	= 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 0259A SAS No.: _____ SDG No.: A0259

Matrix Spike - EPA Sample No.: MW-23

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	100	2	90	88	61-145
Trichloroethene	100	310	380	70*	71-120
Benzene	100	0	100	100	76-127
Toluene	100	1	98	97	76-125
Chlorobenzene	100	0	92	92	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	100	95	93	6	14	61-145
Trichloroethene	100	390	80	13	14	71-120
Benzene	100	100	100	0	11	76-127
Toluene	100	99	98	1	13	76-125
Chlorobenzene	100	92	92	0	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits.

RPD: 0 out of 5 outside limits
Spike Recovery: 1 out of 10 outside limits

COMMENTS: _____

TABLE AS-1.0 Aqueous
7098-0259A
INGERSOLL RAND
MISCELLANEOUS ATOMIC SPECTROSCOPY (Dissolved)

All values are ug/L.

Client Sample I.D.	MW-26	DUP-1	MW-29	MW-3
Lab Sample I.D.	980259A-01	980259A-02	980259A-03	980259A-04
Iron	100.U	560.	100.U	100.U
Manganese	15.0U	45.6	15.0U	23.8

See Appendix for qualifier definitions

TABLE AS-1.1 Aqueous
7098-0259A
INGERSOLL RAND
MISCELLANEOUS ATOMIC SPECTROSCOPY (Dissolved)

All values are ug/L.

Client Sample I.D.	OW-101	MW-20	MW-24	MW-2
Lab Sample I.D.	980259A-05	980259A-07	980259A-08	980259A-09
Iron	4340	106.	2060	8180
Manganese	552.	18.0	125.	198.

See Appendix for qualifier definitions

TABLE AS-1.2 Aqueous
7098-0259A
INGERSOLL RAND
MISCELLANEOUS ATOMIC SPECTROSCOPY (Dissolved)

All values are ug/L.

Client Sample I.D.	MW-23	MW-23 D	MW-23 S	MW-22
Lab Sample I.D.	980259A-10	980259A-10D	980259A-10S	980259A-11
Iron	159.	149.	1010	723.
Manganese	115.	114.	540.	57.3

See Appendix for qualifier definitions

TABLE AS-1.3
7098-0259A
INGERSOLL RAND
MISCELLANEOUS ATOMIC SPECTROSCOPY (Total)

Aqueous

All values are ug/L.

Client Sample I.D.	MW-26	DUP-1	MW-29	MW-3
Lab Sample I.D.	980259A-01	980259A-02	980259A-03	980259A-04
Iron	179.	813.	2020	1620
Manganese	16.9	49.0	50.8	52.4

See Appendix for qualifier definitions

TABLE AS-1.4 Aqueous
7098-0259A
INGERSOLL RAND
MISCELLANEOUS ATOMIC SPECTROSCOPY (Total)

All values are ug/L.

Client Sample I.D.	OW-101	MW-20	MW-24	MW-2
Lab Sample I.D.	980259A-05	980259A-07	980259A-08	980259A-09
Iron	76300	2640	3380	45400
Manganese	1080	61.2	126.	1170

See Appendix for qualifier definitions

TABLE AS-1.5 Aqueous
7098-0259A
INGERSOLL RAND
MISCELLANEOUS ATOMIC SPECTROSCOPY (Total)

All values are ug/L.

Client Sample I.D.	MW-23	MW-23 D	MW-23 S	MW-22
Lab Sample I.D.	980259A-10	980259A-10D	980259A-10S	980259A-11
Iron	2260	2660	3130	8320
Manganese	136.	160.	576.	237.

See Appendix for qualifier definitions

1

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-26

ame: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

atrix: (soil/water) WATER Lab Sample ID: 0259001

Solids: _____ Date Received: 02/04/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	134.			
AMMONIA	0.11			
BOD5	2.00	U		
CHLORIDE	203.			
COD	14.1			
FLUORIDE	0.72			
FERROUS IRON	.50	U		
DISS FERRIC IRON	0.100	U		
NO3-NO2	1.47			
SULFATE	71.6			
SULFIDE	1.000	U		
TOCD (TOTAL)	2.09			
TOCD (DISSOLVED)	3.35			

omments: _____

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WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

DUP-1

Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259002

% Solids: _____ Date Received: 02/04/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	148.			
AMMONIA	0.040	U		
BOD5	2.00	U		
CHLORIDE	244.			
COD	10.00	U		
FLUORIDE	0.79			
FERROUS IRON	.50	U		
DISS FERRIC IRON	0.560			
NO3-NO2	0.100	U		
SULFATE	83.3			
SULFIDE	1.000	U		
TOCD (TOTAL)	3.15			
TOCD (DISSOLVED)	5.27			

Comments: _____

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-29

Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259003

Solids: _____ Date Received: 02/04/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	277.			
AMMONIA	0.040	U		
BOD5	4.			
CHLORIDE	50.9			
COD	89.5			
FLUORIDE	0.58			
FERROUS IRON	.50	U		
DISS FERRIC IRON	0.100	U		
NO3-NO2	0.100	U		
SULFATE	82.5			
SULFIDE	1.000	U		
TOCD (TOTAL)	14.3			
TOCD (DISSOLVED)	10.7			

Comments: _____

i

SAMPLE NO.

WET CHEM ANALYSIS DATA SHEET

MW-3

Name: IEA Contract:

Lab Code: IEA Case No.: 0259A SAS No. : SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259004

% Solids: Date Received: 02/04/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	168.			
AMMONIA	0.11			
BOD5	24.			
CHLORIDE	54.2			
COD	119.			
FLUORIDE	0.88			
FERROUS IRON	.50	U		
DISS FERRIC IRON	0.100	U		
NO3-NO2	0.100	U		
SULFATE	271.			
SULFIDE	1.000	U		
TOCD (TOTAL)	75.0			
TOCD (DISSOLVED)	32.5			

Comments:

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SAMPLE NO.

WET CHEM ANALYSIS DATA SHEET

SW-101

Name: IEA Contract:

Lab Code: IEA Case No.: 0259A SAS No. : SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259005

% Solids: Date Received: 02/04/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	234.			
AMMONIA	0.040	U		
BOD5	3.			
CHLORIDE	86.1			
COD	26.2			
FLUORIDE	0.55			
FERROUS IRON	.50	U		
DISS FERRIC IRON	4.34			
NO3-NO2	0.100	U		
SULFATE	259.			
SULFIDE	25.000	U		
TOCD (TOTAL)	2.47			
TOCD (DISSOLVED)	12.2			

Comments:

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WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-20

Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259007

% Solids: _____ Date Received: 02/05/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	472.			
AMMONIA	0.040	U		
BOD5	5.			
CHLORIDE	74.3			
COD	14.1			
FLUORIDE	0.68			
FERROUS IRON	.50	U		
DISS FERRIC IRON	0.106			
NO3-NO2	0.100	U		
SULFATE	120.			
SULFIDE	1.000	U		
TOCD (TOTAL)	1.00	U		
TOCD (DISSOLVED)	1.00	U		

Comments: _____

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-24

Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259008

% Solids: _____ Date Received: 02/05/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	345.			
AMMONIA	0.040	U		
BOD5	5.			
CHLORIDE	25.0			
COD	16.5			
FLUORIDE	0.95			
FERROUS IRON	2.38			
DISS FERRIC IRON	0.100	U		
NO3-NO2	0.100	U		
SULFATE	110.			
SULFIDE	1.000	U		
TOCD (TOTAL)	3.01			
TOCD (DISSOLVED)	3.09			

Comments: _____

SAMPLE NO.

WET CHEM ANALYSIS DATA SHEET

MW-2

Name: IEA Contract:

Lab Code: IEA Case No.: 0259A SAS No. : SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259009

% Solids: Date Received: 02/05/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	256.			
AMMONIA	0.14			
BOD5	2.			
CHLORIDE	108.			
COD	26.2			
FLUORIDE	0.88			
FERROUS IRON	11.7			
DISS FERRIC IRON	0.100	U		
NO3-NO2	0.100	U		
SULFATE	132.			
SULFIDE	1.000	U		
TOCD (TOTAL)	2.39			
TOCD (DISSOLVED)	2.18			

Comments:

SAMPLE NO.

WET CHEM ANALYSIS DATA SHEET

MW-23

Name: IEA Contract:

Lab Code: IEA Case No.: 0259A SAS No. : SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259010

% Solids: Date Received: 02/05/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	381.			
AMMONIA	0.040	U		
BOD5	2.00	U		
CHLORIDE	22.4			
COD	14.1			
FLUORIDE	0.38			
FERROUS IRON	.50	U		
DISS FERRIC IRON	0.159			
NO3-NO2	0.100	U		
SULFATE	69.9			
SULFIDE	1.000	U		
TOCD (TOTAL)	3.63			
TOCD (DISSOLVED)	3.46			

Comments:

SAMPLE NO.

WET CHEM ANALYSIS DATA SHEET

MW-23

Name: IEA Contract:

Lab Code: IEA Case No.: 0259A SAS No. : SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259010D

% Solids: Date Received: 02/05/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	379.			
AMMONIA	0.040	U		
BOD5	2.			
CHLORIDE	23.0			
COD	11.7			
FLUORIDE	0.39			
FERROUS IRON	.50	U		
DISS FERRIC IRON	0.149			
NO3-NO2	0.100	U		
SULFATE	69.4			
SULFIDE	1.000	U		
TOCD (TOTAL)	3.50			
TOCD (DISSOLVED)	3.38			

Comments:

SAMPLE NO.

WET CHEM ANALYSIS DATA SHEET

MW-23

Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 02590105

% Solids: _____ Date Received: 02/05/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
AMMONIA	1.69			
BOD5	65.			
CHLORIDE	82.1			
COD	109.			
FLUORIDE	0.58			
FERROUS IRON	1.97			
NO3-NO2	0.34			
SULFATE	128.			
SULFIDE	28.8			
TOCD (TOTAL)	28.6			
TOCD (DISSOLVED)	28.7			

Comments: _____

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-22

Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Matrix: (soil/water) WATER Lab Sample ID: 0259011

% Solids: _____ Date Received: 02/05/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	492.			
AMMONIA	0.040	U		
BOD5	2.00	U		
CHLORIDE	11.6			
COD	16.5			
FLUORIDE	0.24			
FERROUS IRON	1.06			
DISS FERRIC IRON	0.100	U		
NO3-NO2	0.40			
SULFATE	78.0			
SULFIDE	1.000	U		
TOCD (TOTAL)	2.20			
TOCD (DISSOLVED)	2.65			

Comments: _____

ORGANICS APPENDIX

U - Indicates that the compound was analyzed for but not detected.

J - Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

B - This flag is used when the analyte is found in the blanks as well as the sample. It indicates possible sample contamination and warns the data user to use caution when applying the results of this analyte.

N - Indicates that the compound was analyzed for but not requested as an analyte. Value will not be listed on tabular result sheet.

S - Estimated due to surrogate outliers.

X - Matrix spike compound.

(1) - Cannot be separated.

(2) - Decomposes to azobenzene. Measured and calibrated as azobenzene.

A - This flag indicates that a TIC is a suspected aldol condensation product.

E - Indicates that it exceeds calibration curve range.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C - Confirmed by GC/MS.

T - Compound present in TCLP blank.

P - This flag is used for a pesticide/aroclor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns (see Form X).

INORGANICS APPENDIX

C - Concentration qualifiers

U - Indicates analyte was not detected at method reporting limit.

B - Indicates analyte result between IDL and contract required detection limit (CRDL)

Q - QC qualifiers

E - Reported value is estimated because of the presence of interference

M - Duplicate injection precision not met

N - Spiked sample recovery not within control limits

S - The reported value was determined by the method of standard additions (MSA)

W - Post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance

* - Duplicate analysis not within control limit

+ - Correlation coefficient for MSA is less than 0.995

M - Method codes

P - ICP

A - Flame AA

F - Furnace AA

CV - Cold vapor AA (manual)

C - Cyanide

NR - Not Required

NC - Not Calculated as per protocols

STATE CERTIFICATIONS

In some instances it may be necessary for environmental data to be reported to a regulatory authority with reference to a certified laboratory. For your convenience, the laboratory identification numbers for the AEN-Connecticut laboratory are provided in the following table. Many states certify laboratories for specific parameters or tests within a category (i.e. method 325.2 for wastewater). The information in the following table indicates the lab is certified in a general category of testing such as drinking water or wastewater analysis. The laboratory should be contacted directly if parameter-specific certification information is required.

AEN-Connecticut
Certification Summary (as of September 1997)

State	Responsible Agency	Certification	Lab Number
Connecticut	Department of Health Services	Drinking Water, Wastewater	PH-0497
Maine	Department of Human Services	Wastewater	CT023
Massachusetts	Department of Environmental Protection	Potable/Non-Potable Water	CT023
New Hampshire	Department of Environmental Services	Drinking Water, Wastewater	2528
New Jersey	Department of Environmental Protection	Drinking Water, Wastewater	46410
New York	Department of Health	CLP, Drinking Water, Wastewater, Solid/ Hazardous Waste	10602
North Carolina	Division of Environmental Management	Wastewater Hazardous Waste	388
North Dakota	Department of Health and Consolidated Laboratories	Non-Potable/Potable Hazardous Waste	R-138
Oklahoma	Department of Environmental Quality	General Water Quality/ Sludge Testing	9614
Rhode Island	Department of Health	Chemistry...Non-Potable Water and Wastewater	A43
Washington	Department of Ecology	Wastewater/ Hazardous Waste	C231
West Virginia	Division of Environmental Protection	Wastewater/ Hazardous Waste	263
Wisconsin	Department of Natural Resources	Wastewater/ Hazarous Waste	998355710

7098-0259A
INGERSOLL RAND
SAMPLE SUMMARY

CLIENT ID	LAB ID	MATRIX	DATE COLLECTED	DATE RECEIVED
MW-26	980259A-01	WATER	02/03/98	02/04/98
DUP-1	980259A-02	WATER	02/03/98	02/04/98
MW-29	980259A-03	WATER	02/03/98	02/04/98
MW-3	980259A-04	WATER	02/03/98	02/04/98
DW-101	980259A-05	WATER	02/03/98	02/04/98
TB 020398	980259A-06		02/03/98	02/04/98
MW-20	980259A-07	WATER	02/04/98	02/05/98
MW-24	980259A-08	WATER	02/04/98	02/05/98
MW-2	980259A-09	WATER	02/04/98	02/05/98
MW-23	980259A-10	WATER	02/04/98	02/05/98
MW-23	980259A-10D	WATER	02/04/98	02/05/98
MW-23	980259A-10MS	WATER	02/04/98	02/05/98
MW-23	980259A-10MSD	WATER	02/04/98	02/05/98
MW-23	980259A-10S	WATER	02/04/98	02/05/98
MW-22	980259A-11	WATER	02/04/98	02/05/98
TB 020498	980259A-12	WATER	02/02/98	02/05/98
TB 020598	980259A-13	WATER	02/05/98	02/06/98
MW-3	980259A-14	WATER	02/05/98	02/06/98
MW-29	980259A-15	WATER	02/05/98	02/06/98
DW-101	980259A-16	WATER	02/05/98	02/06/98
MW-26	980259A-17	WATER	02/05/98	02/06/98
DUP-1	980259A-18	WATER	02/05/98	02/06/98

IEA-CT ANALYTICAL SUMMARY

Client ID: DUP-1, MW-2, MW-20, MW-22, MW-23, MW-24, MW-26, MW-29, MW-3, OW-101, TB 020398, TB 020498, TB 020598
Job Number: 7098-0259A

Date: 2/27/98

Qty	Matrix	Analysis	Description
1	None	DISK	Diskette Prep.
1	None	GLASS	Glassware only
1	None	SHIP	Shipping Cost
2	WATER	ALK-N310.1	Alkalinity
	WATER	ALK-N310.1	Alkalinity
	WATER	AMMONIA-N350.1	Ammonia
10	WATER	AMMONIA-N350.1	Ammonia
2	WATER	BOD5-N405.1	Biochemical Oxygen D
10	WATER	BOD5-N405.1	Biochemical Oxygen D
2	WATER	CC-MISC	Miscellaneous Classi
10	WATER	CC-MISC	Miscellaneous Classi
2	WATER	CHLORIDE-N325.2	Chloride
10	WATER	CHLORIDE-N325.2	Chloride
2	WATER	COD-N410.4	Chemical Oxygen Dema
10	WATER	COD-N410.4	Chemical Oxygen Dema
2	WATER	FE-N600	Iron
10	WATER	FE-N600	Iron
2	WATER	FE-N600-D	Iron (Dissolved)
10	WATER	FE-N600-D	Iron (Dissolved)
2	WATER	FERROUS IRON-D	Ferrous Iron (dissol
10	WATER	FERROUS IRON-D	Ferrous Iron (dissol
2	WATER	FLUORIDE-N340.2	Fluoride
10	WATER	FLUORIDE-N340.2	Fluoride
10	WATER	GC-MISC	Miscellaneous GC
12	WATER	MET-PREP-ICAP	Metals ICAP Prep
12	WATER	MET-PREP-ICAP-D	Metals ICAP Prep (Di

IEA-CT ANALYTICAL SUMMARY

Client ID: DUP-1, MW-2, MW-20, MW-22, MW-23, MW-24, MW-26, MW-29, MW-3, OW-101, TB 020398, TB 020498, TB 020598
Job Number: 7098-0259A

Date: 2/27/98

Qty	Matrix	Analysis	Description
2	WATER	MN-N600	Manganese
10	WATER	MN-N600	Manganese
2	WATER	NITRATE/NIT-N353.2	Nitrate/Nitrite-Nitr
10	WATER	NITRATE/NIT-N353.2	Nitrate/Nitrite-Nitr
	WATER	SULFATE-N375.3	Sulfate
	WATER	SULFATE-N375.3	Sulfate
2	WATER	SULFIDE-N376.1	Sulfide
10	WATER	SULFIDE-N376.1	Sulfide
2	WATER	TOC-N415.1-DUP	Total Organic Carbon
10	WATER	TOC-N415.1-DUP	Total Organic Carbon
2	WATER	TOC-N415.1-DUP-D	Total Organic Carbon
10	WATER	TOC-N415.1-DUP-D	Total Organic Carbon
2	WATER	VOA-N8260A-TCL	TCL Volatile Organic
12	WATER	VOA-N8260A-TCL	TCL Volatile Organic

ILLER, INC.
ronmental Services

Laboratory Task Order No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 2

Project Number AF000220.0001.00009

Project Location Cheektowaga, NY

Laboratory AEN

Sampler(s)/Affiliation JB ARCADIS

SAMPLE IDENTITY	Code	Date/~~Time~~ Sampled	~~Time~~ Lab ID	SAMPLE BOTTLE / CONTAINER DESCRIPTION: TOC-DUP-1 TOC-DUP-2 (HCl preserved)	VOA - TCL	GC 5&3 (HCl preserved)	SULFIDE	MET - MISC	DISSOLVED METALS (FIELD FILTERED)	FERROUS IRON (Field Filtered)	BOD5	Nitrate/Nitrite	TOTAL	
MW-26	L	2/3/98	12:30P	4	2	3	1	1	1	1	1	1	15	01
DUP-1	L	2/3/98	—	4	2	3	1	1	1	1	1	1	15	02
MW-29	L	2/3/98	11:30A	4	2	3	1	1	1	1	1	1	15	0
MW-3	L	2/3/98	9:30A	4	2	3	1	1	1	1	1	1	15	0
OW-101	L	2/3/98	2:00P	4*	2	3	1	1	1*	1*	1	1	15	0

7098-0259A

Preserved Field Sample

D.M P 2/4/98 5*

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers

Relinquished by:	[signature]	Organization:	ARCADIS GEM	Date 2/3/98	Time 5:00 P	Seal Intact? Yes No N/A
Received by:		Organization:		Date / /	Time	
Relinquished by:		Organization:		Date / /	Time	Seal Intact? Yes No N/A
Received by:	D. Plunkett	Organization:	D. Plunkett / AEN	Date 2/4/98	Time 10:30	

Special Instructions/Remarks:

* OW-101 samples were not field filtered. Need to be filtered at lab

Delivery Method: ☐ In Person ☒ Common Carrier FedEx ☐ Lab Courier ☐ Other

SPECIFY SPECIFY

ILLER, INC.
ronmental Services

Laboratory Task Order No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 2

Project Number AY000220.0004.00009

Project Location Charlestown, NH

Laboratory AEN

Sampler(s)/Affiliation JB - ARCADIS

SAMPLE IDENTITY	Code	Date/~~Time~~ Sampled	~~Time~~ Lab ID	SAMPLE BOTTLE / CONTAINER DESCRIPTION: WET CHEM	Trip Blank				7098-0259-A				TOTAL
MW26	L	2/3/98	12:30P	1								01	1
DUP-1	L	2/3/98	—	1								02	1
MW-29	L	2/3/98	11:30A	1								03	1
MW-3	L	2/3/98	9:30A	1								04	1
Trip Blank	L	—	—		2							06	2
MW-101	L	2/3/98	2:00P	1								05	1

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers

Relinquished by: JJ Bausch	Organization: ARCADIS GEO	Date 2/3/98	Time 5:00P	Seal Intact? Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?
Received by: D. Plumbley	Organization: AEN	Date 2/4/98	Time 10:30	Yes No N/A

Special Instructions/Remarks: _____

Delivery Method: ☐ In Person ☒ Common Carrier Fedex SPECIFY ☐ Lab Courier ☐ Other _____ SPECIFY

ILLER, INC.
ronmental Services

Laboratory Task Order No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 2

Project Number AF000220.0001.00009

Project Location Chattanooga, NS

Laboratory AEN

Sampler(s)/Affiliation JB Arcadis

SAMPLE IDENTITY	Code	Date/~~Time~~ Sampled	Time ~~Lab ID~~	SAMPLE BOTTLE / CONTAINER DESCRIPTION: 10C-AMB 10C-DUP (VOA)	VOA-TCL	EC-SUB (VOA)	Sulfate	Met (Diss) Preserved	Met Total UNP	Ferrous Iron	BOD5	Nitrate/Nitrite	TOTAL
MW-20	L	2/4/98	11:30A	4*	2	3	1	1	1	1	1	1	15
MW-24	L	2/4/98	3:45P	4	2	3	1	1	1	1	1	1	15
MW-2	L	2/4/98	2:30P	4*	2	3	1	1*	1	1*	1	1	15
MW-23	L	2/4/98	10:00A	4*	2	3	1	1	1	1	1	1	15
MW-23MS	L	2/4/98	10:00A	4*	2	3	1	1	1	1	1	1	15
MW-23MSD	L	2/4/98	10.00A	4*	2	3	1	1	1	1	1	1	15
MW-22	L	2/4/98	8:45A	4*	2	3	1	1	1	1	1	1	15

7098-0259A

Passed Bad Screen
DC 2/5/98 4°C

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 105

					Seal Intact?
Relinquished by: [signature]	Organization: Arcadis Geraghty + Miller	Date 2/4/98	Time 5:30 PM		Yes No N/A
Received by: _____	Organization: _____	Date / /	Time _____		
Relinquished by: _____	Organization: _____	Date / /	Time _____		Seal Intact?
Received by: Darlyn Colon	Organization: AEN	Date 2/5/98	Time 1015		(Yes) No N/A

Special Instructions/Remarks:

* Bottles had preservative rinsed out, need to be field filtered
MW-23MS + MW-23MSD incorrectly dated 2/3/98

Delivery Method: ☐ In Person ☑ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

EARTH TECH / MILLER, INC. Environmental Services

Laboratory Task Order No. _____

CHAIN-OF-CUSTODY RECORD

Page 1 of 2

Project Number AF000220.0004.00009

Project Location Chattanooga, TN

Laboratory AEN

Sampler(s)/Affiliation JB Arcadis

SAMPLE IDENTITY	Code	Date/~~Time~~ Sampled	Time ~~Lab ID~~	SAMPLE BOTTLE / CONTAINER DESCRIPTION: Wet Chem	Trip Blank								TOTAL
MW-20	L	2/4/98	11:30A	1				07					1
MW-24	L	2/4/98	3:45P	1				08					1
MW-2	L	2/4/98	2:30P	1				09					1
MW-23	L	2/4/98	10:00A	1				10					1
MW-23MS	L	2/4/98	10:00A	1				10					1
MW-23MSD	L	2/4/98	10:00A	1				10					1
MW-22	L	2/4/98	8:46A	1				11					1
Trip Blank	L	2/4/98	—		2			12					2

7098-0259A

Received Red Screen DC 2/5/98 5°C

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 9

					Seal Intact?
Relinquished by: JB Arcadis	Organization: Arcadis Geraghty & Miller	Date 2/4/98	Time 5:30 P		
Received by: _____	Organization: _____	Date / /	Time _____		Yes No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____		Seal Intact?
Received by: Darlyn Colon	Organization: AEN	Date 2/5/98	Time 1015		Yes No N/A

Special Instructions/Remarks:

* Bottles had preservative rinsed out, need to be field filtered

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other _____ (SPECIFY)

AEN Connecticut
Internal Chain-of-Custody

Client: ~~1088~~ Orchard Road

AEN Job #: 1098-059A

Custody Seal: ~~present~~ / absent
~~intact~~ / not intact

Airbill #: FE

Sample #: 1 6

C.O.C. ~~present~~ / absent

Locations: 3, 9, 6, 2, 36

Laboratory Sample #	Matrix	Relinquished by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
1/5	SOIL		2/4	1300	TOC's				
1-5		Bette Alves	2/4/98	0900	$NO_3 - NO_2$	Bette Alves		2/4/98	1545
1-5		AR	2/6	0900	Fe^{++}	AR		2/6	1400
1-5		AR	2/9	1100	Sulfide	AR		2/9	0125
1-5		R Guerrera	2/10	17:30	Alkal.	R Guerrera		2/10	22:00
01-05		C. Cal	02/17	7:00	ICAP	C. Cal		02/17	14:00
1-6		AR	2/17	0900	COD, TOC	AR		2/17	2125
1-5			2/18	9:40	NH_3				
1-5		MM	2/20	11:00	F^-	MM		2/20	18:20

AEN Form# SMF00501.CT

QUESTIONS? CALL 800-238-5355 TOLL FREE.

PACKAGE TRACKING NUMBER 2189777133

2189777133

RECIPIENT'S COPY

1 From — Date 2/4/98

Your Name (Please Print): Jeffrey Busted

Your Phone Number (Very Important): (518) 452-7886

Company: Arcadis Geraghty + Miller

Department/Floor No.:

Street Address: 25 Washington Ave Ext.

City: Albany State: NY ZIP Required: 12205

2 To (Recipient's Name) Please Print

Recipient's Phone Number (Very Important): (203) 261-4458

Company: AEN/SEA

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 200 Monroe Turnpike

City: Monroe State: CT ZIP Required: 06468

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): AR000220.0004.00009

3 PAYMENT 1 ☐ Bill Sender 2 ☒ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party FedEx Acct. No. 4 ☐ Bill Credit Card 5 ☐ Cash/Check

H IF HOLD AT FEDEX LOCATION, Print FEDEX Address Here

Street Address:

City: State: ZIP Required:

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning)
- 11 ☒ OTHER PACKAGING
- 16 ☐ FEDEX LETTER
- 12 ☐ FEDEX PAK*
- 13 ☐ FEDEX BOX
- 14 ☐ FEDEX TUBE

Standard Overnight (Delivery by next business afternoon* No Saturday delivery)
- 51 ☐ OTHER PACKAGING
- 56 ☐ FEDEX LETTER
- 52 ☐ FEDEX PAK*
- 53 ☐ FEDEX BOX
- 54 ☐ FEDEX TUBE

Economy Two-Day (Delivery by second business day.)
- 30 ☐ ECONOMY*

*Economy Letter Rate not available. Minimum charge: One pound Economy rate.

Government Overnight (Restricted for authorized users only)
- 46 ☐ GOVT LETTER
- 41 ☐ GOVT PACKAGE

Freight Service (For packages over 150 lbs.)

5 DELIVERY AND SPECIAL HANDLING (Check services required)

Weekday Service
- 1 ☐ HOLD AT FEDEX LOCATION WEEKDAY (Fill in Section H)
- 2 ☐ DELIVER WEEKDAY

Saturday Service
- 31 ☐ HOLD AT FEDEX LOCATION SATURDAY (Fill in Section H)
- 3 ☐ DELIVER SATURDAY (Extra charge) (Not available to all locations)
- 9 ☐ SATURDAY PICK-UP (Extra charge)

Special Handling
- 4 ☐ DANGEROUS GOODS (Extra charge)
- 6 ☐ DRY ICE (Dangerous Goods Shipper's Declaration not required)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See rgm)
1	17	
Total	Total	Total
1	17	

DIM SHIPMENT (Chargeable Weight) ☐ _____ lbs. L x W x H

Emp. No. | Date

☐ Cash Received
☐ Return Shipment
☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold

Street Address:

City: State: Zip:

Received By: X

Date/Time Received: FedEx Employee Number:

Federal Express Use

Base Charges:
Declared Value Charge:
Other 1:
Other 2:
Total Charges:

REVISION DATE 4/94
PART #145413 GBFE
FORMAT #160

FedEx USA Airbill

Tracking Number 6856481170

Recipient's Copy

From

Date 2/4/98

Sender's Name: Jeffrey Busted Phone: (518) 452-7886

Company: Arcadis Geraghty+Miller Dept./Floor Suite/Room:

Address: 25 Washington Ave. Ext.

City: Albany State: NY Zip: 12205

2 Your Internal Billing Reference Information: AR000220.0004.00009

3 To

Recipient's Name: Phone: (203) 261-4458

Company: AEN/SEA Dept./Floor Suite/Room:

Address: (To "HOLD" at FedEx location, print FedEx address here) 200 Monroe Turnpike

City: Monroe State: CT Zip: 06468

For "HOLD" Service check here: ☐ Weekday ☐ Saturday (Not available at all locations)

For Saturday Delivery check here: ☐ (Extra Charge, Not available to all locations)

4 Service*

☒ FedEx Priority Overnight (Next business morning) ☐ FedEx Standard Overnight (Next business afternoon) ☐ FedEx 2Day (Second business day)
☐ FedEx Govt. Overnight (Authorized user only)
☐ FedEx Overnight Freight ☐ FedEx 2Day Freight (For packages over 150 pounds. Call for delivery schedule.)

*Delivery commitment may be later in some areas

5 Packaging

☐ FedEx Letter* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube ☒ Other Packaging

*Declared value limit $500.

6 Special Handling

Does this shipment contain dangerous goods? ☒ No ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)

☐ Dry Ice, Dry Ice, 9, UN 1845, _____ kg (Dangerous Goods Shipper's Declaration not required)

CA ☐ Cargo Aircraft Only

7 Payment

Bill to: ☐ Sender (Account no. in section 1 will be billed) ☒ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check (Enter FedEx account no. or Credit Card no. below)

☐ Obtain Recipient FedEx Account No.

Total Packages	Total Weight	Total Declared Value*	Total Charges
1	56	$ .00	$

*When declaring a value higher than $100 per package, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY section for further information.

Credit Card Auth.

8 Release Signature

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

6 8 5 6 4 8 1 1 7 0

194

Rev. Date 5/95 • P
©1994-95 FedEx • PRINTED
GBFE 7/95

FedEx USA Airbill

Tracking Number 685648118 1

Recipient's Copy

From

Date 2/4/98

Your Name Jeffrey Busted Phone (518) 452-7826

Company Arcadis Geraghty + Miller Dept/Floor Suite/Room

Address 25 Lushington Ave. Ext.

City Albany State NY Zip 12205

Your Internal Billing Reference Information AY000220.0004.0009

To

Recipient's Name Phone (203) 261-4458

Company AEN/IEA Dept/Floor Suite/Room

Address (To "HOLD" at FedEx location, print FedEx address here) 200 Monroe Turnpike

City Monroe State CT Zip 06468

For "HOLD" Service check here
☐ Weekday ☐ Saturday (Not available at all locations)

For Saturday Delivery check here
☐ (Extra Charge. Not available to all locations)

4 Service*
☒ FedEx Priority Overnight (Next business morning) ☐ FedEx Standard Overnight (Next business afternoon) ☐ FedEx 2Day (Second business day)
☐ FedEx Govt. Overnight (Authorized user only)
☐ FedEx Overnight Freight ☐ FedEx 2Day Freight
(For packages over 150 pounds. Call for delivery schedule.)
*Delivery commitment may be later in some areas

5 Packaging
☐ FedEx Letter* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube ☒ Other Packaging
*Declared value limit $500

6 Special Handling
Does this shipment contain dangerous goods? ☒ No ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)
☐ Dry Ice Dry Ice, 9, UN 1845 (I) ____ x ____ kg. 904 (Dangerous Goods Shipper's Declaration not required)
CA ☐ Cargo Aircraft Only

7 Payment
Bill to: ☐ Sender (Account no. in section 1 will be billed) ☒ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check ☐ Obtain Recipient FedEx Account No.
(Enter FedEx account no. or Credit Card no. below)

Total Packages	Total Weight	Total Declared Value*	Total Charges
		$ .00	$

*When declaring a value higher than $100 per package, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY section for further information

Credit Card Auth.

8 Release Signature
Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims

194

6 8 5 6 4 8 1 1 8 1

FedEx USA Airbill

Tracking Number 685648116 6

Recipient's Copy

From

Date 2/4/98

Your Name Jeffrey Busted Phone (518) 452-7826

Company Arcadis Geraghty + Miller Dept/Floor Suite/Room

Address 25 Lushington Ave. Ext.

City Albany State NY Zip 12205

Your Internal Billing Reference Information AY000220.0004.0009

To

Recipient's Name Phone (203) 261-4458

Company AEN/IEA Dept/Floor Suite/Room

Address (To "HOLD" at FedEx location, print FedEx address here) 200 Monroe Turnpike

City Monroe State CT Zip 06468

For "HOLD" Service check here
☐ Weekday ☐ Saturday (Not available at all locations)

For Saturday Delivery check here
☐ (Extra Charge. Not available to all locations)

4 Service*
☒ FedEx Priority Overnight (Next business morning) ☐ FedEx Standard Overnight (Next business afternoon) ☐ FedEx 2Day (Second business day)
☐ FedEx Govt. Overnight (Authorized user only)
☐ FedEx Overnight Freight ☐ FedEx 2Day Freight
(For packages over 150 pounds. Call for delivery schedule.)
*Delivery commitment may be later in some areas

5 Packaging
☐ FedEx Letter* ☐ FedEx Pak* ☐ FedEx Box ☐ FedEx Tube ☒ Other Packaging
*Declared value limit $500

6 Special Handling
Does this shipment contain dangerous goods? ☒ No ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)
☐ Dry Ice Dry Ice, 9, UN 1845 (I) ____ x ____ kg. 904 (Dangerous Goods Shipper's Declaration not required)
CA ☐ Cargo Aircraft Only

7 Payment
Bill to: ☐ Sender (Account no. in section 1 will be billed) ☒ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check ☐ Obtain Recipient FedEx Account No.
(Enter FedEx account no. or Credit Card no. below)

Total Packages	Total Weight	Total Declared Value*	Total Charges
	60	$ .00	$

*When declaring a value higher than $100 per package, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY section for further information

Credit Card Auth.

8 Release Signature
Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims

194

6 8 5 6 4 8 1 1 6 6

Rev. Date 5/95 • PART #14515
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GAFE 7/95

FEDERAL EXPRESS

USE THIS AIRBILL FOR SHIPMENTS WITHIN THE CONTINENTAL U.S.A., ALASKA AND HAWAII.
USE THE INTERNATIONAL AIR WAYBILL FOR SHIPMENTS TO PUERTO RICO AND ALL NON U.S. LOCATIONS.
QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER **2189777251**

2189777251

RECIPIENT'S COPY

1 Date 2/3/98

From (Your Name) Please Print	Your Phone Number (Very Important)	To (Recipient's Name) Please Print	Recipient's Phone Number (Very Important)
Jeffrey Bookstein	(518) 452-7626		(203) 261-4168
Company ARCADIS Geraghty + Miller	**Department/Floor No.**	**Company** ACN/JEA	**Department/Floor No.**
Street Address 215 Washington Ave. Ext.		**Exact Street Address** (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.) 200 Monroe Turnpike	
City Albany	**State** NY **ZIP Required** 12205	**City** Monroe	**State** CT **ZIP Required** 06468

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)
ARC00220.0004.00009

H **IF HOLD AT FEDEX LOCATION, Print FEDEX Address Here**
Street Address
City State ZIP Required

3 **PAYMENT** 1 ☐ Bill Sender 2 ☐ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party FedEx Acct. No. 4 ☐ Bill Credit Card 5 ☐ Cash/Check

4 **SERVICES** (Check only one box)

Priority Overnight (Delivery by next business morning†)	Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
11 ☒ OTHER PACKAGING	51 ☐ OTHER PACKAGING
16 ☐ FEDEX LETTER*	56 ☐ FEDEX LETTER*
12 ☐ FEDEX PAK*	52 ☐ FEDEX PAK*
13 ☐ FEDEX BOX	53 ☐ FEDEX BOX
14 ☐ FEDEX TUBE	54 ☐ FEDEX TUBE
Economy Two-Day (Delivery by second business day†)	**Government Overnight** (Restricted for authorized users only)
30 ☐ ECONOMY*	46 ☐ GOVT LETTER
	41 ☐ GOVT PACKAGE

* Economy Letter Rate not available. Minimum charge: One pound economy rate.

Freight Service (for packages over 150 lbs.)
70 ☐ OVERNIGHT FREIGHT** (Confirmed reservation required) 80 ☐ TWO-DAY FREIGHT**
†Delivery commitment may be later in some areas. *Declared Value Limit $500. **Call for delivery schedule.

5 **DELIVERY AND SPECIAL HANDLING** (Check services required)

Weekday Service
1 ☐ HOLD AT FEDEX LOCATION WEEKDAY (Fill in Section H)
2 ☒ DELIVER WEEKDAY

Saturday Service
31 ☐ HOLD AT FEDEX LOCATION SATURDAY (Fill in Section H)
3 ☐ DELIVER SATURDAY (Extra charge) (Not available to all locations)
9 ☐ SATURDAY PICK-UP (Extra charge)

Special Handling
4 ☐ DANGEROUS GOODS (Extra charge)
6 ☐ DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice, 9, UN 1845 ____ x ____ kg. 904 III
☐ DESCRIPTION
12 ☐ HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT in Pounds Only	YOUR DECLARED VALUE (See right)
Total	Total 1 95	Total

DIM SHIPMENT (Chargeable Weight)
☐ ____ lbs.
L x W x H
Received At

1 ☐ Regular Stop 3 ☐ Drop Box
2 ☐ On-Call Stop 4 ☐ B.S.C. 5 ☐ Station

7 **Release Signature:**

Emp. No. Date
☐ Cash Received
☐ Return Shipment
☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 4/94
PART #14548 GBFE
FORMAT #160
160

AEN Connecticut
Internal Chain-of-Custody

Client: ~~2000~~ Orchard Road

AEN Job #: 7098-059A

Custody Seal: ~~present~~ / absent
~~intact~~ / not intact

Airbill #: FE

Sample #s: 01-05

Field C-O-C ~~present~~ / absent

Locations: 3, 9, 6, 2, 36

Laboratory Sample #	Relinquished by	Accepted by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
1/5			2/4	1300	BOD 5				
1-5		Bette Alves	2/4/98	0900	$NO_3 - NO_2$	Bette Alves		2/4/98	1545
1-5		AR	2/6	0900	Fe++	AR		2/6	1600
1-5		AR	2/9	1100	Sulfide	AR		2/9	2125
1-5		R Fuentes	2/10	17:30	Alkal.	R Fuentes		2/10	22:00
01-05		C. Cal	02/17	7:00	ICAP	C. Cal		02/17	14:00
1-6		AR	2/17	0900	COD, TOC	AR		2/17	2125
1-5			2/18	9:40	NH3				
1-5		MM	2/20	11:00	F-	MM		2/20	18:20

AEN Form# SMF00501.CT

AEN Connecticut
Internal Chain-of-Custody

Client: G&M

AEN Job #: 7098-0259A

Custody Seal: present / absent
intact / not intact

Airbill #: FE

Sample #s: 07-12

Field C-O-C: present / absent

Locations: 2, 35, 9, 3, 6

Laboratory Sample #	Relinquished by	Accepted by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
7-11	Melon	AR	2/6	0900	Fe ++	CAR	Melon	2/6	1400
7-11	Melon	UOS	2/6	0900	BOD5				
7-12	Melon	D. Humbert	2/6/98	11:30	VOA	used			
7,8,11	Melon	D. Humbert	2/6/98	10:40	VOA	used			
7-11	Melon	CAR	2/9/98	11:00	Sulfide	CAR		2/9	2125
7-11	Melon	R. Guerrera	2/10	17:30	Alkal.	R. Guerrera		2/10	22:00
07-11	Melon	C. Carr	07/17	7:00	TCAN	C. Carr	Melon	04/17	14:00
7-11	Melon	CAR	2/17	0900	CODTA	CAR		2/17	2125
7-11	Melon	UOS	2/18	940	NH3				
7-11		DSM	2/20	11:00	F-	DSM		2/20	18:20

AEN Form# SMF00501.CT

AEN C .necticut
Internal Chain-of-Custody

Client: Fngersol

AEN Job #: 7098-0259A

Custody Seal: present / absent
intact / not intact

Airbill #: FE

Sample #s: 13-18

Field C-O-C present / absent

Locations: 36

Laboratory Sample #	Relinquished by	Accepted by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
13-18	Odon	D. Humbert	2/9/98	10:40	VOA	Used			
13-18	Odon	D. Humbert	2/10/98	9:15	VOA	Used			

AEN Form# SMF00501.CT

an environmental testing company
200 Monroe Turnpike
Monroe, Connecticut 06468
(203) 261-4458
FAX (203) 268-5346

CHAIN OF CUSTODY
ATOMIC SPECTROSCOPY DEPARTMENT

Job Number 25SA Sample Numbers 01-05, 07-11
Total & After

WATER - SOIL - SLUDGE - EPTOX/TCLP

I confirm that I have performed the preparation below following SOP guidelines and authorize the release of this preparation:

Sample Prep			
	C. Cook	02/12/98	ICP/FLME
			FURN
			MERCURY
	Chemist	Date(s)	

I confirm that I have performed the analysis below following SOP guidelines and authorize the release of all associated data:

Analysis	D M Sund	2/18/98	ICP
			FLAME
			FURN
			MERCURY
	Chemist	Date(s)	

I have reviewed and authorize the release of this job:

Complete	D M Sund	2/19/98
	Supervisor	Date

Batch Assignment _____

IEA / CT
LABORATORY CHRONICLE

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSIS

JOB #: 7098-0259A

SAMPLE ID	MATRIX	LIST REQUESTED	DATE RECEIVED	DATE DIGESTED	DATE ANALYZED
MW-26	WATER	FE-N600	02/04/98	2/17/98	2/18/98
MW-26	WATER	FE-N600-D	02/04/98	↓	↓
MW-26	WATER	MN-N600	02/04/98		
DUP-1	WATER	FE-N600	02/04/98		
DUP-1	WATER	FE-N600-D	02/04/98		
DUP-1	WATER	MN-N600	02/04/98		
MW-29	WATER	FE-N600	02/04/98		
MW-29	WATER	FE-N600-D	02/04/98		
MW-29	WATER	MN-N600	02/04/98		
-3	WATER	FE-N600	02/04/98		
MW-3	WATER	FE-N600-D	02/04/98		
MW-3	WATER	MN-N600	02/04/98		
OW-101	WATER	FE-N600	02/04/98		
OW-101	WATER	FE-N600-D	02/04/98		
OW-101	WATER	MN-N600	02/04/98		
MW-20	WATER	FE-N600	02/05/98		
MW-20	WATER	FE-N600-D	02/05/98		
MW-20	WATER	MN-N600	02/05/98		
MW-24	WATER	FE-N600	02/05/98		
MW-24	WATER	FE-N600-D	02/05/98		
MW-24	WATER	MN-N600	02/05/98	↓	↓
MW-2	WATER	FE-N600	02/05/98		

Section Supervisor (signature) Diane Fuerst

iew & Approval (printed name) Diane Fuerst

(Date) 2/19/98

QC Supervisor (signature) _____

Review & Approval (printed name) _____

(Date) __/__/__

IEA / CT
LABORATORY CHRONICLE

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSIS

JOB #: 7098-0259A

SAMPLE ID	MATRIX	LIST REQUESTED	DATE RECEIVED	DATE DIGESTED	DATE ANALYZED
MW-2	WATER	FE-N600-D	02/05/98	2/17/98	2/18/98
MW-2	WATER	MN-N600	02/05/98	↓	↓
MW-23	WATER	FE-N600	02/05/98		
MW-23	WATER	FE-N600-D	02/05/98		
MW-23	WATER	MN-N600	02/05/98		
MW-22	WATER	FE-N600	02/05/98		
MW-22	WATER	FE-N600-D	02/05/98		
MW-22	WATER	MN-N600	02/05/98		

Section Supervisor (signature) Diane Iurno

Review & Approval (printed name) Diane Iurno

(Date) 2/19/98

QC Supervisor (signature) _____

Review & Approval (printed name) _____

(Date) __/__/__

HOLDING TIME REPORT

ab Name: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : ALKALIN

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/10/98
DUP-1	01	02/04/98		
MW-29	01	02/04/98		
MW-3	01	02/04/98		
OW-101	01	02/04/98		
MW-20	01	02/05/98		
MW-24	01	02/05/98		
MW-2	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		

HOLDING TIME REPORT

ab Name: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : AMMONIA

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/23/98
DUP-1	01	02/04/98		
MW-29	01	02/04/98		
MW-3	01	02/04/98		
OW-101	01	02/04/98		
MW-20	01	02/05/98		
MW-24	01	02/05/98		
MW-2	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		

HOLDING TIME REPORT

ab Name: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : BOD5

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/4/9Y
DUP-1	01	02/04/98		
MW-29	01	02/04/98		
MW-3	01	02/04/98		
OW-101	01	02/04/98		
MW-20	01	02/05/98		2/6/9Y
MW-24	01	02/05/98		
MW-2	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		

HOLDING TIME REPORT

ab Name: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : CHLORIDE

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/23/98
DUP-1	01	02/04/98		
MW-29	01	02/04/98		
MW-3	01	02/04/98		
OW-101	01	02/04/98		
MW-20	01	02/05/98		
MW-24	01	02/05/98		
MW-2	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		

HOLDING TIME REPORT

ab Name: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : COD

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/17/98
DUP-1	01	02/04/98		
MW-29	01	02/04/98		
MW-3	01	02/04/98		
OW-101	01	02/04/98		
MW-20	01	02/05/98		
MW-24	01	02/05/98		
MW-2	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		"

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : FLUORIDE

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/20/98
DUP-1	01	02/04/98		
MW-29	01	02/04/98		
MW-3	01	02/04/98		
OW-101	01	02/04/98		
MW-20	01	02/05/98		
MW-24	01	02/05/98		
MW-2	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		

HOLDING TIME REPORT

ab Name: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : MISC-CC

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/6/98
MW-26	02	02/04/98		
DUP-1	01	02/04/98		
DUP-1	02	02/04/98		
MW-29	01	02/04/98		
MW-29	02	02/04/98		
MW-3	01	02/04/98		
MW-3	02	02/04/98		
OW-101	01	02/04/98		
OW-101	02	02/04/98		
MW-20	01	02/05/98		
MW-20	02	02/05/98		
MW-24	01	02/05/98		
MW-24	02	02/05/98		
MW-2	01	02/05/98		
MW-2	02	02/05/98		
MW-23	01	02/05/98		
MW-23	02	02/05/98		
MW-23	01	02/05/98		
MW-23	02	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		
MW-22	02	02/05/98		

HOLDING TIME REPORT

ab Name: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : NO3-NO2

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/5/98
DUP-1	01	02/04/98		
MW-29	01	02/04/98		
MW-3	01	02/04/98		
OW-101	01	02/04/98		
MW-20	01	02/05/98		2/6/98
MW-24	01	02/05/98		
MW-2	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		

HOLDING TIME REPORT

ab Name: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : SULFATE

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/12/98
DUP-1	01	02/04/98		
MW-29	01	02/04/98		
MW-3	01	02/04/98		
OW-101	01	02/04/98		
MW-20	01	02/05/98		
MW-24	01	02/05/98		
MW-2	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		

HOLDING TIME REPORT

ab Name: IEA Contract: _____

ab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : SULFIDE

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/9/98
DUP-1	01	02/04/98		
MW-29	01	02/04/98		
MW-3	01	02/04/98		
OW-101	01	02/04/98		
MW-20	01	02/05/98		
MW-24	01	02/05/98		
MW-2	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-23	01	02/05/98		
MW-22	01	02/05/98		

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Analyte : TOCD

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-26	01	02/04/98		2/20/98
MW-26	02	02/04/98		
DUP-1	01	02/04/98		
DUP-1	02	02/04/98		
MW-29	01	02/04/98		
MW-29	02	02/04/98		
MW-3	01	02/04/98		
MW-3	02	02/04/98		
OW-101	01	02/04/98		
OW-101	02	02/04/98		
MW-20	01	02/05/98		
MW-20	02	02/05/98		
MW-24	01	02/05/98		
MW-24	02	02/05/98		
MW-2	01	02/05/98		
MW-2	02	02/05/98		
MW-23	01	02/05/98		
MW-23	02	02/05/98		
MW-23	01	02/05/98		
MW-23	02	02/05/98		
MW-23	01	02/05/98		
MW-23	02	02/05/98		
MW-22	01	02/05/98		
MW-22	02	02/05/98		

BLANKS

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Preparation Blank Matrix (soil/water) : water

Preparation Blank Concentration Units (mg/L or mg/kg) : mg/L

Analyte	Initial Calib. Blank (mg/L)	C	Continuing Calibration Blank (mg/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
ALKALIN									2.0	U	
AMMONIA									0.040	U	
BOD5									2.00	U	
CHLORIDE									3.00	U	
COD									10.0	U	
UORIDE									0.100	U	
3C-CC									0.100	U	
NO3-NO2									0.100	U	
SULFATE									10.0	U	
SULFIDE									1.00	U	
TOCD									1.00	U	

SPIKE SAMPLE RECOVERY

SAMPLE NO.: MW-23

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Matrix: water

Solids for Sample: _____

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
ALKALIN	75-125	NA							
AMMONIA	75-125	1.69		0.040	U	2.00	84.5		
BOD5	75-125	64.9		2.00	U	66.0	98.3		
CHLORIDE	75-125	82.1		22.4		60.0	99.5		
COD	75-125	109		14.1		100	94.9		
FLUORIDE	75-125	0.580		0.380		0.200	100.0		
MISC-CC	75-125	1.97		0.50	U	2.00	98.5		
NO3-NO2	75-125	0.340		~~0.100~~ 0.100	U	0.400	85.0		
SULFATE	75-125	128		~~69.00~~ 69.9	U	60.0	96.8		
SULFIDE	75-125	28.8		1.00	U	28.5	100.0		
TOC	75-125	28.6		3.46		25.0	100.6		

Comments: _____

5
DUPLICATES

SAMPLE NO.

MW.23

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

% Solids for Sample: _____ % Solids for Duplicate: _____

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
ALKALIN	20.0	381		379		0.53		
AMMONIA	20.0	0.040	U	0.040	U	NC		
BOD5	20.0	2.00	U	2.43		NC		
CHLORIDE	20.0	22.4		23.0		2.6		
COD	20.0	14.1		11.7		18.6		
FLUORIDE	20.0	0.380		0.390		2.6		
MISC-CC	20.0	0.50	U	0.50	U	NC		
[illegible]3-NO2	20.0	0.100	U	0.100	U	NC		
[illegible]FATE	20.0	69.9		69.4		0.72		
SULFIDE	20.0	1.00	U	1.00	U	NC		
TOCD	20.0	3.63		3.50		3.6		

LABORATORY CONTROL SAMPLE

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0259A SAS No. : _____ SDG No.: A0259

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	True	LCS Found	%R	LCS Source
ALKALIN	87.8	79.0	90.0	APG
AMMONIA	6.99	7.24	103.6	
BOD5	NA			
CHLORIDE	235	230	97.9	
COD	324	284	87.7	
FLUORIDE	6.02	5.82	96.7	
MISC-CC	NA			
NO3-NO2	2.52	2.54	100.8	
SULFATE	100.4	94.6	94.2	
SULFIDE	NA			
TOCD	12.1	12.1	100.0	

American Environmental Network
200 Monroe Turnpike • Monroe, CT 06468 • (203) 261-4458 • Fax (203) 268-5346

April 03, 1998

Mr. Marc Sanford
INGERSOLL RAND
Geraghty & Miller
215 Washington Ave Ext.
Albany, NY 12205

Dear Mr. Sanford :

Please find enclosed the analytical results of 2 sample(s) received at our laboratory on March 11, 1998. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

IEA Report #7098-0525A	
Project ID: ARO CORP.	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 261-4458 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Jeffrey C. Curran
Laboratory Manager

JCC

cc: J. HARRY

7098-0525A
INGERSOLL RAND

Case Narrative

Miscellaneous GC - Subcontracted to Microseeps.

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. Samples for TOC were analyzed on 03/11/98. Curve data and correlating QC are part of the 03/10/98 TOC run. No other analytical problems were encountered.

Analyte	Method	Reference
Ferrous Iron	3500-Fe	2
Alkalinity	310.1	1
Chloride	325.2	1
TOCD	415.1	1
NO3-NO2	353.2	1
Sulfate	375.2	1
Ammonia	350.1	1
BOD5	405.1	1
Fluoride	340.2	1
COD	410.4	1
Sulfide	376.1	1

References:

1. Methods of Chemical Analysis of Water and Wastes, EPA 600, 1983.
2. Standard Methods for the Examination of Water and Wastewater. 18th edition, 1992.

Metals - ICAP metals were determined by ICP using a JA61 simultaneous ICP using the USEPA 200.7 SOW.

No problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

IEC's are electronically employed by the ICAP. However, the ICSA is utilized as a monitoring device to detect any additional adjustments that may be required. These modifications are calculated and applied manually. They are so noted in the raw data.

Volatile Organics - Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 8260A. The instrumentation used was a Tekmar Dynamic Headspace Concentrator interfaced with a Hewlett-Packard Model 5995 GC/MS/DS.

The "L" flag on the form 6A's designate that linear regression was used for

quantitation for that compound, due to the %RSD being 15% or greater. The form 1A's reflect the true concentration calculated with linear regression. The quant reports may not agree with form 1A's, due to software limitations. All results for compounds with "L" flags should be taken from either tabulated results or form 1A's.

Sample MW-6 was analyzed at a 1:200 dilution due to high target compound concentrations.

No problems were encountered.

TABLE VO-1.0 Aqueous
7098-0525A
INGERSOLL RAND
TCL VOLATILE ORGANICS

All values are ug/L.

Client Sample I.D.	Method Blank	TB 031098		Quant. Limits with no Dilution
Lab Sample I.D.	VBLKGU	980525A-02		
Method Blank I.D.	VBLKGU	VBLKGU		
Quant. Factor	1.00	1.00		
Chloromethane	U	U		10
Bromomethane	U	U		10
Vinyl Chloride	U	U		10
Chloroethane	U	U		10
Methylene Chloride	U	U		5.0
Acetone	U	U		10
Carbon Disulfide	U	U		5.0
Vinyl Acetate	U	U		10
1,1-Dichloroethene	U	U		5.0
1,1-Dichloroethane	U	U		5.0
1,2-Dichloroethene (total)	U	U		5.0
Chloroform	U	U		5.0
1,2-Dichloroethane	U	U		5.0
2-Butanone	U	U		10
1,1,1-Trichloroethane	U	U		5.0
rbon Tetrachloride	U	U		5.0
romodichloromethane	U	U		5.0
1,2-Dichloropropane	U	U		5.0
cis-1,3-Dichloropropene	U	U		5.0
Trichloroethene	U	U		5.0
Dibromochloromethane	U	U		5.0
1,1,2-Trichloroethane	U	U		5.0
Benzene	U	U		5.0
trans-1,3-Dichloropropene	U	U		5.0
Bromoform	U	U		5.0
4-Methyl-2-Pentanone	U	U		10
2-Hexanone	U	U		10
Tetrachloroethene	U	U		5.0
Toluene	U	U		5.0
1,1,2,2-Tetrachloroethane	U	U		5.0
Chlorobenzene	U	U		5.0
Ethylbenzene	U	U		5.0
Styrene	U	U		5.0
Xylene (total)	U	U		5.0
Date Received		03/11/98		
Date Extracted	N/A	N/A		
Date Analyzed	03/12/98	03/12/98		

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.1
7098-0525A
INGERSOLL RAND
TCL VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	Method Blank	MW-6		Quant. Limits with no Dilution
Lab Sample I.D.	VBLKGV	980525A-01		
Method Blank I.D.	VBLKGV	VBLKGV		
Quant. Factor	1.00	200.		
Chloromethane	U	U		10
Bromomethane	U	U		10
Vinyl Chloride	U	U		10
Chloroethane	U	U		10
Methylene Chloride	U	U		5.0
Acetone	U	U		10
Carbon Disulfide	U	U		5.0
Vinyl Acetate	U	U		10
1,1-Dichloroethene	U	U		5.0
1,1-Dichloroethane	U	U		5.0
1,2-Dichloroethene (total)	U	1400		5.0
Chloroform	U	U		5.0
1,2-Dichloroethane	U	U		5.0
2-Butanone	U	U		10
1,1,1-Trichloroethane	U	U		5.0
rbon Tetrachloride	U	U		5.0
romodichloromethane	U	U		5.0
1,2-Dichloropropane	U	U		5.0
cis-1,3-Dichloropropene	U	U		5.0
Trichloroethene	U	32000		5.0
Dibromochloromethane	U	U		5.0
1,1,2-Trichloroethane	U	U		5.0
Benzene	U	U		5.0
trans-1,3-Dichloropropene	U	U		5.0
Bromoform	U	U		5.0
4-Methyl-2-Pentanone	U	U		10
2-Hexanone	U	U		10
Tetrachloroethene	U	U		5.0
Toluene	U	U		5.0
1,1,2,2-Tetrachloroethane	U	U		5.0
Chlorobenzene	U	U		5.0
Ethylbenzene	U	U		5.0
Styrene	U	U		5.0
Xylene (total)	U	U		5.0
Date Received		03/11/98		
Date Extracted	N/A	N/A		
Date Analyzed	03/13/98	03/13/98		

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

MICROSE

AEN15-982300

----- AMERICAN EMVIRONMENTAL NETWORK -----
----- PROJECT: 7098-0525A -----
----- CONCENTRATIONS IN NANOGRAMS/LITER WATER -----

SAMPLE NAME	METHANE (ng/l)	ETHANE (ng/l)	ETHYLENE (ng/l)	FILE NAME	DATE SAMPLED	DATE RECEIVED	DATE ANALYZED
MW-6	58581	85	8	C15 55	03/10/98	03/12/98	03/13/98
MDLs FOR ABOVE SAMPLES	15	5	5				

20-Mar-98

ANALYST INITIALS JM

REVIEW AS

MICROSEL

AEN15-982300

----- AMERICAN ENVIRONMENTAL NETWORK,INC. -----
----- PROJECT: 7098-0525A -----

SAMPLE NAME	CARBON DIOXIDE (mg/l)	OXYGEN (mg/l)	NITROGEN (mg/l)	METHANE (mg/l)	CARBON MONOXIDE (mg/l)	FILE NAME	DATE SAMPLED	DATE RECEIVED	DATE ANALYZED
MW-6	71.3	7.98	21.3	*	<.4	P20 52	03/10/98	03/12/98	03/18/98
MDLs FOR ABOVE SAMPLES	0.3	0.15	0.4	0.07	0.4				

* REFER TO LIGHT HYDROCARBON REPORT.

20-Mar-98

ANALYST INITIALS JM

REVIEW AS

TABLE AS-1.0 Aqueous
7098-0525A
INGERSOLL RAND
MISCELLANEOUS ATOMIC SPECTROSCOPY (Dissolved)

All values are ug/L.

Client Sample I.D.	MW-6			
Lab Sample I.D.	980525A-01			
Iron	3320			
Manganese	307.			

See Appendix for qualifier definitions

TABLE AS-1.1 Aqueous
7098-0525A
INGERSOLL RAND
MISCELLANEOUS ATOMIC SPECTROSCOPY (Total)

All values are ug/L.

Client Sample I.D.	MW-6			
Lab Sample I.D.	980525A-01			
Iron	106000			
Manganese	2420			

See Appendix for qualifier definitions

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-6

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Matrix: (soil/water) WATER Lab Sample ID: 0525001

% Solids: _____ Date Received: 03/11/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	405.			
AMMONIA	0.040	U		
BOD5	2.00	U		
CHLORIDE	376.			
COD	39.1			
FLUORIDE	0.25			
FERROUS IRON	.5	U		
FERRIC IRON	3.32			
NO3-NO2	0.100	U		
SULFATE	223.			
SULFIDE	1.000	U		
TOCD	1.00	U		
	1.00	U		

Comments: _____

ORGANICS APPENDIX

U - Indicates that the compound was analyzed for but not detected.

J - Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

B - This flag is used when the analyte is found in the blanks as well as the sample. It indicates possible sample contamination and warns the data user to use caution when applying the results of this analyte.

N - Indicates that the compound was analyzed for but not requested as an analyte. Value will not be listed on tabular result sheet.

S - Estimated due to surrogate outliers.

X - Matrix spike compound.

(1) - Cannot be separated.

(2) - Decomposes to azobenzene. Measured and calibrated as azobenzene.

A - This flag indicates that a TIC is a suspected aldol condensation product.

E - Indicates that it exceeds calibration curve range.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C - Confirmed by GC/MS.

T - Compound present in TCLP blank.

P - This flag is used for a pesticide/aroclor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns (see Form X).

INORGANICS APPENDIX

C - Concentration qualifiers

U - Indicates analyte was not detected at method reporting limit.

B - Indicates analyte result between IDL and contract required detection limit (CRDL)

Q - QC qualifiers

E - Reported value is estimated because of the presence of interference

M - Duplicate injection precision not met

N - Spiked sample recovery not within control limits

S - The reported value was determined by the method of standard additions (MSA)

W - Post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance

* - Duplicate analysis not within control limit

+ - Correlation coefficient for MSA is less than 0.995

M - Method codes

P - ICP

A - Flame AA

F - Furnace AA

CV - Cold vapor AA (manual)

C - Cyanide

NR - Not Required

NC - Not Calculated as per protocols

STATE CERTIFICATIONS

In some instances it may be necessary for environmental data to be reported to a regulatory authority with reference to a certified laboratory. For your convenience, the laboratory identification numbers for the AEN-Connecticut laboratory are provided in the following table. Many states certify laboratories for specific parameters or tests within a category (i.e. method 325.2 for wastewater). The information in the following table indicates the lab is certified in a general category of testing such as drinking water or wastewater analysis. The laboratory should be contacted directly if parameter-specific certification information is required.

AEN-Connecticut
Certification Summary (as of September 1997)

State	Responsible Agency	Certification	Lab Number
Connecticut	Department of Health Services	Drinking Water, Wastewater	PH-0497
Maine	Department of Human Services	Wastewater	CT023
Massachusetts	Department of Environmental Protection	Potable/Non-Potable Water	CT023
New Hampshire	Department of Environmental Services	Drinking Water, Wastewater	2528
New Jersey	Department of Environmental Protection	Drinking Water, Wastewater	46410
New York	Department of Health	CLP, Drinking Water, Wastewater, Solid/ Hazardous Waste	10602
North Carolina	Division of Environmental Management	Wastewater Hazardous Waste	388
North Dakota	Department of Health and Consolidated Laboratories	Non-Potable/Potable Hazardous Waste	R-138
Oklahoma	Department of Environmental Quality	General Water Quality/ Sludge Testing	9614
Rhode Island	Department of Health	Chemistry...Non-Potable Water and Wastewater	A43
Washington	Department of Ecology	Wastewater/ Hazardous Waste	C231
West Virginia	Division of Environmental Protection	Wastewater/ Hazardous Waste	263
Wisconsin	Department of Natural Resources	Wastewater/ Hazarous Waste	998355710

7098-0525A
INGERSOLL RAND
SAMPLE SUMMARY

CLIENT ID	LAB ID	MATRIX	DATE COLLECTED	DATE RECEIVED
MW-6	980525A-01	WATER	03/10/98	03/11/98
TB 031098	980525A-02	WATER	03/10/98	03/11/98

IEA-CT ANALYTICAL SUMMARY

Client ID: MW-6, TB 031098
Job Number: 7098-0525A

Date: 4/3/98

Qty	Matrix	Analysis	Description
1	WATER	ALK-N310.1	Alkalinity
1	WATER	AMMONIA-350.1	Ammonia
1	WATER	BOD5-N405.1	Biochemical Oxygen D
1	WATER	CC-MISC	Miscellaneous Classi
	WATER	CHLORIDE-N325.2	Chloride
_	WATER	COD-N410.4	Chemical Oxygen Dema
1	WATER	FE-N600	Iron
1	WATER	FE-N600-D	Iron (Dissolved)
1	WATER	FERROUS IRON-D	Ferrous Iron (dissol
1	WATER	FLUORIDE-N340.2	Fluoride
1	WATER	GC-MISC	Miscellaneous GC
1	WATER	MET-PREP-ICAP	Metals ICAP Prep
1	WATER	MET-PREP-ICAP-D	Metals ICAP Prep (Di
1	WATER	MN-N600	Manganese
1	WATER	MN-N600-D	Manganese (Dissolved
1	WATER	NITRATE/NIT-N353.2	Nitrate/Nitrite-Nitr
1	WATER	SULFATE-N375.3	Sulfate
1	WATER	SULFIDE-N376.1	Sulfide
1	WATER	TOC-N415.1-DUP	Total Organic Carbon
1	WATER	TOC-N415.1-DUP-D	Total Organic Carbon
2	WATER	VOA-N8260A-TCL	TCL Volatile Organic

GERAGHTY & MILLER, INC.
Environme... Infrastructure
a ...mli company

Laboratory Task Order No. 7098-05254

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Number A7000220.0004

Project Location Chattanooga, NT

Laboratory AEN

Sampler(s)/Affiliation JB Arcadis

SAMPLE IDENTITY	Code	Date/~~Time~~ Sampled	Time ~~Lab ID~~	SAMPLE BOTTLE / CONTAINER DESCRIPTION: Fluoride, Sulfate, Chloride, Alkalinity PL1000	Nitrate/Nitrite, COD, Ammonia PL1000	BOD5 PL1000	Ferrous ★ CL500	Diss Met PL 500	TOT MET ★ PL500	Sulfide PL500	TOC PL500	D2O DUP TOC DUP VOA-TCL	5VB-GC VOA-TCL ★ VOA-TCL	TOTAL	
MW-6	L	3/10/98	1:30P	1	1	1	1	1	1	1	4	5	16	01
TripBlank	L	—	—										2	02

Preserved Field Screen
DNP 3/11/98 - 6C

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 18

						Seal Intact?
Relinquished by:	[signature]	Organization: Arcadis Geraghty + Miller	Date 3/10/98	Time 5:45P		
Received by:	[signature] Plumlee	Organization: AEN/CT	Date 3/11/98	Time 10:15		Yes (No) N/A
Relinquished by:		Organization:	Date / /	Time		Seal Intact?
Received by:		Organization:	Date / /	Time		Yes No N/A

Special Instructions/Remarks:
★ Preservative washed out - needs to be lab filtered

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other (SPECIFY)

GERAGHTY & MILLER, INC.
Environment and Infrastructure
an mji company

Laboratory Task Order No. 7098-05254

CHAIN-OF-CUSTODY RECORD

Project Number A7000220.0004

Project Location Chattanooga, NY

Laboratory AEN

Sampler(s)/Affiliation JB-Arcadis

SAMPLE IDENTITY	Code	Date/~~Time~~ Sampled	Time ~~Lab ID~~	SAMPLE BOTTLE / CONTAINER DESCRIPTION: Fluoride, Sulfate, Chloride, Alkalinity PL1000	Nitrate/Nitrite, COD, Ammonia PL1000	BOD5 PL1000	Ferrous ★ CL500	Diss Met PL500	★ Tot Met PL500	Sulfide PL500	TOC DUP TOC DUP	★ Vaqual 5VB-GC VOA-TCC Vaqual	TOTAL	
MW-6	L	3/10/98	1530	1	1	1	1	1	1	1	4	5	16	01
TripBlank	L	—	—										2	02

Passed Bad Screen
DNP 3/11/98 6°C

Sample Code: L = Liquid; S = Solid; A = Air

Total No. of Bottles/ Containers: 18

Relinquished by: [signature]	Organization: Arcadis Geraghty + Miller	Date 3/10/98	Time 5:45P	Seal Intact?		
Received by: [signature] P Jumper	Organization: AEN/CT	Date 3/11/98	Time 10:15	Yes (No)	N/A	
Relinquished by:	Organization:	Date / /	Time	Seal Intact?		
Received by:	Organization:	Date / /	Time	Yes	No	N/A

Special Instructions/Remarks:
★ Preservative washed out - needs to be lab filtered

Delivery Method: ☐ In Person ☒ Common Carrier Fed Ex (SPECIFY) ☐ Lab Courier ☐ Other (SPECIFY)

FedEx USA Airbill

FedEx Tracking Number 802449362069

Form I.D. No. 0200

Recipient's Copy

From

te 3/10/98

nder's me Jeffrey Rustigel Phone (518) 458-7626

npany Accuardi, Geraghty & Miller

dress 315 Washington Ave Ext. Dept./Floor/Suite/Room

y Albany State NY ZIP 12205

Your Internal Billing Reference Information AT00000.0001

To

ipient's me Phone (203) 261-1455

npany AZN

dress 200 Monroe Turnpike Check here if residence (Extra charge applies for FedEx Express Saver)
"HOLD" at FedEx location, print FedEx address here) Dept./Floor/Suite/Room

Monroe State CT ZIP 06468

For HOLD at FedEx Location check here
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For Saturday Delivery check here
☐ (Extra Charge. Not available to all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

8 0 2 4 4 9 3 6 2 0 6 9

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas.

☒ FedEx Priority Overnight (Next business morning) ☐ FedEx Standard Overnight (Next business afternoon)
☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)
☐ FedEx 2Day (Second business day) ☐ FedEx Express Saver (Third business day)
FedEx Letter Rate not available. Minimum charge: One pound rate.

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.

☐ FedEx Overnight Freight (Next business day) ☐ FedEx 2Day Freight (Second business day) ☐ FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging ☐ FedEx Letter ☐ FedEx Pak ☐ FedEx Box ☐ FedEx Tube ☒ Other Pkg.
Declared value limit $500.

6 Special Handling (One box must be checked)

Does this shipment contain dangerous goods?* ☐ No ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)

☐ Dry Ice Dry Ice, 9, UN 1845 ____ x ____ kg. CA ☐ Cargo Aircraft Only

*Dangerous Goods cannot be shipped in FedEx packaging.

7 Payment ☐ Obtain Recipient FedEx Account No.

Bill to: ☒ Sender (Account no. in Section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check
(Enter FedEx account no. or Credit Card no. below)

Total Packages	Total Weight	Total Declared Value*	Total Charges
1	2	$ .00	$

*When declaring a value higher than $100 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY section for further information.

Credit Card Auth.

8 Release Signature

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

288

Questions?
Call 1-800-Go-FedEx (800)463-3339

Rev. Date 8/97
Part #151558
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GBFE 11/97

AEN Connecticut
Internal Chain-of-Custody

Client: Omegasoil Land

AEN Job #: 7098-0525 A

Custody Seal: present / ~~absent~~
intact / not intact

Airbill #: E & E

Sample #s: 01 \ 02

Field C-O-C: present / absent

Locations: R35, 2, 3, 6+9

Laboratory Sample #	Relinquished by	Accepted by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
1			3/11	1400	TOC Fe^{2}, BOD, NO_3			3/12	PM
1		Mike Crowe	3/13	1705	VOA	used			
1			3/16	1700	sulfide			4/3	1500
1		Peter Alves	3/30/98	1010	Cl^-			4/3	1500
1			4/1	PM	Fluoride			4/3	1500
1	SJC		3/19	1000	Alkalinity			4/3	1500
1	SJC		3/23	1000	Ammonia			4/3	1500
1	SJC		4/2	1000	COD			4/3	1500
1	SJC		3/31	1000	SO4			4/3	1500
					~~TOC~~ SJC				

AEN Form# SMF00501.CT

AS:022189:0

an environmental testing company
200 Monroe Turnpike
Monroe, Connecticut 06468
(203) 261-4458
FAX (203) 268-5346

CHAIN OF CUSTODY
ATOMIC SPECTROSCOPY DEPARTMENT

Job Number 525A Sample Numbers 01T + 01F

WATER - SOIL - SLUDGE - EPTOX/TCLP

I confirm that I have performed the preparation below following SOP guidelines and authorize the release of this preparation:

Sample Prep		
C Cole	03/12/92	ICP/FLME
		FURN
		MERCURY
Chemist	Date(s)	

I confirm that I have performed the analysis below following SOP guidelines and authorize the release of all associated data:

Analysis		
[illegible]	3/25/92	ICP
		FLAME
		FURN
		MERCURY
Chemist	Date(s)	

I have reviewed and authorize the release of this job:

Complete	
[illegible]	3/31/92
Supervisor	Date

Batch Assignment _____

AEN 15-98230

IEA
An Aquarion Company

IEA SUBCONTRACTING REQUISITION FORM

PAGE 1 OF 1

A. PROJECT INFORMATION

1. P.O. ER	2. VERBAL DUE DATE	3. FAX DUE DATE	4. HARDCOPY DUE DATE
CT7328	—	—	3/30/98
5. INTERNAL PROJECT NUMBER	**6. SDG COMPLETE?**	**7. PENALTY JOB?**	**8. SDG #**
7098-0525A	☒ YES ☐ NO	☐ YES ☐ NO	A0525
9. REGULATORY METHODS	**10. QC BILLABLE?**	**11. VTSR DATE**	**12. REQUIRED CERTIFICATIONS? IF YES, LIST**
	☐ YES ☒ NO		

15. IEA PROJECT MANAGER	16. TELEPHONE NO.	17. REPORTING LEVEL REQUIRED	18. REPORTING FORMAT?	13. CERT. AGENCY	14. CATEGORY
D. Plunkett	203-452-3[illegible]	1 (2) 3 4	(B) LVL 2		
19. PERCENT DISCOUNT	**20. RUSH MULTIPLIER**	**21. DISKETTE REQUIRED?**	**22. DISKETTE FORMAT?**		
—	—	☐ YES ☐ NO			

23. CLIENT SAMPLE ID	24. LAB ID	25. DATE AND TIME	26. MATRIX	27. PARAMETER/METHOD/PRES.	28. BOTTLE TYPE & NO.	29. NET PRICE
MW-6	980525A-01	3/10/98 12:30	WA	permanent gases/AM15G	3 x 40A VIAL	$75
↓	↓		↓	light HC's/AM18	3	$75

30. SAMPLES RELINQUISHED BY (SIGNATURE)	31. DATE AND TIME	32. SAMPLES RECEIVED BY (SIGNATURE)	33. DATE AND TIME	34. REMARKS ON SAMPLE RECEIPT
DColon	3/11/98 1600			☐ Bottle Intact ☐ Custody Seals ☐ Preserved ☐ Seals Intact ☐ Chilled ☐ See Remarks
SAMPLES RELINQUISHED BY (SIGNATURE)	DATE AND TIME	SAMPLES RECEIVED BY (SIGNATURE)	DATE AND TIME	REMARKS ON SAMPLE RECEIPT
			3/12/98 1000	☐ Bottle Intact ☐ Custody Seals ☐ Preserved ☐ Seals Intact ☐ Chilled ☐ See Remarks

35. SPECIAL INSTRUCTIONS?/REMARKS (ATTACH SEPARATE SHEET IF NECESSARY)

check for cost of analysis will be entered at time of data release

B. SHIPPING INSTRUCTIONS

36. SHIP TO	37. SHIP DATE
microseeps University of Pittsburgh 220 William Pitt Way Pittsburgh PA 15238	3/11/98 (Circle One) Economy (Standard) Priority 1 Saturday Delivery

C. REPORTING INSTRUCTIONS

38. BILL TO	39. REPORT TO
AEN-CT	40. TOTAL NUMBER OF COPIES 1 41. USE FOR REPORTING? (CLIENT) OR LAB ID'S

D. APPROVALS

42. INITIATOR APPROVAL	DATE	44. SENDING LABORATORY
Beatrice Plunkett	3/11/98	
43. RECEIVING LAB APPROVAL	**DATE**	**45. RECEIVING LABORATORY**

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : ALKALIN

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98		03/19/98

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : AMMONIA

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98	03/23/98	03/24/98

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : BOD5

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98	03/11/98	03/16/98

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : CHLORIDE

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98		03/30/98

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : COD

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98		04/02/98

FORM VII - WC

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : FLUORIDE

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98		04/01/98

FORM VII - WC

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : MISC-CC

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98		03/12/98
MW-6	02	03/11/98		↓

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : NO3-NO2

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98		03/11/98

FORM VII - WC

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : SULFATE

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98		03/31/98

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : SULFIDE

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98		03/16/98

HOLDING TIME REPORT

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Analyte : TOCD

Client Sample ID	Rep	Date Received	Date Prepped	Date Analyzed
MW-6	01	03/11/98		03/11/98
MW-6	02	03/11/98		03/11/98

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 0525A SAS No.: _____ SDG No.: A0525

	EPA SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
01	VBLKGU	99	101	106		0
02	TB 031098	89	90	107		0
03	VBLKGV	94	92	103		0
04	MW-6	95	96	103		0
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
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28						
29						
30						

QC LIMITS

SMC1 (TOL) = Toluene-d8 (88-110)
SMC2 (BFB) = Bromofluorobenzene (86-115)
SMC3 (DCE) = 1,2-Dichloroethane-d4 (76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: ~~0412A~~ 0525A SAS No.: _____ SDG No.: ~~A0412~~ A0525

Matrix Spike - EPA Sample No.: MW-1

DS 03/19/98

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50	0	53	106	61-145
Trichloroethene	50	25	72	94	71-120
Benzene	50	0	48	96	76-127
Toluene	50	0	47	94	76-125
Chlorobenzene	50	0	49	98	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50	44	88	18*	14	61-145
Trichloroethene	50	74	98	4	14	71-120
Benzene	50	49	98	2	11	76-127
Toluene	50	48	96	2	13	76-125
Chlorobenzene	50	52	104	6	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits.

RPD: 1 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: _____

MICROSEEPS

FILE NOTE

SUBJECT: Permanent Gas Analysis of Water Samples

The VOA vials are removed from the refrigerator (4°C) and allowed to reach ambient temperature. Samples are prepared by withdrawing 30 cc of water from the bottom of the vial into a 50 cc Hamilton gas tight, locking syringe. Then 10 cc of helium is withdrawn from a reservoir and the syringe is locked. The syringe is then shaken for five minutes and allowed to equilibrate. With the syringe in a near vertical position, the headspace is injected through a septum-fitting into a 0.5 cc sample loop. The loop is allowed to equilibrate at 1 atmosphere pressure prior to switching the valve to place the sample loop into the carrier gas flow stream.

First, headspace concentrations of the analyzed gases are determined by comparison to the results of analysis of the "237" gas standard. Subsequently, the headspace concentrations are converted to the dissolved water concentrations using Henry's Law.

Results of analysis and applicable quality control parameters are supplied on the attached data sheets.

THE RESULTS SUPPLIED ARE THE ORIGINAL DISSOLVED CONCENTRATIONS OF THE ANALYTES IN MG/L AS CALCULATED FROM DETERMINED HEADSPACE CONCENTRATIONS.

220 William Pitt Way, Pittsburgh, PA 15238 • Phone (412) 826-5245, Fax (412) 826-3433

MICROSEEPS

FILE NOTE

SUBJECT: Light Hydrocarbon Analysis of Water Samples

The VOA vials are removed from the refrigerator (4°C) and allowed to reach ambient temperature. Samples are prepared by withdrawing 30 cc of water from the bottom of the vial into a 50 cc Hamilton gas tight, locking syringe. Then 10 cc of helium is withdrawn from a reservoir and the syringe is locked. The syringe is then shaken for five minutes and allowed to equilibrate. With the syringe in a near vertical position, the headspace is injected through a septum-fitting into a 0.5 cc sample loop. The loop is allowed to equilibrate at 1 atmosphere pressure prior to switching the valve to place the sample loop into the carrier gas flow stream.

First, headspace concentrations of the analyzed gases are determined by comparison to the results of analysis of a gas standard. Subsequently, the headspace concentrations are converted to the dissolved water concentrations using Henry's Law.

Results of analysis and applicable quality control parameters are supplied on the attached data sheets.

THE RESULTS SUPPLIED ARE THE ORIGINAL DISSOLVED CONCENTRATIONS OF THE ANALYTES IN NG/L AS CALCULATED FROM DETERMINED HEADSPACE CONCENTRATIONS.

220 William Pitt Way, Pittsburgh, PA 15238 • Phone (412) 826-5245, Fax (412) 826-3433

MICROS

AEN15-982300

**** QUALITY CONTROL ****

----- AMERICAN EMVIRONMENTAL NETWORK -----

----- PROJECT: 7098-0525A -----

CONTINUING CALIBRATION CHECK

STANDARD: "M"

REFERENCE: C15 46

COMPOUND	KNOWN (ppmv)	RESULT (ppmv)	PERCENT DIFFERENCE
METHANE	10.00	10.02	0.20
ETHANE	1.00	1.00	0.00
ETHYLENE	1.00	1.01	1.00

LABORATORY BLANK RESULTS

BLANK: N2 IN LOOP

REFERENCE: C15 47

COMPOUND	BLANK (ppmv)	LOWER DETECTION LIMIT (ppmv)
METHANE	ND	0.01
ETHANE	ND	0.01
ETHYLENE	ND	0.01

13-Mar-98

ANALYST INITIALS

REVIEW

MICROS

AEN15-982300

**** QUALITY CONTROL ****

----- AMERICAN ENVIRONMENTAL NETWORK,INC. -----
----- PROJECT: 7098-0525A -----

CONTINUING CALIBRATION CHECK

STANDARD: "237"

REFERENCE: P20 41

COMPOUND	KNOWN (%)	RESULT (%)	PERCENT DIFFERENCE
CO2	15.01	14.78	1.53
OXYGEN	7.01	6.95	0.91
NITROGEN	66.28	63.61	4.03
METHANE	4.52	4.62	2.21
CO	7.08	6.52	7.91

LABORATORY BLANK RESULTS

BLANK: HE IN LOOP

REFERENCE: P20 51

COMPOUND	BLANK (%)	LOWER DETECTION LIMIT (%)
CO2	ND	0.01
OXYGEN	ND	0.03
NITROGEN	ND	0.1
METHANE	ND	0.03
CO	ND	0.1

20-Mar-98

ANALYST INITIALS JM

REVIEW AS

U.S. EPA - CLP

3
BLANKS

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: _____ SAS No.: _____ SDG No.: A0525

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Iron									100.000	U	P
Manganese									15.000	U	P

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

BOILER #1S

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525 SAS No.: _____ SDG No.: A0525

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Iron	75-125	2203.5470		1227.6360		1000.00	97.6		P
Manganese	75-125	530.8044		55.1829		500.00	95.1		P

Comments:

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

BOILER #1D

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525 SAS No.: _____ SDG No.: A0525

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Iron		1227.6360		1221.7640		0.5		P
Manganese	.0	55.1829		34.3401		46.6		P

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: _____ SAS No.: _____ SDG No.: A0525

Solid LCS Source: _____

Aqueous LCS Source: INORG. VENT.

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Iron	500.0	525.32	105.1						
Manganese	500.0	493.69	98.7						

3
BLANKS

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Preparation Blank Matrix (soil/water) : water

Preparation Blank Concentration Units (mg/L or mg/kg) : mg/L

Analyte	Initial Calib. Blank (mg/L)	C	Continuing Calibration Blank (mg/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
ALKALIN									2.0	U	
AMMONIA									0.04	U	
BOD5									2.0	U	
CHLORIDE									3.0	U	
CO3									10.0	U	
F. JRIDE									0.10	U	
MISC-CC									0.5	U	
NO3-NO2									0.10	U	
SULFATE									10.0	U	
SULFIDE									1.0	U	
TOCD									1.0	U	

4A
SPIKE SAMPLE RECOVERY

SAMPLE NO.

0397A-08

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Matrix: water

Solids for Sample: _____

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
ALKALIN	75-125								
AMMONIA	75-125	1.97		0.040	U	2.00	98.5		
BOD5	75-125	14.5		2.00	U	16.5	87.9		
CHLORIDE	75-125								
COD	75-125								
FLUORIDE	75-125								
MISC-CC	75-125								
NO3-NO2	75-125	0.432		0.100	U	0.400	108		
SULFATE	75-125								
S'' FIDE	75-125								
T D	75-125								

Comments: _____

4A
SPIKE SAMPLE RECOVERY

SAMPLE NO. 0623A-04

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Matrix: water

Solids for Sample: _____

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
ALKALIN	75-125								
AMMONIA	75-125								
BOD5	75-125								
CHLORIDE	75-125	219		163		60.0	93.3		
COD	75-125								
FLUORIDE	75-125	0.200		0.100	U	0.200	100		
MISC-CC	75-125								
NO3-NO2	75-125								
SULFATE	75-125								
[illegible]FIDE	75-125								
TOCD	75-125								

Comments: _____

FORM IV (Part 1) - WC

4A
SPIKE SAMPLE RECOVERY

SAMPLE NO.
0537A-20

La' Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Matrix: water

Solids for Sample: _____

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
ALKALIN	75-125								
AMMONIA	75-125								
BOD5	75-125								
CHLORIDE	75-125								
COD	75-125	7300		2160		5000	103		
FLUORIDE	75-125								
MISC-CC	75-125								
NO3-NO2	75-125								
SULFATE	75-125								
_FIDE	75-125								
TOCD	75-125								

Comments: _____

FORM IV (Part 1) - WC

4A
SPIKE SAMPLE RECOVERY

SAMPLE NO.
0397A-06

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Matrix: water

Solids for Sample: _____

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
ALKALIN	75-125								
AMMONIA	75-125								
BOD5	75-125								
CHLORIDE	75-125								
COD	75-125								
FLUORIDE	75-125								
MISC-CC	75-125								
NO3-NO2	75-125								
SULFATE	75-125	127		71.2		60.0	93		
[illegible]LFIDE	75-125								
[illegible]OCD	75-125								

Comments: _____

FORM IV (Part 1) - WC

4A

SPIKE SAMPLE RECOVERY

SAMPLE NO. 0525A-01

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Matrix: water

Solids for Sample: _____

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
ALKALIN	75-125								
AMMONIA	75-125								
BOD5	75-125								
CHLORIDE	75-125								
COD	75-125								
FLUORIDE	75-125								
MISC-CC	75-125	1.94		0.500	U	2.00	97		
NO3-NO2	75-125								
SULFATE	75-125								
LFIDE	75-125	24.2		1.00	U	24.2	100		
UCD	75-125								

Comments: _____

FORM IV (Part 1) - WC

4A
SPIKE SAMPLE RECOVERY

SAMPLE NO.

03889-01

Lab Name: IEA Contract:

Lab Code: IEA Case No.: 0525A SAS No. : SDG No.: A0525

Matrix: water

Solids for Samole:

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
ALKALIN	75-125								
AMMONIA	75-125								
BOD5	75-125								
CHLORIDE	75-125								
COD	75-125								
FLUORIDE	75-125								
MISC-CC	75-125								
NO3-NO2	75-125								
SULFATE	75-125								
FIDE	75-125								
TuCD	75-125	10.4		1.00	4	10.0	104		

Comments:

5
DUPLICATES

SAMPLE NO.

0397A-10

Lab Name: IEA Contract:

Lab Code: IEA Case No.: 0525A SAS No. : SDG No.: A0525

% Solids for Sample: % Solids for Duplicate:

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
ALKALIN	20.0	104		105		0.957		
AMMONIA	20.0							
BOD5	20.0							
CHLORIDE	20.0							
COD	20.0							
FLUORIDE	20.0							
[illegible]C-CC	20.0							
NO3-NO2	20.0							
SULFATE	20.0							
SULFIDE	20.0							
TOCD	20.0							

5
DUPLICATES

SAMPLE NO.

0397A-08

Lab Name: IEA Contract:

Lab Code: IEA Case No.: 0525A SAS No. : SDG No.: A0525

% Solids for Sample: % Solids for Duplicate:

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
ALKALIN	20.0							
AMMONIA	20.0	0.040	U	0.040	U	NC		
BOD5	20.0	2.00	U	2.00	U	NC		
CHLORIDE	20.0							
COD	20.0							
FLUORIDE	20.0							
TOC-CC	20.0							
NO3-NO2	20.0	0.100	U	0.100	U	NC		
SULFATE	20.0							
SULFIDE	20.0							
TOCD	20.0							

5
DUPLICATES

SAMPLE NO.

0623A-04

Lab Name: IEA Contract:

Lab Code: IEA Case No.: 0525A SAS No. : SDG No.: A0525

% Solids for Sample: % Solids for Duplicate:

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
ALKALIN	20.0							
AMMONIA	20.0							
BOD5	20.0							
CHLORIDE	20.0	163		162		0.615		
COD	20.0							
FLUORIDE	20.0	0.100	U	0.100	U	NC		
3C-CC	20.0							
NU3-NO2	20.0							
SULFATE	20.0							
SULFIDE	20.0							
TOCD	20.0							

5
DUPLICATES

SAMPLE NO.

0537A-20

Lab Name: IEA Contract:

Lab Code: IEA Case No.: 0525A SAS No. : SDG No.: A0525

% Solids for Sample: % Solids for Duplicate:

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
ALKALIN	20.0							
AMMONIA	20.0							
BOD5	20.0							
CHLORIDE	20.0							
COD	20.0	2160		2100		2.82		
FLUORIDE	20.0							
[illegible]C-CC	20.0							
N[illegible]-NO2	20.0							
SULFATE	20.0							
SULFIDE	20.0							
TOCD	20.0							

5
DUPLICATES

SAMPLE NO.

03979-06

Lab Name: IEA Contract:

Lab Code: IEA Case No.: 0525A SAS No. : SDG No.: A0525

% Solids for Sample: % Solids for Duplicate:

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
ALKALIN	20.0							
AMMONIA	20.0							
BOD5	20.0							
CHLORIDE	20.0							
COD	20.0							
FLUORIDE	20.0							
TOC-CC	20.0							
NO3-NO2	20.0							
SULFATE	20.0	71.2		71.6		0.560		
SULFIDE	20.0							
TOCD	20.0							

5
DUPLICATES

SAMPLE NO.

0525A-01

Lab Name: IEA Contract:

Lab Code: IEA Case No.: 0525A SAS No. : SDG No.: A0525

% Solids for Sample: % Solids for Duplicate:

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
ALKALIN	20.0							
AMMONIA	20.0							
BOD5	20.0							
CHLORIDE	20.0							
COD	20.0							
FLUORIDE	20.0							
C-CC	20.0	0.500	U	0.500	U	NC		
NO3-NO2	20.0							
SULFATE	20.0							
SULFIDE	20.0	1.00	U	1.00	U	NC		
TOCD	20.0							

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DUPLICATES

SAMPLE NO.

0388A-01

Lab Name: IEA Contract:

Lab Code: IEA Case No.: 0525A SAS No. : SDG No.: A0525

% Solids for Sample: % Solids for Duplicate:

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
ALKALIN	20.0							
AMMONIA	20.0							
BOD5	20.0							
CHLORIDE	20.0							
COD	20.0							
FLUORIDE	20.0							
SC-CC	20.0							
NO3-NO2	20.0							
SULFATE	20.0							
SULFIDE	20.0							
TOCD	20.0	1.00	U	1.00	U	NC		

LABORATORY CONTROL SAMPLE

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 0525A SAS No. : _____ SDG No.: A0525

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	True	LCS Found	%R	LCS Source
ALKALIN	59.4	60.0	101	APG
AMMONIA	6.99	7.075	101	↓
BOD5				—
CHLORIDE	234.93	255.48	109	APG
COD	323.5	287.0	88.7	↓
FLUORIDE	7.73	7.34	95.0	↓
NO3-NO2	2.52	2.57	102.	↓
SULFATE	123.2	121.9	98.9	↓
SULFIDE				—
TOCD	12.18	12.1	99.3	APG