

**Department of the Navy
Naval Training Center
Environmental Department
Great Lakes, Illinois**

**DELIVERY ORDER COMPLETION REPORT
SYSTEM START-UP REPORT
BUILDING 1600A (OLD GAS STATION)
GREAT LAKES, ILLINOIS**

**ENVIRONMENTAL JOB ORDER CONTRACT
CONTRACT NO. N68950-96-D-0052
DELIVERY ORDER NO. 0099**

September 2001

TOLQUEST, INC.

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Naval Training Center
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**ENVIRONMENTAL JOB ORDER CONTRACT (EJOC)
CONTRACT NO. N68950-96-D-0052
DELIVERY ORDER NO. 0099
TolTEST PROJECT NO. 37755.02**

SUBMITTED TO:

**DEPARTMENT OF THE NAVY
NAVAL TRAINING CENTER (NTC) – ENVIRONMENTAL DEPARTMENT
BUILDING 1-A, 201 DECATUR AVENUE
GREAT LAKES, ILLINOIS 60088-5600**

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LIST OF ACRONYMS

AEA	AEA Laboratories, Inc.
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
COCs	Chemicals of Concern
COTR	Contracting Officer's Technical Representative
DO	Delivery Order
DOT	Department of Transportation
EJ&E	Elgin, Joliet, and Eastern Railway
EPA	Environmental Protection Agency
FAR	Federal Acquisition Regulation
GC	Gas Chromatograph
HES	Heritage Environmental Services
HSA	Hollow Stem Auger
IAC	Illinois Administrative Code
ID	Inside Diameter
IDW	Investigative Derived Waste
IEPA	Illinois Environmental Protection Agency
JULIE	Joint Utility Locating Information for Excavators
LUST	Leaking Underground Storage Tank
NTC	Naval Training Center
O&M	Operations and Maintenance
OD	Outside Diameter
OSFM	Office of the State Fire Marshal
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
PNAAs	Polynuclear Aromatic Hydrocarbons
PWC	Public Works Center
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
SCCR	Site Classification Completion Report
SPLP	Synthetic Precipitate Leaching Procedure
SVOCs	Semi-Volatile Organic Compounds
TACO	Tiered Approach to Corrective Action Objectives
TCLP	Toxicity Characteristic Leaching Procedure
USDOT	United States Department of Transportation
USGS	United States Geological Survey
UST	Underground Storage Tank
USEPA	United States Environmental Protection Agency
VOA	Volatile Organic Analysis
VOCs	Volatile Organic Compounds

1.0 EXECUTIVE SUMMARY

TolTest, Inc. (TolTest) was retained by the Department of the Navy (Navy), Naval Facilities Engineering Command under Contract N68950-96-D-0052 Delivery Order (DO) 0099 to implement remedial system construction at Building 1600A (old gas station). One damaged monitoring well was decommissioned and replaced and three new monitoring wells were also installed at this site under Contract No. N689500-00-D-0200 DO 0028 as part of remedial construction.

TolTest provided labor, transportation, supervision, material, and equipment or directed subcontractors to provide same as appropriate to implement the Work Plan and Site Health & Safety Plan, Building 1600A (Old Gas Station), Remedial Construction, Great Lakes, Illinois submitted to the Navy by TolTest, dated March 2001. The work plan detailed certain construction, installation, and start-up activities for the biosparge system designed to remediate the petroleum hydrocarbon plume at Building 1600A. The biosparge remediation system was proposed by TolTest in the Corrective Action Plan (CAP) and CAP Supplement, dated February 2000 and August 2000, respectively. The Illinois Environmental Protection Agency (IEPA) conditionally approved implementation of the CAP on November 16, 2000.

Chemicals of concern (COCs) include benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertiary butyl ether (MTBE), polynuclear aromatic hydrocarbons (PNAs), total lead, and synthetic precipitate leaching procedure (SPLP) lead. MTBE recently became a concern with the IEPA relative to groundwater and will soon be added to the list of Leaking Underground Storage Tank (LUST) COCs.

Execution of the work plan commenced April 16, 2001 and was initiated with a pre-construction meeting at the site with Navy personnel. Subsequent to this meeting, TolTest decommissioned and replaced one damaged monitoring well, installed three new additional vertical monitoring wells, observed and documented the installation of two horizontal biosparge wells, constructed the remedial systems, and performed system testing and start-up. System optimization was completed by September 20, 2001. This report documents these activities.

2.0 SITE SETTING AND PREVIOUS INVESTIGATION SUMMARY

Building 1600A is located at the Great Lakes Naval Training Center (NTC), Lake County, Illinois. The site is located in the southeast (SE) quarter of the northwest (NW) quarter of the SE quarter of Section 5, Township 44 North, Range 12 East. The facility was utilized as a fueling station for Navy vehicles until 1972 then was used by the Public Works Center motor pool until 1997. The 1600A building was constructed in the 1950's along with two 10,000-gallon steel USTs and steel distribution piping. In 1974, the steel USTs were replaced with two 10,000-gallon fiberglass gasoline tanks and one 6,500-gallon fiberglass diesel tank. These USTs and distribution piping were removed in 1997. Heritage Environmental Services (HES) provided the Navy with a LUST 45-Day/Site Classification Completion Report (SCCR) and a LUST Investigation/Remediation Report in May 1998 as initial responses to the petroleum release discovered at the site. A north-south railroad right-of-way owned by Elgin Joliet and Eastern (EJ&E) Railway transects the detected subsurface petroleum hydrocarbon plume to the east of the former UST location.

The HES report identified the subsurface geology at the site as being part of the Lake Border Moraines of the Wadsworth Till Member of the Wedron Formation. The Wedron Formation generally consists of silty and clayey diamictons and is predominately composed of till with interbedded deposits of water-laid gravel, sand and silt. Based upon TolTest's investigative activities at the site, the upper-most saturated zone (groundwater zone) at the site is within a sandy soil. Groundwater was encountered in this sand zone at a depth of approximately 4.0 to 8.0 feet below grade.

The chemicals of concern are BTEX, MTBE, PNAs, total lead and SPLP lead per 35 Illinois Administrative Code (IAC) Section 732.310 (b) and (c) since the former USTs historically contained leaded gasoline and diesel fuel. Benzene was detected in soil borings from within the EJ&E Railway right-of-way and adjacent to the Navy-owned Iowa Street. MTBE recently became a concern with the IEPA relative to groundwater and will soon be added to the list of LUST COCs. The petroleum hydrocarbon plume appears to be within the saturated sand zone that is present beneath the site starting at a depth of approximately 4.0 to 8.0 feet depending on location.

The site setting is commercial/industrial judging by the manufacturing businesses in close proximity to the site. The EJ&E rail lines traverse over part of the soil and groundwater plume as previously characterized by HES in 1997. Clearly this site is not

residential, however the laboratory results generated during implementation of the CAP will be evaluated in the context most conducive to closure and in keeping with the Navy's objectives and planned future use for the site.

With the exception of benzene and SPLP lead, the soil sample laboratory results indicate the chemicals of concern were generally below the IEPA Tier 1 Site Remediation Objectives for the ingestion, inhalation and migration to groundwater routes of exposure for Industrial-Commercial Property uses.

The groundwater results indicated concentrations of benzene, ethylbenzene, naphthalene, and lead above the Tier I Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route for Class I Groundwater.

3.0 PROJECT OBJECTIVES

ToITest was retained by the Navy to construct the remedial system and perform system testing and start-up activities. The following tasks were performed in association with execution of the work plan:

- Installation of two horizontal biosparge wells;
- Installation of biosparge remediation systems;
- Construction of two equipment sheds;
- Installation of three additional vertical groundwater monitoring wells;
- Decommissioned damaged monitoring well MW-5 and replaced this well with a new well of similar construction and in the same general location;
- Restoration of the site to match existing conditions;
- Removal and disposal of auger cuttings;
- Transportation and recycling, treatment or disposal of other wastes generated during construction and system start-up;
- Environmental documentation and reporting to the IEPA;
- Environmental documentation and reporting to the Navy Contracting Officer's Technical Representative (COTR); and
- System start-up and system testing and performance documentation.

4.0 CONSTRUCTION SEQUENCE

4.1 Permitting and Notification

A pre-construction meeting was conducted at the site on April 16, 2001 prior to the start of work with Navy, TolTest, and subcontractor personnel in attendance. Details of the sequencing of work and site health and safety procedures were reviewed.

4.1.1 Pre-Excavation Notifications

Notification was made to the facility caretaker and Joint Utility Locating Information for Excavators (JULIE) service 72 hours prior to drilling and trenching activities. Known underground utilities are depicted on Figure 1 (Appendix A). Utility maps of the site area were examined by TolTest prior to the start of work. In addition, prior to project implementation, the COTR was consulted regarding any utilities known to be located in the vicinity of Iowa Street and Spaulding Street.

TolTest obtained a permit from EJ&E (March 2001 Work Plan, Appendix B). Each permit requirement including notification, inspection, and flagging protection was met. The EJ&E Chief Engineer was notified in writing before starting any work upon or beneath EJ&E's property.

4.2 Mobilization and Site Set-up

Upon mobilization of the equipment, personnel, and materials to the site, equipment set-up was conducted on April 19, 2001. An inspection of the immediate area was performed to identify any hazards or unusual conditions in the vicinity of the work areas. The work areas were cordoned off with caution tape to deter the intrusion of unauthorized personnel. Daily safety meetings were conducted to identify the work zones for construction activities. A 20-yard roll-off box and 20,000-gallon frac tank were placed north of Building 1506 for the temporary staging of drill cuttings and well development and decontamination water.

4.3 Installation of Vertical Groundwater Monitoring Wells

The Southern Division Naval Facilities Engineering Command (SOUTHNAVFAC) Interim Final Monitoring Well Design, Installation, and Development Guidelines, March 27, 1997 were used to ensure the quality and integrity of well installations.

Drilling activities on July 17, 2001 consisted of installing three additional vertical soil borings/monitoring wells (MW-7, MW-8, and MW-9) and the replacement of MW-5 at locations around the perimeter of the identified subsurface petroleum hydrocarbon plume. The three additional monitoring wells, in conjunction with the existing wells (MW-1 through MW-6), will be used during remedial system operations to verify that the injection of air is not causing the plume to spread. The monitoring wells will also be used to assess groundwater quality within and around the plume and to assess groundwater flow direction(s). The groundwater quality data will be used to monitor progress of the groundwater remediation during the O&M phase of work. In addition to installation of the three new wells described above, TolTest also decommissioned MW-5, which had been damaged by a snowplow. The well was decommissioned by pulling the well, overdrilling the annulus, and backfilling with a cement/bentonite slurry. A replacement monitoring well was installed in the same general area to replace the decommissioned well.

Drilling activities were performed by TolTest under the direct supervision of a TolTest geologist. A truck-mounted drill rig was utilized to advance the four new soil borings using 4.25-inch inside diameter (ID) hollow-stem augers (HSAs). Figure 1 (Appendix A) depicts the locations of the installed soil borings/monitoring wells. The borings were advanced at least five feet into the apparent water table. Total depth is approximately 14 feet below ground surface.

Soil samples were obtained continuously in the soil borings through the auger centers. Standard penetration tests (ASTM D1586) were performed utilizing a 2-inch outside diameter (OD) split-spoon sampler driven by a 140-pound drop hammer. The soil was classified on boring logs indicating lithologic descriptions and Unified Soil Classification System descriptions based upon visual evaluation, degree of sorting, sedimentary contacts, relative moisture content, photoionization detector (PID) readings, etc. Auger cuttings were placed in the 20-yard roll-off box for disposal. Each soil sample was placed into a Mason jar for PID headspace screening.

The split-spoon samplers were cleaned using the following procedure:

- Washed with a non-phosphate detergent and potable water solution
- Rinsed with potable water
- Rinsed with deionized/distilled water
- Air-dried

The monitoring wells were constructed of 2-inch ID, schedule 40, flush joint PVC risers and screens. Ten feet of 0.010-inch machine slotted screen and a sufficient length of riser were placed in each boring to bring the top of each well to near grade level. The screened interval of each well was installed so as to intersect the apparent water table and to allow for potential seasonal water level fluctuations. The annulus around each well screen was backfilled by a quartz sand filter pack to approximately one foot above the top of each screen. A granular bentonite seal approximately one foot thick was then placed atop the sand pack and the remainder of the annulus was then backfilled with bentonite chips to approximately one foot below grade. Flush-mount well covers were installed over each well casing except MW-5 and set in concrete. MW-5 was completed with the top of casing above ground and was surrounded with a steel protective casing and four steel bollards for protection. The top of the riser of each monitoring well was secured with a watertight, lockable cap. Appendix B contains the SOUTHNAVFAC's Log of Boring and Monitoring Well Sheets and IEPA's LUST Well Completion Reports (forms IL 532-2274 and IL 532-2275) for this project.

Upon completion, the wells were developed utilizing a Teflon bailer to remove fines. Development and purge water were containerized in the frac tank staged north of Building 1506 pending disposal. Drilling tools and augers were decontaminated between borings with a pressurized steam cleaner in a temporary decontamination station. Decontamination water was pumped into the frac tank pending disposal.

Each new monitoring well top of casing was surveyed to the nearest 0.01 feet to a United States Geological Survey (USGS) common site datum. Survey information for the top of casings is presented in Appendix C. Depth to ground water will be performed during the O&M activities. From these measurements and the survey data discussed above, groundwater contour maps can be constructed and the groundwater gradient and flow direction(s) can be assessed. Ground water analytical testing was conducted on the site's nine monitoring wells as detailed in Section 5.0 of this document.

4.4 Installation of Horizontal Biosparge Wells

ToITest subcontracted the installation of the two horizontal biosparge wells to Longbore, Inc., a recognized industry leader in the drilling of long horizontal environmental remediation wells. The two horizontal wells were constructed between April 19 and April 26, 2001. The horizontal wells were constructed by pushing the drill string with the hydraulics of the horizontal drill rig. Guidance and position determination of the drill bit was achieved by utilizing a radio signal walkover system. Electronics behind the head of the two-inch diameter drill bit transmitted its location to the surface, where the signal was picked up by the receiver. Water hydraulics were used to guide the drill string on the desired path vertically and horizontally. The screened interval of each horizontal well was installed approximately 7.5 to 10.5 feet below grade depending on location (near the bottom of the impacted sand layer).

The drill rig was positioned adjacent to Building 1506 and was set up with a 22-degree entry angle for horizontal well (HW)-1 and a 20-degree entry angle for HW-2. Once the drill string was guided down to the desired depth, horizontally under the plume, and back up to the surface at the exit pit, a 6.75-inch diameter reamer was attached to the drill string after the drill head was removed. Engineered well screen and casing (4-inch ID HDPE piping) was attached to the reamer and the drill string pulled back to the entry point. The native sand material was allowed to collapse around the piping.

Because the wells were constructed in boreholes below the water table, the borehole had to be kept open for the installation of the well materials. Drilling fluids were pumped through the drill pipe to the bit. The drill fluid returned up the borehole to the surface where it was cleaned and pumped back down the drill pipe. The drilling fluid kept the drilling bit cooled, minimized fluid loss from the borehole into the formation, carried the soil cuttings out of the borehole to the surface, and reduced friction.

The total length of the horizontal screen section is about 230 feet¹ in HW-1 and 228.7 feet¹ in HW-2, with unslotted casing on each end of the screened section of each well. The length of unslotted casing on HW-1 is approximately 84.0 feet¹ on the "entry" side of the well and approximately 89.9 feet¹ on the "exit" side of the well. The length of unslotted casing on HW-2 is approximately 83.4 feet¹ on the "entry" side of the well and approximately 74.3 feet¹ on the "exit" side of the well. Figures 2 through 4 (Appendix A)

¹ Measured in terms of horizontal distance covered. Actual pipe lengths are longer due to curvature of the pipes.

depict the well installation details and vertical and horizontal measurements taken during the horizontal well installation activities.

The horizontal biosparge wells were developed with a combination of chemical and physical treatment methods. The chemical treatment consisted of an acid solution, injected into the borehole through a jetting assembly. The low pH of the solution breaks down the bentonite/mixed metal hydroxide (MMH)-based drilling fluid that was used to keep the boreholes open. Following acid treatment, fresh water was pumped into the wells to dilute the acid solution, MMH, and bentonite. The final step consisted of pumping water with an air lift system into the frac tank. Approximately 17,600 gallons of fluids were pumped during well development activities.

Drilling fluid including soil cuttings and well development water were staged on site until waste approvals were obtained from AWPDF, at which time the materials were manifested and transported to AWPDF's facility in Chicago, Illinois.

4.5 Waste Management

Investigative derived wastes (IDW), including soil cuttings, and well development and purge water were staged adjacent to Building 1506 until disposal approvals were obtained. Wastes were properly manifested and transported to the disposal facility. The American Waste Processing Disposal Facility (AWPDF) used its own internal chemical laboratory (as per their USEPA Permit to Operate under RCRA statutes) to analyze the fluids before acceptance for processing. Approximately 30 cubic yards of soil and solid debris and 17,615 gallons of water were transported offsite to AWPDF. Mr. Kelly Devereaux, Environmental Operations Manager at NTC, reviewed and signed the manifests. Copies of disposal documentation are presented in Appendix D.

4.6 Equipment

The biosparge equipment component descriptions were provided in the CAP Supplement, dated August 2000. Two systems were constructed, one for each horizontal well. The equipment is housed in two wood-constructed sheds, each measuring 10 x 14 feet, and set on concrete pads. Refer to Figure 1 for the shed locations adjacent to Building 1712.

Each shed's foundation was constructed of poured ready-mix concrete (3,000 pounds per square inch-psi) with four-inch on center reinforcing wire mesh and each is 10 feet 2 inches x 14 feet 2 inches x 4 inches thick.

An electric drop pole with meter was installed between the two sheds to provide service to both sheds.

4.7 System Start-up

ToITest performed initial start-up and testing of the systems. System start-up and optimization included pre-start-up checkout, pre-start-up testing, and start-up. The strategy for start-up was to conduct these activities sequentially, comparing observations and test data against design criteria and performance warranties. This allowed the systems to be brought on line in a systematic and safe manner to meet the operational objectives. Copies of the checklists/logs for data collected during system start-up are contained in Appendix E.

4.7.1 Pre-Start-Up Checkout

This inspection verified that the components of the biosparge systems were properly installed. Equipment shed foundations were checked to verify that they were placed properly, and protected from damage while curing. Systems were checked to verify that all equipment has been installed and is properly leveled. A check was made to ensure that protective covers are in place on rotating equipment and that lubrication procedures were followed. The installed setup was checked against the system's piping and instrumentation diagram detailed in the CAP Supplement to verify proper installation and sequencing.

Piping, hoses, and ducts were checked to ensure that connections were tight. Electrical systems were checked to verify that the system wiring was completed correctly. The electrical One-Line Diagrams and Wiring Diagrams located in the CAP Supplement were checked to verify that electrical and instrumentation systems were properly installed. In addition, electrical grounding of the equipment and structures was checked and protective covers were placed on terminal boxes and panels.

Continuity checks were performed to verify wiring loops. ToITest also verified that all the required equipment specified in the Site Health and Safety Plan, as well as

equipment lockouts, safety valves and/or other pressure relief devices, and site security devices were properly installed. Detailed procedures for operating this equipment will be included in the O&M Manual.

4.7.2 Pre-Start-Up Testing

Testing of systems was performed to verify integrity prior to actual operation. The piping and ductwork transporting air was pressure tested to the design requirement set in the system specifications. Electrical wiring was tested to verify that there is no wiring damage or deterioration that could potentially cause damage to personnel or equipment. Once the equipment and electrical systems were tested and determined to be ready for operation, the electrical systems were powered up in preparation for testing the equipment and control systems. Lighting was tested and put in service to support work in the equipment sheds.

Testing of control systems proceeded from this point to verify operability. Safety shutdown sequences in the control systems were tested to ensure these devices are installed and functioning properly.

4.7.3 Start-Up

All related health and safety and emergency response procedures and issues were reviewed before this phase of operation. Equipment that can be operated without process media was started first.

Control systems were energized before the process equipment was started. All equipment to be on "Stand-by" during full operation was started before the process equipment was started.

Before the process systems were started, a final check was made on the position of all valves and control set points. The blowers were set for minimum pressure and then slowly increased once the system stabilized. The pressure was increased incrementally to ensure proper operation. Observation, sampling, and other performance testing were performed during start-up to ensure that the system is operating as expected.

Once the system was running at or close to the expected operating points, the entire system was checked. The flow, pressure, and temperature at each biosparge well and

all test points in the system were checked. The biosparge system stabilized approximately seven days after start-up. After the systems were started, ToITest checked for condensation and accumulation and verified that the condensate removal systems were operating correctly.

4.8 Subsurface System Checks

Of particular concern during start-up are the biosparge well's actual operating conditions, which may be different than those assumed during design. Pressure gauges were temporarily installed at the monitoring wells so that the flows and pressures of the operating system could be adjusted as needed.

Pressure readings and dissolved oxygen measurements were collected September 20, 2001 as initial subsurface system checks. Subsequent measurements will be recorded during the O&M activities. Table 1 summarizes pressure, dissolved oxygen, and temperature measurements.

4.9 Surface Equipment Checks

Numerous components are incorporated into the surface system. Each component was subjected to the check-out, testing, and start-up activities described in Section 4.7.

This System Start-up Report is not intended to describe every potential component and its associated criteria. Detailed information is described in the O&M Manual. However, the major components of the biosparge system include:

- Blowers
- Heat exchangers
- Control instruments

Following the check-out (where each component is compared with system drawings) and testing (where each component is compared with design specifications), the individual components were checked periodically during the actual start-up using the following operation monitors:

- Pressure gauges for blowers.
- Amperage meters for blowers.
- Temperature gauges for blowers.

A data logging procedure was established for operating components. Checks were made very frequently when the system operation began and less frequently as the system equilibrated. Copies of field log sheets from the system start-up testing are presented in Appendix E.

Control instruments were calibrated during the testing activities. Frequent checks (with results logged) and recalibrations (with results logged) of all instruments were made during start-up to assure that proper control and analysis were occurring. This also established real-time reliability of the instruments.

Once O&M activities commence, and steady-state operation was achieved (after water was forced from the wells), operational efficiency data will be collected. These data include:

- Groundwater levels.
- Air flow rates.
- Applied pressure at each well head, and in surrounding wells (to determine well efficiencies).
- Condensate generation rates.

Steady-state operation, as per modeling (see CAP Supplement, August 2000), is as follows:

Measurement	Blower end	Cap end
Internal Pressure	5.9735 psig	5.9701 psig
Air Sparged	115 scfm (0.50 scfm/ft screen	115 scfm (0.50 scfm/ft screen

4.10 Operations and Maintenance

Operation of the remedial systems will be automated. System operation will, however, require periodic monitoring and routine maintenance to insure effective and efficient operation. System monitoring will consist of periodic equipment checks and measurements from the monitoring wells. Groundwater sampling and analysis will also be conducted to monitor performance of the systems to ensure that progress is being made toward remedial goals. Additionally, the systems will require periodic maintenance so as to attempt to prevent unscheduled downtime events and excessive servicing. An Operations and Maintenance (O&M) Manual was developed and provided to the COTR for review in July 2001.

5.0 ANALYTICAL PROCEDURES AND RESULTS

This section summarizes the chemical data that were obtained from monitoring wells MW-5 (replacement), MW-7, MW-8, and MW-9 and the existing monitoring wells MW-1 through MW-6. ToITest was responsible for properly sampling and transporting samples to the analytical laboratory, as well as the quality of data produced.

AEA Laboratories, Inc. (AEA), Chicago, Illinois conducted the chemical analysis of the groundwater samples. All sampling activities were performed in accordance with USEPA SW846 protocols, specific to each parameter of interest, as promulgated by the regulatory agency, the IEPA.

5.1 Sample Handling and Submittal Procedures

A PID headspace analysis was performed for each soil sample collected. Soil from each sampling location/depth was placed into a 16-ounce Mason jar for headspace screening. The instrument's calibration log, located in the PID case, was filled out to document each calibration occurrence. PID readings for each sample are indicated on the soil boring logs in Appendix B.

5.1.1 Specific Sampling and Laboratory Analysis

Prior to collecting groundwater samples for analysis, each monitoring well was purged by bailing with a disposable bailer. Approximately three to five well volumes were removed prior to sampling. The samples were placed in EPA Level I approved glassware, labeled and placed in a cooler.

Site specific sampling procedures, sample preparation and handling, laboratory analysis, chain of custody procedures, and decontamination procedures were performed in accordance with standard industry practices. Chemical analyses were performed on groundwater samples from each well using parameters associated with leaded gasoline and diesel USTs. Groundwater samples were analyzed for BTEX, MTBE, PNAs, total lead, and SPLP lead. MTBE recently became a concern with the IEPA relative to groundwater and will soon be added to the list of LUST COCs.

The samples were preserved according to USEPA protocols established for the parameters of interest. Appropriate measures were taken to ensure that storage

requirements with respect to temperature were maintained during transport to the laboratory and prior to log-in and storage at the laboratory.

Environmental samples were transported to AEA via a same day carrier. Samples were packaged and transported according to USEPA and USDOT regulations.

Samples were collected, transported, and received under strict chain-of-custody protocols consistent with procedures established by the USEPA for litigation-related materials. Upon receipt at the laboratory, the laboratory provided a specific mechanism through which the deposition and custody of the samples was accurately documented during each phase of the analytical process.

5.2 Sample Results

On August 23, 2001, TolTest collected the first round of groundwater samples from the groundwater monitoring wells at Building 1600A. The laboratory reports received from AEA are contained in Appendix F. The results are summarized on Table 2 and graphically by well location on Figure 5.

The laboratory analytical results indicate benzene concentrations for the groundwater samples collected from monitoring wells MW-2, MW-4, MW-5 and MW-8 exceeded the Regulatory Limit (RL) of 0.005 milligrams per liter (mg/L). The analytical results also indicate that the toluene concentration in the groundwater sample collected from monitoring well MW-2 exceeded the toluene RL of 1.0 mg/L and MW-9 exceeded the RL of 0.0075 mg/L for lead. No other analytes were detected above their respective RLs. These groundwater concentrations above their respective RLs are anticipated to decrease as the groundwater treatment system is being operated. It is not uncommon to witness elevated results during the first few months of a bio-sparg system.

5.3 Groundwater Measurements

Depths to groundwater measurements were obtained August 23, 2001 prior to purging for sample collection, and prior to system start-up. An electric monitoring well probe was used for these measurements. This data will be used as a comparison for possible groundwater upwelling during the O&M phase of work. Table 3 summarizes these measurements.

6.0 SUMMARY

The biosparge system is currently functioning in accordance with design specifications. An O&M Manual was prepared for the remediation system. O&M activities under Contract N68950-00-D-0200, DO 0027 will help facilitate efficient operation of the system during remedial activities and minimize equipment downtime.

The initial laboratory analytical results indicate benzene and/or toluene concentrations for the groundwater samples collected from monitoring wells MW-2, MW-4, MW-5 and MW-8 exceeded RL. These groundwater concentrations above their respective RLs are anticipated to decrease as the groundwater treatment system is being operated.

Groundwater samples will be collected from the monitoring wells at the site on a quarterly basis to monitor system performance and remedial progress. When monitoring well concentrations indicate that remediation objectives have been met for two consecutive sampling events at least 30 days apart, closure sampling will be initiated. Closure sampling procedures are detailed in the Work Plan and Site Health & Safety Plan for remedial construction for this site dated March 2001.

TABLES

**Table 1 – Subsurface System Measurements
Building 1600A Remediation System**

September 26, 2001

Measurement	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9
Pressure (Kpa)	0.06	0.71	0.15	0.58	0.01	0.05	0.01	0.01	0.000
Pressure (psi)	0.009	0.103	0.022	0.084	0.001	0.007	0.001	0.001	0.000
Dissolved Oxygen (mg/l)	1.16	2.27	2.14	4.12	2.29	5.04	3.56	4.57	1.49
Temperature (°C)	16.4	17.9	18.0	16.1	17.6	19.2	15.8	15.6	19.5

Notes:

1. Kpa = Kilopascal (1.0 Kpa = 0.145 psi)
2. psi = pounds/inch²
3. mg/l = miligram/liter

Table 2 – Groundwater Sample Analytical Results
Building 1600A Remediation System
 August 23, 2001

Analyte	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	Regulatory Limit
Benzene	ND	1.41	0.0016	0.156	0.0117	ND	ND	0.109	ND	ND	0.005
Ethylbenzene	ND	0.375	0.0019	0.648	0.102	ND	ND	ND	ND	ND	0.7
MTBE	ND	ND	0.0324	ND	ND	ND	ND	ND	ND	ND	NR
Toluene	ND	2.38	0.0067	0.122	0.036	0.0017	ND	ND	ND	ND	1.0
Total Xylenes	ND	1.7	0.0088	1.03	0.273	ND	ND	ND	ND	ND	10
Acenaphthene	ND	0.0017	ND	0.00033	0.0002	ND	ND	ND	ND	ND	0.42
Acenaphthylene	ND	0.024	ND	ND	ND	ND	ND	ND	ND	ND	NR
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.1
Fluorene	ND	ND	ND	ND	0.00031	ND	ND	ND	ND	ND	0.28
Naphthalene	ND	ND	ND	0.04	0.00027	0.00036	ND	ND	ND	ND	0.025
Phenanthrene	ND	0.038	ND	ND	0.00013	0.00012	0.00011	ND	ND	ND	NR
Total Lead	NA	NA	NA	NA	NA	NA	NA	NA	0.018	NA	0.0075
SPLP Lead	NA	NA	NA	NA	NA	NA	NA	NA	0.018	NA	0.0075

Notes:

1. Concentrations are reported in milligrams per liter (mg/L)
2. NA – Not Analyzed
3. ND – Not Detected
4. NR – No established Regulatory Limit
5. Shaded – Exceed Regulatory Limit
6. MW-10 is duplicate of MW-9

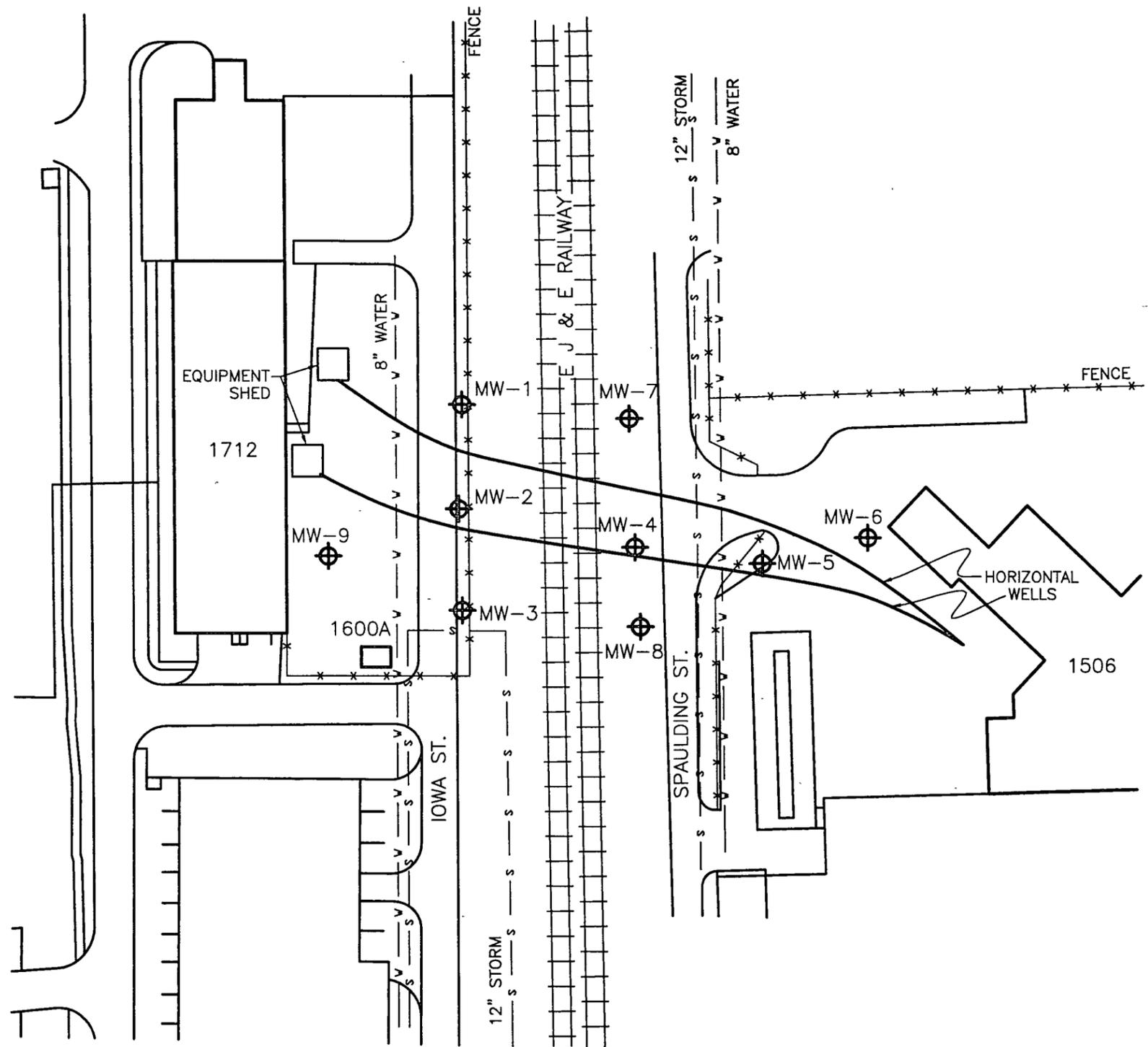
Table 3 – Monitoring Well Measurements
Building 1600A Remediation System
 August 23, 2001

Well No	Total Depth (ft)	TOC Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
MW-1	12.4	663.22	4.29	658.93
MW-2	12.6	663.33	5.75	657.58
MW-3	14.0	662.80	5.51	657.29
MW-4	12.8	660.73	3.75	656.98
MW-5	16.2	662.24	5.62	656.62
MW-6	13.4	658.73	2.42	656.31
MW-7	12.8	660.06	3.11	656.95
MW-8	12.8	660.89	3.75	657.14
MW-9	13.3	664.25	6.44	657.81

Notes:

TOC = top of casing elevation referenced to site USGS benchmark

APPENDIX A
SITE MAPS



 - EXISTING MONITORING WELL
 MW-1

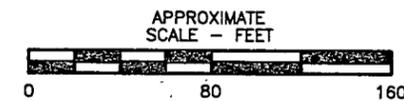
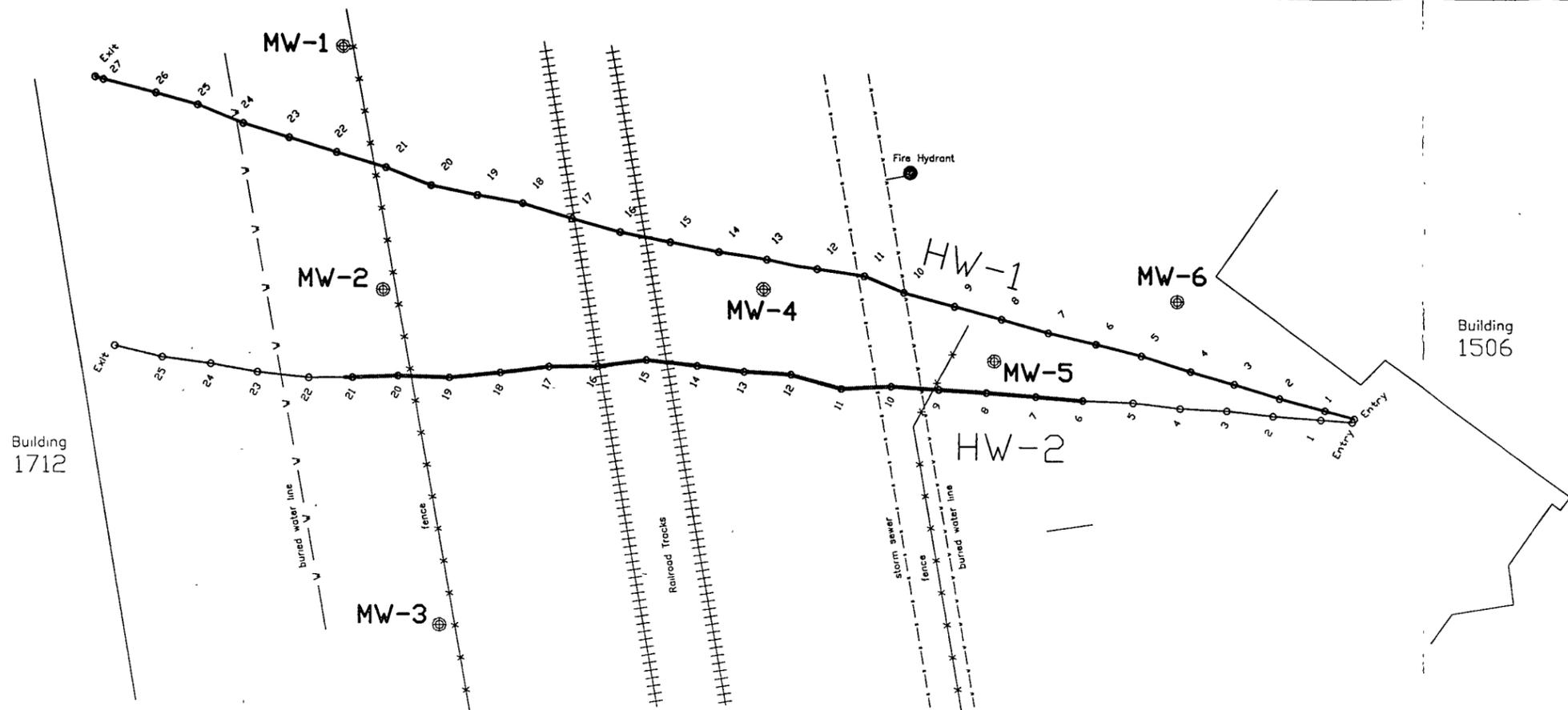


FIGURE 1 SITE MAP BUILDING 1600A GREAT LAKES NAVAL TRAINING CENTER, ILLINOIS	
PREPARED FOR UNITED STATES NAVY GREAT LAKES NAVAL TRAINING CENTER	
DRAWN MRC\5-25-00 REVISED NAS\9-27-01 JOB NO.: 37755.02	CHECKED APPROVED
DRAWING NUMBER 37755-A1	



HW-1

Survey Point	Measured Depth	% Grade	Depth Below Surface
Entry	0.0	-22	0.0
1	9.4	-20	1.9
2	24.4	-17	4.9
3	39.4	-13	7.5
4	54.4	-9	9.1
5	69.4	-5	10.0 *
6	84.4	-3	10.8
7	99.4	0	11.3
8	114.4	0	11.6
9	129.4	2	11.9
10	144.4	1	11.6 *
11	159.4	4	10.9 *
12	174.4	4	10.3 *
13	189.4	5	9.9
14	204.4	1	9.6
15	219.4	-2	9.9
16	234.4	0	10.2
17	249.4	0	11.0
18	264.4	1	10.7
19	279.4	0	12.3
20	294.4	0	12.9
21	309.4	0	12.4 *
22	324.4	3	11.0
23	339.4	7	10.2
24	354.4	10	9.5 *
25	369.4	15	8.2 *
26	384.4	21	5.8
27	399.4	29	2.1 *
Exit	403.9	29	0.0

* Indicates interference observed in survey data

HW-2

Survey Point	Measured Depth	% Grade	Depth Below Surface
Entry	0.0	-20	0.0
1	9.4	-16	1.7
2	24.4	-15	3.8
3	39.4	-13	5.7
4	54.4	-9	7.3
5	69.4	-5	8.6
6	84.4	-2	9.6
7	99.4	-5	10.5
8	114.4	0	11.0
9	129.4	-1	11.2 *
10	144.4	4	11.3
11	159.4	3	11.5
12	174.4	2	11.6 *
13	189.4	1	11.2
14	204.4	2	10.8 *
15	219.4	0	11.1
16	234.4	3	11.4
17	249.4	0	11.0
18	264.4	0	12.0
19	279.4	0	12.7
20	294.4	0	12.3
21	309.4	5	11.1
22	324.4	10	10.7
23	339.4	15	8.4
24	354.4	16	6.5
25	369.4	20	4.0
Exit	386.4	20	0.0

* Indicates interference observed in survey data

- ⊕ - EXISTING MONITORING WELL
- - Survey Point
- - 4" SDR 11 HDPE Riser Pipe
- - 4" Slotted SDR 11 HDPE Screen

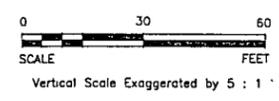


FIGURE 2

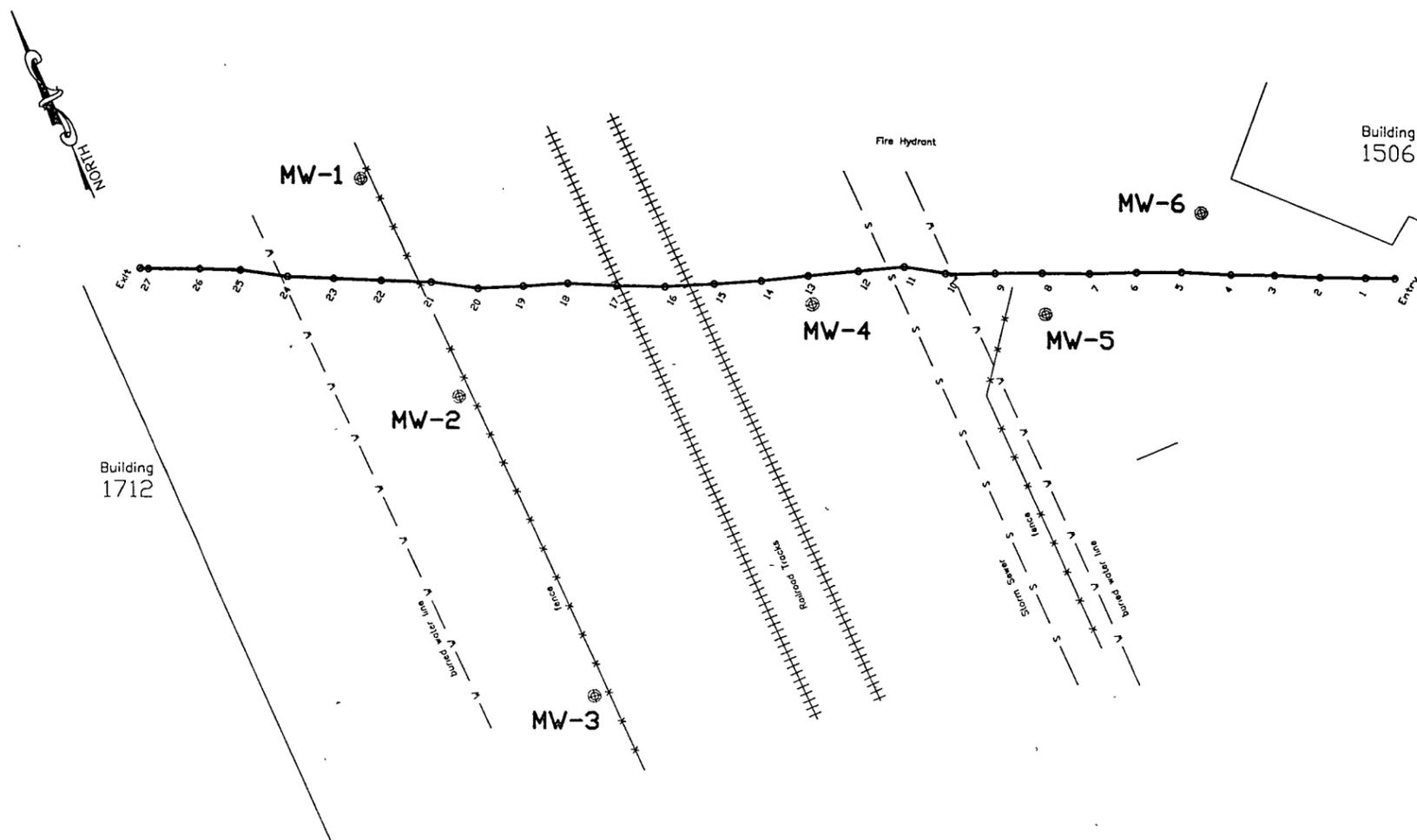
HORIZONTAL WELLS 1 & 2

United States Navy
GREAT LAKES NAVAL TRAINING CENTER
Great Lakes, Illinois

TOLLES, INC.
1915 North 12th Street, Toledo, Ohio

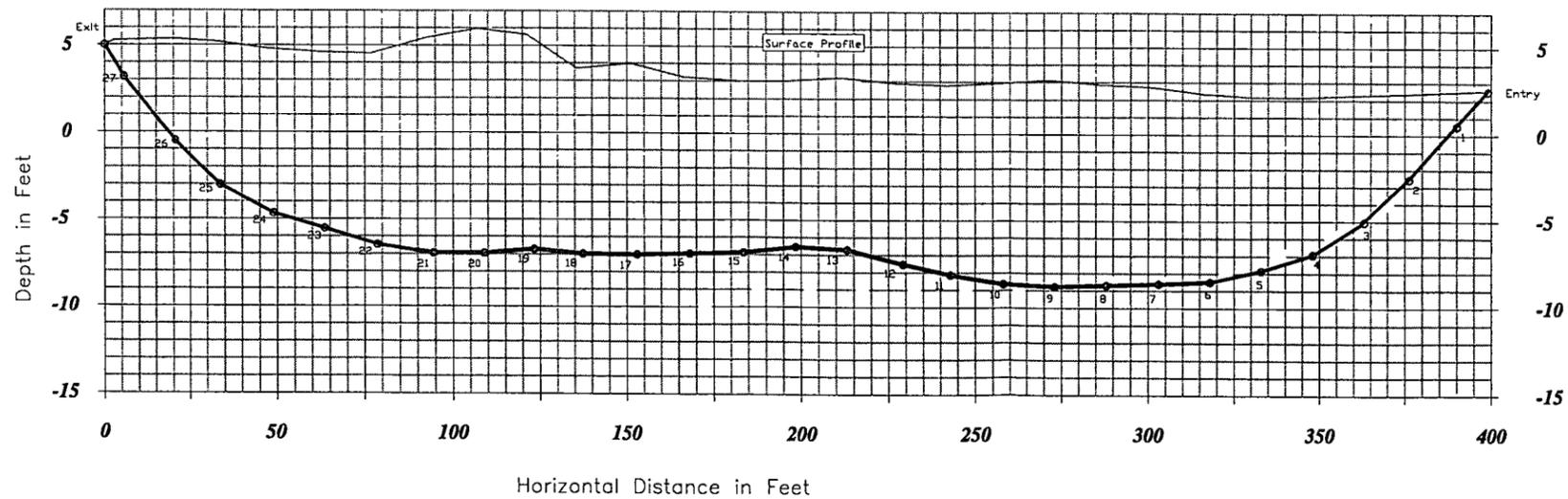
Drawn By: S.Ferguson	Checked By: D. Bardsley	PROJECT NO 2102
Date 7 May 2001	Date 7 May 2001	Scale AS SHOWN

LONGBORE
4125 Southerland, Houston, Texas 77092
(713) 690-8440 <http://www.longbore.com>



Survey Point	Measured Depth	X Grade	Depth Below Surface
Entry	0.0	-22	0.0
1	9.4	-20	1.9
2	24.4	-17	4.9
3	39.4	-13	7.5
4	54.4	-9	9.1
5	69.4	-5	10.0 *
6	84.4	-3	10.8
7	99.4	0	11.3
8	114.4	0	11.6
9	129.4	2	11.9
10	144.4	1	11.6 *
11	159.4	4	10.9 *
12	174.4	4	10.3 *
13	189.4	5	9.9
14	204.4	1	9.6
15	219.4	-2	9.9
16	234.4	0	10.2
17	249.4	0	11.0
18	264.4	1	10.7
19	279.4	0	12.3
20	294.4	0	12.9
21	309.4	0	12.4 *
22	324.4	3	11.0
23	339.4	7	10.2
24	354.4	10	9.5 *
25	369.4	15	8.2 *
26	384.4	21	5.8
27	399.4	29	2.1 *
Exit	403.9	29	0.0

* Indicates interference observed in survey data



230.0' of 4" SDR 11 HDPE Slotted Screen set between 84.0' and 314.0' measured from entry point

- ⊗ - EXISTING MONITORING WELL
- - Survey Point
- - 4" SDR 11 HDPE Riser Pipe
- - 4" Slotted SDR 11 HDPE Screen

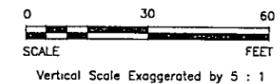


FIGURE 3

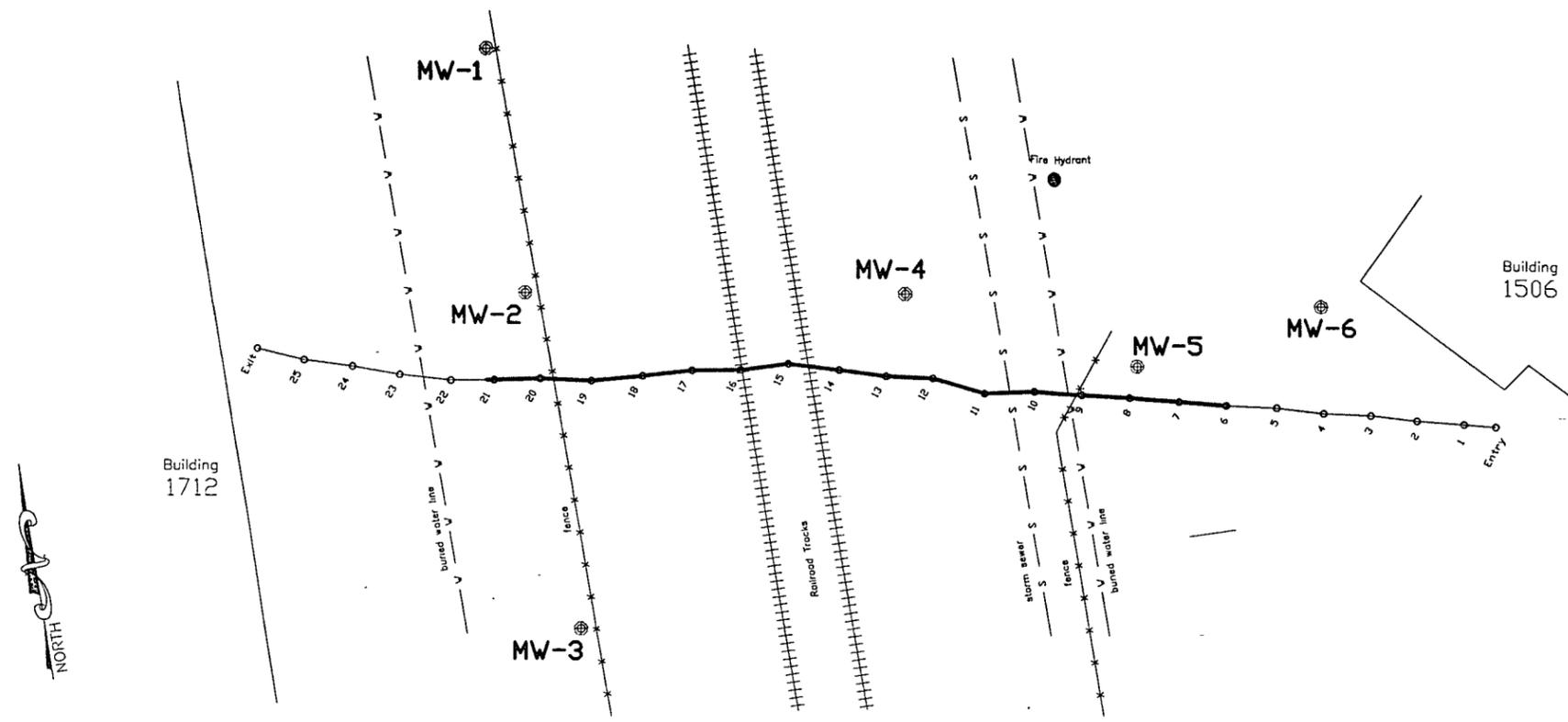
HORIZONTAL WELL 1

United States Navy
GREAT LAKES NAVAL TRAINING CENTER
Great Lakes, Illinois

TOLLEST, INC.
1915 North 12th Street, Toledo, Ohio

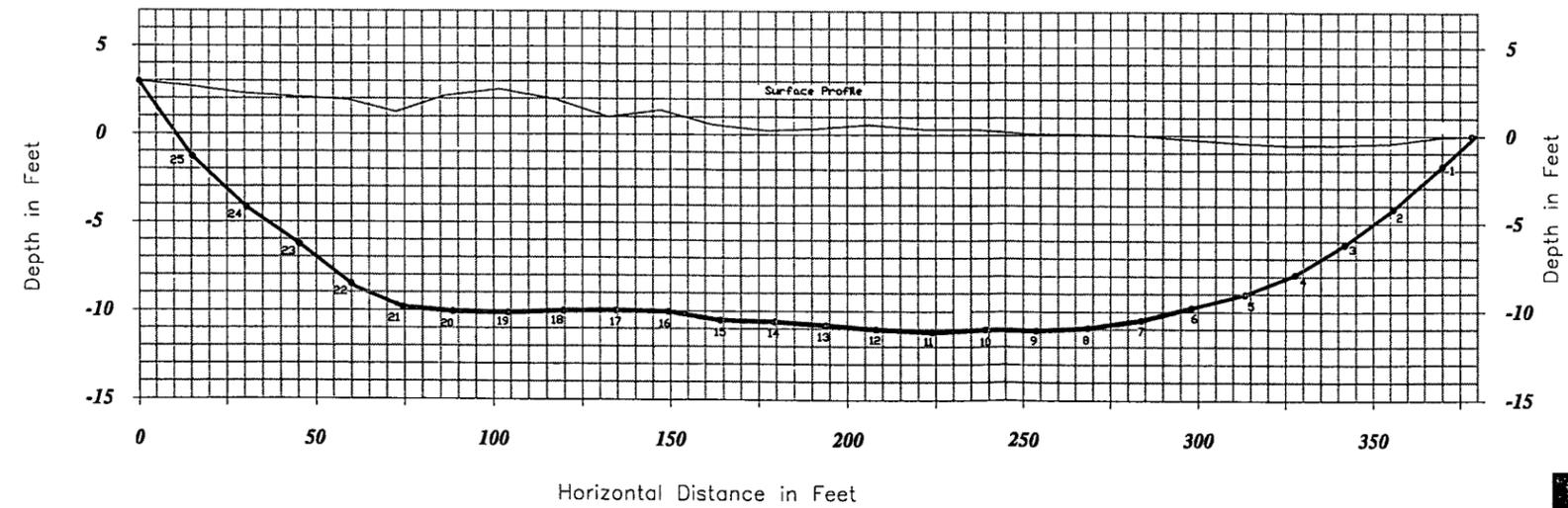
Drawn By: S.Ferguson	Checked By: D. Bardsley	PROJECT NO 2102
Date 10 May 2001	Date 10 May 2001	Scale AS SHOWN



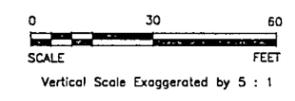


Survey Point	Measured Depth	% Grade	Depth Below Surface
Entry	0.0	-20	0.0
1	9.4	-16	1.7
2	24.4	-15	3.8
3	39.4	-13	5.7
4	54.4	-9	7.3
5	69.4	-5	8.6
6	84.4	-2	9.6
7	99.4	-5	10.5
8	114.4	0	11.0
9	129.4	-1	11.2 *
10	144.4	4	11.3
11	159.4	3	11.5
12	174.4	2	11.6 *
13	189.4	1	11.2
14	204.4	2	10.8 *
15	219.4	0	11.1
16	234.4	3	11.4
17	249.4	0	11.0
18	264.4	0	12.0
19	279.4	0	12.7
20	294.4	0	12.3
21	309.4	5	11.1
22	324.4	10	10.7
23	339.4	15	8.4
24	354.4	16	6.5
25	369.4	20	4.0
Exit	386.4	20	0.0

* indicates interference observed in survey data



- ⊗ - EXISTING MONITORING WELL
- - Survey Point
- - 4" SDR 11 HDPE Riser Pipe
- (thick) - 4" Slotted SDR 11 HDPE Screen



228.7' of 4" SDR 11 HDPE Slotted Screen set between 83.4' and 312.1' measured from entry point



FIGURE 4
HORIZONTAL WELL 2
United States Navy
GREAT LAKES NAVAL TRAINING CENTER
Great Lakes, Illinois

TOLLEST, INC.
1915 North 12th Street, Toledo, Ohio

Drawn By: S.Ferguson	Checked By: D. Bardsley	PROJECT NO 2102
Date 7 May 2001	Date 7 May 2001	Scale AS SHOWN

⊕ - EXISTING MONITORING WELL
MW-1



ANALYTE	MW-1
BENZENE	ND
ETHYLBENZENE	ND
MTBE	ND
TOLUENE	ND
TOTAL XYLENES	ND
ACENAPHTHENE	ND
ACENAPHTHYLENE	ND
ANTHRACENE	ND
FLUORENE	ND
NAPHTHALENE	ND
PHENANTHRENE	ND
TOTAL LEAD	NA
SPLP LEAD	NA

ANALYTE	MW-2
BENZENE	1.41
ETHYLBENZENE	0.375
MTBE	ND
TOLUENE	2.38
TOTAL XYLENES	1.7
ACENAPHTHENE	0.0017
ACENAPHTHYLENE	0.024
ANTHRACENE	ND
FLUORENE	ND
NAPHTHALENE	ND
PHENANTHRENE	0.038
TOTAL LEAD	NA
SPLP LEAD	NA

ANALYTE	MW-9
BENZENE	ND
ETHYLBENZENE	ND
MTBE	ND
TOLUENE	ND
TOTAL XYLENES	ND
ACENAPHTHENE	ND
ACENAPHTHYLENE	ND
ANTHRACENE	ND
FLUORENE	ND
NAPHTHALENE	ND
PHENANTHRENE	ND
TOTAL LEAD	0.018
SPLP LEAD	0.018

ANALYTE	MW-3
BENZENE	0.0016
ETHYLBENZENE	0.0019
MTBE	0.0324
TOLUENE	0.0067
TOTAL XYLENES	0.0088
ACENAPHTHENE	ND
ACENAPHTHYLENE	ND
ANTHRACENE	ND
FLUORENE	ND
NAPHTHALENE	ND
PHENANTHRENE	ND
TOTAL LEAD	NA
SPLP LEAD	NA

ANALYTE	MW-7
BENZENE	ND
ETHYLBENZENE	ND
MTBE	ND
TOLUENE	ND
TOTAL XYLENES	ND
ACENAPHTHENE	ND
ACENAPHTHYLENE	ND
ANTHRACENE	ND
FLUORENE	ND
NAPHTHALENE	ND
PHENANTHRENE	0.00011
TOTAL LEAD	NA
SPLP LEAD	NA

ANALYTE	MW-4
BENZENE	0.156
ETHYLBENZENE	0.648
MTBE	ND
TOLUENE	0.122
TOTAL XYLENES	1.03
ACENAPHTHENE	0.00033
ACENAPHTHYLENE	ND
ANTHRACENE	ND
FLUORENE	ND
NAPHTHALENE	0.04
PHENANTHRENE	ND
TOTAL LEAD	NA
SPLP LEAD	NA

ANALYTE	MW-6
BENZENE	ND
ETHYLBENZENE	ND
MTBE	ND
TOLUENE	0.0017
TOTAL XYLENES	ND
ACENAPHTHENE	ND
ACENAPHTHYLENE	ND
ANTHRACENE	ND
FLUORENE	ND
NAPHTHALENE	0.00036
PHENANTHRENE	0.00012
TOTAL LEAD	NA
SPLP LEAD	NA

ANALYTE	MW-5
BENZENE	0.0117
ETHYLBENZENE	0.102
MTBE	ND
TOLUENE	0.036
TOTAL XYLENES	0.273
ACENAPHTHENE	0.0002
ACENAPHTHYLENE	ND
ANTHRACENE	ND
FLUORENE	0.00031
NAPHTHALENE	0.00027
PHENANTHRENE	0.00013
TOTAL LEAD	NA
SPLP LEAD	NA

ANALYTE	MW-8
BENZENE	0.109
ETHYLBENZENE	ND
MTBE	ND
TOLUENE	ND
TOTAL XYLENES	ND
ACENAPHTHENE	ND
ACENAPHTHYLENE	ND
ANTHRACENE	ND
FLUORENE	ND
NAPHTHALENE	ND
PHENANTHRENE	ND
TOTAL LEAD	NA
SPLP LEAD	NA

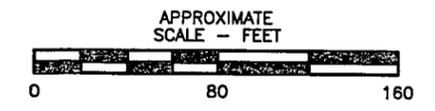
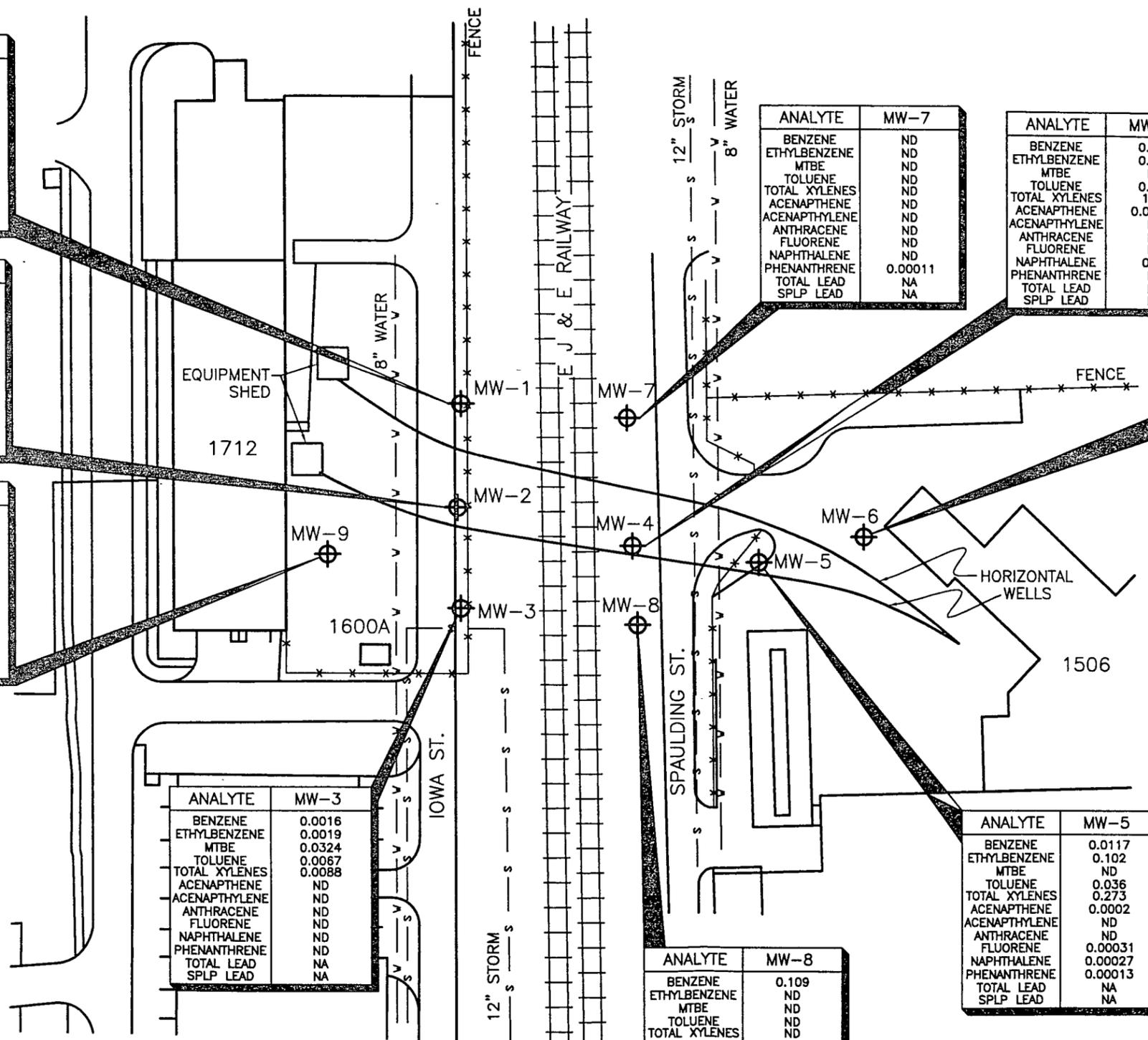


FIGURE 5
GROUNDWATER CONCENTRATION MAP
BUILDING 1600A
GREAT LAKES NAVAL TRAINING CENTER, ILLINOIS

PREPARED FOR
UNITED STATES NAVY
GREAT LAKES NAVAL TRAINING CENTER

DRAWN MRC\5-25-00	CHECKED
REVISED RJO/9-28-01	APPROVED
JOB NO.: 37755.02	TOLLEST, INC.
DRAWING NUMBER 37755-BTX	

APPENDIX B

BORING LOGS/MONITORING WELL CONSTRUCTION DIAGRAMS

The Agency is authorized to require this information under 415 ILCS 5/4-21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000.00 for each day the failure continues, a fine up to \$50,000.00 and imprisonment up to five years. This form has been approved by the Federal Management Center.

LUST Incident No.: 971739	Boring Number: Replacement MW-5	Page: 1 of 1
Site Name: Naval Training Center	Boring Location: 80' E of Bldg 1506 inside Gate	Date: Start 7-17-01
Address: Building 1600A, Ray Street Great Lakes, Illinois		Finish 7-17-01

Sample Number	Sample Device	Sample Recovery	Lithology Symbol	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content %	Q _u Hand Penetrometer	OVA/PID/FID/OVM	Remarks
A-1			GC	0	Topsoil				
				1	FILL, medium dense, crushed stone with some clay, brown				
				2					
A-2			CL	3	CLAY, brown, some sand and silt, moist			1.0	
				4					
				5					▽
A-3			SP	6	SAND, and silt, dark gray, wet				
				7					
				8				0.8	▽
A-3			CL	9	CLAY, gray, and silt with tr. sand				
				10					
				11				0.8	
				12					
				13					
				14					
				15					End of boring at 14.0 ft

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data ▽ Depth While Drilling <u>9.0'</u> ▽ Depth After Drilling <u>5.62</u>	Auger Depth <u>14.0'</u> Rig <u>CME 75</u> Rotary Depth _____ Geologist <u>Lynn P. Smith</u> Driller/Co. <u>Toi Test, Inc.</u> Note: Boring backfilled unless otherwise noted.	 Illinois Environmental Protection Agency
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The Agency is authorized to require this information under 415 ILCS 5/4-1.21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000.00 for each day the failure continues, a fine up to \$50,000.00 and imprisonment up to five years. This form has been approved by the Forms Management Center.

LUST Incident No.: 971739	Boring Number: MW-7	Page: 1 of 1
Site Name: Naval Training Center	Boring Location: 180' NW of Bldg 1506 Entrance Gate	Date: Start 7-17-01 Finish 7-17-01
Address: Building 1600A, Ray Street Great Lakes, Illinois		

Sample Number	Sample Device	Sample Recovery	Lithology Symbol	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content %	Hand Penetrometer	OVA/PID/FID/OVM	Remarks
				0	Topsoil				
A-1			CL	1	CLAY, brown some fine to medium sand with silt, moist			0	A
				2					
				3					
				4					
A-2			SP	5	SAND and silt, gray, wet			0	A
				6					
				7					
				8					
A-3			CL	9	CLAY, gray, and silt with tr. sand			0	End of boring at 14.0 ft
				10					
				11					
				12					
				13					
				14					
				15					

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data ▼ Depth While Drilling <u>8.0</u> ▽ Depth After Drilling <u>3.11</u>	Auger Depth <u>14.0'</u> Rig <u>CME 75</u> Rotary Depth _____ Geologist <u>LYAN P. SMITH</u> Driller/Co. <u>To I Test, Inc.</u> Note: Boring backfilled unless otherwise noted.	 Illinois Environmental Protection Agency
--	--	--

The Agency is authorized to require this information under 415 ILCS 5/4-21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000.00 for each day the failure continues, a fine up to \$50,000.00 and imprisonment up to five years. This form has been approved by the Forensic Management Center.

LUST Incident No.: 971739	Boring Number: MW-8	Page: 1 of 1
Site Name: Naval Training Center	Boring Location: 180' SW of Bldg 1506 Entrance Gate	Date: Start 7-17-01
Address: Building 1600A, Ray Street Great Lakes, Illinois		Finish 7-17-01

Sample Number	Sample Device	Sample Recovery	Lithology Symbol	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content %	Q _u Hand Penetrometer	OVA/PID/FID/OVM	Remarks
				0	Topsoil				
A-1			CL	1	CLAY, brown some silt, fine to medium sand, moist same, with some pebbles, moist			0	▼
				2					
				3					
				4					
				5					
A-2			SP	6	SAND and silt, gray, wet			0	▼
				7					
				8					
				9					
				10					
A-3				11				0	End of boring at 14.0 ft
				12					
				13					
				14					
				15					

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data ▼ Depth While Drilling <u>11.0</u> ▽ Depth After Drilling <u>3.75</u>	Auger Depth <u>14.0'</u> Rig <u>CME 75</u> Rotary Depth _____ Geologist <u>Lynn P. Smith</u> Driller/Co. <u>To I Test, Inc.</u> Note: Boring backfilled unless otherwise noted.	 Illinois Environmental Protection Agency
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The Agency is authorized to require this information under 415 ILCS 5/21-22. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000.00 for each day the failure continues, a fine up to \$50,000.00 and imprisonment up to five years. This form has been approved by the Permit Management Center.

LUST Incident No.: 971739	Boring Number: MW-9	Page: 1 of 1
Site Name: Naval Training Center	Boring Location: 80' NE of Bldg 1600A	Date: Start 7-17-01
Address: Building 1600A, Ray Street Great Lakes, Illinois		Finish 7-17-01

Sample Number	Sample Device	Sample Recovery	Lithology Symbol	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content %	Hand Penetrometer	OVA/PID/FID/OVM	Remarks
A-1			GC	0	Asphalt				
				1	Crushed stone sub-base				
			CL	2	CLAY, brown, few medium sand, damp			0.5	
A-2			SP	6					
				7	SAND and silt, gray, wet				
				8	SAND with some medium grains and some pebbles, wet			6.5	
A-3			CL	10					
				11					
				12				0.2	
				13	CLAY, gray, and silt, moist				End of boring at 14.0 ft
				14					
				15					

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data ▼ Depth While Drilling <u>7.0</u> ▽ Depth After Drilling <u>6.44</u>	Auger Depth <u>14.0'</u> Rig <u>CME 75</u> Rotary Depth _____ Geologist <u>Lyan P. Smith</u> Driller/Co. <u>ToiTest, Inc.</u> Note: Boring backfilled unless otherwise noted.	 Illinois Environmental Protection Agency
---	--	--



SOUTHNAVFAC

LOG OF BORING

MW-5

Page 1 of 1

PROJECT NO: D.O. # 28	PROJECT NAME: Grandwater well Install
PROJECT LOCATION: Building 1600A	DATE DRILLED: 7-17-01
DRILLING COMPANY: To Test, Inc.	SURFACE ELEVATION: Feet
DRILLING METHOD: HSA	BORING DIAMETER: Inches 9
DRILLING RIG: CME 75	GEOLOGIST: Lynn P. Smith

DEPTH feet	SAMPLE NUMBER	BLOWS/FT.	PID (ppm)				GRAPHIC LOG	USCS/ROD	GEOLOGIC DESCRIPTION Density/Consistency, Hardness, Color	WELL DIAGRAM
			Sample	B. Zone	Borehole	Dir B. Z.				
0								Topsoil		
0-5	A-1	1.0					GC FILL, crushed stone, brn clay			
5-10	A-2	0.8					CL CLAY, brn, some sand and silt, moist			
10-15	A-3	0.8					SP SAND and silt, dark gray, wet			
15-14.0							CL CLAY, gray, and silt with tr. Sand End of boring at 14.0 ft			



SOUTHNAVFAC

LOG OF BORING

MW-7

Page 1 of 1

PROJECT NO: D.O. # 28	PROJECT NAME: Groundwater well Eastall
PROJECT LOCATION: Building 1600A	DATE DRILLED: 7-17-01
DRILLING COMPANY: TolTest, Inc.	SURFACE ELEVATION: Feet
DRILLING METHOD: HSA	BORING DIAMETER: Inches 9
DRILLING RIG: CME 75	GEOLOGIST: Lynn P. Smith

DEPTH feet	SAMPLE NUMBER	BLOWS/FT.	PID (ppm)				GRAPHIC LOG	USCS/ROD	GEOLOGIC DESCRIPTION Density/Consistency, Hardness, Color	WELL DIAGRAM
			Sample	B. Zone	Borehole	D/B B. Z.				
								Topsoil		
5	A-1	0					CL	CLAY, brn. some fine to medium sand with silt, moist		
10	A-2	0					SP	SAND and silt, gray, wet		
15	A-3	0					CL	CLAY, gray, and silt with tr. sand End of boring at 14.0 ft		
20										
25										
30										
35										
40										



SOUTHNAVFAC

LOG OF BORING

mw-8

Page 1 of 1

PROJECT NO: D.O. # 28	PROJECT NAME: Groundwater well Install
PROJECT LOCATION: Building 1600A	DATE DRILLED: 7-17-01
DRILLING COMPANY: TolTest, Inc.	SURFACE ELEVATION: Feet
DRILLING METHOD: HSA	BORING DIAMETER: Inches 9
DRILLING RIG: CME 75	GEOLOGIST: Lynn P. Smith

DEPTH feet	SAMPLE NUMBER	BLONS/FT.	PID (ppm)				GRAPHIC LOG	USCS/ROD	GEOLOGIC DESCRIPTION Density/Consistency, Hardness, Color	WELL DIAGRAM
			Sample	B. Zone	Borehole	Dir B. Z.				
0	A-1		0					Topsoil CL CLAY, brown, some silt, fine to medium sand, moist some, with some pebbles		
5	A-2		0				SP SAND and silt, gray, wet			
10	A-3		0				End of boring at 14.0 ft			
15										
20										
25										
30										
35										
40										



SOUTHNAVFAC

LOG OF BORING MW-9

Page 1 of 1

PROJECT NO: D.O. # 28	PROJECT NAME: Groundwater well Install
PROJECT LOCATION: Building 1600A	DATE DRILLED: 7-17-01
DRILLING COMPANY: TolTest, Inc.	SURFACE ELEVATION: Feet
DRILLING METHOD: HSA	BORING DIAMETER: Inches 9
DRILLING RIG: CME 75	GEOLOGIST: Lynn P. Smith

DEPTH feet	SAMPLE NUMBER	BLOWS/FT.	PID (ppm)				GRAPHIC LOG	USCS/ROD	GEOLOGIC DESCRIPTION Density/Consistency, Hardness, Color	WELL DIAGRAM
			Sample	B. Zone	Borehole	DI# B. Z.				
5	A-1	0.5					GC	Asphalt and crushed stone sub-base		
							CL	CLAY, brown, few medium sand, damp		
10	A-2	6.5					SP	SAND and silt, gray, wet SAND with some medium grains and some pebbles, wet		
							CL	CLAY, gray, and silt, moist		
15	A-3	0.2								
20										
25										
30										
35										
40										



Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 971739
Site Name: Naval Training Center, Bldg 1600A
Drilling Contractor: TOST, Inc.
Driller: Neil Wiktor
Drilling Method: 4 1/4-inch HSA

Well No.: MW-5
Date Drilled Start: 7-17-01
Date Completed: 7-17-01
Geologist: Lynn P. Smith
Drilling Fluids (type): None

Annular Space Details

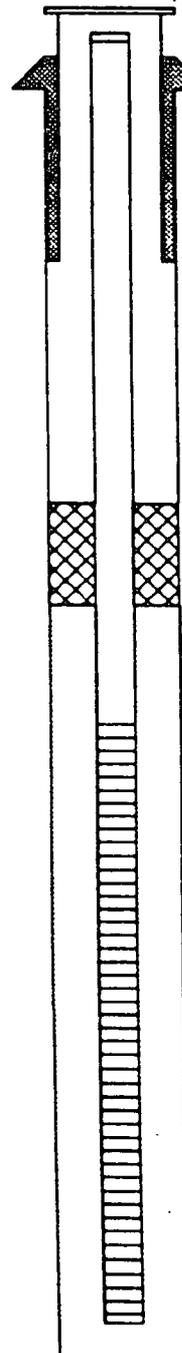
Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite chips
Type of Bentonite Seal (Granular, Pellet): Granular
Type of Sand Pack: #5 silica sand

Elevations - .01 ft.

662.43 Top of Protective Casing
662.24 Top of Riser Pipe
660 Ground Surface
660.00 Top of Annular Sealant
2.43 Casing Stickup

Well Construction Materials

Table with 4 columns: Material, Stainless Steel Specify Type, PVC 2" Specify Type Sch. 40, Other Specify Type. Rows include Riser coupling joint, Riser pipe above w.t., Riser pipe below w.t., Screen, Coupling joint screen to riser, Protective casing.



658.00 Top of Seal
1 Total Seal Interval
657.00 Top of Sand
656.00 Top of Screen
10.0 Total Screen Interval
646.00 Bottom of Screen
646.00 Bottom of Borehole

Measurements

to .01 ft (where applicable)

Table with 2 columns: Measurement, Value. Rows include Riser pipe length (6.24), Screen length (10.0), Screen slot size (0.010), Protective casing length (1.5), Depth to water (5.62), Elevation of water (656.62), Free Product thickness (NA), Gallons removed (develop) (10), Gallons removed (purge), Other.

Completed by: Robert R. Beckwith, PG

The Agency is authorized to require this information under 415 ILCS 5/4 and 21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000.00 for each failure and up to \$50,000.00 for each violation. This form has been approved by the Illinois Management Center.



Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 971739
 Site Name: Naval Training Center, Bldg. 1600A
 Drilling Contractor: TOITEST, INC.
 Driller: Neil Wiktor
 Drilling Method: 4 1/4-inch HSA

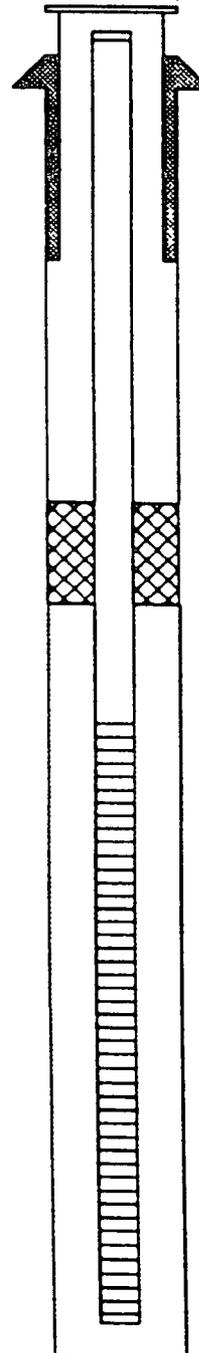
Well No.: MW-7
 Date Drilled Start: 7-17-01
 Date Completed: 7-17-01
 Geologist: Lynn P. Smith
 Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
 Type of Annular Sealant: Bentonite chips
 Type of Bentonite Seal (Granular, Pellet): Granular
 Type of Sand Pack: #5 silica sand

Elevations - .01 ft.

660.59 Top of Protective Casing
660.06 Top of Riser Pipe
 _____ Ground Surface
659.73 Top of Annular Sealant
0.0 Casing Stickup



658.06 Top of Seal
 _____ Total Seal Interval
657.06 Top of Sand

656.06 Top of Screen

10.0 Total Screen Interval

646.06 Bottom of Screen
646.06 Bottom of Borehole

Well Construction Materials

	Stainless Steel Specify Type	PVC 2" Specify Type Sch. 40	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		40	
Riser pipe below w.t.			
Screen		10.0'	
Coupling joint screen to riser		threaded	
Protective casing	steel		

Measurements

to .01 ft (where applicable)

Riser pipe length	4.0
Screen length	10.0
Screen slot size	0.010
Protective casing length	1.5
Depth to water	3.11
Elevation of water	656.95
Free Product thickness	NA
Gallons removed (develop)	10
Gallons removed (purge)	
Other	

Completed by: Robert R. Beckwith, PG

The Agency is authorized to require this information under 415 ILCS 5/4 and 21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000.00 for each day the failure continues, a fine up to \$50,000.00 and imprisonment up to five years. This form has been approved by the Illinois Environmental Protection Agency.



Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 971739
 Site Name: Naval Training Center, Bldg. 1600A
 Drilling Contractor: ToiTest, Inc.
 Driller: Neil Wiktor
 Drilling Method: 4 1/4-inch HSA

Well No.: MW-8
 Date Drilled Start: 7-17-01
 Date Completed: 7-17-01
 Geologist: Lynn P. Smith
 Drilling Fluids (type): None

Annular Space Details

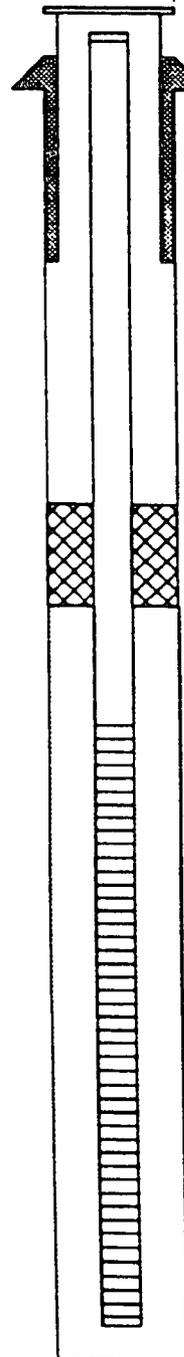
Type of Surface Seal: Concrete
 Type of Annular Sealant: Bentonite chips
 Type of Bentonite Seal (Granular, Pellet): Granular
 Type of Sand Pack: #5 silica sand

Elevations - .01 ft.

661.12 Top of Protective Casing
660.89 Top of Riser Pipe
 Ground Surface
660.56 Top of Annular Sealant
0.0 Casing Stickup

Well Construction Materials

	Stainless Steel Specify Type	PVC 2" Specify Type Sch. 40	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		4.0'	
Riser pipe below w.t.			
Screen		10.0'	
Coupling joint screen to riser		threaded	
Protective casing	steel		



658.89 Top of Seal
1 Total Seal Interval
657.89 Top of Sand

656.89 Top of Screen

10.0 Total Screen Interval

646.89 Bottom of Screen
646.89 Bottom of Borehole

Measurements

to .01 ft (where applicable)

Riser pipe length	4.0
Screen length	10.0
Screen slot size	0.010
Protective casing length	1.5
Depth to water	3.75
Elevation of water	657.14
Free Product thickness	NA
Gallons removed (develop)	10
Gallons removed (purge)	
Other	

Completed by: Robert R. Beckwith, PG

The Agency is authorized to require this information under 415 ILCS 5/4-21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000.00 for each day the failure continues, a fine up to \$50,000.00 and imprisonment up to five years. This form has been approved by the Illinois Management Center.



Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 971739
 Site Name: Naval Training Center, Bldg 1600A
 Drilling Contractor: TOITEST, Inc.
 Driller: Neil Wiktor
 Drilling Method: 4 1/4-inch HSA

Well No.: MW-9
 Date Drilled Start: 7-17-01
 Date Completed: 7-17-01
 Geologist: Lynn P. Smith
 Drilling Fluids (type): None

Annular Space Details

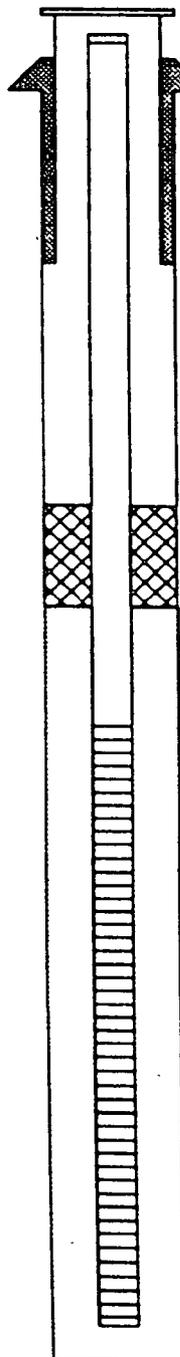
Type of Surface Seal: Concrete
 Type of Annular Sealant: Bentonite chips
 Type of Bentonite Seal (Granular, Pellet): Granular
 Type of Sand Pack: #5 silica sand

Elevations - .01 ft.

664.51 Top of Protective Casing
664.25 Top of Riser Pipe
 _____ Ground Surface
663.92 Top of Annular Sealant
0.0 Casing Stickup

Well Construction Materials

	Stainless Steel Specify Type	PVC 2" Specify Type Sch. 40	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		4.0'	
Riser pipe below w.t.			
Screen		10.0'	
Coupling joint screen to riser		threaded	
Protective casing	steel		



662.25 Top of Seal
 _____ Total Seal Interval
661.25 Top of Sand

660.25 Top of Screen

10.0 Total Screen Interval

650.25 Bottom of Screen
650.25 Bottom of Borehole

Measurements

to .01 ft (where applicable)

Riser pipe length	4.0
Screen length	10.0
Screen slot size	0.010
Protective casing length	1.5
Depth to water	6.44
Elevation of water	657.81
Free Product thickness	NA
Gallons removed (develop)	10
Gallons removed (purge)	
Other	

Completed by: Robert R. Beckwith, PG

The Agency is authorized to require this information under 415 ILCS 5/4 and 21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$25,000.00 for each day the failure continues, a fine up to \$50,000.00 and imprisonment up to five years. This form has been approved by the Illinois Environmental Protection Agency Management Center.



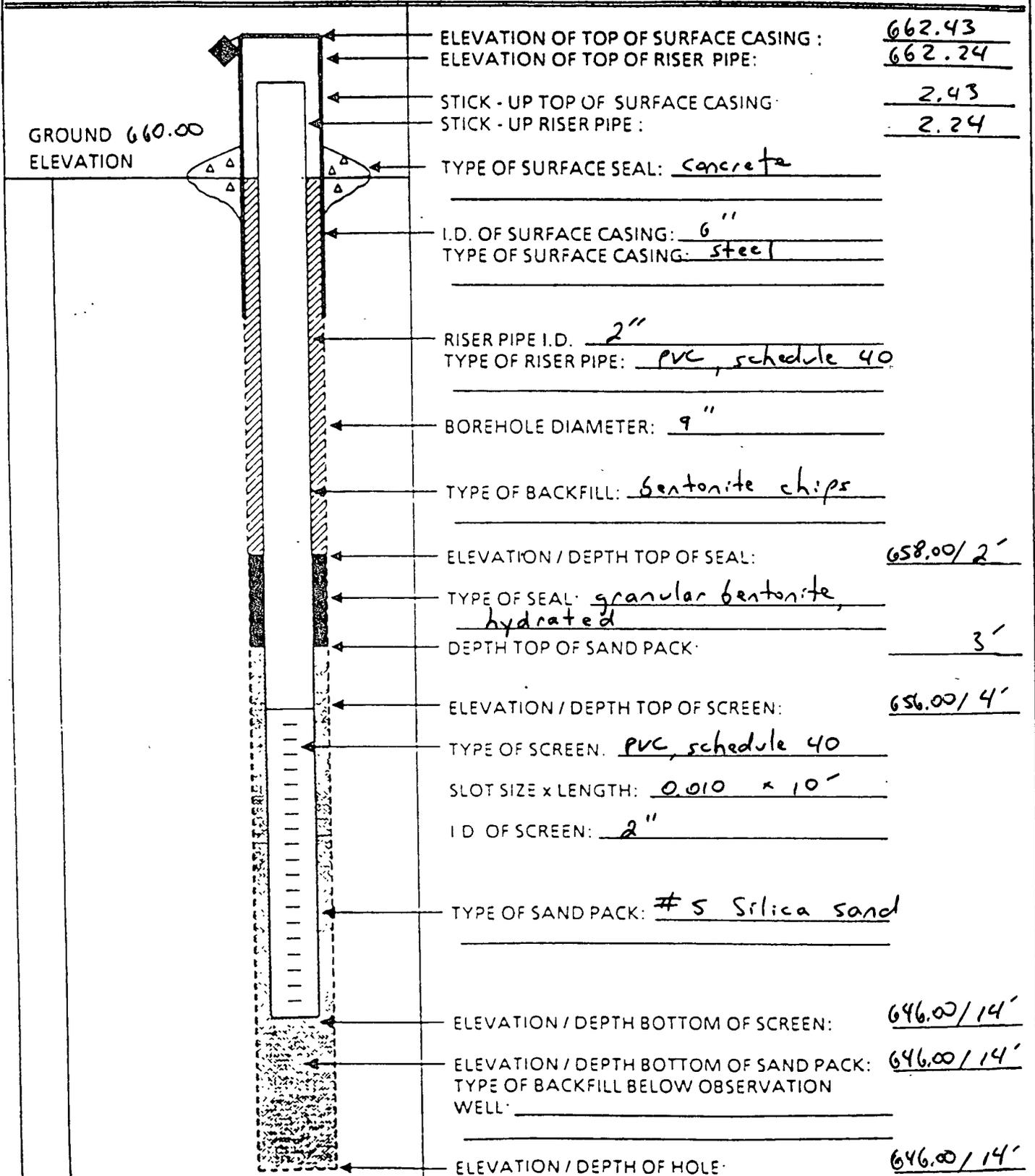
SOUTHNAVFAC

BORING NO.: MW-5

OVERBURDEN MONITORING WELL SHEET

PROJECT D.O. # 28 LOCATION Bldg 1600A
 PROJECT NO. 37755.02 BORING MW-5
 ELEVATION _____ DATE 7-17-01
 FIELD GEOLOGIST Lynn P. Smith

DRILLER Neil Wiktor
 DRILLING METHOD HSA
 DEVELOPMENT METHOD Ball





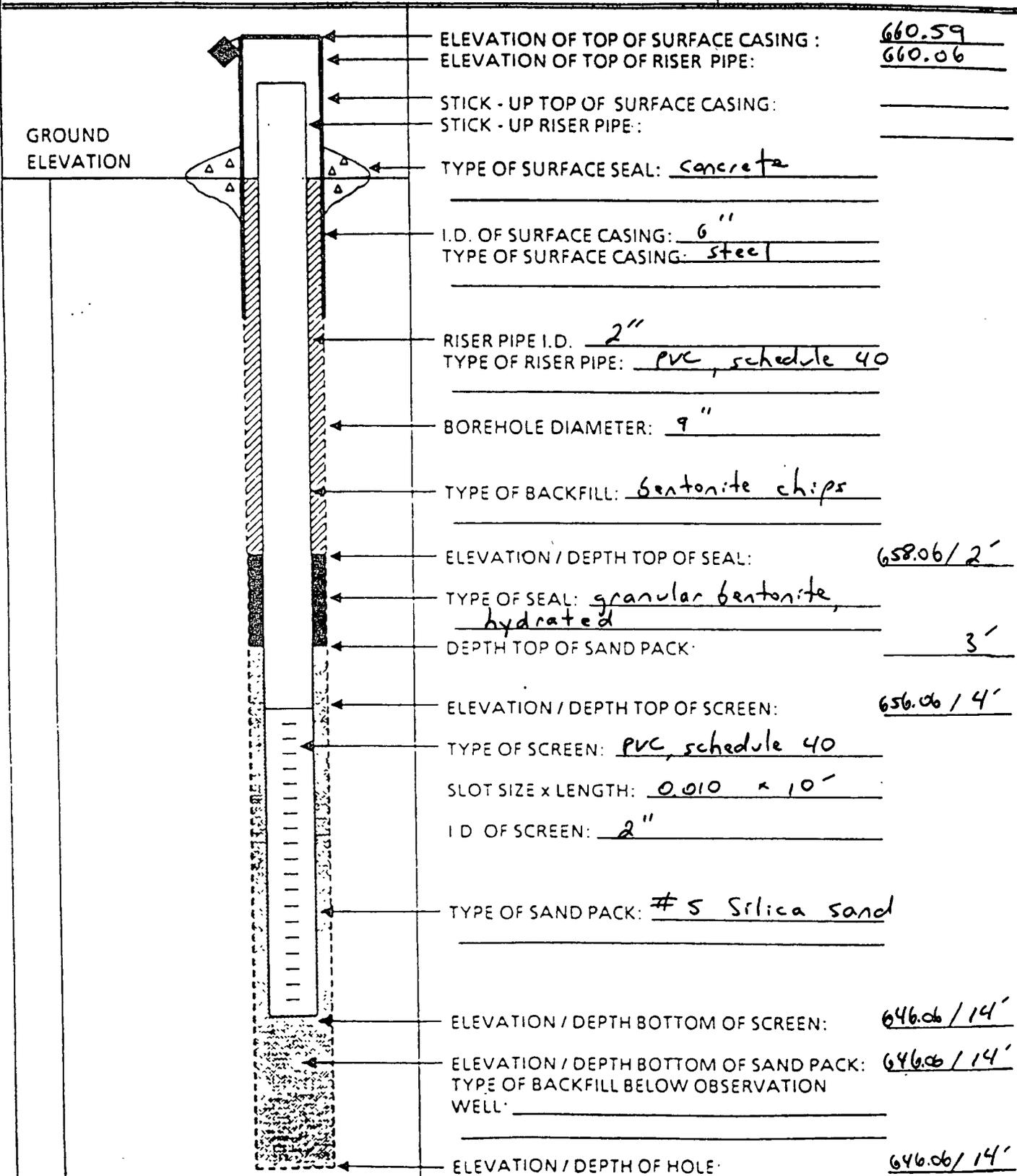
SOUTHNAVFAC

BORING NO.: MW-7

OVERBURDEN MONITORING WELL SHEET

PROJECT D.O. # 28 LOCATION Bldg 1600A
 PROJECT NO. 37755.02 BORING MW-5
 ELEVATION _____ DATE 7-17-01
 FIELD GEOLOGIST Lynn P. Smith

DRILLER Neil Wiktor
 DRILLING METHOD HSA
 DEVELOPMENT METHOD Bail





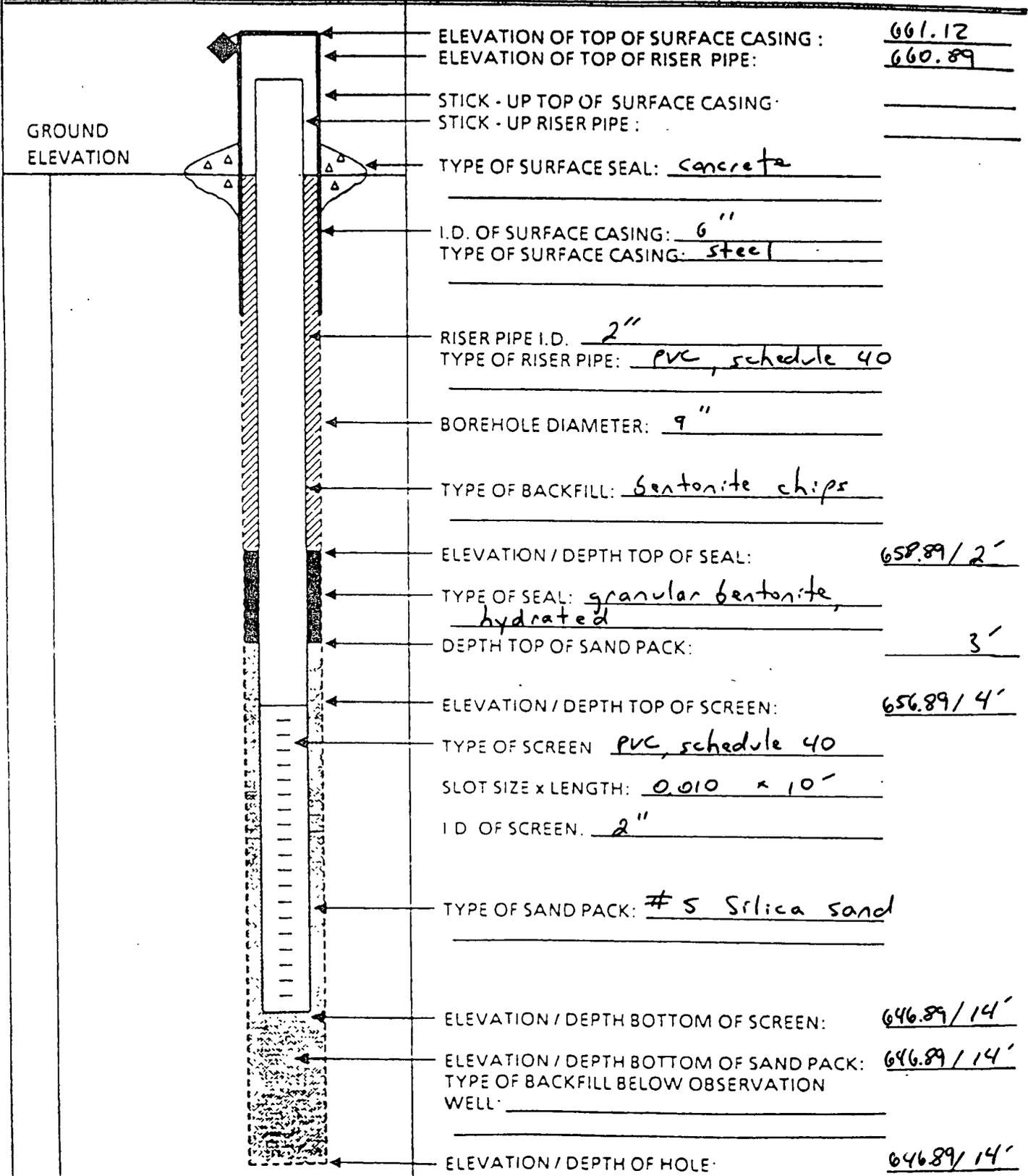
SOUTHNAVFAC

BORING NO.: MW-8

OVERBURDEN MONITORING WELL SHEET

PROJECT D.O. # 28 LOCATION Bldg 1600A
 PROJECT NO. 37755.02 BORING MW-5
 ELEVATION _____ DATE 7-17-01
 FIELD GEOLOGIST Lynn P. Smith

DRILLER Neil Wiktor
 DRILLING METHOD HSA
 DEVELOPMENT METHOD Baril





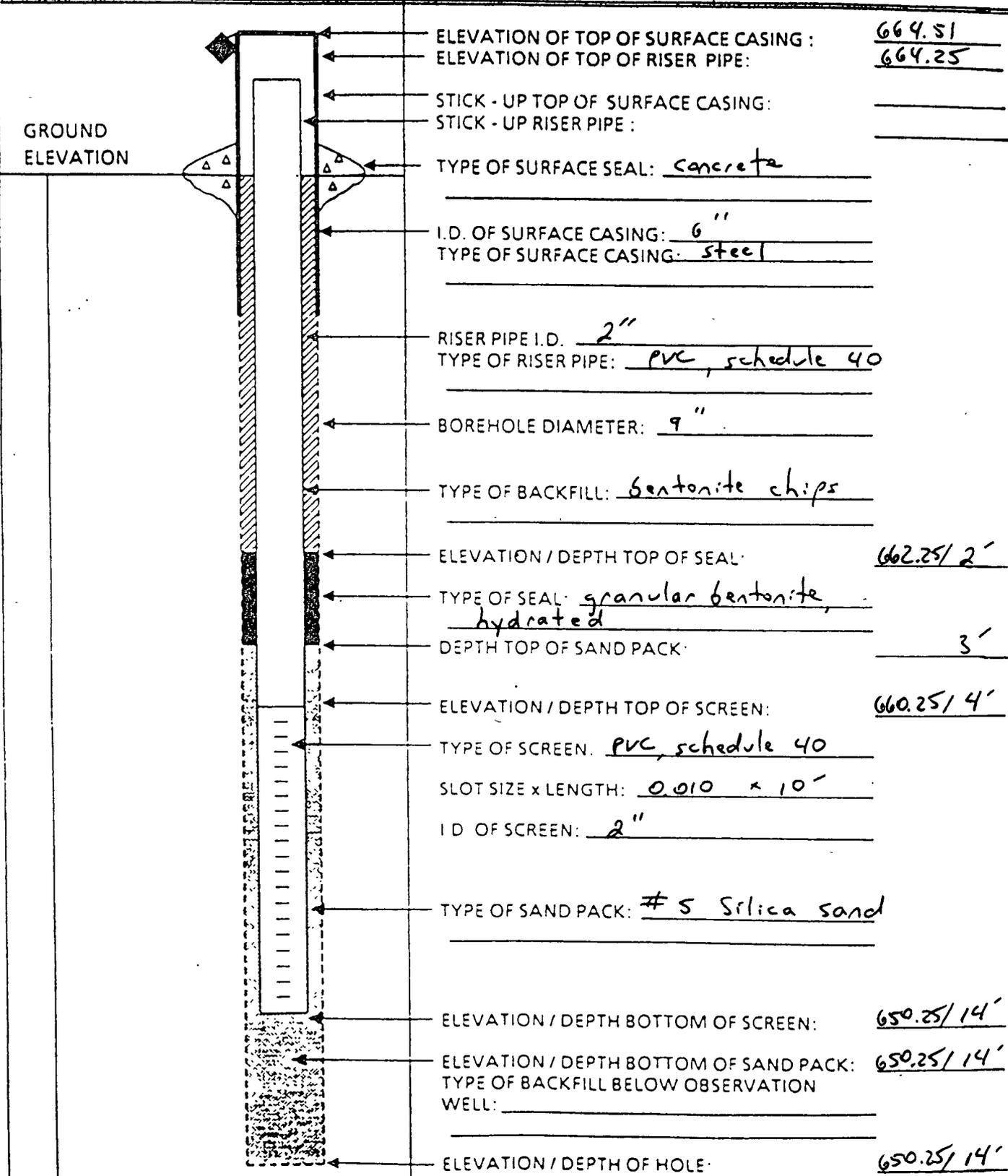
SOUTHNAVFAC

BORING NO.: MW-9

OVERBURDEN MONITORING WELL SHEET

PROJECT D.O. # 28 LOCATION Bldg 1600A
 PROJECT NO. 37755.02 BORING MW-5
 ELEVATION _____ DATE 7-17-01
 FIELD GEOLOGIST Lynn P. Smith

DRILLER Neil Wiktor
 DRILLING METHOD HSA
 DEVELOPMENT METHOD Bail



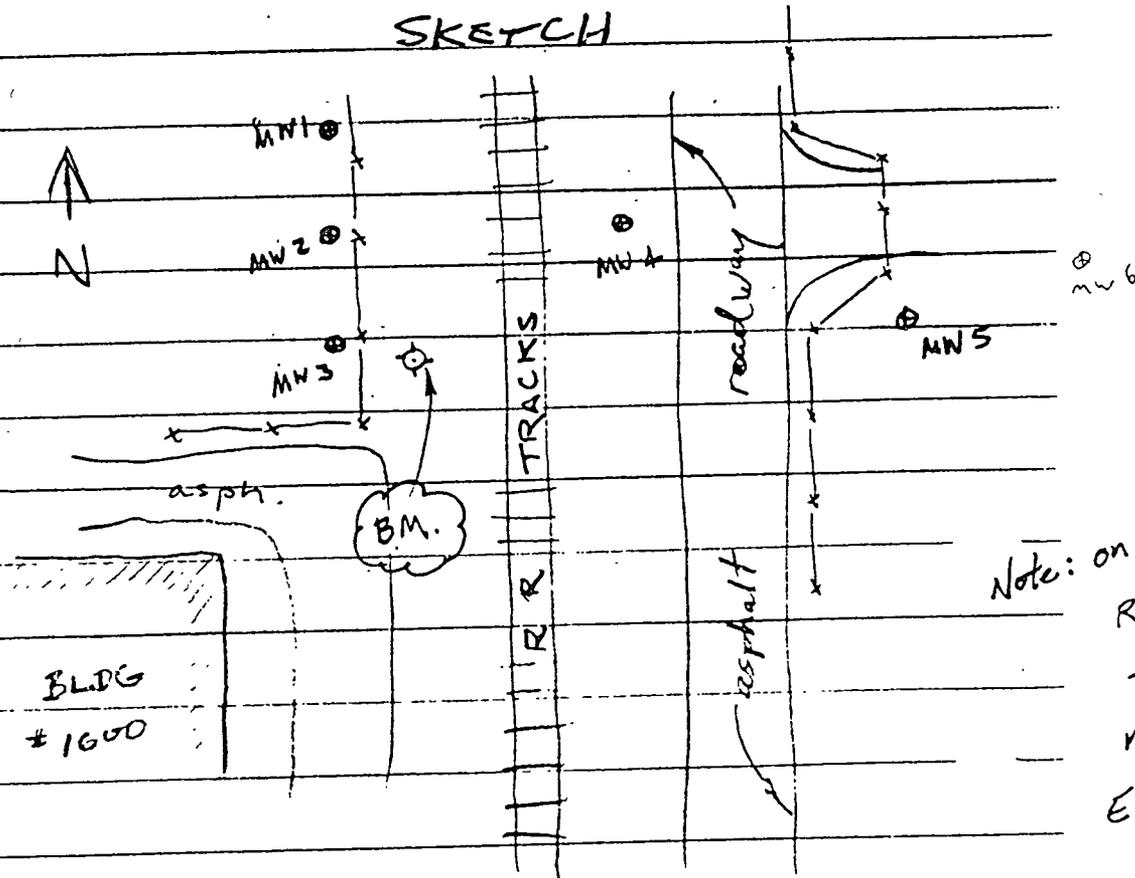
GROUND ELEVATION

ELEVATION OF TOP OF SURFACE CASING: 664.51
 ELEVATION OF TOP OF RISER PIPE: 664.25
 STICK - UP TOP OF SURFACE CASING: _____
 STICK - UP RISER PIPE: _____
 TYPE OF SURFACE SEAL: concrete
 I.D. OF SURFACE CASING: 6"
 TYPE OF SURFACE CASING: steel
 RISER PIPE I.D. 2"
 TYPE OF RISER PIPE: PVC, schedule 40
 BOREHOLE DIAMETER: 9"
 TYPE OF BACKFILL: Bentonite chips
 ELEVATION / DEPTH TOP OF SEAL: 662.25 / 2'
 TYPE OF SEAL: granular bentonite, hydrated
 DEPTH TOP OF SAND PACK: 3'
 ELEVATION / DEPTH TOP OF SCREEN: 660.25 / 4'
 TYPE OF SCREEN: PVC, schedule 40
 SLOT SIZE x LENGTH: 0.010 x 10'
 I.D. OF SCREEN: 2"
 TYPE OF SAND PACK: #5 Silica sand
 ELEVATION / DEPTH BOTTOM OF SCREEN: 650.25 / 14'
 ELEVATION / DEPTH BOTTOM OF SAND PACK: 650.25 / 14'
 TYPE OF BACKFILL BELOW OBSERVATION WELL: _____
 ELEVATION / DEPTH OF HOLE: 650.25 / 14'

APPENDIX C
SURVEY DATA

MON WELL

SKETCH



	RIM ELEV.	TOP OF CASING ELEV.
MON. WELL # 1	663.61	663.22
MON. WELL # 2	663.71	663.33
MON. WELL # 3	663.26	662.80
MON. WELL # 4	661.17	660.73
MON. WELL # 5	660.07	659.51
Mon WELL # 6	659.17	658.73



Edward Peklay
11/22/99

FILE NO. 99-60

* ALL ELEV. ARE U.S.G.S. DATUM

APPENDIX D

WASTE DISPOSAL DOCUMENTATION

PLEASE TYPE (Form designed for use on a 12-pitch typewriter)

State Form LFC 62 B/61 IL 532-0810 EPA Form 8700-22 (Rev. 8-89)

Form Approved OMB No 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. IL 9710024577		Manifest Document No. 110036	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but is required by Illinois law.	
3. Generator's Name and Mailing Address ACOS INSTALLATION & ENVIRONMENTAL BUILDING 1A, 201 DECATUR AVENUE, GREAT LAKES, IL 60088					A. Illinois Manifest Document Number IL 9639271 FEE PAID IF APPLICABLE		
4. *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* 847-688-6934					B. Generator's ID Number 0971255004		
5. Transporter 1 Company Name AMERICAN WASTE HAULERS, INC.					C. Transporter's ID Number UPM227060-IL		
6. US EPA ID Number					D. Transporter's Phone (708.) 681-3999		
7. Transporter 2 Company Name					E. Transporter's ID Number		
8. US EPA ID Number					F. Transporter's Phone ()		
9. Designated Facility Name and Site Address AMERICAN WASTE PROCESSING, LTD. 2010 W. MADISON STREET HAYWOOD, IL 60153					G. Facility's IL ID Number 0911830002		
10. US EPA ID Number					H. Facility's Phone (708.) 681-3999		
11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)				12. Containers No.	13. Total Quantity	14. Unit Wt/Vol	Waste No.
a. NON-HAZARDOUS LUST WATER				001	TT	05000	G
b.							EPA HW Number 00384C
c.							EPA HW Number
d.							EPA HW Number
J. Additional Description for Materials Listed Above APPROVAL #481384					K. Handling Codes for Wastes Listed Above In Item #14		
15. Special Handling Instructions and Additional Information IN CASE OF EMERGENCY NOTIFY 708-681-3999							
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment. OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.							
Printed/Typed Name Walter Lewis				Signature <i>Walter Lewis</i>		Date Month Day Year 05/30/01	
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name JOE BRIDER				Signature <i>Joe Brider</i>		Date Month Day Year 05/30/01	
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name				Signature		Date Month Day Year	
19. Discrepancy Indication Space							
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.						Date	
Printed/Typed Name W J Brider				Signature <i>W J Brider</i>		Month Day Year 05/30/01	

This Agency is authorized to require, pursuant to Illinois Revised Statutes, 1989, Chapter 111 1/2, Section 1004 and 1007, that this information be submitted to the Agency Failure to provide this information may result in a civil penalty against the owner or operator not to exceed \$25,000 per day of violation. Fabrication of this information may result in a fine up to \$10,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Council.

In case of a spill call the Illinois Office of Emergency Response at 217/782-7860 and the National Response Center at 800/424-9002 or 202/742-2013.

PLEASE TYPE

(Form designed for use on ditto (12-pitch) typewriter.)

State Form LFC 62 0/01 IL532-0010

EPA Form 8700-22 (Rev. 6-89)

Form Approved. OMB No. 2050-0039

In case of a spill call the Illinois Office of Emergency Response at 217 782-7860 and the National Response Center at 800 / 424-8802 or 202 / 426-2675.

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. IL170024577		Manifest Document No. 110050		2. Page 1 of 1		Information in the shaded areas is not required by Federal law, but is required by Illinois law.					
3. Generator's Name and Mailing Address ACOS INSTALLATION & ENVIRONMENTAL BUILDING 1A, 201 DECATUR AVENUE, GREAT LAKES, IL 60088						A. Illinois Manifest Document Number IL 9639270 <small>FEE PAID IF APPLICABLE</small>							
4. "24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS" 847-688-6934						B. Generator's IL ID Number 6971235004							
5. Transporter 1 Company Name AMERICAN WASTE HAULERS, INC.						C. Transporter's ID Number UPM227060-IL							
6. US EPA ID Number						D. Transporter's Phone (708) 681-3999							
7. Transporter 2 Company Name						E. Transporter's ID Number							
8. US EPA ID Number						F. Transporter's Phone ()							
9. Designated Facility Name and Site Address AMERICAN WASTE PROCESSING, LTD. 2010 W. MADISON STREET MAYWOOD, IL 60153						G. Facility's IL ID Number 0311830002							
10. US EPA ID Number						H. Facility's Phone (708) 681-3999							
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers No. Type		13. Total Quantity		14. Unit Wt/Vol		Waste No.	
a. NON-HAZARDOUS LUST WATER						0 0 1 TT		03,050		G		00384C	
b.												EPA HW Number	
c.												EPA HW Number	
d.												EPA HW Number	
J. Additional Description for Materials Listed Above APPROVAL #481384						K. Handling Codes for Wastes Listed Above In Item #14							
19. Special Handling Instructions and Additional Information IN CASE OF EMERGENCY NOTIFY 708-681-3999													
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.													
Printed/Typed Name X NOW WEA						Signature <i>[Signature]</i>				Date Month Day Year 053001			
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name HARRY POTTER						Signature <i>[Signature]</i>				Date Month Day Year 053001			
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name						Signature				Date Month Day Year			
19. Discrepancy Indication Space													
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.												Date	
Printed/Typed Name W. J. Vaidik						Signature <i>[Signature]</i>				Date Month Day Year 053001			

This Agency is authorized to require, pursuant to Illinois Revised Statute, 1989, Chapter 117, Sections 1004 and 1021, that this information be submitted to the Agency. Failure to provide this information may result in a civil penalty against the owner or operator not to exceed \$20,000 per day of violation. Falsification of this information may result in a fine up to \$50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

LEASE TYPE

(Form designed for use on 8 1/2 (12-pitch) typewriter)

State Form LPC 02 0/81 11.532-0010

EPA Form 8700-22 (Rev. 6-89)

Form Approved OMB No. 2050-0038

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. **1717002N-77** Manifest Document No. **110289**

2. Page 1 of 1 Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address: **WASTE INSTALLATION & ENVIRONMENTAL BUILDING 1A, 201 DECATUR AVENUE, GREAT LAKES, IL 60088**

4. '24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS' **847-688-6934**

5. Transporter 1 Company Name: **AMERICAN WASTE HAULERS, INC.** 6. US EPA ID Number

7. Transporter 2 Company Name 8. US EPA ID Number

9. Designated Facility Name and Site Address: **AMERICAN WASTE PROCESSING, LTD. 2010 W. MADISON STREET MAYWOOD, IL 60153** 10. US EPA ID Number

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number): **NON-HAZARDOUS LUST WATER**

12. Containers	13. Total Quantity	14. Unit Wt/Vol	Waste No.
No.	Typo		EPA HW Number
001	TI	02325 G	00384C
			EPA HW Number
			EPA HW Number
			EPA HW Number

15. Special Handling Instructions and Additional Information: **IN CASE OF EMERGENCY NOTIFY 708-681-3999**

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

17. Transporter 1 Acknowledgement of Receipt of Materials: Printed/Typed Name **Norm Luchs**, Signature *[Signature]*, Date **05/10/01**

18. Transporter 2 Acknowledgement of Receipt of Materials: Printed/Typed Name **JOE BRIDER**, Signature *[Signature]*, Date **05/30/01**

19. Discrepancy Indication Space

Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19. Printed/Typed Name **W J Vaidis**, Signature *[Signature]*, Date **05/31/01**

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In case of a spill call the Illinois Office of Emergency Response at 217/782-7850 and the National Response Center at 800/424-8802 or 202/426-2670.

This Agency is authorized to require, pursuant to Illinois Revised Statute, 1989, Chapter 111 1/2, Section 1004 and 1021, that this information be submitted to the Agency. Failure to provide this information may result in a civil penalty against the owner or operator not to exceed \$25,000 per day of violation. Falsification of this information may result in a fine up to \$50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

PLEASE TYPE

(Form designed for use on plain (12-pitch) typewriter)

State Form LPC 02 0/81 IL532-0810

EPA Form 8700-22 (Rev. 8-89)

Form Approved. OMB No 2050-0039

AND SPECIAL WASTE

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. **112700024577** Manifest Document No. **110735**

2. Page 1 of 1 Information in the shaded areas is not required by Federal law, but is required by Illinois law

3. Generator's Name and Mailing Address **ACOS INSTALLATION & ENVIRONMENTAL, BUILDING 1A, 201 DECATUR AVENUE, GREAT LAKES, IL 60088** Location If Different

4. *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* **847-688-6934**

5. Transporter 1 Company Name **AMERICAN WASTE HAULERS, INC.** 6. US EPA ID Number

7. Transporter 2 Company Name 8. US EPA ID Number

9. Designated Facility Name and Site Address **AMERICAN WASTE PROCESSING, LTD. 2010 W. MADISON STREET MAYWOOD, IL 60153** 10. US EPA ID Number

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)

No.	Type	13. Total Quantity	14. Unit Wt/Vol	Waste No. EPA HW Number
a. 001	TT	0.5000	G	00384C
b.				
c.				
d.				

12. Containers

13. Total Quantity

14. Unit Wt/Vol

15. Special Handling Instructions and Additional Information

IN CASE OF EMERGENCY NOTIFY 708-681-3999

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name **LARRY PORTER** Signature **Larry Porter** Date **05/30/01**

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name _____ Signature _____ Date _____

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name **W. J. VALEK** Signature **W. J. Valek** Date **05/30/01**

A. Illinois Manifest Document Number **IL 9639268** FEE PAID F. APPLICABLE

B. Generator's IL ID Number **0971255004**

C. Transporter's ID Number **UPM227060-11**

D. Transporter's Phone **(708) 681-3999**

E. Transporter's ID Number

F. Transporter's Phone ()

G. Facility's IL ID Number **0311830002**

H. Facility's Phone **(708) 681-3999**

GENERATOR FACILITY TRANSPORTER

In case of a spill call the Illinois Office of Emergency Response at 217 / 782-7860 and the National Response Center at 800 / 424-8802 or 202 / 426-2675.

This Agency is authorized to require, pursuant to Illinois Revised Statute, 1989, Chapter 111 1/2, Section 1104 and 1021, that this information be submitted to the Agency. Failure to provide this information may result in a civil penalty against the owner or operator not to exceed \$25,000 per day of violation. Falsification of this information may result in a fine up to \$50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Farms Management Center.

**NON-HAZARDOUS
WASTE MANIFEST**

1. Generator's US EPA ID No.

IL7170024577

Manifest Doc. No.

59740

2. Page 1

of 1

3. Generator's Name and Mailing Address

ACOS INSTALLATION & ENVIRONMENT
201 DECATUR AVENUE
GREAT LAKES IL 60088-5600

4. Generator's Phone (847) 668-4820

10053

BR10-0071

5. Transporter 1 Company Name

OSI ENVIRONMENTAL INC.

6. US EPA ID Number

MNT 230011586

A. Transporter's Phone

(262) 790-9300

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

OSI ENVIRONMENTAL INC.
12630 W. CUSTER AVE.
BUTLER, WI 53007

10. US EPA ID Number

WI R 000048736

C. Facility's Phone

(262) 790-9300

11. Waste Shipping Name and Description

a. NON HAZARDOUS LIQUID (OILY WATER)

12. Containers

No. Type

13. Total Quantity

14. Unit Wt/Vol

218 DM 00990 G

b.

c.

d.

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

24 HOUR EMERGENCY PHONE #: 1-800-732-5667

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Mark H...

Signature

Mark H...

Month Day Year

11 12 01

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

John Williams

Signature

John Williams

Month Day Year

10 2 01

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

GENERATOR

TRANSPORTER

FACILITY

AMERICAN WASTE HAULERS, INC.

13300

2100 W. MADISON STREET

P.O. BOX 306

MAYWOOD, IL 60153

708-681-3999

PO # _____

Phone # _____

Acas / Tolbert
Customer's Name

Delivery Address

COD _____

Billing Address

CHARGE _____

Lloyd Curtis
Signature of Customer's Agent

2/6/01
Date Time

EQUIPMENT/LABOR

MATERIAL DELIVERY

TT 112 #
TR. 519 #
DR. LARRY #
GLS. 12001

Driver/Truck # LARRY
TR. 519

Depart Yard _____

Arrive Job 7:30 AM

Depart Job 10:00 AM

If box is checked, weigh load

WEIGHT

Gross _____

Tare _____

Net _____

Arrive Yard _____

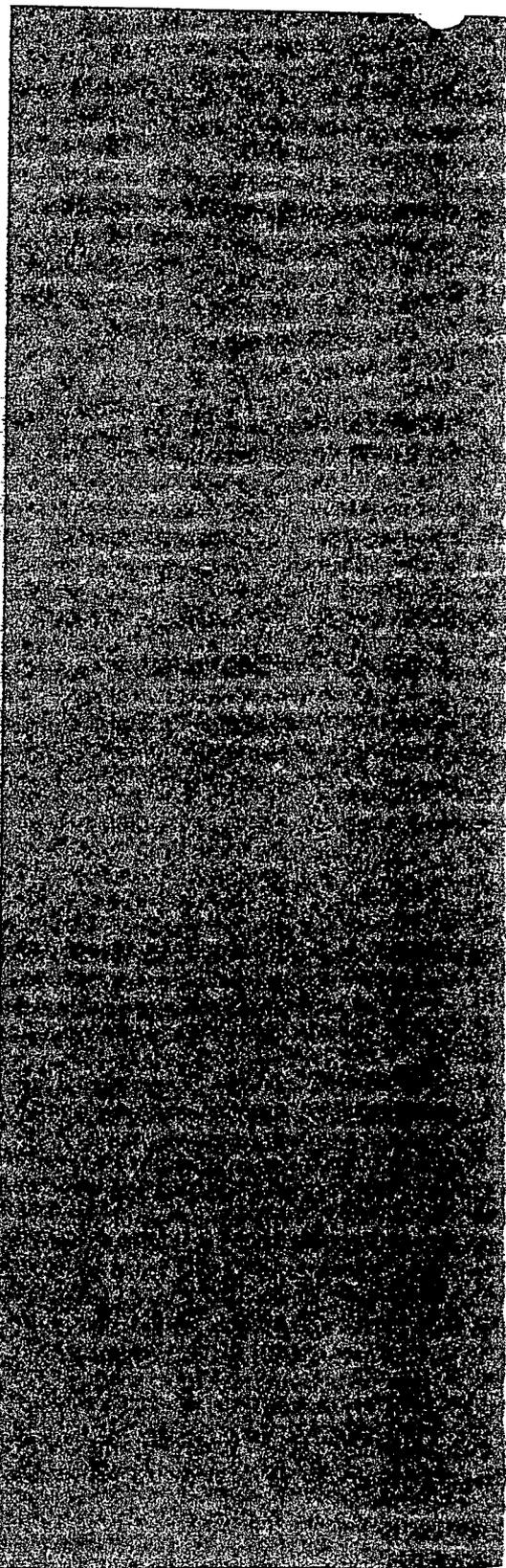
TOTAL HOURS

DELIVER MT BOX # _____

PICK UP FULL BOX # _____

CUSTOMER ASSUMES ALL LIABILITY FOR ANY DAMAGE TO PRIVATE PROPERTY

Office Copy (White) Billing Copy (Yellow) Customer Copy (Pink)



American Waste Haulers, Inc

Invoice

2100 W. Madison Street

P.O. Box 306

Maywood, IL 60153

PH: 708-681-3999 FAX: 708-681-5583

Date	Invoice #
7/25/2001	16206

Bill To Toltes, Inc. Attn: Greg Egan 1915 N. 12th Street Toledo, OH 43624	Ship To Accos Installation
--	--------------------------------------

P.O. Number	Terms	Due Date
	Due upon receipt	7-25/2001

Service	Description	Quantity	U/M	Rate	Amount
7/6/2001	IL EPA Manifest #9627967	1,200	Crals	0.25	300.00
	Transportation	1	Load	350.00	350.00
	Demurrage	1.5	Hrs	80.00	120.00
	1 Hr Demurrage Free Ticket #19361				
	1.5% Fuel Surcharge	1	Lot	11.55	11.55

Thank you for your business

Balance Due 5791.55

AMERICAN WASTE HAULERS, INC.

2100 W. MADISON STREET
P.O. BOX 306
MAYWOOD, IL 60153
708-681-3999

N^o 19213

PO # _____

Phone # _____

ACOS/TOLLEST
Customer's Name

Delivery Address

Billing Address

Signature of Customer's Agent

5/30/01
Date Time

EQUIPMENT/LABOR

Driver/Truck # Long Point
554
Depart Yard
Arrive Job
Depart Job

MATERIAL DELIVERY
LOAD # 1 30 min
LOAD # 2 45 min
Pump
T 1.922 1/4 hr

If box is checked, weigh load
 WEIGHT
Gross _____
Tare _____
Net _____

Arrive Yard
TOTAL HOURS

DELIVER MT BOX # _____
PICK UP FULL BOX # _____

CUSTOMER ASSUMES ALL LIABILITY FOR ANY DAMAGE TO PRIVATE PROPERTY

Office Copy (White) Billing Copy (Yellow) Customer Copy (Pink)

AMERICAN WASTE HAULERS, INC.

2100 W. MADISON STREET
P.O. BOX 306
MAYWOOD, IL 60153
708-681-3999

N^o 19212

PO # _____

Phone # _____

ACOS/Toltest Inc.
Customer's Name

Great Lakes
Delivery Address

Billing Address

Signature of Customer's Agent

5/30/01
Date Time

EQUIPMENT/LABOR

Driver/Truck # Joe Brider
517
Depart Yard
Arrive Job
Depart Job

MATERIAL DELIVERY
Pump Tank
LOAD # 1 45 min
LOAD # 2 N/C
Pump Time 3/4 hr

If box is checked, weigh load
 WEIGHT
Gross _____
Tare _____
Net _____

Arrive Yard
TOTAL HOURS

DELIVER MT BOX # _____
PICK UP FULL BOX # _____

CUSTOMER ASSUMES ALL LIABILITY FOR ANY DAMAGE TO PRIVATE PROPERTY

Office Copy (White) Billing Copy (Yellow) Customer Copy (Pink)

FROM : AMERICAN WASTE INDUSTRIES INC

FAX NO. : 7086815583

Sep. 11 2001 05:16PM P9

APPENDIX E
SYSTEM START-UP TESTING CHECKLISTS / LOGS

North and South Sheds

Precommissioning Checklist

Checklist Item	Initials	Date
Subsurface		
Wells/trenches installed per specification	TAB	9/20/01
Wells purged/cleaned	TAB	9/20/01
Monitoring points installed	TAB	9/20/01
Temperature/pressure gauges installed on wellheads and monitoring points	N/A	
Piping Installation		
Piping complete (including from wells/trenches)	TAB	9/20/01
Piping flushed/cleaned	TAB	9/20/01
Strainers/filters installed/cleaned	N/A	—
Valves installed and operation verified	N/A	—
Insulation/heat tape installed	N/A	—
Thermometers and gauges installed on piping	TAB	9/20/01
Pressure test complete	TAB	9/20/01
Blowers		
Foundations complete	TAB	9/20/01
Vibration dampers installed	N/A	—
Coupling alignment/level to specifications	TAB	9/20/01
Pipe connections installed/tested	TAB	9/20/01
Pumps and seals intact (no leaks)	TAB	9/20/01
Electrical		
Grounding installed/checked	TAB	9/20/01
Lighting/HVAC functional	TAB	9/20/01
Lockouts/covers/panels in place	TAB	9/20/01
Pump rotation verified	TAB	9/20/01
Disconnects in sight of unit being controlled	TAB	9/20/01
Controls/alarms and interlocks functional	TAB	9/20/01
Power connected to monitoring instruments	TAB	9/20/01
Subsystems		
Instruments calibrated	TAB	9/20/01
Air treatment (heat exchangers) installed/functional	TAB	9/20/01

Functional Performance Checklist

Checklist Item	Initials	Date
Subsurface		
No piping/well pneumatic leaks	TAB	9/20/01
Water level rise within specification tolerances		
Monitoring point compositions within expected ranges (if measured)		
Monitoring point pressures and temperatures within expected ranges		
Blowers		
Start/stop from all control mechanisms	TAB	9/20/01
Operating points match blower curve specification for flow rate vs. pressure through start-up	TAB	9/20/01
Current draw and voltage balance match specifications for all phases	TAB	9/20/01
No excessive vibration/noise/temperature rise	TAB	9/20/01
Systems		
Air treatment system (heat exchangers) performance meets specifications	TAB	9/20/01
Control system operates within set parameters	TAB	9/20/01
Monitoring systems/instruments hold calibration	TAB	9/20/01

APPENDIX F

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS



Toltest, Inc.
 1000 Northpointe Blvd.
 Waukegan, IL 60085
 Fax: (847) 689-0698
 Attn: Khush Mander

First Lab Number: 01080630
 Project Name: Bldg 1600A, GLNTC
 Project No.: 37755.02
 Sample Matrix: water

Sampled: 08/23/01
 Received: 08/24/01
 Analyzed: 08/30-09/04/01
 Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-01		
Field ID	MW-1		
Description	na		
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits
BTEX by 8021B	---	---	---
Benzene	< 0.0007	0.0007	0.005
Ethylbenzene	< 0.0014	0.0014	0.7
Methyl tert-butyl ether	< 0.005	0.005	
Toluene	< 0.0016	0.0016	1.0
Xylenes, Total	< 0.005	0.005	10
Polynuclear Aromatics by 8310	---	---	---
Acenaphthene	< 0.000072	0.000072	0.42
Acenaphthylene	< 0.00021	0.00021	
Anthracene	< 0.000031	0.000031	2.1
Benz(a)anthracene	< 0.000031	0.000031	0.00013
Benzo(a)pyrene	< 0.000052	0.000052	0.0002
Benzo(b)fluoranthene	< 0.000083	0.000083	0.00018
Benzo(g,h,i)perylene	< 0.00017	0.00017	
Benzo(k)fluoranthene	< 0.000046	0.000046	0.00017
Chrysene	< 0.000041	0.000041	0.0015
Dibenz(a,h)anthracene	< 0.000041	0.000041	0.0003
Fluoranthene	< 0.0002	0.0002	0.28
Fluorene	< 0.000052	0.000052	0.28
Indeno(1,2,3-cd)pyrene	< 0.00012	0.00012	0.00043
Naphthalene	< 0.0002	0.0002	0.025
Phenanthrene	< 0.000093	0.000093	
Pyrene	< 0.000093	0.000093	0.21

AEA Laboratories, Inc.

Arminta P. Priddy

Arminta P. Priddy
 Director of Laboratory Customer Service



laboratories inc.

Toltest, Inc.
1000 Northpointe Blvd.
Waukegan, IL 60085
Fax: (847) 689-0698
Attn: Khush Mander

First Lab Number: 01080630
Project Name: Bldg 1600A, GLNTC
Project No.: 37755.02
Sample Matrix: water

Sampled: 08/23/01
Received: 08/24/01
Analyzed: 08/30-09/04/01
Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-02			
Field ID	MW-2			
Description	na			
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits	
BTEX by 8021B	---	---	---	---
Benzene	1.41	0.0007	0.005	
Ethylbenzene	0.375	0.0014	0.7	
Methyl tert-butyl ether	< 0.005	0.005		
Toluene	2.38	0.0016	1.0	
Xylenes, Total	1.7	0.005	10	
Polynuclear Aromatics by 8310	---	---	---	---
Acenaphthene			0.42	
Acenaphthylene	0.0017	0.000057		
Anthracene	0.024	0.00016	2.1	
Benz(a)anthracene	< 0.000025	0.000025	0.00013	
Benzo(a)pyrene	< 0.000025	0.000025	0.0002	
Benzo(b)fluoranthene	< 0.000041	0.000041	0.00018	
Benzo(g,h,i)perylene	< 0.000065	0.000065		
Benzo(k)fluoranthene	< 0.00013	0.00013	0.00017	
Chrysene	< 0.000037	0.000037	0.0015	
Dibenz(a,h)anthracene	< 0.000033	0.000033	0.0003	
Fluoranthene	< 0.000033	0.000033	0.28	
Fluorene	< 0.00016	0.00016	0.28	
Indeno(1,2,3-cd)pyrene	< 0.000041	0.000041	0.00043	
Naphthalene	< 0.000098	0.000098	0.025	
Phenanthrene	0.038	0.0078		
Pyrene	< 0.000074	0.000074	0.21	
	< 0.000074	0.000074		

AEA Laboratories, Inc.

Arminta P. Priddy
Arminta P. Priddy
Director of Laboratory Customer Service



laboratories inc.

Toltest, Inc.
1000 Northpointe Blvd.
Waukegan, IL 60085
Fax: (847) 689-0698
Attn: Khush Mander

First Lab Number: 01080630
Project Name: Bldg 1600A, GLNTC
Project No.: 37755.02
Sample Matrix: water

Sampled: 08/23/01
Received: 08/24/01
Analyzed: 08/30-09/04/01
Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-03		
Field ID	MW-3		
Description	na		
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits
BTEX by 8021B	---	---	---
Benzene	0.0016	0.0007	0.005
Ethylbenzene	0.0019	0.0014	0.7
Methyl tert-butyl ether	0.0324	0.005	
Toluene	0.0067	0.0016	1.0
Xylenes, Total	0.0088	0.005	1.0
Polynuclear Aromatics by 8310	---	---	---
Acenaphthene	< 0.000076	0.000076	0.42
Acenaphthylene	< 0.00022	0.00022	
Anthracene	< 0.000033	0.000033	2.1
Benz(a)anthracene	< 0.000033	0.000033	0.00013
Benzo(a)pyrene	< 0.000054	0.000054	0.0002
Benzo(b)fluoranthene	< 0.000087	0.000087	0.00018
Benzo(g,h,i)perylene	< 0.00017	0.00017	
Benzo(k)fluoranthene	< 0.000049	0.000049	0.00017
Chrysene	< 0.000044	0.000044	0.0015
Dibenz(a,h)anthracene	< 0.000044	0.000044	0.0003
Fluoranthene	< 0.00021	0.00021	0.28
Fluorene	< 0.000054	0.000054	0.28
Indeno(1,2,3-cd)pyrene	< 0.00013	0.00013	0.00043
Naphthalene	< 0.00021	0.00021	0.025
Phenanthrene	< 0.000098	0.000098	
Pyrene	< 0.000098	0.000098	0.21

AEA Laboratories, Inc.

Arminta P. Priddy

Arminta P. Priddy
Director of Laboratory Customer Service



laboratories inc

Toltest, Inc.
1000 Northpointe Blvd.
Waukegan, IL 60085
Fax: (847) 689-0698
Attn: Khush Mander

First Lab Number: 01080630
Project Name: Bldg 1600A, GLNTC
Project No.: 37755.02
Sample Matrix: water

Sampled: 08/23/01
Received: 08/24/01
Analyzed: 08/30-09/04/01
Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-04		
Field ID	MW-4		
Description	na		
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits
BTEX by 8021B	---	---	---
Benzene	0.156	0.0007	0.005
Ethylbenzene	0.648	0.0014	0.7
Methyl tert-butyl ether	< 0.005	0.005	
Toluene	0.122	0.0016	1.0
Xylenes, Total	1.03	0.005	10
Polynuclear Aromatics by 8310	---	---	---
Acenaphthene	0.00033	0.000077	0.42
Acenaphthylene	< 0.00022	0.00022	
Anthracene	< 0.000033	0.000033	2.1
Benz(a)anthracene	< 0.000033	0.000033	0.00013
Benzo(a)pyrene	< 0.000055	0.000055	0.0002
Benzo(b)fluoranthene	< 0.000088	0.000088	0.00018
Benzo(g,h,i)perylene	< 0.00018	0.00018	
Benzo(k)fluoranthene	< 0.00005	0.00005	0.00017
Chrysene	< 0.000044	0.000044	0.0015
Dibenz(a,h)anthracene	< 0.000044	0.000044	0.0003
Fluoranthene	< 0.00021	0.00021	0.28
Fluorene	0.00049	0.000055	0.28
Indeno(1,2,3-cd)pyrene	< 0.00013	0.00013	0.00043
Naphthalene	0.04	0.00021	0.025
Phenanthrene	< 0.000099	0.000099	
Pyrene	< 0.000099	0.000099	0.21

AEA Laboratories, Inc.

Arminta P. Priddy
Arminta P. Priddy
Director of Laboratory Customer Service



laboratories inc.

Toltest, Inc.
1000 Northpointe Blvd.
Waukegan, IL 60085
Fax: (847) 689-0698
Attn: Khush Mander

First Lab Number: 01080630
Project Name: Bldg 1600A, GLNTC
Project No.: 37755.02
Sample Matrix: water

Sampled: 08/23/01
Received: 08/24/01
Analyzed: 08/30-09/04/01
Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-05		
Field ID	MW-5		
Description	na		
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits
BTEX by 8021B	---	---	---
Benzene	0.0117	0.0007	0.005
Ethylbenzene	0.102	0.0014	0.7
Methyl tert-butyl ether	< 0.005	0.005	
Toluene	0.036	0.0016	1.0
Xylenes, Total	0.273	0.005	10
Polynuclear Aromatics by 8310	---	---	---
Acenaphthene	0.0002	0.000072	0.42
Acenaphthylene	< 0.0003	0.0003	
Anthracene	< 0.000031	0.000031	2.1
Benz(a)anthracene	< 0.000031	0.000031	0.00013
Benzo(a)pyrene	< 0.000051	0.000051	0.0002
Benzo(b)fluoranthene	< 0.000082	0.000082	0.00018
Benzo(g,h,i)perylene	< 0.00016	0.00016	
Benzo(k)fluoranthene	< 0.000046	0.000046	0.00017
Chrysene	< 0.000041	0.000041	0.0015
Dibenz(a,h)anthracene	< 0.000041	0.000041	0.0003
Fluoranthene	< 0.00019	0.00019	0.28
Fluorene	0.00031	0.000051	0.28
Indeno(1,2,3-cd)pyrene	< 0.00012	0.00012	0.00043
Naphthalene	0.00027	0.00019	0.025
Phenanthrene	0.00013	0.000092	
Pyrene	< 0.000092	0.000092	0.21

AEA Laboratories, Inc.

Arminta P. Priddy

Arminta P. Priddy
Director of Laboratory Customer Service



laboratories inc.

Toltest, Inc.
1000 Northpointe Blvd.
Waukegan, IL 60085
Fax: (847) 689-0698
Attn: Khush Mander

First Lab Number: 01080630
Project Name: Bldg 1600A, GLNTC
Project No.: 37755.02
Sample Matrix: water

Sampled: 08/23/01
Received: 08/24/01
Analyzed: 08/30-09/04/01
Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-06		
Field ID	MW-6		
Description	na		
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits
BTEX by 8021B	---	---	---
Benzene	< 0.0007	0.0007	0.005
Ethylbenzene	< 0.0014	0.0014	0.7
Methyl tert-butyl ether	< 0.005	0.005	
Toluene	0.0017	0.0016	1.0
Xylenes, Total	< 0.005	0.005	10
Polynuclear Aromatics by 8310	---	---	---
Acenaphthene	< 0.000071	0.000071	0.42
Acenaphthylene	< 0.0002	0.0002	
Anthracene	< 0.00003	0.00003	2.1
Benz(a)anthracene	< 0.00003	0.00003	0.00013
Benzo(a)pyrene	< 0.000051	0.000051	0.0002
Benzo(b)fluoranthene	< 0.000081	0.000081	0.00018
Benzo(g,h,i)perylene	< 0.00016	0.00016	
Benzo(k)fluoranthene	< 0.000046	0.000046	0.00017
Chrysene	< 0.000041	0.000041	0.0015
Dibenz(a,h)anthracene	< 0.000041	0.000041	0.0003
Fluoranthene	< 0.00019	0.00019	0.28
Fluorene	< 0.000051	0.000051	0.28
Indeno(1,2,3-cd)pyrene	< 0.00012	0.00012	0.00043
Naphthalene	0.00036	0.00019	0.025
Phenanthrene	0.00012	0.000091	
Pyrene	< 0.000091	0.000091	0.21

AEA Laboratories, Inc

Arminta P. Priddy

Arminta P. Priddy
Director of Laboratory Customer Service



laboratories inc.

Toltest, Inc.
1000 Northpointe Blvd.
Waukegan, IL 60085
Fax: (847) 689-0698
Attn: Khush Mander

First Lab Number: 01080630
Project Name: Bldg 1600A, GLNTC
Project No.: 37755.02
Sample Matrix: water

Sampled: 08/23/01
Received: 08/24/01
Analyzed: 08/30-09/04/01
Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-07		
Field ID	MW-7		
Description	na		
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits
BTEX by 8021B	---	---	---
Benzene	< 0.0007	0.0007	0.005
Ethylbenzene	< 0.0014	0.0014	0.7
Methyl tert-butyl ether	< 0.005	0.005	
Toluene	< 0.0016	0.0016	1.0
Xylenes, Total	< 0.005	0.005	1.0
Polynuclear Aromatics by 8310	---	---	---
Acenaphthene	< 0.000075	0.000075	0.42
Acenaphthylene	< 0.00021	0.00021	
Anthracene	< 0.000032	0.000032	2.1
Benz(a)anthracene	< 0.000032	0.000032	0.00013
Benzo(a)pyrene	< 0.000053	0.000053	0.0002
Benzo(b)fluoranthene	< 0.000086	0.000086	0.00018
Benzo(g,h,i)perylene	< 0.00017	0.00017	
Benzo(k)fluoranthene	< 0.000048	0.000048	0.00017
Chrysene	< 0.000043	0.000043	0.0015
Dibenz(a,h)anthracene	< 0.000043	0.000043	0.0003
Fluoranthene	< 0.0002	0.0002	0.28
Fluorene	< 0.000053	0.000053	0.28
Indeno(1,2,3-cd)pyrene	< 0.00013	0.00013	0.00043
Naphthalene	< 0.0002	0.0002	0.025
Phenanthrene	0.00011	0.000096	
Pyrene	< 0.000096	0.000096	0.21

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Fax: (847) 689-0698
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First Lab Number: 01080630
Project Name: Bldg 1600A, GLNTC
Project No.: 37755.02
Sample Matrix: water

Sampled: 08/23/01
Received: 08/24/01
Analyzed: 08/30-09/04/01
Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-08		
Field ID	MW-8		
Description	na		
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits
BTEX by 8021B	---	---	---
Benzene	0 109	0.0007	0.005
Ethylbenzene	< 0 0014	0.0014	0 7
Methyl tert-butyl ether	< 0.005	0.005	
Toluene	< 0.0016	0.0016	1.0
Xylenes, Total	< 0.005	0.005	10
Polynuclear Aromatics by 8310	---	---	---
Acenaphthene	< 0.000073	0 000073	0.42
Acenaphthylene	< 0 00021	0.00021	
Anthracene	< 0.000031	0.000031	2 1
Benzo(a)anthracene	< 0.000031	0 000031	0.00013
Benzo(a)pyrene	< 0 000052	0.000052	0.0002
Benzo(b)fluoranthene	< 0.000083	0.000083	0.00018
Benzo(g,h,i)perylene	< 0.00017	0.00017	
Benzo(k)fluoranthene	< 0.000047	0.000047	0.00017
Chrysene	< 0.000042	0 000042	0 0015
Dibenz(a,h)anthracene	< 0 000042	0.000042	0.0003
Fluoranthene	< 0 0002	0.0002	0.28
Fluorene	< 0 000052	0.000052	0 28
Indeno(1,2,3-cd)pyrene	< 0.00012	0 00012	0.00043
Naphthalene	< 0 0002	0.0002	0.025
Phenanthrene	< 0 000094	0.000094	
Pyrene	< 0.000094	0 000094	0.21

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1000 Northpointe Blvd.
Waukegan, IL 60085
Fax: (847) 689-0698
Attn: Khush Mander

First Lab Number: 01080630
Project Name: Bldg 1600A, GLNTC
Project No.: 37755.02
Sample Matrix: water

Sampled: 08/23/01
Received: 08/24/01
Analyzed: 08/30-09/04/01
Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-09		
Field ID	MW-9		
Description	na		
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits
Total Lead by 7421	NA		0.0075
SPLP Lead by 7421	0.018	0.013	0.0075
BTEX by 8021B	---	---	---
Benzene	< 0.0007	0.0007	0.005
Ethylbenzene	< 0.0014	0.0014	0.7
Methyl tert-butyl ether	< 0.005	0.005	
Toluene	< 0.0016	0.0016	1.0
Xylenes, Total	< 0.005	0.005	10
Polynuclear Aromatics by 8310	---	---	---
Acenaphthene	< 0.000099	0.000099	0.42
Acenaphthylene	< 0.00028	0.00028	
Anthracene	< 0.000042	0.000042	2.1
Benz(a)anthracene	< 0.000042	0.000042	0.00013
Benzo(a)pyrene	< 0.000071	0.000071	0.0002
Benzo(b)fluoranthene	< 0.00011	0.00011	0.00018
Benzo(g,h,i)perylene	< 0.00023	0.00023	
Benzo(k)fluoranthene	< 0.000063	0.000063	0.00017
Chrysene	< 0.000056	0.000056	0.0015
Dibenz(a,h)anthracene	< 0.000056	0.000056	0.0003
Fluoranthene	< 0.00027	0.00027	0.28
Fluorene	< 0.000071	0.000071	0.28
Indeno(1,2,3-cd)pyrene	< 0.00017	0.00017	0.00043
Naphthalene	< 0.00027	0.00027	0.025
Phenanthrene	< 0.00013	0.00013	
Pyrene	< 0.00013	0.00013	0.21

SPLP Lead showed that the solids present were less than 0.5%, therefore the SPLP Lead results and the Total Lead are the same.

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Waukegan, IL 60085
Fax: (847) 689-0698
Attn: Khush Mander

First Lab Number: 01080630
Project Name: Bldg 1600A, GLNTC
Project No.: 37755.02
Sample Matrix: water

Sampled: 08/23/01
Received: 08/24/01
Analyzed: 08/30-09/04/01
Reported: 09/05/01

ANALYTICAL REPORT

Lab Number	01080630-10			
Field ID	MW-10			
Description	na			
Compound	Result mg/L	Reporting Limit mg/L	Regulatory Limits	
BTEX by 8021B	---	---	---	---
Benzene	< 0.0007	0.0007	0.005	
Ethylbenzene	< 0.0014	0.0014	0.7	
Methyl tert-butyl ether	< 0.005	0.005		
Toluene	< 0.0016	0.0016	1.0	
Xylenes, Total	< 0.005	0.005	10	
Polynuclear Aromatics by 8310	---	---	---	---
Acenaphthene	< 0.000071	0.000071	0.42	
Acenaphthylene	< 0.0002	0.0002		
Anthracene	< 0.00003	0.00003	2.1	
Benz(a)anthracene	< 0.00003	0.00003	0.00013	
Benzo(a)pyrene	< 0.000051	0.000051	0.0002	
Benzo(b)fluoranthene	< 0.000081	0.000081	0.00018	
Benzo(g,h,i)perylene	< 0.00016	0.00016		
Benzo(k)fluoranthene	< 0.000045	0.000045	0.00017	
Chrysene	< 0.00004	0.00004	0.0015	
Dibenz(a,h)anthracene	< 0.00004	0.00004	0.0003	
Fluoranthene	< 0.00019	0.00019	0.28	
Fluorene	< 0.000051	0.000051	0.28	
Indeno(1,2,3-cd)pyrene	< 0.00012	0.00012	0.00043	
Naphthalene	< 0.00019	0.00019	0.025	
Phenanthrene	< 0.000091	0.000091		
Pyrene	< 0.000091	0.000091	0.21	

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1915 N. 12th St., P.O. Box 2186, Toledo, OH 43603-2186; Voice (419) 241-7175, Fax (419) 321-6259.
 Ship To Address: ATTN: RECEIVING LAB; 1810 N 12th St., Toledo, OH 43624-1304; Voice (419) 241-7175, Fax (419) 241-1808
 Sent From: Corporate Plymouth Pittsburgh Other Great Lakes

Chain of Custody Record

31080 Page 1 of 1

Project No.: 37755.02		Client: NTC - Environmental TOTest, Inc. 1000 Northpoint Blvd, Waukegan, IL 60085		Parameters							
P.O. No.		Project/Location: NTC - Environmental, Bldg 1600A, GLNTR, IL		Total No. of Containers							
Project Mgr: Khush Mander		Sampler's Name: Timothy A. Boos		BTEX/MIBE 5035							
Phone No.: 847 689-0697		Sampler's Signature: <i>Timothy A. Boos</i>		PNA 8100							
Item No.	Sample ID	Date Sampled	Time Sampled	Type	Matrix	Sample Location				Preserved Yes/No	LAB USE ONLY
1	MW-1	8/23/01	8:36	G	Liq.	Bldg 1600A, Great Lakes, IL	3	X	X		01A-B
2	MW-2		8:40				3	X	X		02AB
3	MW-3		8:40				3	X	X		03AB
4	MW-4		9:36				3	X	X		04AB
5	MW-5		10:15				3	X	X		05AB
6	MW-6		10:20				3	X	X		06AB
7	MW-7		9:30				3	X	X		07AB
8	MW-8		9:23				3	X	X		08AB
9	MW-9		8:15				5	X	X	X	09ABC
10	MW-10		8:30				3	X	X		10AB
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time	LAB USE ONLY						
1/10	<i>Timothy A. Boos</i>	8/23/01 12:00	<i>J. Davis</i>	8-24-01 5:14	Were samples delivered <input type="checkbox"/> in person <input type="checkbox"/> by courier Were samples preserved <input type="checkbox"/> in field <input type="checkbox"/> in lab <input type="checkbox"/> N/A Temp of samples _____ °C Did samples arrive intact and sealed? <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> N/A Were proper containers used? <input type="checkbox"/> yes <input type="checkbox"/> no Was container labeled properly for contents? <input type="checkbox"/> yes <input type="checkbox"/> no Were samples packaged properly for type of material? <input type="checkbox"/> yes <input type="checkbox"/> no Was shipping label completed properly per regulations? (49 CFR 170, etc.) <input type="checkbox"/> yes <input type="checkbox"/> no Comments: TAT						
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time							
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time							
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time							

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