IND. PETROCHEMICALS 86317

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December 30, 1992

Department of Environmental Protection
And Energy Industrial Site Evaluation Element
401 E. State Street
Trenton, New Jersey 08625

Attn: William Patterson

Re: Industrial Petrochemicals, Inc.
ECRA Case No.: 86317
Newark, Essex County, New Jersey

Dear Mr. Patterson:

In accordance with N.J.A.C. 7:26B-5.3, please find enclosed a proposed Cleanup Plan for the above-referenced ECRA facility. This proposed Cleanup Plan is being submitted to you in accordance with our previously agreed-upon schedule.

In this plan, our consultant has proposed a soil and groundwater cleanup to be performed in a phased approach using a combination of available technologies. Because those technologies, which we believe offer the only practical avenues toward remediation of this site, must be tailored to the individual site and to the condition found therein, it is necessary to install, fine-tune and evaluate the effectiveness of the system. We propose that this first phase evaluation take place before the issue of cleanup standards to be applied to the site is decided. Only with the available information as to effectiveness of these remedies can a truly reasoned decision be made as to what remediation may be practicably achieved. We therefore suggest that a meeting be held between representatives of the DEPE and all interested parties to discuss specific cleanup standards following the completion of Phase I activities.

You will note that the proposed Cleanup Plan is unsigned and does not contain the required filing fee. These deficiencies are necessitated by the late date at which this Plan was prepared and the unavailability of the principals involved. Messrs. Herzberg and Masci will execute a certification page and return same to you following the new year. As you are aware, Mr. Borda has suffered a stroke and is unable to complete his certification. We will discuss with his court-appointed guardian ad litem, Jay R. Benenson, Esq., the execution of that certification but we must advise you that Mr. Benenson does not have any personal knowledge of site activities or conditions and Mr. Borda's counsel has asked us to reserve his right to discuss with you an appropriate certification. Likewise, the only authorized signatory to the trust account from which the filing fee will come is unavailable until after the new year. We will submit that filing fee which we calculate to be $5,000 pursuant to N.J.A.C. 7:26B-1.11 upon his return.

We look forward to hearing form you with regard to your review of this Plan.

Very truly yours,

POSS & ROTELLA, ESQS.

BY:________________________
GERALD POSS, ESQ.

GP:cat
Enclosures

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1.0 STATEMENT OF COMPLIANCE

Dames & Moore, on behalf of Industrial Petrochemicals, Inc., located at 128 Doremus Avenue, Newark, New Jersey, has prepared this Remedial Action Work Plan.

The Work Plan has been prepared in accordance with the requirements of and in compliance with the following proposed rules of the NEW JERSEY ADMINISTRATIVE CODE:

• NJAC 7:26B	Environmental Cleanup Responsibility Act Rules
• NJAC 7:26C	Procedures for Department Oversight of the Remediation of Construction Sites
• NJAC 7:26D	Cleanup Standards of Contaminated Sites; and
• NJAC 7:26E	Technical Requirements for Site Remediation

Attached are the Certifications prepared by the Signatories of those responsible for remedial implementation, as executed by their designated corporate representatives.

INDUSTRIAL PETROCHEMICALS INC.
128 DOREMUS AVENUE
NEWARK, NEW JERSEY
ECRA CASE NO. 86317

CERTIFICATION AND SIGNATORIES

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

	SIGNATURE	**DATE**
Henry P. Borda by Jay R. Benenson, Esq.- Guardian Ad Litem Benenson & Scher 159 Millburn Avenue Millburn, New Jersey 07041		
Industrial Petrochemicals, Inc. Denny J. Hertzberg - President		
MASCI Doremus Enterprizes Giousue Masci, President		

INDUSTRIAL PETROCHEMICALS INC.
128 DOREMUS AVENUE
NEWARK, NEW JERSEY
ECRA CASE NO. 86317

CERTIFICATION AND SIGNATORIES

"I certify under penalty of law that the information provided in this document is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Preparer: Dames & Moore, Inc.

Authorized Representative: David Henderson

Title: Manager, Eastern Division
Construction and Remediation

Date: 12/29/92

2.0 BACKGROUND

2.1 GENERAL

Industrial Petrochemicals, Inc. (IPC) is located at 128 Doremus Avenue, Newark City, Essex County, New Jersey, just off Exit 15E of the New Jersey Turnpike in a heavily industrialized surrounding. Immediately to the north and south of the IPC Site are tank farms operated by Getty and Hess Oil Company, respectively. The site is also bounded by the Passaic River on the east and Doremus Avenue on the west (Figures 1 and 2).

2.2 HISTORY

The site was originally owned by American Oil Company and was operated as a tank farm. The date of the property's first use is not known, however, a Riparian Lease was granted to American Oil Company in 1946.

Mr. Henry P. Borda purchased the property and operated IPC until 1983, when he sold the business to Vitusa Corporation of Englewood Cliffs, New Jersey. Vitusa is the parent corporation of IPC. Henry P. Borda retained ownership of the property (Figures 2 and 3).

A summary of ECRA project history is presented below.

PROJECT HISTORY

DATE	ACTIVITY
January 1985	First round of soil sampling.
May 6, 1986	General Information Submission.
June 6, 1986	Site Evaluation Submission; Storch Engineer's Sampling Plan.
August 22, 1986	NJDEPE Review of GIS and SES; completed.
March 28, 1989	Recon System's Sampling Plan; submission to NJDEPE.
May 10, 1989	Recon System's Addendum to Sampling Plan submission to NJDEPE.
October 5, 1989	Recon System's results of Implementation of Revised Sampling Plan Addendum Report submission to NJDEPE.
March 1990	Recon System's Report on Contaminants Found On-Site vs. Site History and Operation.
May 1990	Recon Systems replaced by EcolSciences on the job.
June 1990	Revised Sampling Plan submitted by EcolSciences for NJDEPE review.
January 1991	Addendum to Revised Sampling Plan submitted by EcolSciences for NJDEPE review.
Feb. 11, 1991	NJDEPE Approval of EcolSciences Sampling Plan.
Sept. 30, 1991	EcolSciences submitted "Implementation of Sampling Plan" Report to NJDEPE.
October 7, 1991	Negative Declaration Affidavit submitted to NJDEPE.
March 23, 1992	NJDEPE rejected Proposal for No Further Action and Negative Declaration.
March 30, 1992	Letter to NJDEPE from Henry Borda's attorney pointing out NJDEPE's delay in responding to the Negative Declaration Application.
July 9, 1992	NJDEPE letter to EcolSciences requesting submission of a Cleanup Plan for the site by July 31, 1992.
July 15, 1992	EcolSciences letter to IPC requesting permission to contact prospective contractors to perform pilot studies on-site.
July 23, 1992	EcolSciences RFP to AA Pollution Control Inc.
Sept. 1, 1992	NJDEPE letter to IPC asking IPC to submit an Investigative and/or Corrective Action Initiation Program (original due date August 22, 1992).
July 31, 1992	Another round of groundwater sampling completed by EcolSciences.
Sept. 10, 1992	EcolSciences letter to NJDEPE requesting an extension to October 30, 1992, for submission of Cleanup Plan.
Oct. 27, 1992	Letter to NJDEPE confirming a telecon with the Case Manager to extend the Cleanup Plan submittal deadline to December 31, 1992.

2.3 SUBSURFACE CONDITIONS

2.3.1 Soils

The results of previous investigations at the IPC Site (Recon 1989 and EcolSciences 1991 reports) indicate that overburden materials at shallow depths generally consist of fill materials and recent alluvial and flood plain deposits. Generalized geologic cross-sections (A-A' and B-B') that were developed based on soil boring logs from previous investigations are presented in Figures 4 and 5. The soil boring logs are presented in Appendix A. The plan locations of these cross-sections are shown in Figure 3.

The fill layer throughout the majority of the site is currently covered by an 8 to 12-inch thick concrete slab that is underlain by about 8 inches of crushed stone. The tank farm area appears to be covered by about 6 to 8 inches of either an asphalt/aggregate pavement or crushed stone. The fill stratum was reported to vary in thickness from 2 to 8 feet. The thickness variation of the fill layer is likely to be associated with past site cut and fill activities. Generally, the fill is composed of various amounts of brown and gray sands and silt with miscellaneous debris materials such as bricks, concrete, coke and asphalt fragments and ash. Both oil stained soils and hydrocarbon odors were reportedly noted in this layer during previous subsurface investigations.

Underlying the fill layer, a layer of black and gray coarse to fine sand/silty sand and silt was observed with a thickness ranging between 1 and 6 feet. Beneath the sandy layer, a stratum of black-brown peat and organic silt and clay was encountered. This stratum was encountered at depths ranging from 5 to 10 feet below ground surface. The exact thickness of the organic layer could not be estimated, insofar as this stratum was not fully penetrated during previous subsurface investigations, although this layer is known to be at least 8 feet thick. This relatively impervious stratum appears to extend laterally throughout the site and is also reported to extend regionally.

2.3.2 Groundwater

Previous subsurface investigations were limited to a maximum depth of 12 feet below grade. Groundwater was generally, but not always, encountered within the fill and the sandy alluvial deposits, yielding a saturated thickness that varied between 0.5 and 5 feet. The depth to groundwater was reported to vary from 2 to 4 feet below grade. This groundwater is believed to be under perched water table conditions that are associated with localized surface water infiltration, since water was observed to be missing in these strata at several boring locations. Thus, this perched water is not likely to be associated with a regional lateral groundwater flow system.

Groundwater elevation contour maps were developed during previous investigations based on water level measurements in on-site wells and piezometers. These contour maps are presented in Appendix B. Generally, the contour maps indicate that this perched water unit flows laterally above the organic silt/clay in a northerly/northeasterly direction. Additionally, it appears that groundwater flows locally in an easterly direction towards the Passaic River. The average hydraulic gradient of the lateral groundwater flow was estimated to be 0.012 ft/ft. Observations reported during previous investigations indicate that wells installed in this formation were not capable of yielding appreciable quantities of water.

The groundwater contour maps also indicate the presence of a localized groundwater mound and depression which are likely to be associated with surface and subsurface features. Such features include variations in surface topography, imperviousness of surface cover (i.e., concrete, asphalt or crushed stone), variations of the fines content and perviousness of subsurface materials (i.e., fill) and variations in the depth to the organic clay unit. This organic, silty clay unit is believed to act as a relatively impermeable barrier (with a thickness of more than 8 feet) retarding downward groundwater flow and migration of constituents from the upper fill and sand layers into the underlying strata.

Temporal water level measurements performed during previous investigations (Appendix B) indicate that water level fluctuations associated with the tidal influence of the Passaic River were noted primarily in the northeastern corner of the site. These fluctuations were noted at PZ-3, which had a tidal response of about ±0.5 foot, and MW-3 and MW-8, which had a tidal response of about ±1 foot.

2.3.3 Free-Phase Product

Total petroleum hydrocarbons were detected in groundwater samples MW-1 and MW-2 at 2.9 and 3.1 mg/l, respectively. Floating product was detected in MW-3 which exhibited a TPHC concentration of 6,190 mg/l.

2.4 SUMMARY OF HISTORICAL ANALYTICAL DATA

2.4.1 General

An assessment of the available historical data was undertaken to evaluate the potential contaminants of concern across the site, as well as to assess the potential for "hot spots" on site.

A preliminary quality assurance review was performed by Dames & Moore on all previous laboratory data received for review. Data were examined to assess the usability of the data as well as compliance relative to the NJDEPE ECRA requirements for data deliverables. Our Preliminary Quality Assurance Review Report discussing the validation of the 1989 and 1991 analytical data is presented in Appendix C.

Numerous transcriptional errors were noted between the raw laboratory data and the historical summary tables reported by the previous consultants. It should be noted that to avoid such errors, the tables constructed for our review were developed directly from the laboratory reports and not from other sources.

2.4.2 1985 Investigation

Based on the historical information we reviewed, previous investigations were conducted on-site as early as 1985. Four soil samples were collected in January 1985 and analyzed for volatile organic compounds and polychlorinated biphenyls (PCBs). Limited information was available regarding these samples. The analytical results from the January 1985 soil sampling are summarized on Table 1. Only those parameters which were detected at or above the method detection limit in one or more samples are presented.

2.4.3 1989 Investigation

As part of ECRA Case No. 86317, an initial Sampling Plan dated March, 1989 and a Sampling Plan Addendum dated May, 1989 were submitted to NJDEPE by Recon Systems, Inc. (Recon) of Three Bridges, New Jersey. In May and June of 1989, Recon implemented the Revised Sampling and Analysis Plan that included the collection of 19 soil samples from 18 soil borings and 3 groundwater samples from 3 overburden wells.

All soil samples obtained from the soil boring locations were analyzed for total petroleum hydrocarbons and volatile organic compounds plus library searches. Additionally, seven (7) of the soil samples collected were also analyzed for base/neutral extractable organic compounds plus library searches. The analytical results associated with the 1989 soil sampling program are summarized on Table 2 and shown in detail on Figure 6. Only those parameters which were detected at or above the method detection limit in one or more samples are presented in Table 2.

All groundwater samples collected by Recon were analyzed for pH, total petroleum hydrocarbons (TPHC) and priority pollutants plus 40 (volatile and semi-volatile organic compounds plus library searches, pesticides/PCBs, metals, total cyanide and total phenol). The analytical results from the 1989 groundwater sampling event are summarized on Table 3 and shown in detail on Figure 7. Only those parameters which were detected at or above the method detection limit in one or more samples are presented.

2.4.4 1991 Investigation

EcolSciences, Inc. (EcolSciences) of Rockaway, New Jersey, was retained in May, 1990 to conduct supplemental remedial investigations at the site. EcolSciences submitted a second Sampling Plan dated June, 1990 and a Sampling Plan Addendum dated January, 1991. The plan was implemented in July through September, 1991 and included the collection of nine (9) soil boring samples, the installation of five (5) groundwater monitoring wells and five (5) piezometers, and the collection of groundwater samples. The analytical results from the 1991 soil sampling program are summarized on Table 4 and shown in detail on Figure 6. Only those parameters which were detected at or above the method detection limit in one or more samples are presented.

All soil samples (EB Series) obtained from the soil borings were analyzed for total petroleum hydrocarbons, volatile and semi-volatile organic compounds plus library searches and metals.

Eight groundwater samples were also collected by EcolSciences. The analytical results associated with the 1991 groundwater sampling events are summarized on Table 5 and shown on Figure 7. Only those parameters which were detected at or above the method detection limit in one or more samples are presented.

2.4.5 1991 Tank Removal Program

A Tank Removal Program was undertaken by EcolSciences in April, 1991. The tank removal activities included a 500-gallon above-ground fuel oil No. 2 storage tank, a 1,000-gallon underground fuel oil storage tank, a 2,000-gallon gasoline tank which was abandoned in place and a 6,000-gallon diesel tank. Post-excavation soil sampling (T-Series), following Bureau of Underground Storage Tank (BUST) guidelines was conducted for the 1,000-gallon and 6,000-gallon tanks. Only two soil samples were collected at the 2,000-gallon tank due to the tank's location.

Seven soil samples were analyzed for total petroleum hydrocarbons. Four samples were also analyzed for semi-volatile base/neutral extractable organic compounds plus library searches. Two samples associated with the underground gasoline storage tank were also analyzed for volatile organic compounds and lead.

The analytical results associated with the tank removal sampling program are summarized on Table 4 and shown in detail on Figure 6. Only those parameters which were detected at or above the method detection limit in one or more samples are presented.

3.0 SOIL AND SEDIMENT CONTROL PLAN

A phased approach has been adopted in this Remedial Action Plan, whereby any soil excavation activities, if required, will disturb less than the minimum area requirement of 5,000 square feet provided by the Soil Conservation Service Soil Erosion and Sediment Control Regulations. Therefore, a Soil and Sediment Control Plan will not be required.

None of the proposed remedial activities are anticipated to produce significant amounts of dust which would require dust control measures. During the on-site remedial activities, which include vacuum extraction, the collected soil vapors will be treated through a trailer-mounted vacuum extraction system which will include vapor-phase granular activated carbon (VP-GAC) treatment units. It is anticipated that all vapor emissions will be effectively captured by the VP-GAC units, such that there will be no odor emissions from the site remediation activities.

4.0 PLANNED CONSTRUCTION ACTIVITIES

4.1 PROPOSED REMEDIAL APPROACH

Dames & Moore reviewed and evaluated several approaches for remediation at the IPC Site. These approaches included:

- Hot-Spot Excavation and Disposal
- Site Dewatering for a Complete Vacuum Extraction Remedy
- Groundwater Recovery, Treatment & Disposal
- Vacuum Extraction
- Sparging
- Bioremediation

Given that the IPC Site is an active facility, the potential hazards (fire and explosion hazards) associated with site operations and the land-ban restrictions potentially applicable to the excavated soils, rendered excavation and disposal to be infeasible.

Site dewatering and groundwater recovery and treatment have two significant drawbacks: (1) off-site contaminants could be encouraged to migrate on-site as a result of depressing the groundwater table; and (2) the Passaic River would act as a natural groundwater recharge reservoir. Moreover, groundwater recovery and treatment systems typically require prolonged periods of operation to recover the contaminants present on-site and to satisfy the regulatory requirements for a treated groundwater discharge permit approval.

Based on the review of available site information and the evaluation of potentially applicable remedial options, it appears that the most practicable approach to meet the remedial objectives of the IPC site would involve the use of a combination of vacuum extraction, sparging and bioventing.

The sparge wells are designed to inject air or nitrogen at the surface of the relatively impermeable organic clay layer to strip the volatile contaminants from the groundwater in-situ. Therefore, the need for a separate groundwater treatment system is not evaluated until Phase I will be completed. The vacuum extraction system will be designed to recover the contaminants from the unsaturated zone, and recover the sparge gas being used in the groundwater cleanup program. The recovered soil vapor will be treated prior to discharge to the atmosphere.

4.2 REMEDIAL FIELD PROGRAM

Upon obtaining NJDEPE approval, the Field Program of the Remedial Action Plan will be initiated. A phased approach will be adopted to meet the remedial objectives of the on-site Soils and Groundwater Cleanup Program. Presented below is a list of proposed activities for the Remedial Field Program:

Phase I

Task 1: Core Vacuum Extraction Point
Task 2: Install Vapor Piezometers and Sparging Wells
Task 3: Perform Baseline Sampling
Task 4: Install Vacuum Extraction (VE) System
Task 5: Commence Point Vacuum Extraction Operations
Task 6: Evaluate Effectiveness of Point Vacuum Extraction System
Task 7: Commence Sparging in Combination with Point Vacuum Extraction System
Task 8: Evaluate Results of Sparging in Combination with Point Vacuum Extraction System
Task 9: Install Additional Core Points, Vacuum Piezometers and Sparge Well
Task 10: System Operation and Monitoring for Results Verification
Task 11: Install Horizontal Vacuum Extraction Wells and Operate Vacuum Extraction System in Combination with Sparging (if necessary)

Task 12: Expand Site Remedial Operations - Free-Phase Product Investigation

Dames & Moore proposes to immediately initiate a program to recover, characterize the composition of and assess the extent of the free-phase floating product at MW-4, and to explore whether the potential source of this product is on-site or off-site.

Initially, the floating product will be recovered with hand bailers. By observing the recharge rate of the hydrocarbon product, we can assess the need for a product-only pneumatic pumping system. A sample of the floating product will be collected and submitted to a chemical laboratory for a gas chromatograph (GC) fingerprint analysis.

Dames & Moore proposes to drill up to six soil borings and complete up to three of the borings as monitoring wells to estimate the extent of the floating product plume. Two of the new wells will be placed hydraulically upgradient of MW-4, and one well will be placed hydraulically downgradient of MW-4. If MW-4 is not appropriate for use as a product recovery well, one of the three proposed wells will be used for product recovery.

Based on the review of site historical data, the results of the fingerprint analysis and the product plume delineation, the source of this free product will be assessed, and appropriate remedial measures will be developed.

Phase II: Project into a Long-Term Remediation

A flow diagram indicating the proposed sequence of activities is presented on Figure 8.

This phased approach will permit improving the definition of the site subsurface contamination issues and to test and evaluate the effectiveness of the proposed remedial technology/approach in addressing these site contamination issues. Consequently, some of the detailed information required by NJAC 7:26E-6.2(a)4 et.seq. is not available or applicable at this stage of the remedial planning process. These requirements will be addressed more fully when the appropriate site or remediation information becomes available during this phased remedial program.

Task 1 - Core Vacuum Extraction Point

Given the site conditions, including the shallow groundwater table and the coarse-grained composition of the unsaturated zone, Dames & Moore proposes to install a Vacuum Extraction Point instead of a conventional extraction well. The VE Point will be constructed by installing a steel casing in a 6-inch core hole through the concrete slab. The space between the casing and the concrete slab will be sealed to prevent any short-circuiting of air during the VE operation. The location of the VE Point will be determined by actual field conditions and previous soils and groundwater analytical data related to hot spots. The VE Point will serve to utilize the crushed stone layer immediately below the concrete slab as a planar collector for vapors within the underlying unsaturated site fill/soils.

Figure 9 presents a typical schematic of a Vacuum Extraction Point System.

Task 2 - Install Vapor Piezometers and Sparging Wells

Upon installation of the VE Point, up to 12 vacuum piezometers will be installed at varying distances around the VE Point. At various pre-determined locations, the concrete pavement will be cut and semi-permanent vapor sampling points will be installed. At each location, a hydraulic probe will be used to advance interconnected 3-foot lengths of 1-inch diameter steel pipe to the sampling depth. Sampling points will consist of a 1/4-inch Teflon tube attached to a screened sampling tip, installed through the 1-inch diameter steel pipe. The hole will be backfilled with sand or glass beads at the sampling tip, and with granular bentonite for the remaining height of the column as the pipe is removed. The Teflon tubing will terminate above ground with a Swagelock ferruled fitting and cap. The top of the sampling point will be grouted and outfitted with a flush-mounted waterproof cap for resistance to tampering, destruction from vehicles, and infiltration from run-off. Vacuum readings at these piezometers will be collected at regular time intervals during the operation of the Point VE System.

Concurrent with the installation of the vacuum piezometers, two sparge wells will be constructed. Each will be located about 10 feet away from the VE Point. The sparge wells will be constructed of 2-inch diameter Schedule 40 PVC, having a 2-foot long, 0.010-inch slotted, well screen at the bottom. The wells will be terminated at the top of the organic clay unit at a depth which will be determined in the field during installation of the sparge wells.

The locations of the piezometers and sparge wells are also shown on Figure 9.

Task 3 - Baseline Soils and Groundwater Sampling

Prior to commencement of the Point VE operations, Dames & Moore proposes to perform baseline soils and groundwater sampling. A total of four soil samples (two from each sparge well) and two groundwater samples will be collected at submitted to a New Jersey-certified laboratory for volatile organics, base/neutrals and metals, including iron, analyses. Sampling procedures, analytical methods and other relevant details are presented in Section 8.0 of this document. Results obtained from the baseline sampling will be used in the evaluation of the VE system's performance.

Task 4 - Vacuum Extraction System Installation

Upon completion of the baseline sampling, a trailer-mounted vacuum extraction system will be installed near the location of the VE Point. The primary components of the trailer-mounted unit will include:

- A rotary lobe, positive displacement vacuum blower capable of moving approximately 500 actual cubic feet per minute (ACFM) of air at a vacuum of 15 inches of mercury;
- A knock-out drum to separate any liquid from the extracted soil vapor;
- A silencer.

Additionally, a portable gas chromatograph and vapor-phase granular activated carbon units will be used to monitor and treat the extracted soil vapor. Prior to commencement of operations, one soil vapor sample will be collected and analyzed for volatile organic compounds to provide a baseline for obtaining an appropriate standard for the gas chromatograph. Limited quantities of groundwater are expected to be generated during the operation of the VE system. This water will be collected, analyzed and shipped off-site for disposal at a permitted disposal facility in accordance with the applicable state and federal regulations. Figure 10 presents a typical VE System Process & Instrumentation Diagram.

Task 5 - Operation and Monitoring of Point Vacuum Extraction System

Dames & Moore will commence operation of the VE system to evaluate the effectiveness of the VE Points. Parameters to be monitored and recorded during operation will include:

- Operating Time
- Suction & Discharge Vapor Temperature

- Vacuum at the Extraction Point and at Piezometers
- Vapor Flow Rate
- Vapor-Phase VOC Concentrations Before and After Vapor Treatment

It is anticipated that the Point VE system will be operated for two to three days in order to obtain enough data to evaluate its effectiveness.

Task 6 - Evaluate Effectiveness of the Point Vacuum Extraction System

Data recorded during the operation of the Point VE System will be compiled to evaluate the following:

- Radius of Influence of the VE System

- Achievable Air Flow Rates at Subject Vacuum

- The Various VOC Constituents and their Respective Concentrations in the Extracted Vapor

- Feasibility of using Vapor-Phase GAC for Extracted Soil Vapor Treatment

Task 7 - Commence Sparging in Combination with Point Vacuum Extraction System

Upon confirming the effectiveness of the Point Vacuum Extraction System, sparging operations will be initiated in combination with the Point System. Figure 9 presents a typical schematic diagram of Vacuum Extraction Point in conjunction with sparge wells. The two installed sparge wells will be used to sequentially inject air and nitrogen into the groundwater at the surface of the clay layer at flow rates ranging from 1 to 5 Standard Cubic Feet per Minute (SCFM). The combined sparging and VE System will be operated for a period of approximately six weeks. System monitoring during operation will include those parameters outlined in Task 5.

Task 8 - Evaluate Effectiveness of Sparging in Combination with Point Vacuum Extraction System

In addition to evaluating (1) the radius of influence, (2) achievable air glow rates, and (3) the soil vapor characteristics (i.e., constituents and concentrations of VOCs), the impact of sparging on the on-site groundwater and the effectiveness of using either air or nitrogen as the sparge gas for future operations will be evaluated.

Soil and groundwater samples will be collected from the vicinity of the sparge wells and the Vacuum Extraction Point, and will be analyzed for parameters included in the Baseline Sampling Program. Results obtained from the analyses will be used to evaluate:

- Reduction in target contaminant concentrations in both soils and groundwater (i.e., removal rates);

- Potential future use of air or nitrogen for sparging based on iron concentrations in both soils and groundwater.

Task 9 - Install Additional Vacuum Extraction Point, Vacuum Piezometers and Sparge Well

Upon confirming the effectiveness of sparging in conjunction with the vacuum extraction system, one additional Vacuum Extraction Point, one sparge well and five additional vacuum piezometers will be installed. Construction details of the VE Point, the sparge well and the piezometers will be similar to those outlined in Tasks 1 and 2 (Sections 4.2.1 and 4.2.2, respectively). Two soil and one groundwater sample will be collected from the additional sparge well during installation. Samples will be analyzed for parameters outlined in the Baseline Sampling Program (Task 3).

Task 10 - System Operation and Monitoring for Results Verification

Upon completion of installation of the additional VE Point, the additional sparge well and the five additional vacuum piezometers, the sparging system in combination with the VE system will be operated at the newly installed VE Point to investigate the reproducibility of results obtained at the initial VE point. Parameters monitored during this operation will be similar to those outlined in Task 6.

Task 11 - Installation of Horizontal Vacuum Extraction Well and Operation of VE System with Air Sparging (if necessary)

If the results of the evaluation of the Point VE System (Task 6, Figure 8) indicate that the Point VE System is not a feasible approach for on-site remediation, a horizontal VE well system will be used for vapor extraction. The well will be constructed using a 20-foot long, 4-inch diameter Schedule 40 PVC perforated pipe, installed at a depth of approximately 4 feet below grade. The location of this well will coincide with the location of the Vacuum Extraction Core Point. Figure 11 presents a typical schematic diagram of a horizontal vacuum extraction system in combination with air sparging.

Upon installation of the horizontal extraction well, the horizontal VE System will be operated in combination with the existing sparging wells. System monitoring and evaluation will be similar to that outlined for the core Point Vacuum Extraction System.

Task 12 - Confirmatory Soil and Groundwater Sampling

As part of the Phase I Remedial Program, several confirmatory soil and groundwater samples will be collected within the estimated zone of influence upon completion of the operation and monitoring of the VE System (Point VE System or Horizontal VE System). The samples will be analyzed for target compounds identified in the Baseline Sampling Plan to verify the reduction in contaminant levels since the commencement of the remedial action.

Based on the results of confirmatory sampling, additional VE core point locations (or horizontal VE wells) and sparge wells will be added to assess the reproducability of the results and to address other on-site areas that require remediation.

Phase II

Upon completion of the Phase I Program of the Remedial Action Plan, a Phase II Program will be initiated involving the following:

- Expanding the operation of the VE and Groundwater Sparging System to encompass 15 to 20 percent of additional site area;

- Evaluating the effectiveness of bioventing to address remediation of both the unsaturated soils and groundwater in cases where vacuum extraction ceases to be a viable option. In general, bioventing would consider the introduction of injected air or oxygen (and potentially also nutrients) into the subsurface site soils to facilitate the growth of indigenous bacteria which can effectively metabolize the subsurface contaminants to effectively convert these chemicals into carbon dioxide and water as metabolite end-products.

5.0 IDENTIFICATION OF APPLICABLE CLEANUP STANDARDS

5.1 INTRODUCTION

For remedial efforts to be realistic and feasible, the cleanup levels should account for site-specific and regional operational and hydrogeological conditions. In selecting applicable cleanup levels for the IPC Site, these conditions have been considered. These cleanup levels are the NJDEPE-proposed non-residential surface soil cleanup standards for soils, and proposed Class IIB/III aquifer cleanup standards for groundwater.

The land has historically been washed over and flooded by the Passaic River, and the high tide still rises over the wall and floods the land. Consequently, the River's contaminants have been deposited upon the land. The Passaic River has infiltrated the groundwater below IPC's land. The same chemical transshipment business will continue on this site in the future. The Doremus Avenue area is a highly industrialized area and the IPC facility occupies a tine 2 1/2-acre parcel sandwiched between the Getty and Hess facilities and the Passaic River. Consequently, to require cleanup to the level of NJDEPE's standards is unreasonable and wasteful.

It should be noted that these cleanup levels, given the proposed phased remedial approach, will be negotiated with NJDEPE upon completion Phase I of the remedial action. Moreover, the final cleanup levels will take into account the potential impacts of off-site sources on the quality of on-site soils and groundwater.

5.2 SOIL

Based on historical and current activities and operations conducted at the IPC facility and in this part of Newark in general, the IPC facility and this portion of Newark has been and will likely continue to be a highly industrialized area. Furthermore, many of the environmental issues at the IPC site are likely to be associated with a regional fill, which is ubiquitously present throughout this site and throughout much of this highly industrialized area of Newark. This fill, used historically to reclaim tidal marshlands of Newark, is characteristically heterogeneous and consists predominantly of combustion by-products and construction debris (i.e., asphalt and coke fragments, cinder, ash, slag, concrete, brick, etc.). Thus many of the compounds detected in the soil at the IPC site, particularly petroleum hydrocarbons (PHC), base neutrals (B/Ns) and priority pollutant metals (PPM), are inherent characteristic components of the fill, and would, therefore, almost inevitably be expected to be found wherever this fill is present.

5.3 GROUNDWATER

The occurrence of groundwater within this saturated zone in the fill stratum is primarily associated with localized surface water infiltration and percolation. This perched groundwater flowing over the organic clay layer is not associated with a regional lateral flow system. Based on the current and potential future use of the groundwater in the overburden in this highly industrialized area, this perched water unit is not likely to be considered as, nor is it transmitting water to a Class IIA aquifer or a potentially potable water supply. This consideration is based on: 1) the limiting hydrogeologic characteristics of this perched water zone where significantly low groundwater yields (pumping rates) are expected (due to the thin and laterally limited saturated zone and the low transmissivity and storage capacity); and 2) the regional deterioration and degradation of groundwater quality caused by past regional discharges, the adverse quality of the fill material, and/or salt-water intrusion due to tidal effects and/or historical over-pumpage (as evidenced by elevated TDS concentrations).

A previous review of published records and literature about water resources in Newark, including available well records on file at the NJDEPE, indicated that no municipal water supply well fields are identified in the area and that groundwater, especially from the overburden, is not likely to be used as a potable water supply.

6.0 IDENTIFICATION OF AREAS PROPOSED FOR REMEDIATION

6.1 INTRODUCTION

The proposed Remedial Action Plan will address the following areas of concern:

- Soils in the unsaturated zone
- Groundwater
- Free-phase product

These areas have been identified based on the results of the previous investigation. Since limited information is available on the presence of free-phase product, this Remedial Action Plan will assess the extent of the free-phase product and will address its removal, if present (see Section 7.2).

6.2 NATURE AND POTENTIAL EXTENT OF CONTAMINATION

Analytical results from the previous soil and groundwater sampling events indicate the presence of petroleum hydrocarbons (PHC), volatile organic compounds (VOC), base neutrals (B/N) and metals. Figures 6 and 7 present the locations of previous soil samples and existing monitoring wells. Also presented in these figures are analytical results for those samples which exceeded the applicable cleanup standards (SEC 5.0) for soils and groundwater.

6.2.1 Soils

Based on the data obtained, it appears that the contaminants of concern in the soils are primarily VOCs. The PHC, B/N and metals detected in soil samples are an inherent component, which are characteristic of the regional fill. Consequently, these compounds would be expected wherever this fill is present (throughout much of the industrial area in Newark). The B/N compounds detected in the soil samples are heavier compounds rather than the lighter B/Ns typically associated with petroleum hydrocarbons such as those stored at the IPC site. Review of the site history and operation data reveals that metals were not used in the site operations. Therefore, it appears that the metals detected in the soil samples are associated with the heterogeneous fill encountered on-site. Given these site conditions and the sampling information that has been gathered to date, it should be recognized that attempts to further differentiate between potential contamination pertaining to on-site operations and compounds that are inherently indigenous in the fill are likely to be counter productive.

6.2.2 Groundwater

Groundwater sampling results indicate that the major contaminants of concern are the VOCs. The only other class of compounds detected above applicable cleanup standards in groundwater samples are metals. It should be noted that metals analyses were performed on unfiltered groundwater samples. The concentrations detected could potentially be associated with the suspended solids in the groundwater samples. In order to verify this, the proposed Remedial Action Plan will include one round of baseline groundwater sampling for filtered and non-filtered samples, prior to commencement of remedial construction activities.

6.2.3 Free-Phase Product

Free-phase floating product was detected during the 1991 sampling event in upgradient monitoring well MW-4, which is located near the southern site boundary. The source and nature of this floating product are not currently known. However, given the vicinity of this well to the southern site boundary, it is suspected that this floating product is likely to be associated with a potential off-site source.

6.2.4 Summary

This Remedial Action Plan will address the on-site volatile organics contamination in both soils and groundwater in conjunction with free product removal. The estimated lateral extent of contamination in soils and groundwater based on data presented in Figures 4, 5, 6 and 7 appears to encompass a majority of the site. A phased approach has been proposed to implement the Remedial Action Plan due to on-site operational constraints. Each phase will be designed and implemented to encompass about 15 to 20 percent of the site.

7.0 SUPPLEMENTAL REMEDIAL INVESTIGATION

Due to the extent of previous investigations, the only additional data to be collected will include floating-product sampling and baseline sampling for confirmation of the planned remedial action.

8.0 QUALITY ASSURANCE PROJECT PLAN

8.1 RELATIONSHIP TO OVERALL REMEDIAL STRATEGY

The objective of this Quality Assurance Project Plan (QAPP) is to provide a mechanism for control and evaluation of the quality of the data to be acquired throughout the course of the project. Dames & Moore proposes to initiate a phased approach to the soil and groundwater remedial actions at the site. The data generated throughout the remedial action will be utilized to:

- Establish baseline concentrations prior to the installation and start-up of the vacuum extraction system;
- Evaluate the effectiveness of the air/nitrogen sparging systems in remediating contaminated soils and groundwater;
- Evaluate the extent of metals precipitation, if any, in soils adjacent to the air injection wells; and
- Evaluate the effectiveness of the remedial system.

This QAPP provides Quality Assurance guidelines to be followed during the course of the remedial action field program. This QAPP does not provide detailed guidelines regarding the quality assurance activities of the analytical laboratory. The laboratory guidelines will be provided under separate cover in the laboratory's Standard Operating Procedures (SOP) manual and QAPP upon selection of the analytical laboratory.

The QA data results generated in conformance to this plan will be used to evaluate the precision and accuracy of the measured values. The practical quantitation limits (PQLs) for the target analytes and the associated methodologies are detailed on Table 6.

8.2 PROJECT ORGANIZATION AND RESPONSIBILITIES

Specific members of the project team have been designated to ensure the collection of valid measurement and for routine assessment of precision and accuracy. Responsibilities and the lines of authority are shown on Figure 12.

8.3 QUALITY ASSURANCE SAMPLING AND LABORATORY ACTIVITIES

The monitoring parameters were selected on the basis of available site information provided in the Initial Assessment Study (Recon 1989, and EcolScience 1990/1991). Based on Dames & Moore's review of these historical data, the monitoring parameters were expanded to include the Target Compound List (TCL) Volatile and Semi-volatile Organic Compounds plus the volatile compounds methyl-t-butyl ether (MTBE) and tert-butyl alcohol (TBA), as well as metals.

As discussed previously, the multi-phase sampling program consists of baseline evaluation of soils, groundwater, river sediment and soil vapor (air) samples and monitoring to evaluate the effectiveness of the remedial action through the collection and analysis of soil, groundwater and soil vapor (air) samples. The baseline sampling program shall include the following:

- Soil borings - Two soil samples will be collected from two different intervals from each of the three sparge wells to be installed on the Industrial Petrochemical Site to evaluate baseline concentrations of Target Compound List (TCL) Volatile Organic Compounds plus MTBE and TBA, TCL Semi-volatile (base/neutral and acid extractable) Organic Compounds and metals, following USEPA-SW-846 methodologies.

- Groundwater Samples - One round of groundwater sampling will be collected and analyzed at each of the newly installed sparge wells installed on the Industrial Petrochemical Site to evaluate baseline concentrations of Target Compound List (TCL) Volatile Organic Compounds plus MTBE and TBA, TCL Semi-volatile (base/neutral and acid extractable) Organic Compounds and metals, following USEPA 600 Series methodologies (40 CFR Part 136.

- <u>Sediment Samples</u> - Two river sediment samples (one upstream and downstream) will be collected at the Site to evaluate baseline concentrations of Target Compound List (TCL) Volatile Organic Compounds plus MTBE and TBA, TCL Semi-volatile (base/neutral and acid extractable) Organic Compounds and metals, following USEPA-SW-846 methodologies.

- <u>Soil Vapor Samples</u> - One 1-liter air sample will be collected and analyzed to evaluate baseline concentrations of Target Compound List (TCL) Volatile Organic Compounds plus MTBE and TBA recovered from the vapor extraction system. The sample will be analyzed for TCL Volatile Organic Compounds following a modified USEPA SW-846/8240 methodology.

- <u>Free-Phase Floating Product Sample Collection and Analysis</u> - In addition to the baseline evaluation, one sample of floating product, if any, will be collected from MW-4 and analyzed by gas chromatography with flame ionization detector (GC-FID) for hydrocarbon fingerprinting following a modified USEPA SW-846 methodology.

The remedial action monitoring program will include the collection and analysis of soil, groundwater and soil vapor (air) samples for those constituents which were identified at or above the proposed NJDEPE Cleanup Standards during the baseline evaluation. Based on the findings of the baseline sampling event, the remedial action monitoring field program may include the following:

- **Soil Samples** - To evaluate metals precipitation, if any, in the soils in the vicinity of the sparge wells, shallow soil samples will be collected and analyzed for metals, following USEPA SW-846 methodologies.

- **Groundwater Samples** - To evaluate the effectiveness of the air and nitrogen sparging, three groundwater sampling rounds (if required) will be completed at the sparge wells and analyzed for Target Compound List (TCL) Volatile Organic Compounds plus methyl-tertiary-butyl ether (MTBE) and tertiary-butyl alcohol (TBA), following USEPA 600 Series methodologies (40 CFR Parts 136).

- **Soil Vapor Samples** - One liter air samples will be collected and analyzed to evaluate concentrations of Target Compound List (TCL) Volatile Organic Compounds plus MTBE and TBA recovered from the vapor extraction system. The sample will be analyzed for TCL Volatile Organic Compounds, following a modified USEPA SW-846/8240 methodology.

Table 7 details for each category of analyte, the sample matrix, analytical method reference, sample preservation, holding time and type of container.

8.4 SAMPLE COLLECTION PROCEDURES

8.4.1 Preliminary Activities

The following steps will be accomplished prior to commencement of field activities to ensure that the sampling is carried out correctly and safely.

1. The Field Supervisor will notify the laboratory of the upcoming sampling event so that the laboratory can prepare the appropriate type and number of sample containers. The anticipated number of sampling locations, the list of parameters to be analyzed for each location and the

number of extra bottles needed for quality control testing will be specified to the Laboratory Manager.

2. All equipment to be used during the sampling event will be inspected.

3. All forms to be used in the field (including the field log book, chain-of-custody sheets and sample analyses request forms) will be assembled.

4. If appropriate, bottles will be "pre-labeled" during the preliminary phase of the sampling event. Pertinent information (e.g., well number, sample point, sample identification number, preservative and type of parameters) will be identified on the label with permanent ink during the pre-field activities. Other information (e.g., sample time and date, sampler's name, etc.) will be added to the label once the sample has been collected. After all the information is printed on the label, the label is covered with tape to protect it from ice packs within the cooler. A cross-reference to the information contained on the label will be documented in the field notebook to correspond with the sample location.

5. The sampling personnel will review proper sampling protocols. In addition, proper health and safety protocols will be reviewed to ensure that no injuries occur during the sampling event.

8.4.2 Monitoring Well Sampling Procedures

1. Wells will be allowed to stabilize before sampling. Wells will be sampled in order of least suspected contamination to most suspected contamination.

2. Appropriate sections of "Groundwater Sampling Record" (Figure 14) will be completed. After removing the well cap, OVA or PID measure-

ments will be obtained by inserting probe inside well casing, and the measurement will be recorded on the groundwater sampling record. The static water level in the well will be measured to the nearest 0.01 foot with an electric water-level indicator equipped with a calibrated tape or cable, and depth to water will be recorded. To avoid cross-contamination between wells, the indicator probe and the immersed portion of the tape or cable will be rinsed off with distilled water. If there is any oily residue, a non-phosphate detergent will be used, which will be followed by distilled water.

3. Previous sampling rounds identified a floating product at MW-4. An interface probe will be used to detect the presence, if any, of light-phase (floating) immiscible organic layers at the wells. Samples of light organic layers will be forwarded to the laboratory in a separate container for analysis. Routine chain-of-custody procedures, as described later, will be followed.

4. The well will be evacuated (purged) using a centrifugal pump. A new section of dedicated, check-valve-equipped, polyethylene flexible suction hose will be used in each well. The water will be drawn from the top of the water column. Pump out three well volumes (or less if the well has a very low specific capacity). To compute the well volume, the total static water column in the well (in feet) must be multiplied by 0.65 gal/foot for 4-inch I.D. wells. A calibrated bucket will be used to estimate the pumping rate. The purged water for the first round of sampling will be drummed for subsequent disposal. The sampling record will be partially filled out while evacuating the well.

5. Dedicated polyethylene hose will be used in each well. After sampling, the used hose will be properly disposed of.

6. The well will be sampled immediately following purging. A pre-cleaned stainless-steel bailer equipped with a Teflon check valve will be used to obtain a groundwater sample. Using polypropylene line, the bailer will be lowered into the well. The bailer will be lowered until it is approximately opposite to the well screen.

7. Water samples will be carefully transferred from the bailer to the sample bottles to minimize the potential for aeration of the sample, especially those designated for volatile organic analysis (VOA). The first bailer-full will be used to collect the VOA sample. No headspace or air bubbles in the VOA sample bottles are allowed, so special care will be taken in filling and capping these bottles. In addition, overflowing bottles should be avoided to prevent loss of floating substances (i.e., oil and grease). With the exception of VOCs, a 1-inch air space should be allowed at the top of the sample bottle to allow for mixing the sample prior to its analysis. Samples will be collected in the following order, as appropriate for each specific well:

   a. Volatile organics (VOA)
   b. Semi-volatile organics (SVOs)
   c. Metals, total and dissolved (i.e., filtered and non-filtered)

   Aqueous samples will be field filtered for dissolved metals.

8. When applicable, field blanks will be collected in accordance with procedures described in this section.

9. The well will be capped and the protective casing will be locked.

A summary of monitoring well groundwater sampling procedures, presented in Section 8.3.2, will be carried by field personnel for reference during sampling. A "Groundwater Sampling Record" (Figure 13) will be completed for each sample collected.

8.4.3 Soil Sampling Procedures

Collection of soil samples in borings will be performed using a standard split spoon sampler. To the extent possible, soil which has come in contact with the walls of the sampler will be discarded. In all borings, soil will be collected at the 3 to 5 foot interval and at the 5 to 7 foot interval. Immediately after the spoon is opened, an OVA or PID will be used to screen the split spoon contents and readings will be recorded. A pre-cleaned stainless steel scoop or trowel will be used to transfer soil into sample containers. All soil sampling equipment will be decontaminated prior to each use following the procedure outlined in Section 8.5.

After the volatile portion of the sample has been jarred, all soil will be homogenized by thoroughly mixing in a stainless steel bowl. Small aliquots of the soil will be placed in the sample containers until the required volume is collected.

Vials containing soil for volatile organic compounds will be packed with soil to minimize headspace. If necessary, soil may be packed using a decontaminated stainless steel or teflon devise, such as a spatula or a scoop.

8.4.4 Sediment Sampling Procedures

Sediment samples will be collected from the sampling point furthest downstream to the furthest upstream point. To the extent possible, sediment samples will be collected from the point of thickest sediment accumulation . Sediment samples will be collected from the upper six inches of the river bed using a precleaned stainless steel scoop or trowel. Rocks and vegetative materials will be discarded. Care should be exercised to avoid losing the fine materials that tend to disperse when disturbed. Native water on top of the sample will not be removed. The depth of the water at the sampling location will be measured and recorded.

8.5 DATA QUALITY ASSURANCE SAMPLES

As part of the Quality Assurance program, several QA/QC samples, if required, will be prepared and collected to provide control over the collection of environmental measurements and subsequent review, interpretation and validation of generated analytical data. Two types of QA/QC samples will be prepared or collected: trip (travel) blanks and field (equipment rinse) blanks. These QA/QC samples are discussed in more detail below.

Additionally, the laboratory analyzes method blanks (laboratory blanks), matrix spike samples and duplicate samples as part of their internal quality assurance program. Detailed information regarding laboratory QA procedures will be forwarded under separate cover upon selection of the analytical laboratory.

8.5.1 Trip (Travel) Blanks

The primary purpose of this type of blank is to detect additional sources of contamination that could potentially influence contaminant values reported in actual samples, both quantitatively and qualitatively. Trip blanks serve as a mechanism of control on sample bottle preparation, blank water quality and sample handling. The trip blank travels to the site with the empty sample bottles and back from the site with the collected samples in an effort to simulate sample handling conditions. Trip blanks are used exclusively for volatile organic analysis, aqueous samples only. Contaminated trip blanks may indicate inadequate bottle cleaning or blank water of questionable quality. The following have been identified as potential sources of contamination:

- Laboratory reagent water
- Sample containers
- Cross-contamination in shipment

- Ambient air or contact with analytical instrumentation during preparation and analysis at the laboratory
- Laboratory reagents used in analytical procedures

A trip blank consists of a set of sample bottles filled at the laboratory with laboratory-demonstrated analyte-free water. This water must originate from one common source and physical location within the laboratory and must be the same water as the method blank water used by the laboratory performing the analysis. Trip blanks should be handled, transported and analyzed in the same manner as the samples acquired that day, except that the sample containers themselves are not opened in the field. Rather, they just travel with the sample collector. Individual sample matrices and associated blanks must be packaged in separate sample containers prior to shipment back to the laboratory. Trip blanks must return to the laboratory with the same set of bottles they accompanied to the field.

Other issues affecting the use and integrity of trip/travel blanks include the following:

a. Holding Time - If possible, trip blanks will not be held on-site for more than two calendar days. The temperature of the trip blanks must be maintained at 4°C while on-site and during shipment.

b. Holding Time - The clock governing holding times for trip blanks analyzed by SW-846 or the 600 series begins at the time of sample collection.

8.5.2 Field Blank

The primary purpose of this type of blank is to provide an additional check on possible sources of contamination beyond those intended for trip blanks. A field blank serves the same purpose as a trip blank and is also used to indicate potential contamination from ambient air and from sampling instruments used to collect and transfer samples from point of collection into sample containers.

A field blank is collected using two identical sets of laboratory-cleaned sample containers. One set of containers is empty and will serve as the sample containers to be analyzed. The second set of containers is filled at the laboratory with laboratory-demonstrated analyte-free water. This water must originate from one common source and physical location within the laboratory and must be the same water as the method blank water used by the laboratory performing the analysis. Field blanks should be handled, transported and analyzed in the same manner as the samples acquired that day. At the field location, in the most contaminated area, this analyte-free water is passed through clean sample equipment and placed in the empty sample container for analysis. (Note: The laboratory may have to provide extra, full volatile organics vials to ensure sufficient volume of blank water to eliminate headspace.) The reason for collecting field blanks in the most contaminated area is to attempt to simulate a worst-case scenario regarding ambient air contributions to sample contamination. Field blanks must return to the laboratory with the same set of sample bottles they accompanied to the field. Field blanks must be packaged with their associated matrix.

The purpose of a field blank is to place a mechanism of control on sample handling, storage and shipment. The field blank will be transported and stored with the sample, and is thereby representative of effects on sample quality. By being opened in the field and transferred over a cleaned sampling device (where applicable), the field blank is also indicative of ambient conditions and/or equipment conditions that may potentially affect the quality of the associated samples.

Other requirements affecting the use and integrity of field blanks include the following:

a. **Holding Time** - The field blank water should be utilized for sample preparation within four days of receipt at the site. The temperature of the blank water must be maintained at 4°C while on-site and during shipment.

b. **Holding Time** - The clock governing holding times for field blanks analyzed by SW-846 or the 600 series begins at the time of sample collection.

Field blanks will be collected and analyzed at a rate of one per day per matrix. The field blanks will be analyzed for all the parameters that the environmental samples collected that day in the same area will be analyzed for. Field blanks will be collected during the sampling of various matrices.

8.6 EQUIPMENT DECONTAMINATION PROCEDURES

In order to minimize the potential for cross-contamination of soil and/or groundwater samples between sample locations, dedicated field equipment (bailers, trowels, etc.) will be utilized. All other field equipment (i.e., split spoons, hand augers) will be decontaminated prior to each usage according to the following procedure:

1. Wash with non-phosphate detergent
2. Rinse with tap water
3. Rinse with deionized water
4. Rinse with methanol
5. Rinse with deionized water
6. Air dry

After the equipment has air dried, it will be wrapped in aluminum foil (shiny side out) until use.

8.7 SAMPLE CUSTODY PROCEDURES

Sample chain-of-custody is initiated by the laboratory with the selection and preparation of the sample containers. To reduce the chance for error, the number of personnel assuming custody of the sample will be held to a minimum.

On-site monitoring and sampling data will be controlled and entered onto appropriate records. Personnel involved in completing chain-of-custody and transferring of samples will be trained on the purpose and procedures prior to implementation.

Field Sample Custody - The project manager will notify the laboratory of upcoming field sampling activities and the subsequent transfer of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped and the anticipated date of arrival. Sample shipping containers (coolers) will be provided by the laboratory. Dames & Moore personnel receiving the sample containers will check each cooler for the integrity of the containers.

The "Remarks" column of the Chain-of-Custody Form (Figure 14) will be used to record specific considerations associated with sample acquisition such as sample type, container type, etc. The laboratory will maintain on file the completed, original forms. Copies will be submitted as part of the final analytical report.

Laboratory Sample Custody - Receipt, storage and tracking of samples submitted to the laboratory are conducted according to strict protocol to prevent sample contamination or loss, and to prevent the production of invalid data as a result of sample deterioration or tampering.

8.8 ANALYTICAL METHODS

The analytical procedures used for this project are USEPA methods. Table 7 provides a breakdown of the number of samples proposed, the preservative required, holding times and the corresponding analytical method. All analytical results will be presented following the NJDEPE Reduced Data Deliverable Format.

Table 6 identifies the analytes and the corresponding analytical method and detection limits.

8.9 DATA REDUCTION, VALIDATION, AND REPORTING

Documentation, data reduction, and reporting will be controlled through a set of standard operating procedures in the field and laboratory.

Data documentation and reduction is controlled through the use of field notebooks, field data sheets, chain-of-custody records, labeling of samples, sample tracking records (in the laboratory), and laboratory reports and reviews of the results to check for completeness and accuracy.

The precision of the data submitted by the laboratory will be checked by comparing the analytical results from duplicate samples. The data validity will be assessed by comparing the analytical results of field blanks, trip blanks, duplicates and spike samples. Specific data points may be rejected if there is significant difference in duplicate-sample analytical results. Data points identified in blanks may be considered suspect. Non-conforming items are noted and corrective actions implemented as necessary to correct problems with data documentation.

The laboratory will validate its own analytical program by the use of spike recoveries, detection limits for each matrix, precision and accuracy control charts, and records of instrument calibrations. Accuracy, performance and reporting requirements will conform to EPA laboratory protocols.

Dames & Moore will perform a complete review of the analytical data based on the Data Reporting Summary forms for both organic and inorganic parameters. The following procedures will be used to evaluate both the organic and inorganic data for compliance with method QC criteria and to evaluate the organic and inorganic data in terms of useability (actual rejecting/qualifying non-acceptable data). These procedures are applicable to all data generated for NJDEPE to ensure comparable quality and useability of the results.

For Organics:	NJDEPE DHWM Quality Assurance Data Validation of Analytical Deliverables - TCL - Organics (based upon USEPA CLP SOW OLM01.0 with revisions) SOP No. 5.A.13 dated 10/91.
For Inorganics:	NJDEPE DHWM Quality Assurance Data Validation of Analytical Deliverables - TAL - Inorganics (based upon USEPA CLP SOW ILM02.0) SOP No. 5.A.02 dated 2/92.

Completeness will be evaluated by continuously comparing the project objectives with the acquired data and identifying data gaps and deficiencies in the data base with respect to the project objectives. Data quality assessments described in this QA plan will be used to ensure that the collected data are valid and completed.

8.10 INTERNAL QUALITY CONTROL

Quality control checks are performed to assure that the data collected are both representative and valid.

8.10.1 Field Checks

The use of field notebooks and standardized checklists helps to provide adequate documentation of field activities, changes in procedures, site conditions during sampling etc. Field notebooks will be kept on a daily basis by all staff involved in field activities. The type of information recorded in field notebooks includes:

- Procedures used, any deviations
- Sample location, type
- Weather conditions
- Date, person's initials
- General observations
- Subcontractor activities
- Problems, corrective action taken
- Time and events.

Field blanks, equipment blanks, and trip blanks will be used to identify potential sources of contamination. The field blank is distilled water that is transferred from its original vessel to a sample container at the sampling location, and then preserved with the appropriate reagents. The field blank serves as a check on reagent and environmental contamination. Contaminants in the ambient air that can affect an actual environmental sample may be picked up by the field blank.

Equipment blanks (field rinsate blanks) are used to evaluate equipment cleaning or decontamination procedures. At the sample location, distilled water is poured over or through the sample collection device, collected in a sample container and preserved as appropriate.

8.10.2 Laboratory Checks

Analytical activities used by the laboratory as QC checks include:

- Method blank
- Calibration check samples
- Replicate analysis
- Matrix spikes
- Surrogates

USEPA defines these samples in SW-846, Third Edition and 600 Series, and sets criteria for evaluating a laboratory's performance in SW-846, Third Edition. The laboratory's specific SOPs explain the type and frequency of quality control checks, including such items as analysis of USEPA reference standards, matrix spikes, laboratory duplicates, blanks, use of internal standards and surrogate spikes will be forwarded under separate cover upon selection of the analytical laboratory.

In general, the laboratory performs a matrix spike/matrix spike duplicate for organic QC and a duplicate/matrix spike for inorganic QC. The results of these analyses are used to generate control charts to monitor the precision and accuracy of each parameter analyzed. The laboratory also employs method blanks for all analyses which must be in control in order for the data to be approved.

Surrogate spikes are added to all volatile and semi-volatile samples prior to extraction or analysis. Results of these are checked to verify that the recoveries meet the requirements of the SOPs. If the recoveries are out of limits, the sample is re-analyzed to determine if a matrix interference exists.

8.10.3 Preventative Maintenance

The following tasks will be performed in order to minimize any downtime associated with this project:

- Prior to field activities, all required equipment will be assembled and, if necessary, cleaned.

- Prior to field activities, if necessary, all field instruments will be charged and calibrated.

- In the field, all activities will proceed in an orderly fashion as specified in the Work Plan and Health and Safety Plan.

- Samples will be shipped to the laboratory with 24 hours of sample collection.

8.10.4 Corrective Action

The following procedures have been established to ensure that conditions adverse to quality (such as malfunctions, deficiencies, deviations and errors) are promptly investigated, documented, evaluated and corrected.

When a significant condition adverse to quality is noted at the site, laboratory or subcontractor locations, the cause of the condition will be determined and corrective action taken to preclude repetition. Items, activities or documents determined to be in non-compliance with quality assurance requirements will be documented and corrective actions mandated throughout the remedial action program. All project personnel have the responsibility, as part of the normal work duties, to promptly identify, solicit approved correction and report conditions adverse to quality.

Corrective actions may be initiated as a minimum when:

- Pre-determined acceptance standards are not attained.
- Procedure or data compiled are determined to be deviant.
- Equipment or instrumentation is found to be faulty.
- Samples and test results are questionably traceable.
- Quality assurance requirements have been violated.
- Designated approvals have been circumvented.

OR

- As a result of management assessment
- As a result of laboratory/inter-field comparison studies

8.10.5 Quality Assurance Reports

Effective management of a field sampling and analytical effort requires timely assessment and review of field activities. It requires effective interaction and feedback between the field team members, the task leader and the project manager.

The task leader will keep the project manager up to date regarding potential quality control problems so that a quick and effective solution can be implemented. Topics that may be addressed include:

- Summary of activities and general program status
- Summary of calibration data
- Summary of unscheduled maintenance activities
- Summary of corrective action activities
- Status of any unresolved problems
- Assessment and summary of data completeness
- Summary of any significant QA/QC problems and recommended and/or implemented solutions to include above.

Problems requiring swift resolution will be brought to the immediate attention of the project manager and project director.

9.0 DESCRIPTION OF PROPOSED REMEDIAL ACTION TECHNOLOGIES

9.1 INTRODUCTION

Based on the review of available information, a combination of the following remedial technologies have been proposed for the IPC site remediation:

- Vacuum extraction (VE)
- Sparging
- Bioventing

The proposed technologies will address both the unsaturated soils and the groundwater contamination. The following sections provide a description of the selected remedial technologies.

9.2 VACUUM EXTRACTION

The VE process entails extracting soil vapor from the vadose zone soil matrix through strategically located extraction wells. A vacuum pump exerts vacuum on the extraction wells screened in the vadose zone, which induces subsurface soil vapor to flow towards the extraction wells. As a result VOCs adsorbed onto the unsaturated soils and diffused in the soil vapor are removed. Soil vapor collected from the extraction wells is typically treated utilizing thermal oxidation, catalytic oxidation or granular activated carbon, prior to discharge to the atmosphere.

Parameters that are typically monitored during system operation include:

- Air flow rate and temperature
- Vacuum induced
- Concentration of VOCs before and after treatment
- Radius of influence

Soil vapor collected from the extraction system can be treated in a number of ways prior to discharge to the atmosphere. The following is a brief description of some of the off-gas treatment technologies:

Thermal Oxidation

Thermal oxidation of the extracted soil vapors is designed to destroy the vapor phase contaminants by converting the contaminants to carbon dioxide and water. This conversion usually takes place at temperatures between 1,000 and 1,600 degrees Fahrenheit. Destruction efficiencies can exceed 99 percent.

In cases where the contaminant concentration of the inlet vapor is high, the energy needed to maintain the desired operating temperature comes from the inlet vapor stream, minimizing auxiliary fuel requirements. As the concentration of the inlet vapor stream decreases, the auxiliary fuel requirement increases, decreasing the economic viability of this treatment option.

To optimize thermal oxidizer energy use, the hot effluent gases are often fed to a heat exchanger to heat the inlet vapor. This greatly reduces the fuel requirements that are needed to maintain the desired operating temperature. The presence of chlorinated VOCs in the soil vapor would require an acid gas scrubber to be included as part of the thermal oxidation system package to prevent discharge of acid vapors to the atmosphere.

Catalytic Oxidation

The catalytic oxidation process also destroys the soil vapor contaminants by converting them to carbon dioxide and water. However, a catalyst reduces the temperature at which this chemical conversion takes place. Typical operating temperatures of the catalytic oxidizer are between 600 to 900 degrees Fahrenheit. Catalytic unit destruction efficiencies are similar to those of the thermal oxidizer. The presence of chlorinated VOCs in the soil vapor could potentially lead to poisoning of the catalyst thereby requiring frequent replacement of the catalyst.

Vapor Phase Granular Activated Carton (GAC)

Soil vapor from the VE system can be treated using vapor phase GAC units. The process involves passing of the soil vapor through a series of GAC units wherein the VOCs get adsorbed onto the GAC. The treated vapor can then be discharged to the atmosphere. Carbon usage will be based on the types of volatile organic constituents in the vapor, the individual adsorptive capacity and the temperature of the incoming vapor. Upon detection of breakthrough of VOC coming out of the GAC unit, the unit will be shipped off-site for regeneration.

Summary

Due to the shallow groundwater table and the coarse grained composition of the unsaturated zone, the proposed system for the IPC Site would include a vacuum extraction point instead of an extraction well. A typical schematic diagram for such a system is presented in Figure 10. A pilot study has been proposed to evaluate the effectiveness of the VE point. Results of the pilot study will also be used to recommend the most technically feasible and cost effective soil vapor treatment system for the full scale unit.

9.3 SPARGING

Sparging, also called "in-situ stripping" and "in-situ volatilization," entails injecting air or an inert gas like nitrogen into the saturated zone to strip VOCs dissolved in the groundwater and adsorbed to soil. These VOCs transfer into a vapor phase to the unsaturated zone, wherein they can be captured and removed via a VE system. The extracted vapor can then be treated using a soil gas treatment system. If air is used as the sparge gas, then in addition to removing VOCs via mass transfer, the oxygen in the injected air enhances subsurface biodegradation of contaminants.

The proposed sparging system for the IPC site involves installation of sparge wells designed to inject air or nitrogen at the surface of the underlying organic clay unit. Sparge gas from this system will be collected by the proposed VE system and treated prior to discharge to the atmosphere. A schematic diagram of the proposed sparging system is presented in Figure 11.

Details of the proposed sparging system are presented in Sec. 4.2 of this document. The objectives of this pilot study are (i) to evaluate the feasibility of using a sparging system for on-site remediation; and (ii) to determine the method (air or nitrogen) of sparging for future full scale operations.

9.4 BIOVENTING

Bioventing is an in-situ remediation process which is typically applicable to the removal of aerobically biodegradable contaminants present both in the saturated and unsaturated soils. The process involves maintaining a conducive atmosphere for biodegradation in the subsurface soils through injecting air and/or nutrients.

A typical bioventing system involves use of a VE system in combination with air sparging wells. The injected air is extracted by the VE system resulting in continuous flushing of subsurface soils with oxygen-rich air, thereby maintaining a conducive atmosphere for biodegradation. The proposed remedial action for the IPC site involves a similar system.

10.0 SITE RESTORATION PLAN

The proposed remedial phased approach encompasses 15 to 20 percent of the site at a time. Due to the existing 1-foot concrete cover at the site, the proposed drilling and trenching will be done with minimum disturbance to the ongoing site operations. At the end of each sparging, vacuum extraction and monitoring piping installation, the site surfaces will be restored to the original condition in order to minimize interference with the ongoing site operation activities.

11.0 BACKFILL SOURCES

Where applicable, all on-site excavations will be backfilled with certified "clean fill". Appropriate documentation confirming the volume of fill brought on-site, along with certification that the imported backfill material is clean in accordance with current NJDEPE requirements for certification of "imported clean fill," will be submitted to NJDEPE in the final report.

12.0 REMEDIAL EQUIPMENT DEMOBILIZATION

All equipment and materials associated with sampling will be cleaned prior to usage as per NJDEPE FIELD SAMPLING PROCEDURES MANUAL (MAY 1992).

Items such as drill rigs, well casing, auger flights and back hoes that may come in contact with materials adjacent to the matrix being sampled or may be attached to actual sampling equipment will be cleaned in accordance with ASTM D-5088-90.

Heavy equipment that can potentially retain contaminants from other sources such as roadways or storage areas will be cleaned prior to use on site and prior to leaving the site.

Cleaning of equipment will be performed by manual scrubbing or by steam cleaning.

Backhoes/Drill Rigs

These items will be thoroughly steam cleaned or manually scrubbed upon initial arrival on-site, between drilling or excavation locations and prior to leaving the site.

Drilling items such as auger flights, drill rods and drill bits will be cleaned between sample locations and prior to leaving the site.

Pumps and Process Equipment

All pumps, pipes and process equipment will be cleaned and flushed prior, in between and upon demobilization.

The cleaning will be a combination of steam, scrubbing and 20 gallons of water flushing followed by a distilled and deionized rinse of the outside of the equipment.

A cleaning location for all equipment will be designated on-site at the time of remediation and, in accordance with the ongoing site operations.

The fate of cleaning materials as well as purged well water and process water will be determined after review of analytical data generated from samples, and on-site discharge impact have been evaluated. Spent carbon will be shipped off-site for regeneration.

13.0 COST ESTIMATE OF REMEDIAL ACTION

Capital cost for a Vapor Extraction/Air Sparging System will encompass design, engineering, permitting, equipment procurement, installation, instrumentation and contingencies for components such as:

- Wells (extraction, sparging and monitoring wells) - installation, piping and trench construction
- Mechanical equipment - blowers, compressors and vacuum pumps
- Instrumentation - flow meters, pressure gauges and analytical equipment for vapor testing
- Vapor treatment equipment - includes emission control (activated carbon units and catalytic oxidation systems)
- Baseline soil and groundwater sampling, free-phase product delineation and river sediment sampling

During the Phase I activities, the cost associated with the vapor extraction and sparging are estimated for a level of effort involving the preliminary design and field activities involving drilling, analytical baseline and installation of the unit. The capital cost has been estimated at $104,000, and the monthly operation and maintenance cost has been estimated at approximately $10,000. The operation and maintenance costs will include the equipment rental, analytical costs and associated labor cost.

At the end of Phase I activities (approximately six months), an evaluation of treatment effectiveness and recommendations for additional design, remedial components, and operation and maintenance costs, if required, will be submitted to NJDEPE for review.

During the subsequent phases of cleanup operations, based on the data collected during the first phase, cost can then be projected for a longer term remediation.

SUMMARY OF ESTIMATED COSTS

Phase I Capital Cost	$104,000.00
Six-month projected operation and maintenance at $10,000/month	60,000.00
TOTAL PHASE I:	**$164,000.00**

14.0 SCHEDULE AND PROGRESS REPORTS

The following tasks are associated with the proposed Remedial Action Work Plan:

1. Remedial Action Work Plan - Preparation
   - Submittal to NJDEPE
   - NJDEPE Review and Approval

2. Air Discharge Permit - Preparation, submittal to NJDEPE and NJDEPE Review and Approval

3. Free-Phase Floating Product Investigation
   - Initial product recovery with hand bailers
   - Install up to 6 soil borings
   - Complete up to 3 soil boring as monitoring wells
   - Collect one sample of the floating product for GC fingerprint analysis
   - Assess the source of the floating hydrocarbon product

4. Site Remediation Phase I
   - Mobilization
   - Install 2 Vacuum Extraction well points
   - Install 3 Sparge wells
   - Install up to 17 Piezometers
   - Install Electrical Service
   - Install Horizontal wells (only if necessary)
   - Baseline soil and groundwater sampling
   - Run the Radius of Influence tests for the extraction and injection wells
   - Run the Air Permeability tests
   - Run the Vacuum Extraction tests
   - Run the Air Sparge test
   - Run the Nitrogen Sparge test

- Performance Soil, Vapor and Groundwater sampling
- Evaluate the dissolved iron concentration
- Evaluate the impact of dissolved iron on the operation of the remedial system
- De-mobilization
- Identify the most cost effective Vapor Treatment technology
- Identify the optimal Remedial System configuration
- Prepare a Summary Report on the findings of the initial remediation system

The above tasks are presented on Figure 15 - Project Schedule.

Reporting

Following approval of the Remedial Action Work Plan by NJDEPE, Dames & Moore will provide the necessary informational and technical inputs for progress and monthly reports required under NJAC 7:26E-6.5. Such information will typically include:

- Actions and results during the past period
- Discussion of problems or delays and proposed corrective actions
- Deviations/modifications to the approved Remedial Action Work Plan and appropriate justification
- Proposed future actions/activities
- An annual summary of remediation costs to-date, and justification for partial release of financial security
- Summaries of analytical data for confirmation sampling and water classification activities

At the completion of the site remediation, Dames & Moore will prepare a Remedial Action Report in accordance with NJAC 7:26E-6.6 to document these remedial activities and results. Such a report would typically include:

- Information from the remedial Investigation Report and, specifically, the Findings/Recommendations section describing each area of environmental concern, to which descriptions of the specific remedial action in each area will be added
- Summarized analytical data to confirm the effectiveness of the cleanup efforts
- Actual cleanup costs
- Manifests for waste disposal off-site
- Restrictions (if any) on future site use

15.0 HEALTH AND SAFETY

A site-specific Health and Safety Plan (Appendix D) will be utilized by Dames & Moore personnel during on-site activities. All contractors involved in site activities will be required to prepare and implement a Health and Safety Plan to protect the field investigation team from potential hazards that may be encountered during the field investigations. The objectives of the plan are achieved by assigning responsibilities, establishing personnel protection standards and mandatory safety practices and procedures, and providing for contingencies that may arise while operations are conducted at the site. The health and safety procedures will address:

- Pertinent background information, including site history and site conditions;

- Key personnel, assignment of responsibilities and strategy of compliance and implementation of the plan;

- Assessment of on-site hazards (physical and chemical), including permissible exposure limits or recommended threshold limit values, breakdown of component job functions, and an estimate of potential employee exposure to chemical and/or physical hazards;

- Air monitoring procedures for toxic vapors and/or selection of appropriate levels of respiratory protection;

- Standard Safe Work Practices that the field staff must follow to prevent exposure to hazards;

- First aid, medical equipment, facilities, practices and personnel;

- Personnel protective clothing, equipment, respiratory protective devices, and approval for each activity, establishment of the specific criteria to select the level of protection, the decision process to change the level of protection, and a program for the ongoing assessment of both respiratory and skin hazards;

- Work zone distribution and decontamination practices and facilities;
- Site security and procedures for controlling access to the site;
- Emergency contacts and procedures, including emergency coordinators and their responsibilities, evacuation plan for on-site personnel, list of emergency equipment and their locations, arrangements with local first-aid units, fire departments and hospitals.

16.0 LIST OF REQUIRED PERMITS

In evaluating the various proposed remedial options for addressing site contamination issues, the following represents a listing of potentially applicable permitting requirements:

- NJ Air Pollution Control Regulations (NJAC 7:27-16 et.seq.) Permits for Emissions Limitations for Volatile Organic Compounds (VOCs) from the proposed vacuum extraction system.

- NJDEPE Well Drilling Permits.

Upon completion of Phase I remedial activities and review of the data obtained, a more detailed evaluation of the permitting requirements will be conducted.

Applications for all potentially applicable permits will then be completed and submitted to the NJDEPE for their review and approval prior to installation of any full-scale remedial operations.

TABLES

TABLE 1

SUMMARY OF SOIL ANALYTICAL RESULTS
JUNE 1986 SAMPLING PLAN
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

Sample I.D.: Date Sampled:	S1134 1/08/85	S1135 1/08/85	S1136 1/08/85	S1137 1/08/85
<u>Volatile Organic Compounds</u> (mg/kg)				
Benzene	51.4	16.3	110.6	37.44
Ethylbenzene	ND	ND	1,156.7	ND
Chloroform	5.8	ND	ND	ND
Tetrachloroethylene	83.2	33,848.7	3,358.2	ND
Toluene	3,831.9	7.01	2,596.9	14.04
Methyl Isobutyl Ketone	152.1	ND	ND	ND
Trichloroethylene	ND	111.8	1,767.5	ND
Xylenes	5,106	72.3	74,846	631.8
<u>PCBs</u> (mg/kg)				
Arochlor 1260	0.28	ND	ND	*

*Data provided for review was illegible.

<u>NOTE</u>: ND - Not Detected

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
OCTOBER 1989 REPORT
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

Sample I.D.	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11/1
Date Sampled	6/1/89	6/1/89	6/1/89	6/19/89	6/1/89	5/31/89	6/1/89	6/1/89	5/31/89	5/31/89	6/1/89
Sample Depth (ft)	2-2.5	2.5-3	2-2.5	2-2.5	0.5-1	4.5-5	1 *	3-3.5	2.5-3	1.6-2	2-2.5
PARAMETER											
Volatile Organic Compounds (ug/kg)											
Methylene Chloride	ND	ND	ND	14	ND	ND	840 J	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	46 J	710,000	960 J	ND	ND	11,000	5,100	ND	50,000	ND	ND
Tot. Xylenes	24,000	5,000	42,000	102	ND	203,000	126,000	ND	430,000	ND	ND
Toluene	ND	800	ND	ND	780,000	11,000	53,000	860	600,000	ND	ND
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	2,100	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	2,300	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	9,200	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	2,800	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	38,000	770 J	ND	5,700	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800
Base Neutral Extractable Compounds (ug/kg)											
N-Nitrosodiphenylamine	ND	NA	NA	ND	NA	NA	ND	1,300	NA	ND	NA
Bis(2-ethylhexyl)phthalate	13,000	NA	NA	7,000 B	NA	NA	170,000	1,500	NA	820	NA
Di-n-butylphthalate	ND	NA	NA	230 J	NA	NA	110,000	ND	NA	ND	NA
Di-n-octylphthalate	ND	NA	NA	ND	NA	NA	ND	ND	NA	8,400	NA
Acenaphthylene	ND	NA	NA	ND	NA	NA	2,200	ND	NA	ND	NA
Acenaphthene	810 J	NA	NA	ND	NA	NA	2,900	200 J	NA	1,800	NA
Anthracene	ND	NA	NA	55 J	NA	NA	2,700	ND	NA	ND	NA
Phenanthrene	ND	NA	NA	150 J	NA	NA	16,000	310 J	NA	3,500	NA
Fluoranthene	28 J	NA	NA	63 J	NA	NA	3,400	92 J	NA	900	NA
Fluorene	1,300	NA	NA	130 J	NA	NA	6,400	440 J	NA	ND	NA
Pyrene	550 J	NA	NA	130 J	NA	NA	10,000	220 J	NA	2,800	NA
Benzo(a)anthracene	ND	NA	NA	ND	NA	NA	2,400	ND	NA	450	NA
Chrysene	ND	NA	NA	ND	NA	NA	ND	ND	NA	650	NA
Benzo(b)fluoranthene	ND	NA	NA	ND	NA	NA	960 J	ND	NA	ND	NA
Benzo(k)fluoranthene	ND	NA	NA	ND	NA	NA	1,600	ND	NA	ND	NA
Benzo(a)pyrene	ND	NA	NA	ND	NA	NA	ND	ND	NA	450	NA
Benzo(g,h,i)perylene	ND	NA	NA	ND	NA	NA	3,500	ND	NA	ND	NA
Dibenz(a,h)anthracene	ND	NA	NA	ND	NA	NA	390 J	ND	NA	ND	NA
Naphthalene	3,200	NA	NA	140 J	NA	NA	46,000	710 J	NA	ND	NA
1,2-Dichlorobenzene	ND	NA	NA	ND	NA	NA	3,200	ND	NA	ND	NA
Pest./PCBs (ug/kg)	NA	NA	NA	NA	NA	ND	NA	NA	ND	NA	NA
Arochlor 1254											
Total Petroleum Hydrocarbons (mg/kg)	5,730	4,480	12,600	1,380	4,480	2,490	19,400	8,670	7,980	9,650	18,700

NOTE:
J – Quantitation is approximate due to limitations identified during the preliminary quality assurance review.
B – This result is qualitatively suspect since this compound was detected in a field and/or laboratory blank at a similar concentration.
* – Sidewall
ND– Not Detected
NA– Not Analyzed

TABLE 2 (continued)
SUMMARY OF SOIL ANALYTICAL RESULTS
OCTOBER 1989 REPORT
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

Sample I.D.	B-11/2	B-12	B-13	B-14	B-15	B-16	B-17	B-18
Date Sampled	6/1/89	5/31/89	5/31/89	6/1/89	5/31/89	5/31/89	6/1/89	6/1/89
Sample Depth (ft)	2.5-3	2-2.5	2.5-3	0-0.50	3.8-4.3	4-4.5	2-2.5	2.5-3
PARAMETER								
Volatile Organic Compounds (ug/kg)								
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	120 J	ND	ND	ND	4,200	9,200	ND
Ethylbenzene	ND	2,700	ND	470,000	100	15,000	40,000	35,000
Tot. Xylenes	ND	3,600	48,000	6,800,000	83	ND	430,000	211,000
Toluene	320 J	190	1,600,000	1,500,000	130	1,500 J	58,000	18,000 J
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	1,300	11,000
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	64,000
Trichloroethene	ND	ND	ND	160,000	ND	ND	6,600	300,000
1,1,1-Trichloroethane	ND	ND	ND	210,000	ND	ND	ND	110,000
Tetrachloroethene	900 J	ND	ND	370,000	ND	ND	ND	1,100,000
1,1,2,2-Tetrachloroethane	1,600	ND	ND	ND	ND	ND	ND	ND
Base Neutral Extractable Compounds (ug/kg)								
N-Nitrosodiphenylamine	NA	4,700	NA	NA	NA	NA	ND	NA
Bis(2-ethylhexyl)phthalate	NA	19,000 B	NA	NA	NA	NA	19,000	NA
Di-n-butylphthalate	NA	ND	NA	NA	NA	NA	16,000	NA
Di-n-octylphthalate	NA	ND	NA	NA	NA	NA	ND	NA
Acenaphthylene	NA	10,000	NA	NA	NA	NA	ND	NA
Acenaphthene	NA	12,000	NA	NA	NA	NA	470 J	NA
Anthracene	NA	16,000	NA	NA	NA	NA	240 J	NA
Phenanthrene	NA	66,000	NA	NA	NA	NA	1,400	NA
Fluoranthene	NA	500 J	NA	NA	NA	NA	550 J	NA
Fluorene	NA	38,000	NA	NA	NA	NA	640 J	NA
Pyrene	NA	1,200	NA	NA	NA	NA	870 J	NA
Benzo(a)anthracene	NA	12,000	NA	NA	NA	NA	ND	NA
Chrysene	NA	18,000	NA	NA	NA	NA	ND	NA
Benzo(b)fluoranthene	NA	4,800	NA	NA	NA	NA	ND	NA
Benzo(k)fluoranthene	NA	6,300	NA	NA	NA	NA	ND	NA
Benzo(a)pyrene	NA	13,000	NA	NA	NA	NA	ND	NA
Benzo(g,h,i)perylene	NA	19,000	NA	NA	NA	NA	ND	NA
Dibenz(a,h)anthracene	NA	4,200	NA	NA	NA	NA	ND	NA
Naphthalene	NA	64,000	NA	NA	NA	NA	ND	NA
1,2-Dichlorobenzene	NA	ND	NA	NA	NA	NA	ND	NA
Pest./PCBs (ug/kg)	NA	NA	NA	ND	NA	NA	NA	NA
Arochlor 1254								
Total Petroleum Hydrocarbons (mg/kg)	25,200	18,000	1,350	117,000	2,060	11,300	8,200	2,170

NOTE:
J – Quantitation is approximate due to limitations identified during the preliminary quality assurance review.
B – This result is qualitatively suspect since this compound was detected in a field and/or laboratory blank at a similar concentration.
* – Sidewall
ND– Not Detected
NA– Not Analyzed

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
OCTOBER 1989 REPORT
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

Sample I.D. Date Sample Collected	MW-1 7/7/89	MW-2 7/7/89	MW-3 # 7/7/89
PARAMETERS			
Volatile Organic Compounds (ug/l)			
Benzene	78	ND	24
Ethylbenzene	ND	ND	28
Toluene	13	36	37
m-Xylene	2.7 J	ND	44
o,p-Xylene	5	ND	250
t-Butyl alcohol	3200	ND	ND
1,1-Dichloroethane	ND	ND	17
Trans-1,2-dichloroethene	ND	ND	11
Tetrachloroethene	ND	ND	12
Base Neutral Extractable Compounds (ug/l)			
Acenaphthene	2.0 J	1.5 J	23
Bis(2-ethylhexyl)phthalate	2.2 J	2.8 J	1800
Chrysene	ND	ND	11
Phenanthrene	1.1 J	3.1 J	43
Fluoranthene	ND	ND	29
Pyrene	ND	1.4 J	25
Naphthalene	2.7 JB	ND	59
Diethylphthalate	ND	49	ND
Di-n-butylphthalate	ND	ND	35
Acid Extractable Compounds (ug/l)			
Phenol	3.0 J	52	ND
2,4-Dimethyl phenol	ND	4.5 J	ND
Pest/PCBs (ug/l)	0.1 (pest)	ND	ND
TOTAL ALL ORGANICS (ug/l)	3296.1	137	2448
Priority Pollutant Metals (ug/l)*			
Antimony (total)	ND	200	300
Arsenic (total)	ND	ND	ND
Beryllium (total)	ND	ND	ND
Cadmium (total)	24	11	13
Chromium (total)	ND	140	60
Copper (total)	ND	110	ND
Lead (total)	130	290	465
Mercury (total)	ND	ND	ND
Nickel (total)	190	150	60
Selenium (total)	ND	ND	ND
Silver (total)	ND	ND	ND
Thallium (total)	ND	ND	70
Zinc (total)	46	144	62
CONVENTIONAL PARAMETERS (ug/l)			
Total Petroleum Hydrocarbons	3100	2900	619000
Cyanide	ND	11	ND
Phenols	ND	170	130
pH (s.u.)	6.23	7.9	6.55

Legend:

ND	– Not Detected
J	– Quantitation is approximate due to limitations identified during the preliminary quality assurance reivew.
B	– This result is qualitatively suspect since this compound was detected in a field and/or laboratory blank at a similar concentration.
#	– Free Product Noted
*	– Samples were analyzed for total metals. Samples were not filtered.

TABLE 4
SUMMARY OF SOIL ANALYTICAL RESULTS
SEPTEMBER 1991 REPORT
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

Sample I.D. Date Sampled Sample Depth (ft)	T-101 9/91	T-102 9/91	T-103 9/91	T-601 9/91	T-602 9/91	T-603 9/91	T-604 9/91	T-301 9/91	T-302 9/91
PARAMETER									
Volatile Organic Compounds (ug/kg)									
Methylene Chloride	NA	NA	NA	NA	NA	NA	NA	ND	730 J
Benzene	NA	NA	NA	NA	NA	NA	NA	ND	910 J
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	ND	4700
Xylene	NA	NA	NA	NA	NA	NA	NA	ND	19000
Toluene	NA	NA	NA	NA	NA	NA	NA	ND	ND
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	ND	ND
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	ND	ND
1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	ND	ND
2-Butanone (MEK)	NA	NA	NA	NA	NA	NA	NA	ND	ND
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	ND	ND
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	ND	ND
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	ND	ND
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	ND	ND
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	ND	ND
Carbon Disulfide	NA	NA	NA	NA	NA	NA	NA	ND	ND
Dibromochloroethane	NA	NA	NA	NA	NA	NA	NA	ND	ND
2-Propanone (Acetone)	NA	NA	NA	NA	NA	NA	NA	ND	ND
4-Methyl-2-Pentanone (MIBK)	NA	NA	NA	NA	NA	NA	NA	ND	ND
Styrene	NA	NA	NA	NA	NA	NA	NA	ND	ND
Base Neutral Extractable Compds (ug/kg)									
2- Methylnaphthalene	NA	30000	320 J	NA	NA	4900	16000	NA	NA
Dibenzofuran	NA	ND	ND	NA	NA	ND	800	NA	NA
Butylbenzylphthalate	NA	ND	ND	NA	NA	ND	ND	NA	NA
N-Nitrosodiphenylamine	NA	9200	ND	NA	NA	7400	3200	NA	NA
Di-n-butylphthalate	NA	5300	1900	NA	NA	2800	1700	NA	NA
bis(2-Ethylhexyl) phthalate	NA	2000 B	17000 B	NA	NA	1700 B	360 JB	NA	NA
Acenaphthylene	NA	ND	ND	NA	NA	ND	ND	NA	NA
Acenaphthene	NA	3800	ND	NA	NA	ND	ND	NA	NA
Anthracene	NA	ND	ND	NA	NA	1500	680	NA	NA
Phenanthrene	NA	12000	ND	NA	NA	11000	5500	NA	NA
Fluoranthene	NA	14000	ND	NA	NA	430 J	ND	NA	NA
Fluorene	NA	ND	ND	NA	NA	ND	2900	NA	NA
Pyrene	NA	34000	ND	NA	NA	1200	840	NA	NA
Benzo(a)anthracene	NA	620	ND	NA	NA	ND	ND	NA	NA
Chrysene	NA	1100	ND	NA	NA	ND	ND	NA	NA
Benzo(b)fluoranthene	NA	ND	ND	NA	NA	ND	ND	NA	NA
Benzo(k)fluoranthene	NA	ND	ND	NA	NA	ND	ND	NA	NA
Benzo(a)pyrene	NA	ND	ND	NA	NA	ND	ND	NA	NA
Benzo(g,h,i)perylene	NA	ND	ND	NA	NA	ND	ND	NA	NA
Indeno(1,2,3-cd)pyrene	NA	ND	ND	NA	NA	ND	ND	NA	NA
Dibenz(a,h)anthracene	NA	ND	ND	NA	NA	ND	ND	NA	NA
Isophorone	NA	ND	ND	NA	NA	ND	ND	NA	NA
Naphthalene	NA	ND	ND	NA	NA	ND	ND	NA	NA
Diethylphthalate	NA	ND	ND	NA	NA	ND	ND	NA	NA
Acid Extractable Compounds (ug/kg)									
4-Mehtylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Priority Pollutant Metals (mg/kg)									
Lead	NA	NA	NA	NA	NA	NA	NA	44.7	17
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)	2510	5570	3590	1300	4330	7190	4360	NA	NA

Legend:
ND- Not Detected
NA- Not Analyzed For
J - Quantitation is approximate due to limitations identified during the preliminary quality assurance review.
B - This result is qualitatively suspect since this compounds was detected in a field and/or laboratory blank at a similar concentration.

TABLE 4 (continued)
SUMMARY OF SOIL ANALYTICAL RESULTS
SEPTEMBER 1991 REPORT
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

Sample I.D.	EB-19	EB-20	EB-21	EB-22	EB-23	EB-24	EB-25	EB-26	EB-27
Date Sampled	8/8/91	8/8/91	8/8/91	8/8/91	8/8/91	8/8/91	8/8/91	8/8/91	8/8/91
Sample Depth (ft)	1.5	2.5	2	2	2	1.5	2.5	2	1.5
PARAMETER									
Volatile Organic Compounds (ug/kg)									
Methylene Chloride	5400 JB	2600 B	2400 B	30	1600 B	1200 B	6000 B	1500 B	1800 B
Benzene	ND	6800	32000	120	240 J	200 J	920 J	30 J	ND
Ethylbenzene	ND	45000	3400	110	110 J	73 J	29000	ND	ND
Xylene	ND	140000	25000	ND	420 J	280 J	73000	ND	180 J
Toluene	1100 JB	ND	8700 B	ND	190 J	ND	ND	230 J	2900
1,1-Dichloroethene	1400 J	ND	ND	ND	ND	ND	1000 J	ND	ND
1,1-Dichloroethane	22000 J	ND	ND	ND	ND	ND	4800	ND	ND
1,2-Dichloroethene	1300 J	300 J	930	ND	ND	90	ND	ND	150 J
2-Butanone (MEK)	1800 J	ND	2000 J	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	1400 J	ND	ND	ND	870 J	180 J	200 J
1,1,1-Trichloroethane	200000 J	ND	370 J	160	110 J	160 J	180000	ND	160 J
Chlorobenzene	ND	5400	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	390 J	ND	ND	ND	ND	5800	260 J	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	160 J	ND	ND	ND
Carbon Disulfide	ND	ND	79 J	ND	ND	ND	800 J	ND	ND
Dibromochloroethane	ND	ND	520 J	ND	ND	ND	ND	ND	ND
2-Propanone (Acetone)	ND	ND	ND	440	ND	ND	ND	ND	16000
4-Methyl-2-Pentanone (MIBK)	ND	ND	ND	ND	ND	340 J	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	28000	ND	ND
Base Neutral Extractable Compnds (ug/kg)									
2- Methylnaphthalene	170 J	36000	39000	12000	5300	4700	61000	1600	23000
Dibenzofuran	ND	ND	ND	ND	690	ND	ND	ND	1900
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	ND	310 J	ND
N-Nitrosodiphenylamine	130 J	ND	2900	ND	2000	1400	ND	21000	ND
Di-n-butylphthalate	670 J	360 J	790 J	810	1600	1400	ND	280 J	840 J
bis(2-Ethylhexyl) phthalate	3500 J	15000	460 J	69 J	ND	410 J	ND	960	4800
Acenaphthylene	ND	ND	1200	ND	1100 J	ND	ND	ND	ND
Acenaphthene	25 J	120 J	1300	540 J	ND	ND	900	ND	ND
Anthracene	39 J	640 J	1000	600 J	830 J	270 J	170 J	1600	1800
Phenanthrene	360 J	3600 J	3100	2300	3900	620 J	1500	5700	9500
Fluoranthene	170 J	410 J	730 J	910	2600	85 J	370 J	1300	360 J
Fluorene	87 J	1800	1900	740	1300	550 J	670	2900	3800 J
Pyrene	140 J	430 J	770	500 J	4700	100 J	420 J	770 J	200 J
Benzo(a)anthracene	88 J	420 J	1600	840	720 J	88 J	150 J	1100	150 J
Chrysene	290 J	720 J	3300	1300	1800	250 J	430 J	2200	430 J
Benzo(b)fluoranthene	62 J	260 J	1600	570 J	ND	ND	110 J	1400	330 J
Benzo(k)fluoranthene	76 J	280 J	1400	410 J	ND	ND	110 J	940	150 J
Benzo(a)pyrene	ND	240 J	2100	740 J	ND	ND	ND	1300	190 J
Benzo(g,h,i)perylene	ND	290 J	1700	530 J	ND	ND	ND	1100	310 J
Indeno(1,2,3-cd)pyrene	ND	210 J	1700	560 J	ND	ND	ND	1100	330 J
Dibenz(a,h)anthracene	ND	ND	540 J	100 J	ND	ND	ND	ND	ND
Isophorone	130 J	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	51 J	1600	33000	6000	ND	ND	54000	ND	ND
Diethylphthalate	49 J	ND	ND	ND	ND	ND	ND	ND	ND
Acid Extractable Compounds (ug/kg)									
4-Methylphenol	350	ND	ND	ND	ND	ND	ND	ND	940
Priority Pollutant Metals (mg/kg)									
Lead	716	402	399	587	607	200	126	465	162
Antimony	72	18.7	13	17.4	10.1	5.93	77.3	5.89	ND
Arsenic	ND	12.5	18.6	11.9	9.33	5.2	ND	6.84	12.8
Beryllium	14.6	ND	ND	ND	ND	ND	21.5	ND	ND
Chromium	6700	268	216	ND	29.4	119	787	44.4	75.6
Copper	55.9	149	362	592	132	118	ND	75.6	73.6
Mercury	ND	1.71	2.4	0.824	0.671	0.229	ND	2.3	1.59
Nickel	512	13.9	46.4	19.8	17.3	19.4	672	14.2	12.3
Zinc	318	376	6.19	25.2	566	1130	333	331	65.3
Total Petroleum Hydrocarbons (mg/kg)	1390	4200	7610	7060	774	3370	10900	5500	12500

Legend:
ND – Not Detected
NA – Not Analyzed For
J – Quantitation is approximate due to limitations identified during the preliminary quality assurance review.
B – This result is qualitatively suspect since this compounds was detected in a field and/or laboratory blank at a similar concentration.

TABLE 5
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
SEPTEMBER 1991 REPORT
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

Sample I.D. Date Sampled	MW-1 7/1/91	MW-2 7/1/91	MW-3 7/1/91	MW-4 7/1/91	MW-5 7/1/91	MW-6 7/1/91	MW-7 7/1/91	MW-8 7/1/91
PARAMETERS								
Volatile Organic compounds (ug/l)								
Benzene	20	ND	ND	ND	ND	480	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	170 J	490 J	ND
Toluene	2 J	240	ND	ND	13000	8600	7900	ND
Methyl-tert Butyl ether	13	ND	ND	12 J	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	62 J	2000 J	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	15000	ND
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	23000	2 J
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	18000	ND
2-Butanone	ND	7200	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	2700	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	11000	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	3100	ND
2-Propanone (Acetone)	ND	6400	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	3000	280	ND	ND	660	36000	23
Base Neutral Extractable Compounds (ug/l)								
2- Methylnaphthalene	19	ND	ND	1 J	160	ND	340	2
N-Nitrosodiphenylamine	ND	ND	290	ND	ND	ND	ND	4
Acenaphthene	ND	2	ND	ND	2 J	ND	16	1
Anthracene	ND	1	32 J	ND	1 J	1 J	ND	ND
Phenanthrene	ND	2	58	ND	3 J	6 J	46	1
Fluoranthene	ND	ND	20 J	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	3 J	7 J	16	1
Pyrene	ND	ND	38 J	ND	ND	ND	2	2
Isophorone	ND	ND	ND	ND	7 J	ND	230	ND
Naphthalene	ND	ND	ND	ND	370	ND	150	3
Diethylphthalate	ND	ND	ND	ND	ND	2 J	ND	ND
Di-n-octylphthalate	ND	ND	64	ND	3 7	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	320	ND
Di-n-butyl phthalate	ND	ND	53	ND	ND	71	ND	1 J
Bis(2-ethyl hexyl)phthalate	ND	ND	7400	ND	ND	13 J	75 J	15 J
Acid Extractable Compounds (ug/l)								
Phenol	ND	240J	ND	ND	ND	53	34	ND
2-Methylphenol	ND	ND	ND	ND	180J	190	45	ND
4-Mehtylphenol	ND	ND	ND	ND	160J	260	290	ND
2,4-Dimethylphenol	ND	15J	ND	ND	ND	34	53	2
Benzoic Acid	ND	420	ND	ND	ND	130	790	5
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	22	ND
TOTAL ALL ORGANICS (ug/l)	52	17265	8145	--	13530	10478	119054	44
Priority Pollutant Metals (ug/l)*								
Antimony (total)	ND	ND	130	ND	ND	ND	160	ND
Arsenic (total)	ND	ND	40	ND	30	50	67	10
Beryllium (total)	ND	ND	ND	ND	ND	ND	11	ND
Cadmium (total)	ND	ND	ND	ND	ND	ND	82	ND
Chromium (total)	10	ND	1380	10	580	70	2450	60
Copper (total)	ND	410	162	39	46	37	4440	91
Lead (total)	ND	ND	2880	90	130	60	6100	770
Mercury (total)	0.6	3	ND	6.6	1	ND	8	0.4
Nickel (total)	70	ND	270	ND	ND	330	610	40
Silver (total)	ND	ND	ND	ND	ND	ND	20	ND
Zinc (total)	40	ND	145	100	80	110	9950	260
CONVENTIONAL PARAMETERS (mg/l)								
Total Petroleum Hydrocarbons	0.5	0.1	86	1.3	15.7	5.6	30.3	4.3
Total Dissolved Solids	930	2530	13700	455	1130	2190	858	14700
pH (s.u.)	7.21	12.64	8.79	8.13	9.03	8.46	7.67	7.82

Legend:

ND	– Not Detected
J	– Quantitation is approximate due to limitations identified during the preliminary quality assurance reivew.
B	– This result is qualitatively suspect since this compound was detected in a field and/or laboratory blank at a similar concentration.
*	– Samples were analyzed for total metals. Samples were not filtered.
#	– Free Product Noted

TABLE 6
TARGET COMPOUND LIST AND PRACTICAL QUANTITATION LIMITS
USEPA SW-846 METHOD 8240

VOLATILE COMPOUNDS	CAS Number	Practical Quantitation Limits Water ug/L	Practical Quantitation Limits Soil ug/Kg
Chloromethane	74-87-3	10.0	10.0
Bromomethane	74-83-9	10.0	10.0
Vinyl Chloride	75-01-4	10.0	10.0
Chloroethane	75-00-3	10.0	10.0
Methylene Chloride	75-09-2	5.0	5.0
Acetone	67-64-1	10.0	10.0
Carbon Disulfide	75-15-0	5.0	5.0
1,1-Dichloroethene	75-35-4	5.0	5.0
1,1-Dichloroethane	75-34-3	5.0	5.0
1,2-Dichloroethene (total)	540-59-0	5.0	5.0
Chloroform	67-66-3	5.0	5.0
1,2-Dichloroethane	107-06-2	5.0	5.0
2-Butanone	78-93-3	5.0	5.0
1,1,1-Trichloroethane	71-55-6	5.0	5.0
Carbon Tetrachloride	56-23-5	5.0	5.0
Bromodichloromethane	75-27-4	5.0	5.0
1,2-Dichloropropane	78-87-5	5.0	5.0
cis-1,3-Dichloropropene	10061-01-5	5.0	5.0
Trichloroethene	79-01-6	5.0	5.0
Dibromochloromethane	124-48-1	5.0	5.0
1,1,2-Trichloroethane	79-00-5	5.0	5.0
Benzene	71-43-2	5.0	5.0
trans-1,3-Dichloropropene	10061-02-6	5.0	5.0
Bromoform	75-25-2	5.0	5.0
4-Methyl-2-Pentanone	108-10-1	5.0	5.0
2-Hexanone	591-78-6	5.0	5.0
Tetrachloroethene	127-18-4	5.0	5.0
Toluene	108-88-3	5.0	5.0
1,1,2,2-Tetrachloroethane	79-34-5	5.0	5.0
Chlorobenzene	108-90-7	5.0	5.0
Ethylbenzene	100-41-4	5.0	5.0
Styrene	100-44-5	5.0	5.0
Xylenes (total)	1330-20-7	5.0	5.0
Methyl-t-butyl ether	1634-04-4	**	**
tert-Butyl alcohol	75-65-0	**	**

** Practical Quantitation Limits will be provided by selected laboratory.

TABLE 6 (continued)
TARGET COMPOUND LIST AND PRACTICAL QUANTITATION LIMITS
USEPA SW-846 METHOD 8270

		Practical Quantitation Limits	
SEMIVOLATILE COMPOUNDS	CAS Number	Water ug/L	Soil ug/Kg
Phenol	108-95-2	10.0	330
Bis(2-chloroethyl) Ether	111-44-1	10.0	330
2-Chlorophenol	95-57-8	10.0	330
1,3-Dichlorobenzene	541-73-1	10.0	330
1,4-Dichlorobenzene	106-46-7	10.0	330
1,2-Dichlorobenzene	95-50-1	10.0	330
2-Methyl Phenol	95-48-7	10.0	330
2,2'-Oxybis(1-Chloropropane)	108-60-1	10.0	330
4-Methyl Phenol	106-44-5	10.0	330
N-Nitroso-di-n-propylamine	621-64-7	10.0	330
Hexachloroethane	67-72-1	10.0	330
Nitrobenzene	98-95-3	10.0	330
Isophorone	78-59-1	10.0	330
2-Nitrophenol	88-75-5	10.0	330
2,4-Dimethylphenol	105-67-9	10.0	330
bis(2-Chloroethoxy) methane	111-91-1	10.0	330
2,4-Dichlorophenol	120-83-2	10.0	330
1,2,4-Trichlorobenzene	120-82-1	10.0	330
Naphthalene	91-20-3	10.0	330
4-Chloroaniline	106-47-8	10.0	330
Hexachlorobutadiene	87-68-3	10.0	330
4-Chloro-3-methylphenol	59-50-7	10.0	330
2-Methylnaphthalene	91-57-6	10.0	330
Hexachlorocyclopentadiene	77-47-4	10.0	330
2,4,6-Trichorophenol	88-06-2	10.0	330
2,4,5-Trichlorophenol	95-95-4	50.0	1700
2-Chloronaphthalene	91-58-7	10.0	330
2-Nitroaniline	88-74-4	50.0	1700
Dimethylphthalate	131-11-3	10.0	330
Acenaphthylene	208-96-8	10.0	330
2,6-Dinitrotoluene	606-20-2	10.0	330
3-Nitroaniline	99-09-2	50.0	1700
Acenaphthene	83-32-9	10.0	330
2,4-Dinitrophenol	51-28-5	50.0	1700
4-Nitrophenol	100-02-7	50.0	1700
Dibenzofuran	132-64-9	10.0	330
2,4-Dinitrotoluene	121-14-2	10.0	330
Diethylphthalate	84-66-2	10.0	330
4-Chlorophenylphenylether	70005-72-3	10.0	330
Fluorene	86-73-7	10.0	330
4-Nitroaniline	100-01-6	50.0	1700
4,6-Dinitro-2-methylphenol	534-52-1	50.0	1700
N-Nitrosodiphenylamine	86-30-6	10.0	330
4-Bromophenylphenylether	101-55-3	10.0	330
Hexachlorobenzene	118-74-1	10.0	330
Pentachlorophenol	87-86-5	50.0	1700
Phenanthrene	85-01-8	10.0	330
Anthracene	120-12-7	10.0	330
Carcazole	86-74-8	10.0	330
Di-n-butylphthalate	84-74-2	10.0	330
Fluoranthene	206-44-0	10.0	330
Pyrene	129-00-0	10.0	330
Butylbenzylphthalate	85-68-7	10.0	330
3,3'-Dichlorobenzidine	91-94-1	10.0	330
Benzo(a)anthracene	56-55-3	10.0	330
Chrysene	218-01-9	10.0	330
bis(2-Ethylhexyl)phthalate	117-84-7	10.0	330
Di-n-octylphthalate	117-81-0	10.0	330
Benzo(b)fluoranthene	205-99-2	10.0	330
Benzo(k)fluoranthene	207-08-9	10.0	330
Benzo(a)pyrene	50-32-8	10.0	330
Indeno(1,2,3-cd)pyrene	193-39-5	10.0	330
Dibenz(a,h)anthracene	53-70-3	10.0	330
Benzo(g,h,i)perylene	191-24-2	10.0	330

TABLE 6 (continued)
TARGET COMPOUND LIST AND PRACTICAL QUANTITATION LIMITS
USEPA SW-846 METHOD 6010 and 7000 SERIES

INORGANIC PARAMETERS	Established Detection Limit* ug/L
Antimony	32
Arsenic	53
Beryllium	0.3
Cadmium	4
Chromium	7
Copper	6
Iron	7
Lead	42
Mercury	0.2
Nickel	15
Selenium	75
Silver	7
Thallium	40
Zinc	2

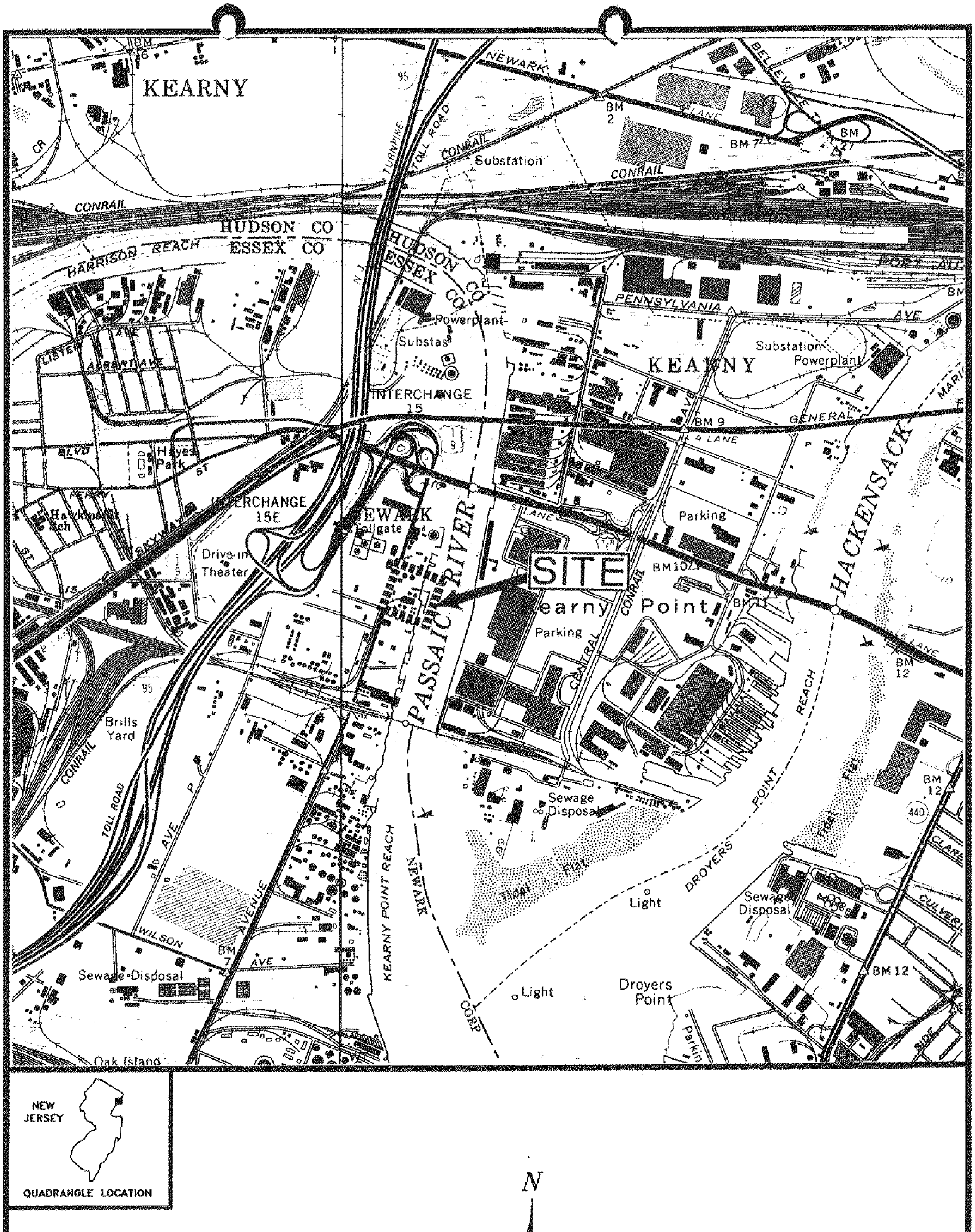
* The establised instrument detection limits are taken from Table 1, "Recommended Wavelengths and Estimated Instumental Detection Limits", SW-846, Third Edition, Volume 1A, Chapter 3.

TABLE 7

SUMMARY OF ANALYTICAL METHODOLOGIES
INDUSTRIAL PETROCHEMICAL, INC.

Analytical Parameter	Matrix	Container	Preservative	Hold Time	Detection Limits	Method Reference
VOC+10	Soil/Sediment	Glass – Wide mouth, teflon liner (4 oz)	4 deg C.	14 Days	5–10 ug/kg	SW–846, GC/MS 8240
VOC+10	Water	Glass – 40 mls (2), teflon liner	1:1 HCl to pH<2, 4 deg C	14 Days (7 days BTEX without HCl)	5–10 ug/L	40 CFR 136.3 GC/MS 624
VOCs	Soil/Sediment	Glass – Wide mouth, teflon liner (4 oz)	4 deg C.	14 Days	1–5 ug/kg	SW–846, GC 8010/8020
VOCs	Water	Glass – 40 mls (2), teflon liner	1:1 HCl to pH<2, 4 deg C	14 Days (7 days BTEX without HCl)	1–5 ug/L	40 CFR 136.3 GC 601/602
BNA + 20	Soil/Sediment	Glass – Wide mouth, teflon liner (8 oz)	4 deg C.	14 Days Extract, Analysis 40 days from extraction	330–1,600 ug/kg	SW–846, GC/MS 8270
BNA + 20	Water	1 liter amber, teflon liner	4 deg C.	14 Days Extract, Analysis 40 days from extraction	10 – 50 ug/L	40 CFR 136.3 GC/MS 625
BN + 20	Soil/Sediment	Glass – Wide mouth, teflon liner (8 oz)	4 deg C.	14 Days Extract, Analysis 40 days from extraction	330–1,600 ug/kg	SW–846, GC/MS 8270
BN + 20	Water	1 liter amber, teflon liner	4 deg C.	14 Days Extract, Analysis 40 days from extraction	10 – 50 ug/L	40 CFR 136.3 GC/MS 625
PP Metals plus Iron (except Mercury)	Soil/Sediment	Glass – Wide mouth, (8 oz)	4 deg C.	180 Days	5 –5,000 ug/kg	SW–846, 6010/7000 SERIES
PP Metals plus Iron (except Mercury)	Water	1 liter plastic	HNO3 to pH<2	180 Days	5 –5,000 ug/L	40 CFR 136.3
Mercury	Soil/Sediment	Glass – Wide mouth, (8 oz)	4 deg C.	28 Days	0.1 mg/kg	SW–846, 7470
Mercury	Water	500 ml plastic	HNO3 to pH<2	28 Days	0.2 ug/L	40 CFR 136.3
Iron	Soil/Sediment	Glass – Wide mouth, (8 oz)	4 deg C.	180 Days	50–5,000 ug/L	SW–846, 6010/7380
Iron	Water	500 ml plastic	HNO3 to pH<2	180 Days	50–5,000 ug/L	40 CFR 136.3

FIGURES



0 2000 4000 FEET

SCALE

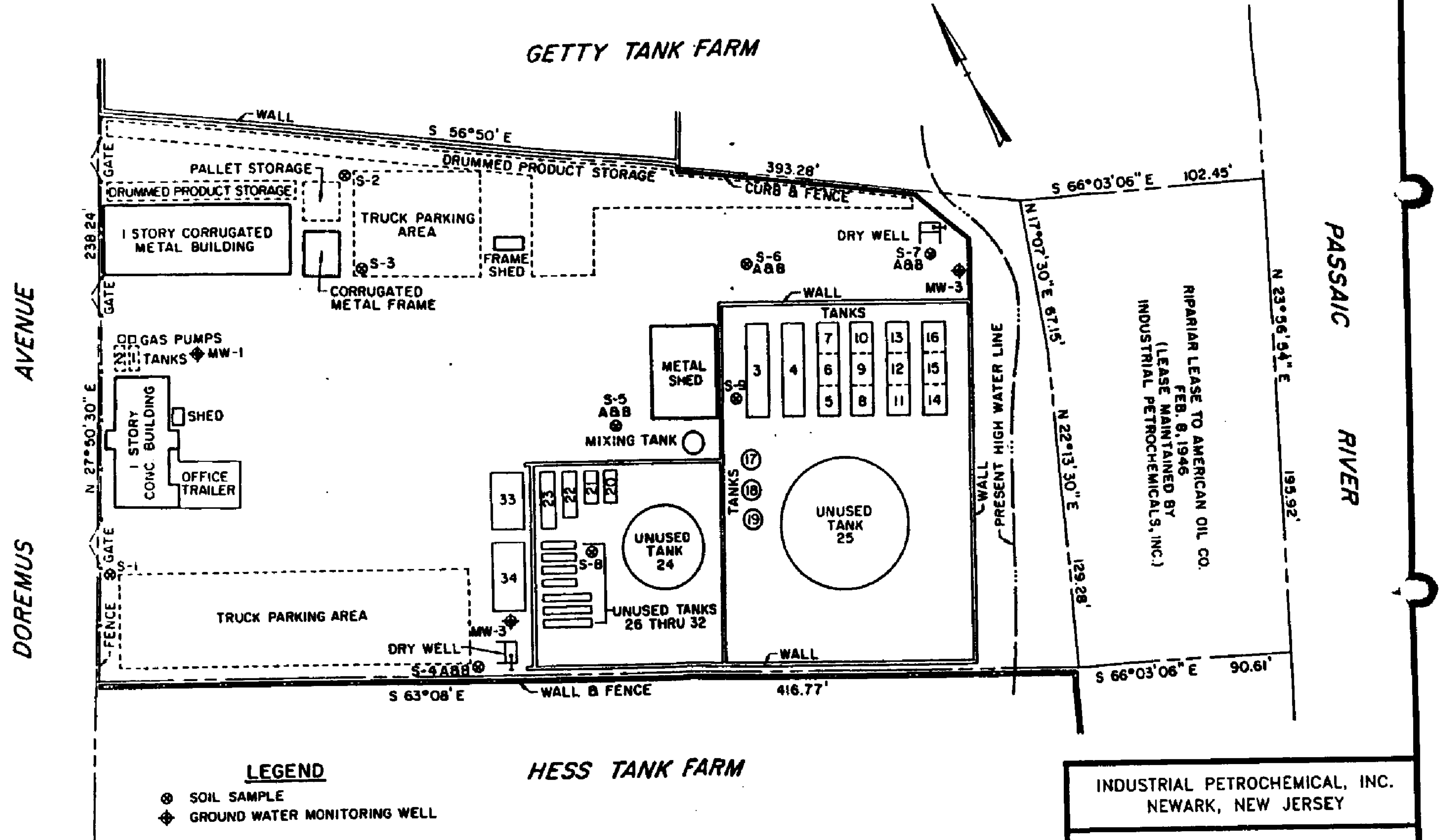
REFERENCE:
U.S.G.S. 7.5' QUADRANGLES;
ELIZABETH, N.J.–N.Y., 1967,
JERSEY CITY, N.J.–N.Y.,, 1967
PHOTOREVISED; 1981

INDUSTRIAL PETROCHEMICAL, INC.
NEWARK, NEW JERSEY

SITE LOCATION MAP

Dames & Moore, Inc.
CRANFORD, NEW JERSEY

FIGURE 1



LEGEND

⊗ SOIL SAMPLE

⌖ GROUND WATER MONITORING WELL

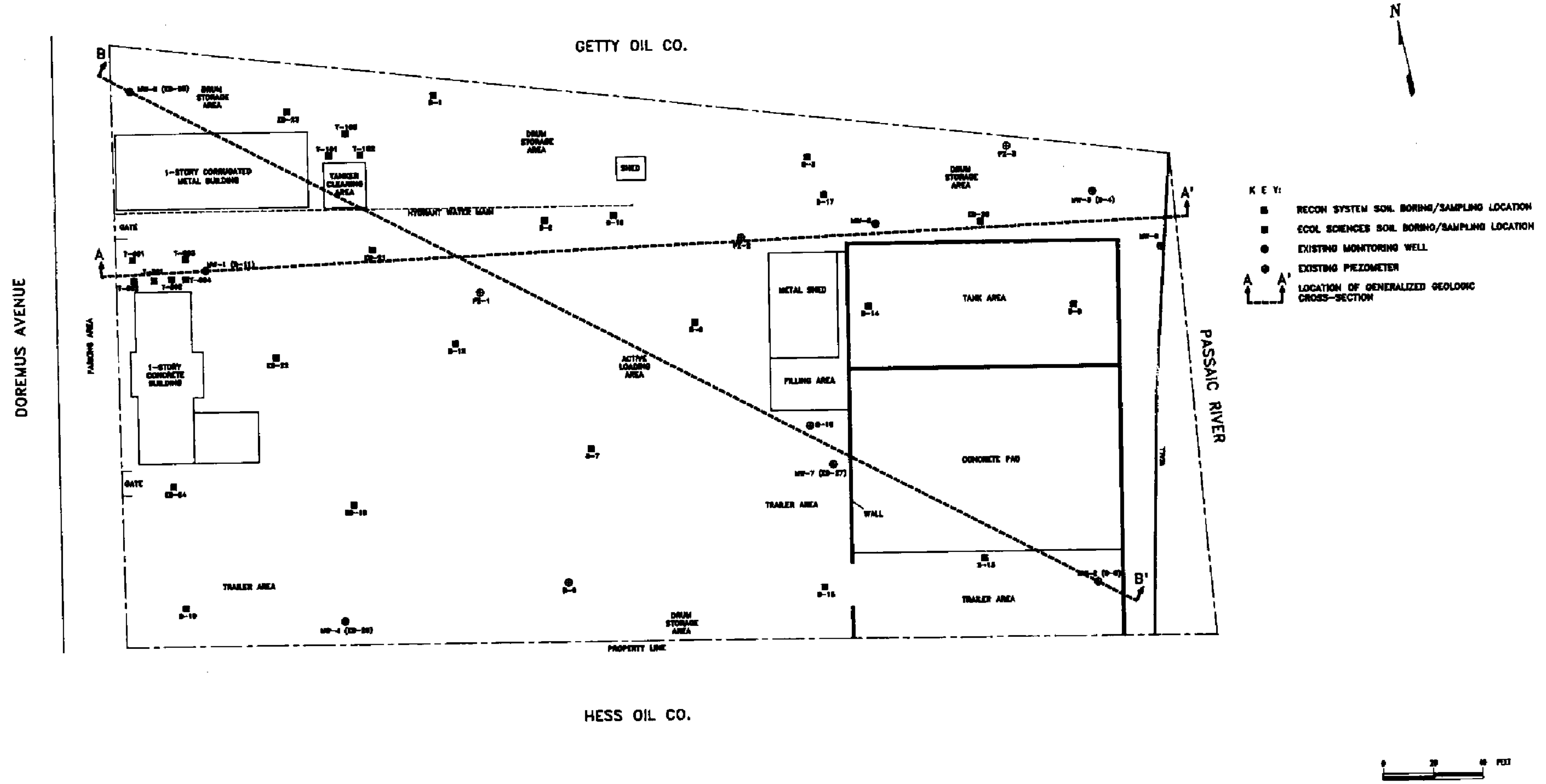
NOTE:
TOPO INFORMATION TAKEN FROM SURVEY PLAN PREPARED BY BORRIE, McDONALD & WATSON, NEWARK, N.J., JULY 1985.

INDUSTRIAL PETROCHEMICAL, INC.
NEWARK, NEW JERSEY

SITE PLAN
BEFORE RENOVATION

Dames & Moore, Inc.
CRANFORD, NEW JERSEY

FIGURE
2



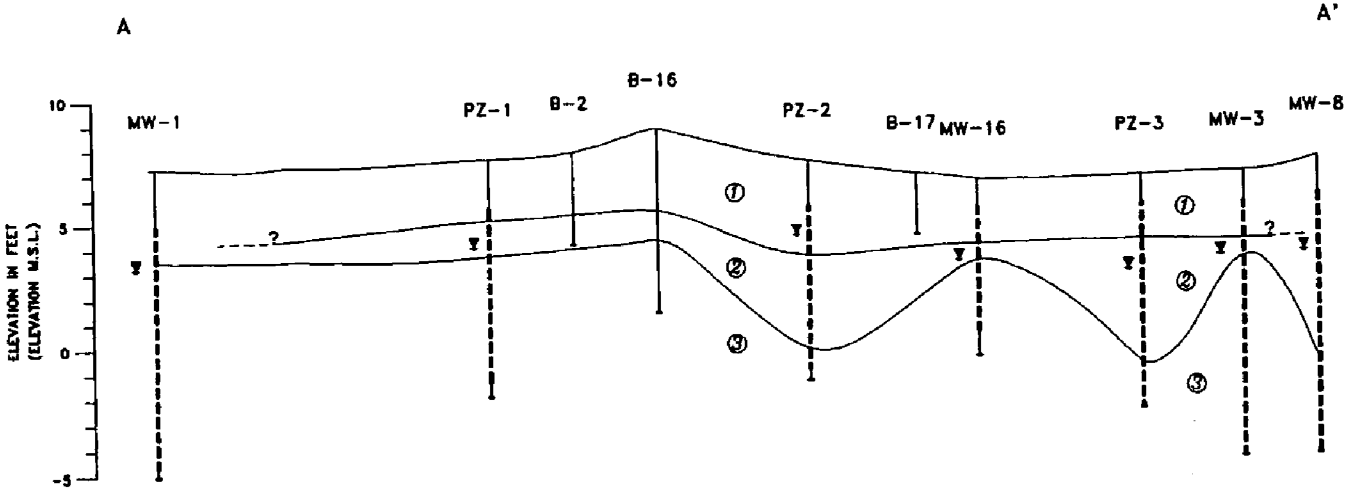
REFERENCE:
BASE MAP WAS PREPARED BASED ON FIGURE NO. 1
TITLED "SITE LOCATION MAP" PROVIDED BY ECOLSCIENCE, 1981

INDUSTRIAL PETROCHEMICAL, INC.
NEWARK, NEW JERSEY

SITE PLAN
AFTER RENOVATION

DATE: 12/10/92
JOB NO: 20400-001
FIGURE 3

Dames & Moore, Inc.



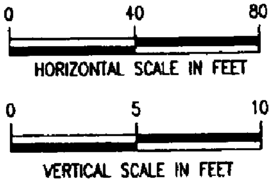
K E Y:

LOCATION OF WELL SCREEN

▼ ESTIMATED WATER LEVEL AS MEASURED ON 9/23/91

NOTES:

1. GENERALIZED CROSS-SECTION SHOWN IS CONCEPTUAL AND IS AN APPROXIMATE REPRESENTATION OF CONDITIONS REPORTED DURING THE INSTALLATION OF WELLS AND BORINGS.
2. IT SHOULD BE NOTED THAT CURRENT GROUND SURFACE CONDITIONS ARE DIFFERENT FROM THOSE SHOWN AS A 1-FOOT THICK CONCRETE SLAB WAS RECENTLY INSTALLED OVER MOST OF THE SITE.
3. SUBSURFACE CONDITIONS SHOWN REPRESENT OUR EVALUATION OF THE MOST PROBABLE CONDITIONS BASED ON INTERPRETATION OF PRESENTLY AVAILABLE DATA. SOME VARIATIONS FROM THESE CONDITIONS MUST BE EXPECTED.
4. FOR LOCATIONS SEE SITE MAP.



STRATA DESCRIPTION

① FILL; CONCRETE, ASPHALT AND CRUSHED STONE UNDERLAIN BY MISCELLANEOUS DEBRIS (BRICKS, COAL AND CONCRETE FRAGMENTS AND ASH) AND REDDISH BROWN AND GRAY/BLACK SAND WITH VARYING AMOUNTS OF SILT

② BLACK COARSE TO FINE SAND TO SANDY SILT, TRACE TO SOME SILT AND TRACE TO LITTLE GRAVEL

③ GRAY/BLACK-BROWN ORGANIC SILTY AND CLAY AND PEAT

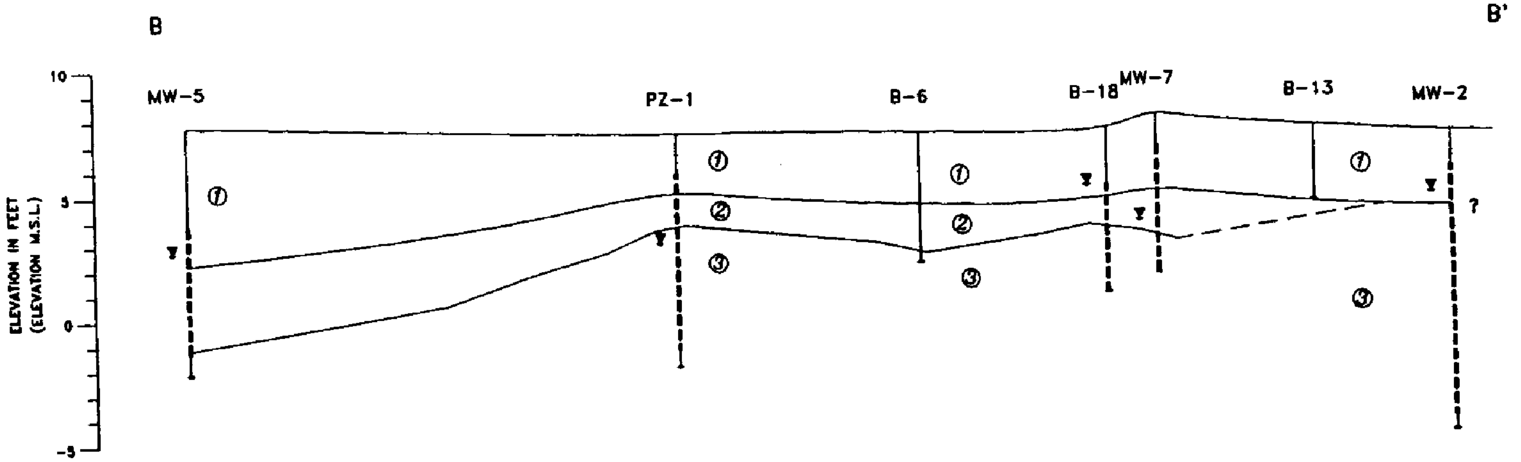
INDUSTRIAL PETROCHEMICAL CORPORATION
NEWARK, NEW JERSEY

GENERALIZED GEOLOGIC CROSS SECTION A-A'

DATE: 12/16/92
JOB NO: 25496-001
FIGURE 4

Dames & Moore, Inc.
CRANFORD, NEW JERSEY

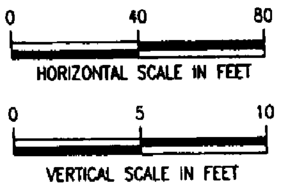
\25496\001-2



KEY:

┆ LOCATION OF WELL SCREEN

▼ ESTIMATED WATER LEVEL AS MEASURED ON 9/23/91



NOTES:

1. GENERALIZED CROSS-SECTION SHOWN IS CONCEPTUAL AND IS AN APPROXIMATE REPRESENTATION OF CONDITIONS REPORTED DURING THE INSTALLATION OF WELLS AND BORINGS.
2. IT SHOULD BE NOTED THAT CURRENT GROUND SURFACE CONDITIONS ARE DIFFERENT FROM THOSE SHOWN AS A 1-FOOT THICK CONCRETE SLAB WAS RECENTLY INSTALLED OVER MOST OF THE SITE.
3. SUBSURFACE CONDITIONS SHOWN REPRESENT OUR EVALUATION OF THE MOST PROBABLE CONDITIONS BASED ON INTERPRETATION OF PRESENTLY AVAILABLE DATA. SOME VARIATIONS FROM THESE CONDITIONS MUST BE EXPECTED.
4. FOR LOCATIONS SEE SITE MAP.

STRATA DESCRIPTION

① FILL: CONCRETE, ASPHALT AND CRUSHED STONE UNDERLAIN BY MISCELLANEOUS DEBRIS (BRICKS, COAL AND CONCRETE FRAGMENTS AND ASH) AND REDDISH BROWN AND GRAY/BLACK SAND WITH VARYING AMOUNTS OF SILT

② BLACK COARSE TO FINE SAND TO SANDY SILT, TRACE TO SOME SILT AND TRACE TO LITTLE GRAVEL

③ GRAY/BLACK-BROWN ORGANIC SILT AND CLAY AND PEAT

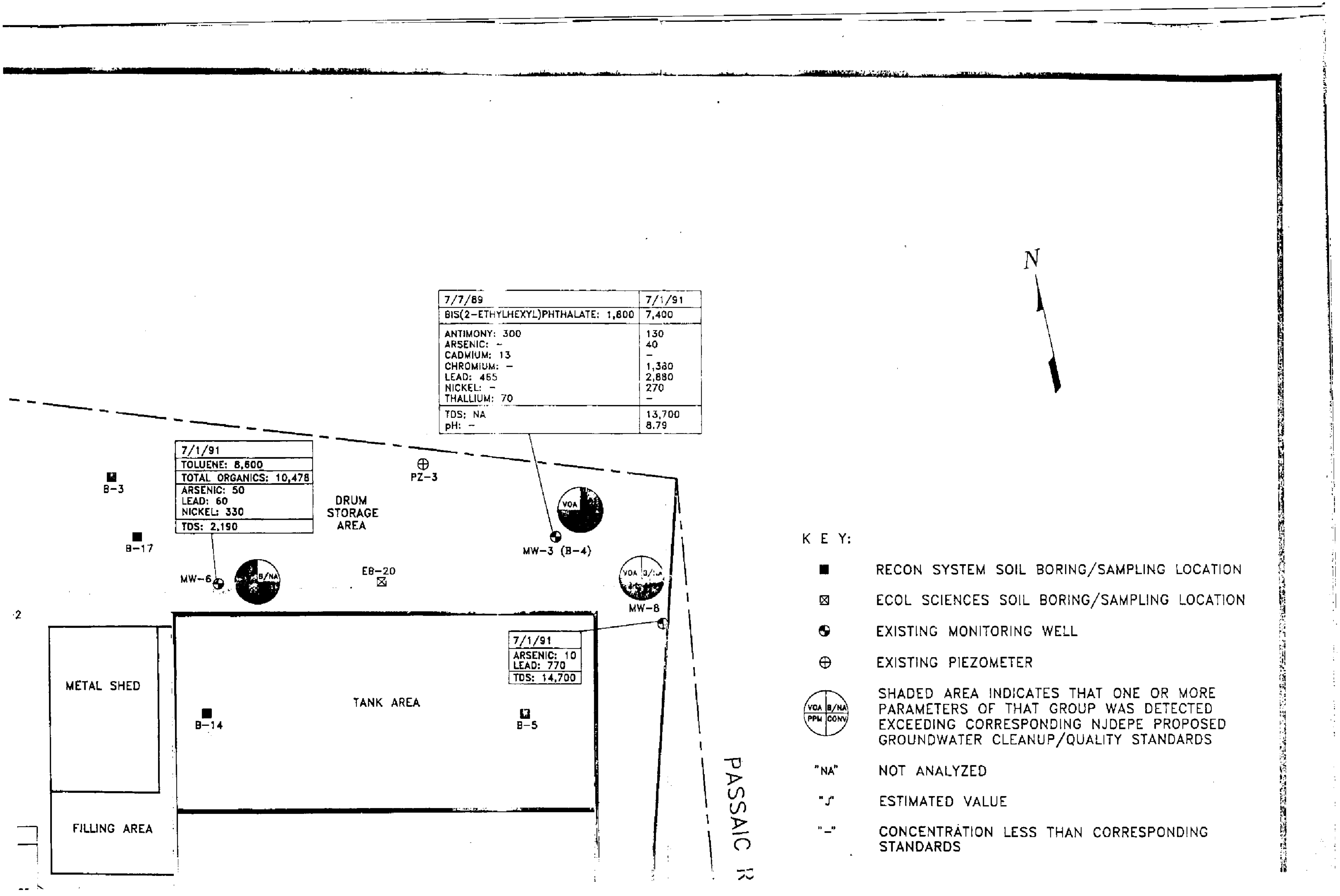
INDUSTRIAL PETROCHEMICAL CORPORATION
NEWARK, NEW JERSEY

GENERALIZED GEOLOGIC CROSS SECTION B-B'

DATE: 12/16/92	JOB NO: 25496-001	FIGURE 5

Dames & Moore, Inc.
CRANFORD, NEW JERSEY

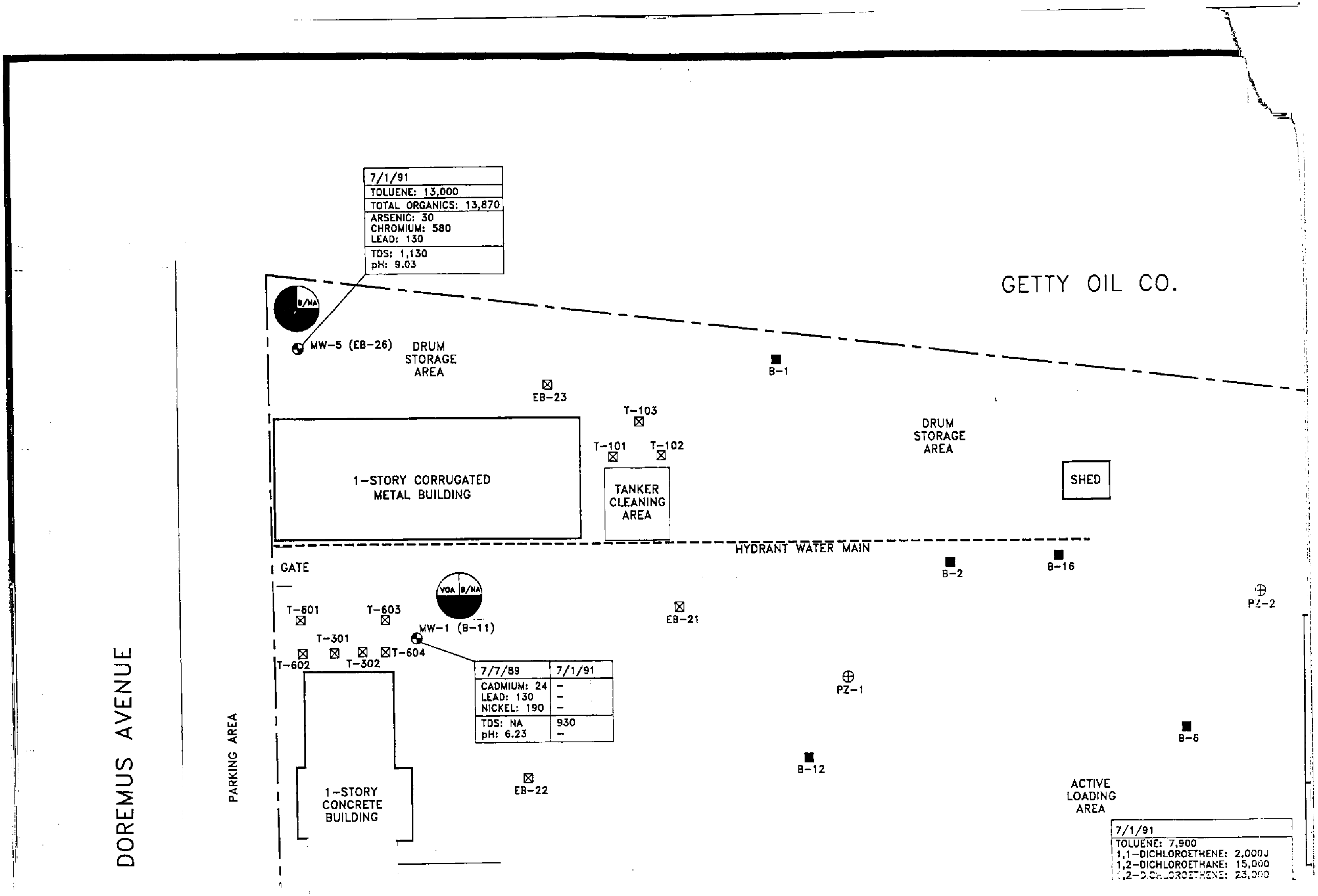
\25496\001-3



7/7/89	7/1/91
BIS(2-ETHYLHEXYL)PHTHALATE: 1,800	7,400
ANTIMONY: 300	130
ARSENIC: –	40
CADMIUM: 13	–
CHROMIUM: –	1,380
LEAD: 465	2,880
NICKEL: –	270
THALLIUM: 70	–
TDS: NA	13,700
pH: –	8.79

7/1/91
TOLUENE: 8,600
TOTAL ORGANICS: 10,478
ARSENIC: 50
LEAD: 60
NICKEL: 330
TDS: 2,190

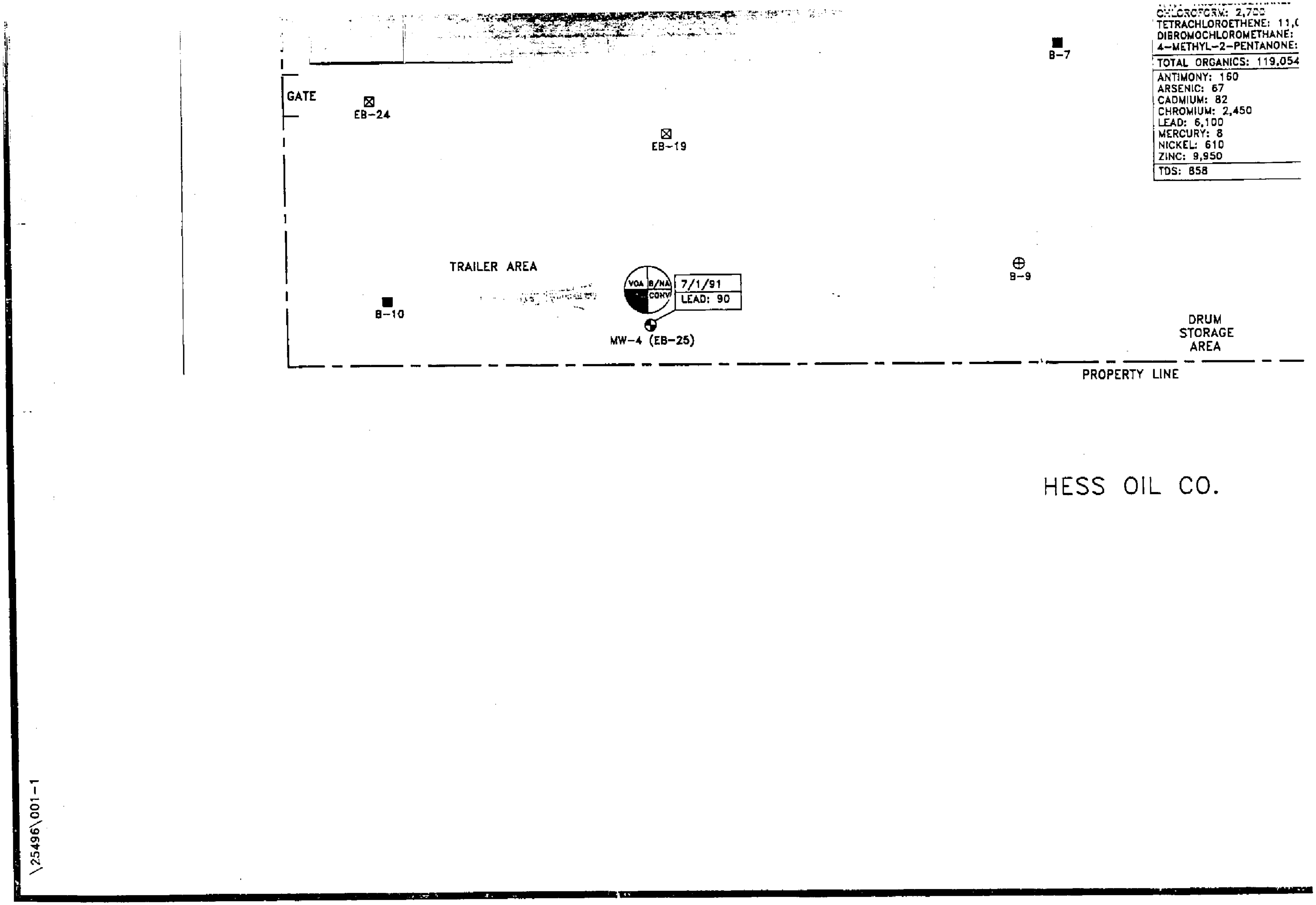
7/1/91
ARSENIC: 10
LEAD: 770
TDS: 14,700

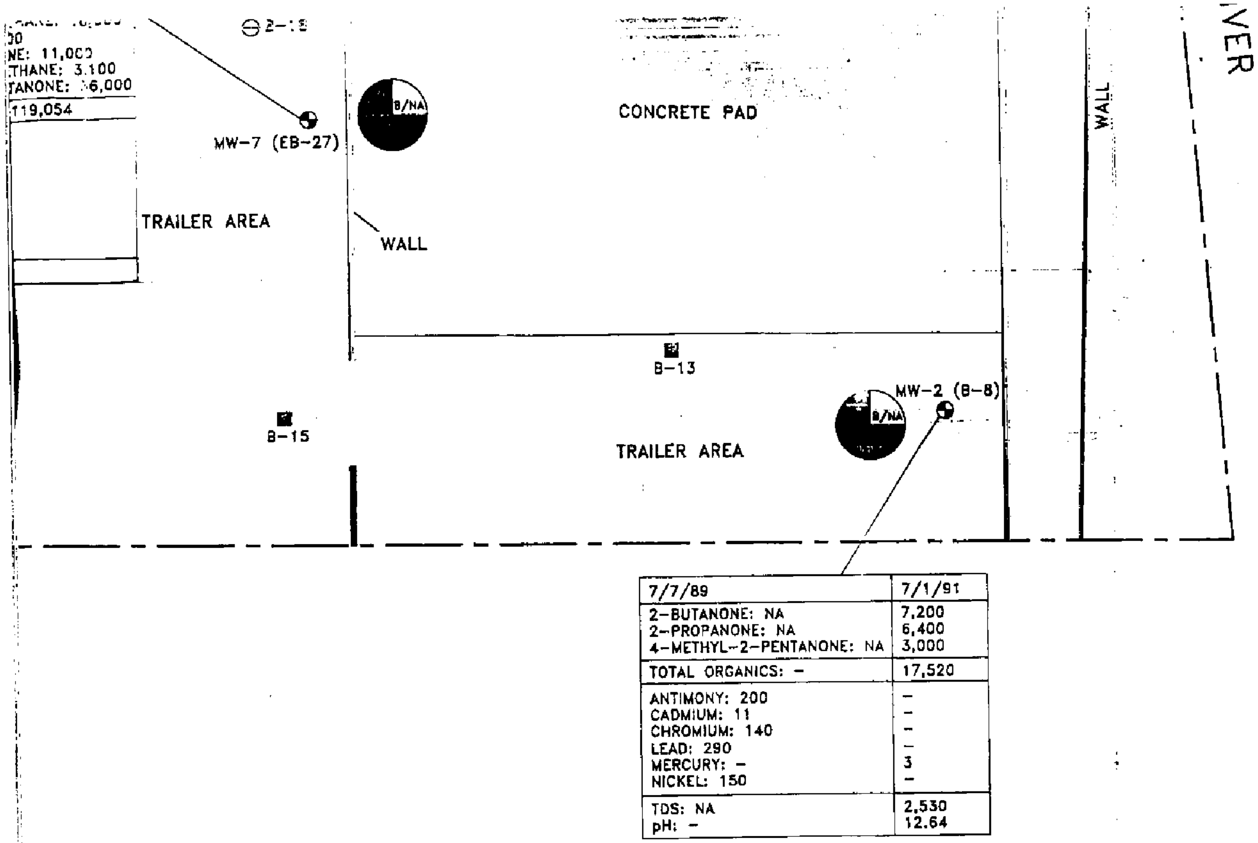


7/1/91
TOLUENE: 13,000
TOTAL ORGANICS: 13,870
ARSENIC: 30 CHROMIUM: 580 LEAD: 130
TDS: 1,130 pH: 9.03

7/7/89	7/1/91
CADMIUM: 24 LEAD: 130 NICKEL: 190	– – –
TDS: NA pH: 6.23	930 –

7/1/91
TOLUENE: 7,900 1,1-DICHLOROETHENE: 2,000J 1,2-DICHLOROETHANE: 15,000 1,2-DICHLOROETHENE: 23,000

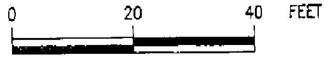

CHLOROFORM: 2,700
TETRACHLOROETHENE: 11,
DIBROMOCHLOROMETHANE:
4-METHYL-2-PENTANONE:
TOTAL ORGANICS: 119,054
ANTIMONY: 160
ARSENIC: 67
CADMIUM: 82
CHROMIUM: 2,450
LEAD: 6,100
MERCURY: 8
NICKEL: 610
ZINC: 9,950
TDS: 858
B-7
GATE
EB-24
EB-19
TRAILER AREA
VOA
B/NA
CONV
7/1/91
LEAD: 90
B-9
B-10
MW-4 (EB-25)
DRUM STORAGE AREA
PROPERTY LINE
HESS OIL CO.
\25496\001-1



7/7/89	7/1/91
2-BUTANONE: NA 2-PROPANONE: NA 4-METHYL-2-PENTANONE: NA	7,200 6,400 3,000
TOTAL ORGANICS: –	17,520
ANTIMONY: 200 CADMIUM: 11 CHROMIUM: 140 LEAD: 290 MERCURY: – NICKEL: 150	– – – – 3 –
TDS: NA pH: –	2,530 12.64

NOTES:

1. CONCENTRATIONS OF VOLATILE ORGANICS (VOA), BASE/NEUTRAL AND ACID EXTRACTABLE ORGANICS (B/NA) AND TOTAL ORGANICS SHOWN ARE THOSE EXCEEDING NJDEPE PROPOSED GROUNDWATER CLEANUP STANDARDS FOR CLASS IIB/III AQUIFERS.
2. CONCENTRATIONS OF METALS (PPM) SHOWN ARE THOSE EXCEEDING NJDEPE PROPOSED GROUNDWATER CLEANUP STANDARDS FOR CLASS IIA AQUIFERS (THESE STANDARDS ARE REFERENCED FOR SCREENING AND COMPARISON PURPOSES ONLY AS NO SPECIFIC CLEANUP STANDARDS WERE PROPOSED FOR METALS IN CLASS IIB/III AQUIFERS).
3. CONCENTRATIONS OF CONVENTIONAL PARAMETERS (CONV) INCLUDING TOTAL DISSOLVED SOLIDS (TDS) AND pH SHOWN ARE THOSE EXCEEDING NJDEPE PROPOSED GROUNDWATER QUALITY STANDARDS FOR CLASS IIA AQUIFERS (THESE STANDARDS ARE REFERENCED FOR COMPARISON AND SCREENING PURPOSES ONLY AS NO SPECIFIC CLEANUP STANDARDS WERE PROPOSED FOR THESE PARAMETERS IN CLASS IIB/III AQUIFERS).
4. CONCENTRATIONS OF VOA, B/NA AND PPM SHOWN ARE IN MICROGRAM PER LITER (ug/l).
5. CONCENTRATIONS OF TDS AND pH SHOWN ARE IN MILLIGRAM PER LITER (mg/l) AND STANDARD UNITS (s.u.), RESPECTIVELY.

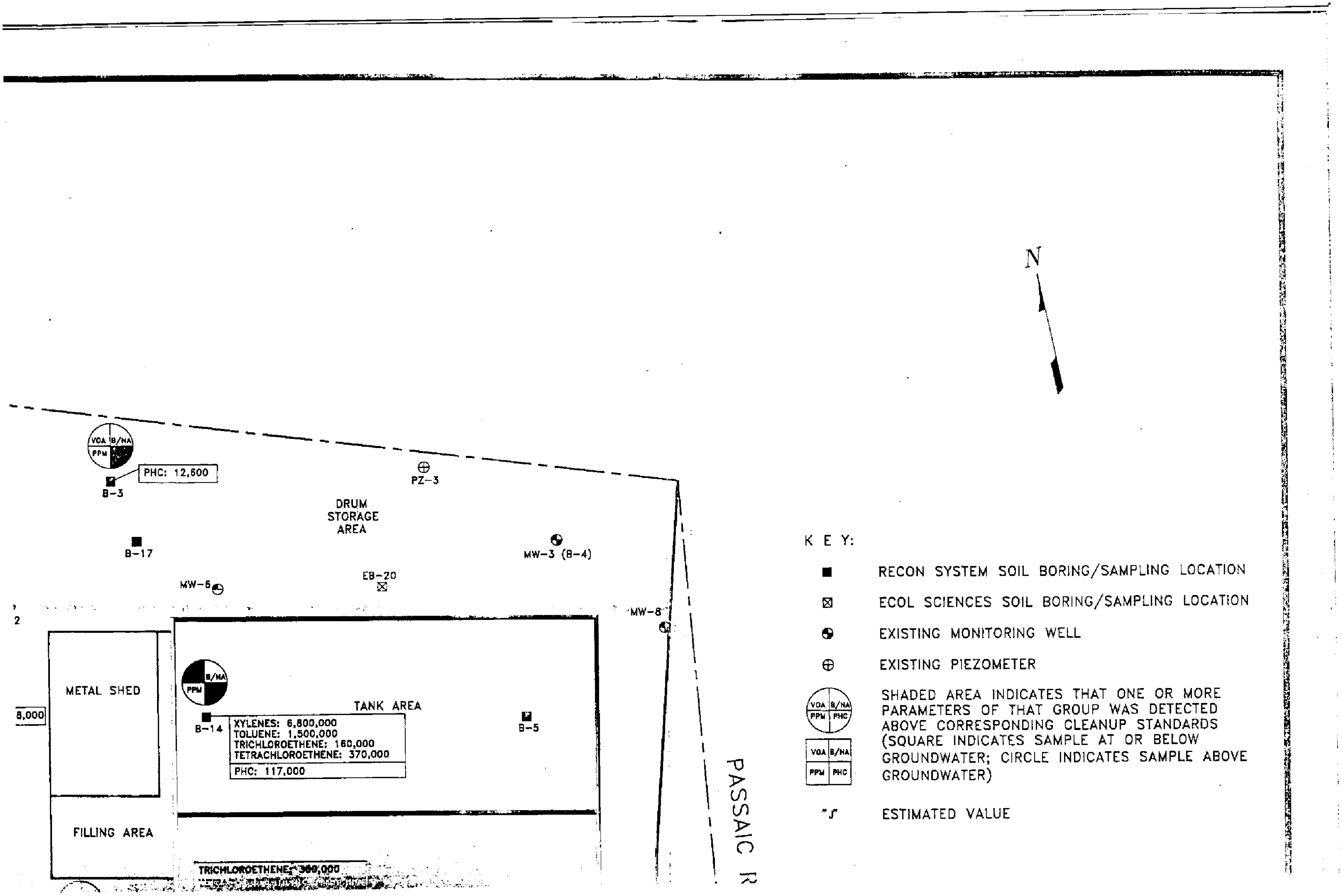


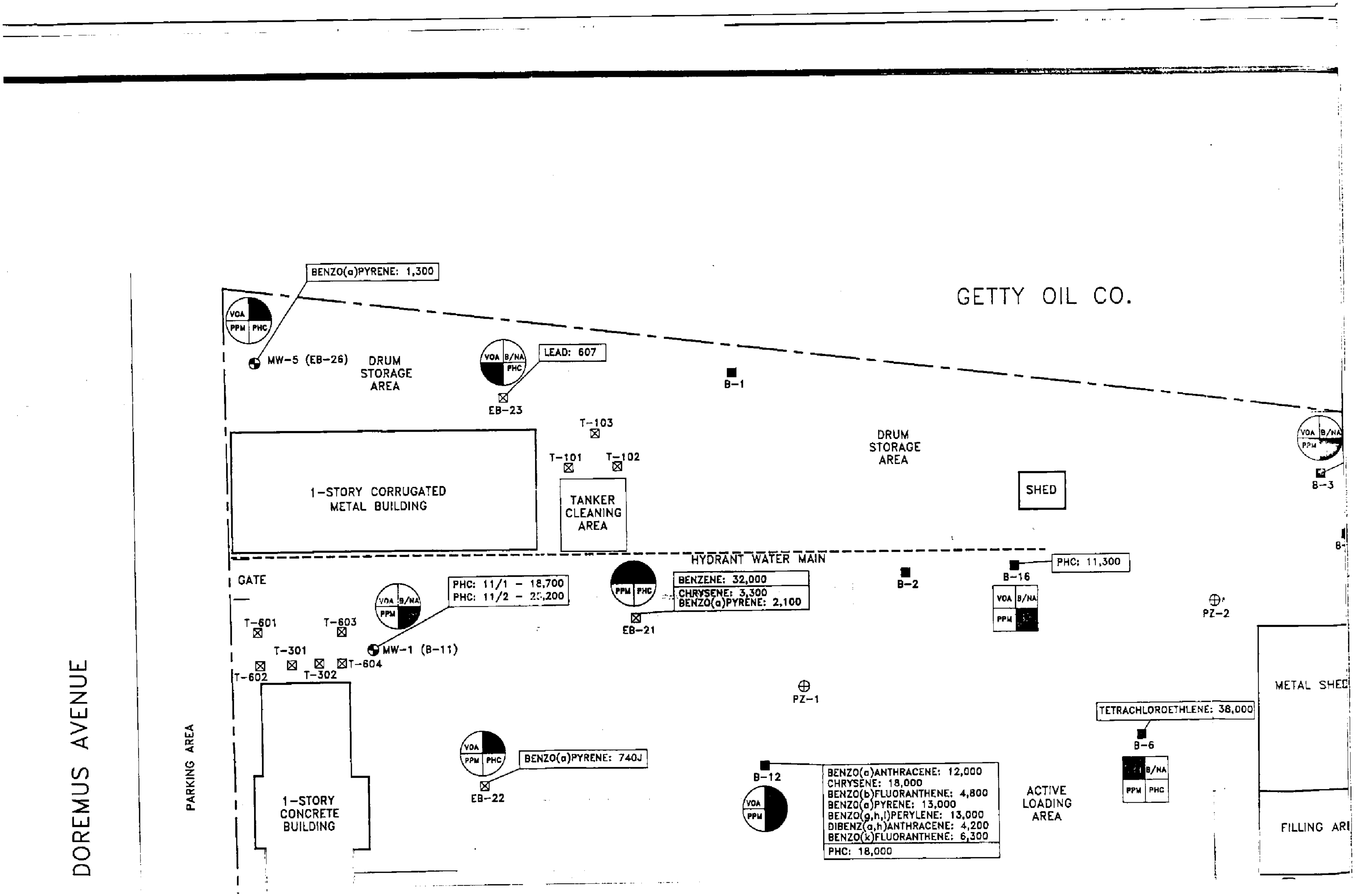
INDUSTRIAL PETROCHEMICAL, INC.
NEWARK, NEW JERSEY

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

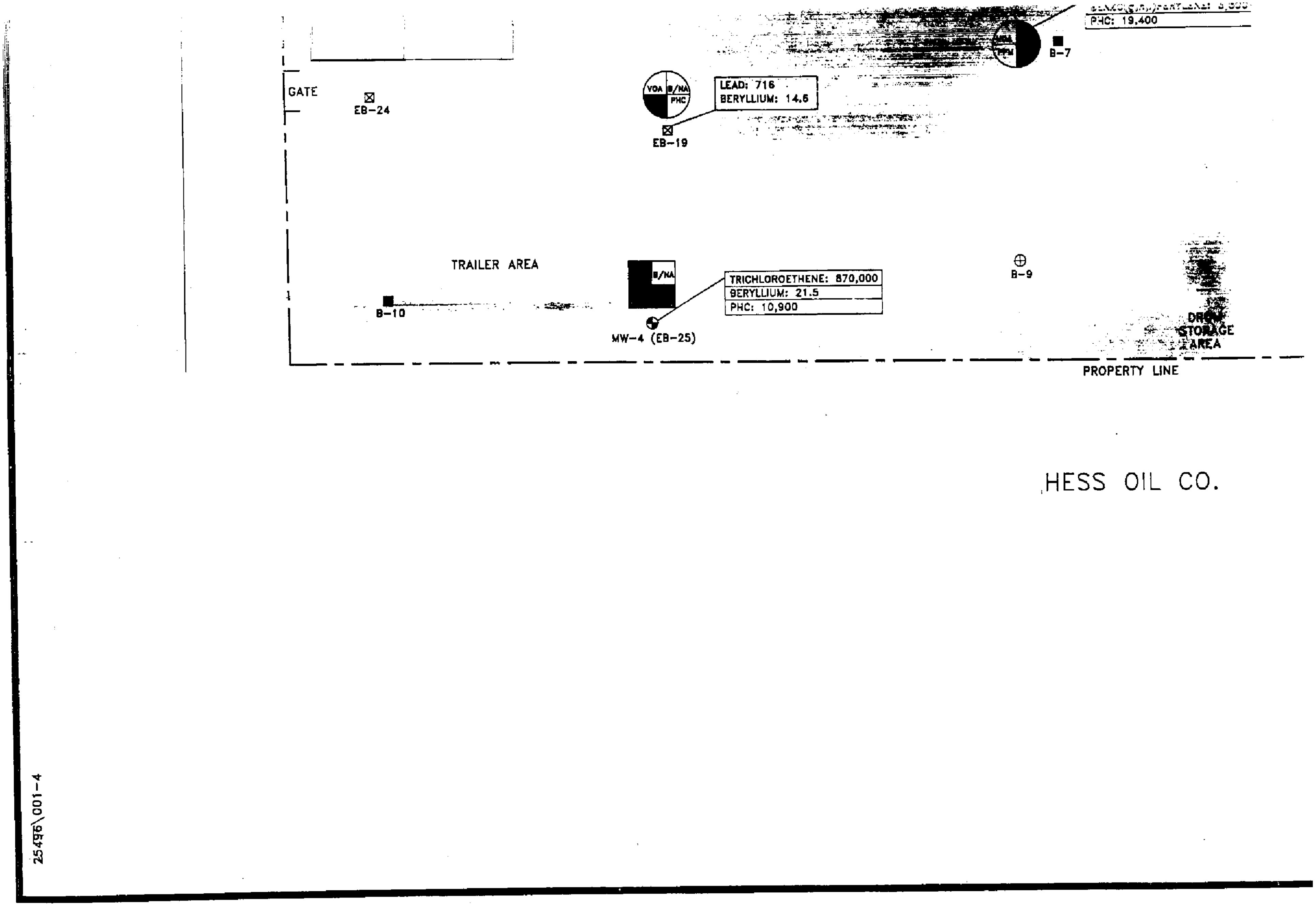
DATE: 12/15/92
JOB NO: 25496-001
FIGURE 7

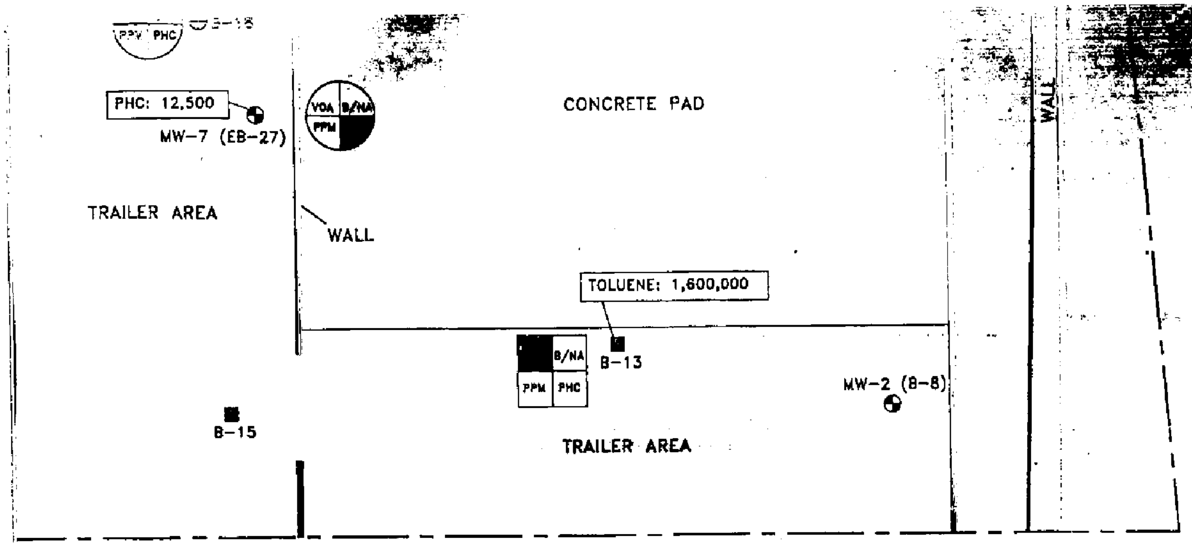
Dames & Moore, Inc.
CRANFORD, NEW JERSEY


N
VOA
B/NA
PPM
PHC: 12,600
B-3
PZ-3
DRUM STORAGE AREA
B-17
MW-3 (B-4)
MW-6
EB-20
MW-8
2
METAL SHED
8,000
B/NA
PPM
TANK AREA
B-14
XYLENES: 6,800,000
TOLUENE: 1,500,000
TRICHLOROETHENE: 160,000
TETRACHLOROETHENE: 370,000
PHC: 117,000
B-5
FILLING AREA
TRICHLOROETHENE: 360,000
PASSAIC R
K E Y:
■ RECON SYSTEM SOIL BORING/SAMPLING LOCATION
☒ ECOL SCIENCES SOIL BORING/SAMPLING LOCATION
EXISTING MONITORING WELL
⊕ EXISTING PIEZOMETER
VOA B/NA PPM PHC
SHADED AREA INDICATES THAT ONE OR MORE PARAMETERS OF THAT GROUP WAS DETECTED ABOVE CORRESPONDING CLEANUP STANDARDS (SQUARE INDICATES SAMPLE AT OR BELOW GROUNDWATER; CIRCLE INDICATES SAMPLE ABOVE GROUNDWATER)
"J" ESTIMATED VALUE



GETTY OIL CO.
DOREMUS AVENUE
PARKING AREA
BENZO(a)PYRENE: 1,300
VOA
PPM
PHC
MW-5 (EB-26)
DRUM STORAGE AREA
VOA B/NA PHC
LEAD: 607
EB-23
B-1
T-103
T-101
T-102
1-STORY CORRUGATED METAL BUILDING
TANKER CLEANING AREA
DRUM STORAGE AREA
SHED
VOA B/NA PPM
B-3
HYDRANT WATER MAIN
GATE
PHC: 11/1 - 18,700
PHC: 11/2 - 25,200
VOA B/NA PPM
T-601
T-603
MW-1 (B-11)
T-301
T-604
T-602
T-302
PPM PHC
BENZENE: 32,000
CHRYSENE: 3,300
BENZO(a)PYRENE: 2,100
EB-21
B-2
PHC: 11,300
B-16
VOA B/NA PPM
PZ-2
PZ-1
METAL SHED
TETRACHLOROETHLENE: 38,000
B-6
B/NA PPM PHC
1-STORY CONCRETE BUILDING
VOA PPM PHC
BENZO(a)PYRENE: 740J
EB-22
B-12
VOA PPM
BENZO(a)ANTHRACENE: 12,000
CHRYSENE: 18,000
BENZO(b)FLUORANTHENE: 4,800
BENZO(a)PYRENE: 13,000
BENZO(g,h,i)PERYLENE: 13,000
DIBENZ(a,h)ANTHRACENE: 4,200
BENZO(k)FLUORANTHENE: 6,300
PHC: 18,000
ACTIVE LOADING AREA
FILLING ARI


PHC: 19,400
B-7
GATE
EB-24
VOA
B/NA
PHC
LEAD: 716
BERYLLIUM: 14.6
EB-19
TRAILER AREA
B/NA
TRICHLOROETHENE: 870,000
BERYLLIUM: 21.5
PHC: 10,900
B-10
MW-4 (EB-25)
B-9
DRUM
STORAGE
AREA
PROPERTY LINE
HESS OIL CO.
25496\001-4



NOTES:
1. CONCENTRATIONS SHOWN ARE THOSE EXCEEDING NJDEPE PROPOSED NON-RESIDENTIAL SURFACE SOIL CLEANUP STANDARDS.
2. CONCENTRATIONS OF VOLATILE ORGANICS (VOA) AND BASE/NEUTRAL AND ACID EXTRACTABLE ORGANICS (B/NA) SHOWN ARE IN MICROGRAM PER KILOGRAM (ug/kg).
3. CONCENTRATIONS OF PETROLEUM HYDROCARBONS (PHC) AND PRIORITY POLLUTANT METALS (PPM) SHOWN ARE IN MILLIGRAM PER KILOGRAM (mg/kg).

INDUSTRIAL PETROCHEMICAL, INC.
NEWARK, NEW JERSEY

SUMMARY OF SOIL ANALYTICAL RESULTS

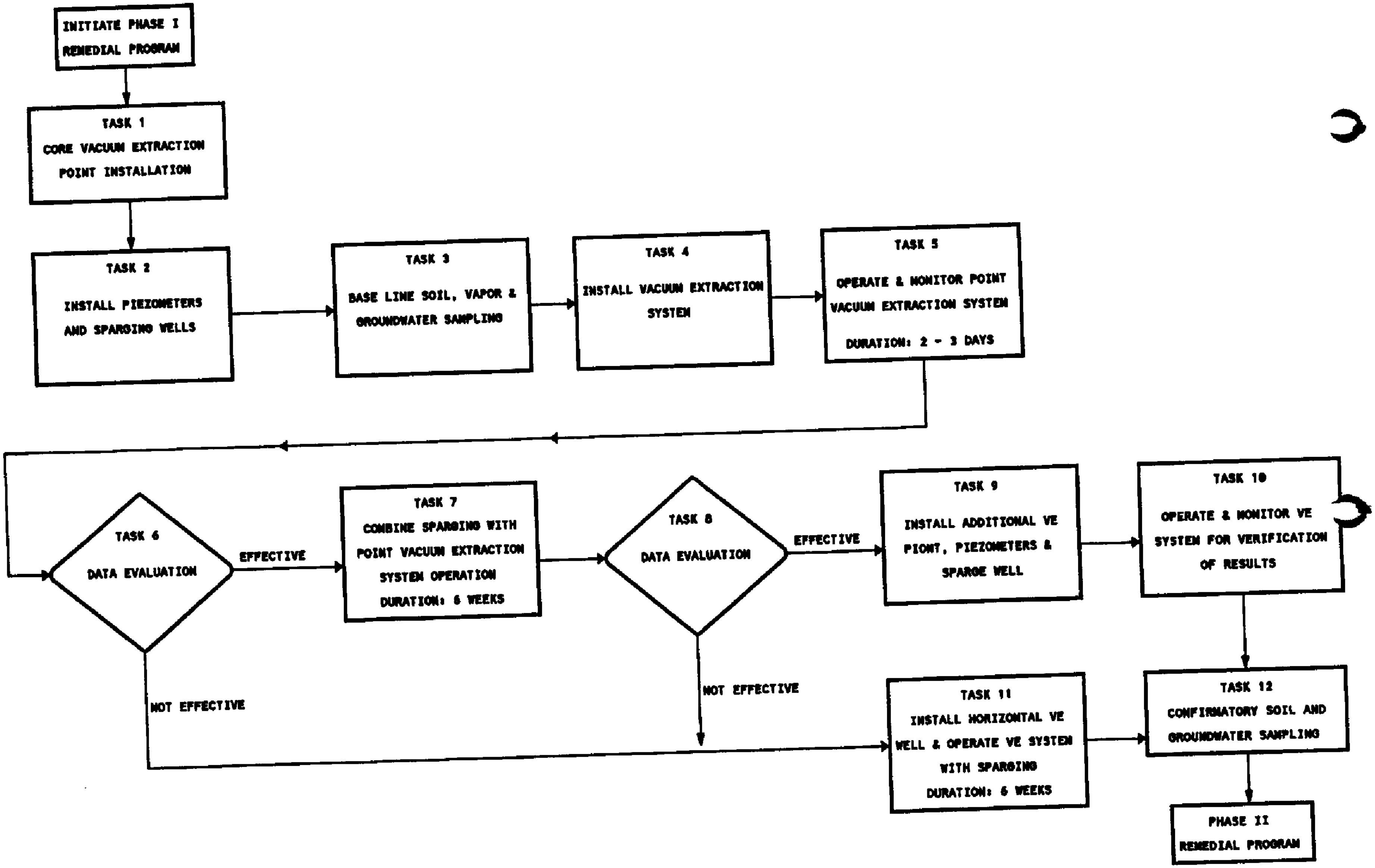
DATE: 12/15/92
JOB NO: 25496-001
FIGURE
6

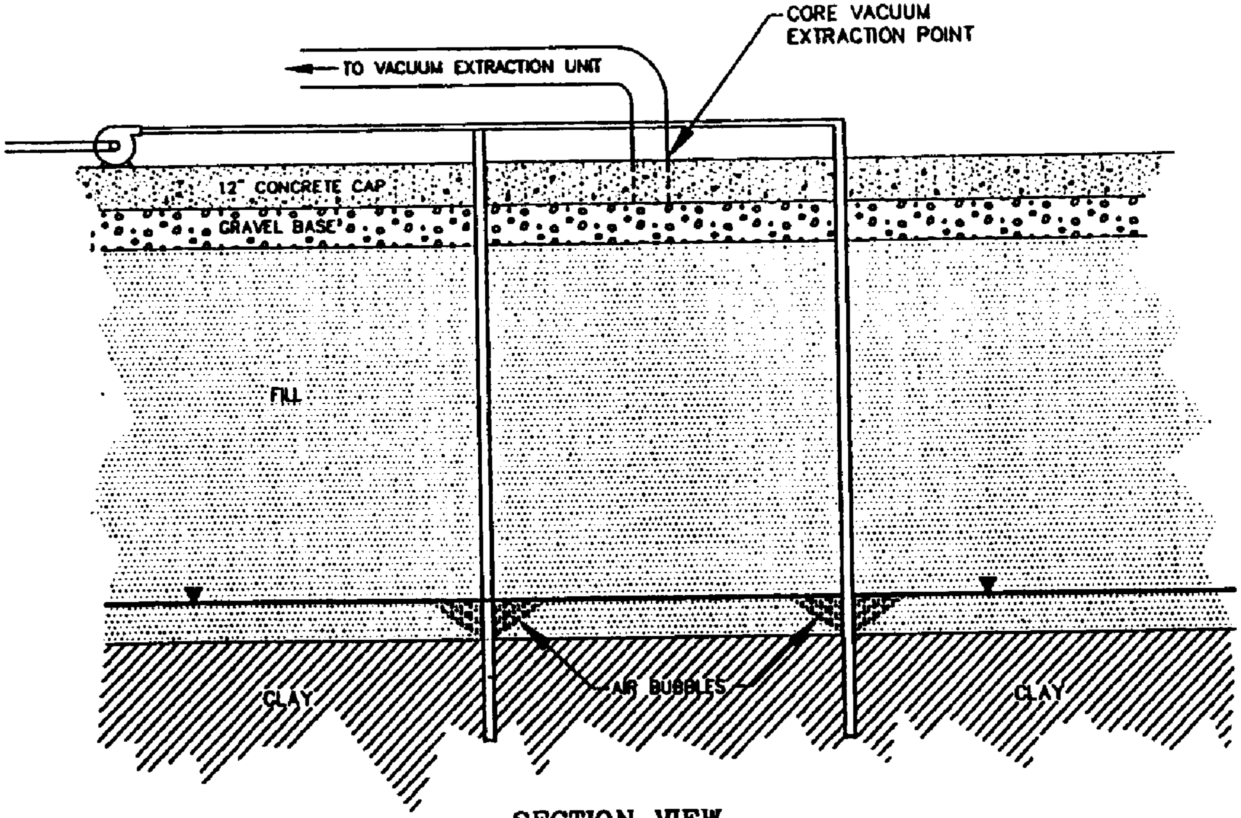
Dames & Moore, Inc.
CRANFORD, NEW JERSEY

FIGURE 8

PROPOSED SEQUENCE OF REMEDIAL FIELD PROGRAM

INDUSTRIAL PETROCHEMICALC INC., NEWARK, NEW JERSEY





SECTION VIEW

NOTES:

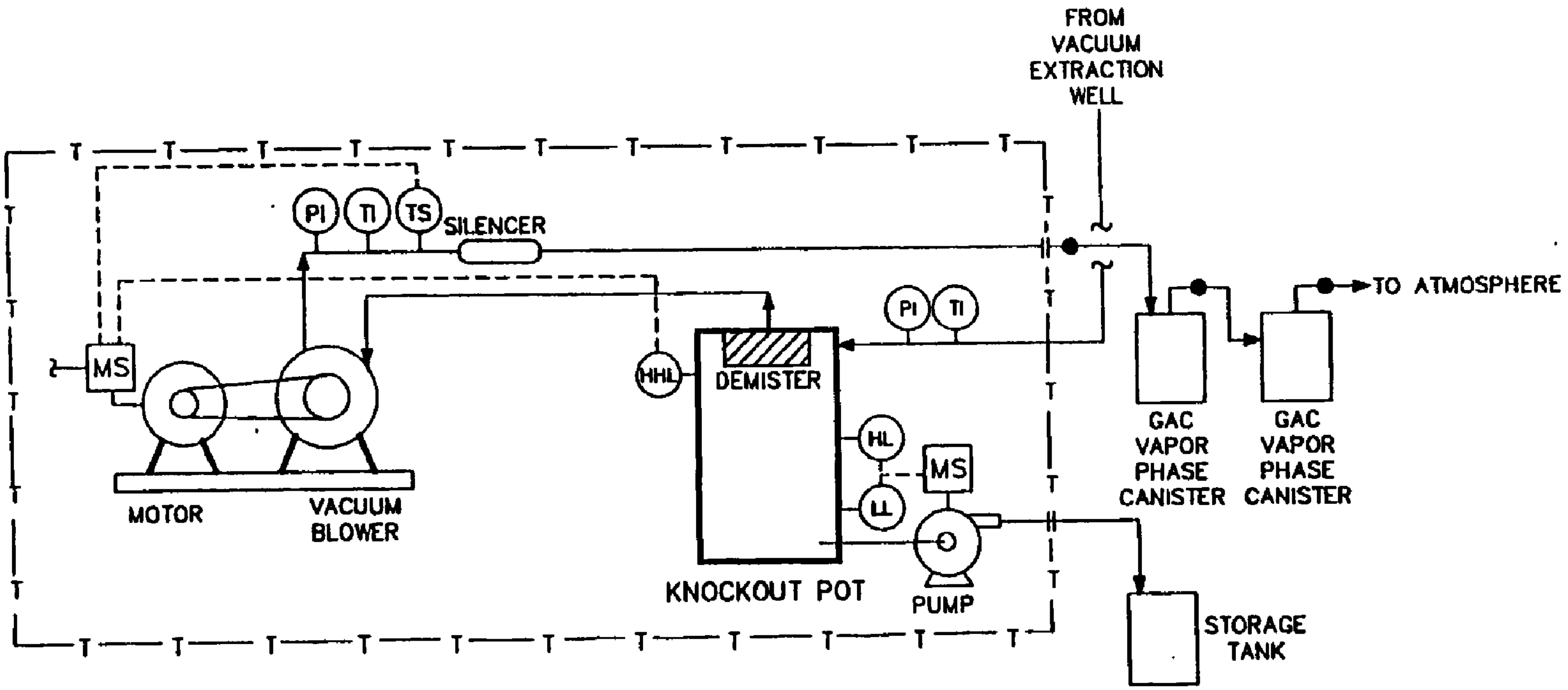
1. TRENCH APPROXIMATELY 20 FEET LONG.
2. V.E. LINE WILL BE INSTALLED THE LENGTH OF THE TRENCH AND CONSTRUCTED OF 4" PVC WITH PERFORATED HOLES AT 45° ANGLES.

INDUSTRIAL PETROCHEMICAL, INC.
NEWARK, NEW JERSEY

CORE VACUUM EXTRACTION/
AIR SPARGE WELLS

Dames & Moore, Inc.
CRANFORD, NEW JERSEY

FIGURE
9



EXPLANATION:

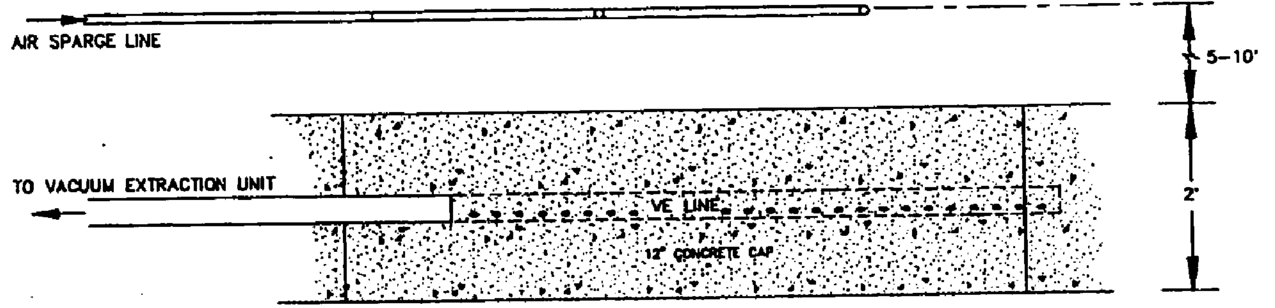
-T-T- = TRAILER MOUNTED EQUIPMENT
PI = PRESSURE INDICATOR
TI = TEMPERATURE INDICATOR
TS = TEMPERATURE SWITCH
HL = HIGH LEVEL SWITCH
LL = LOW LEVEL SWITCH
HHL = HIGH HIGH LEVEL SWTICH
MS = MOTOR STARTER
● = SAMPLE PORT

INDUSTRIAL PETROCHEMICAL, INC.
NEWARK, NEW JERSEY

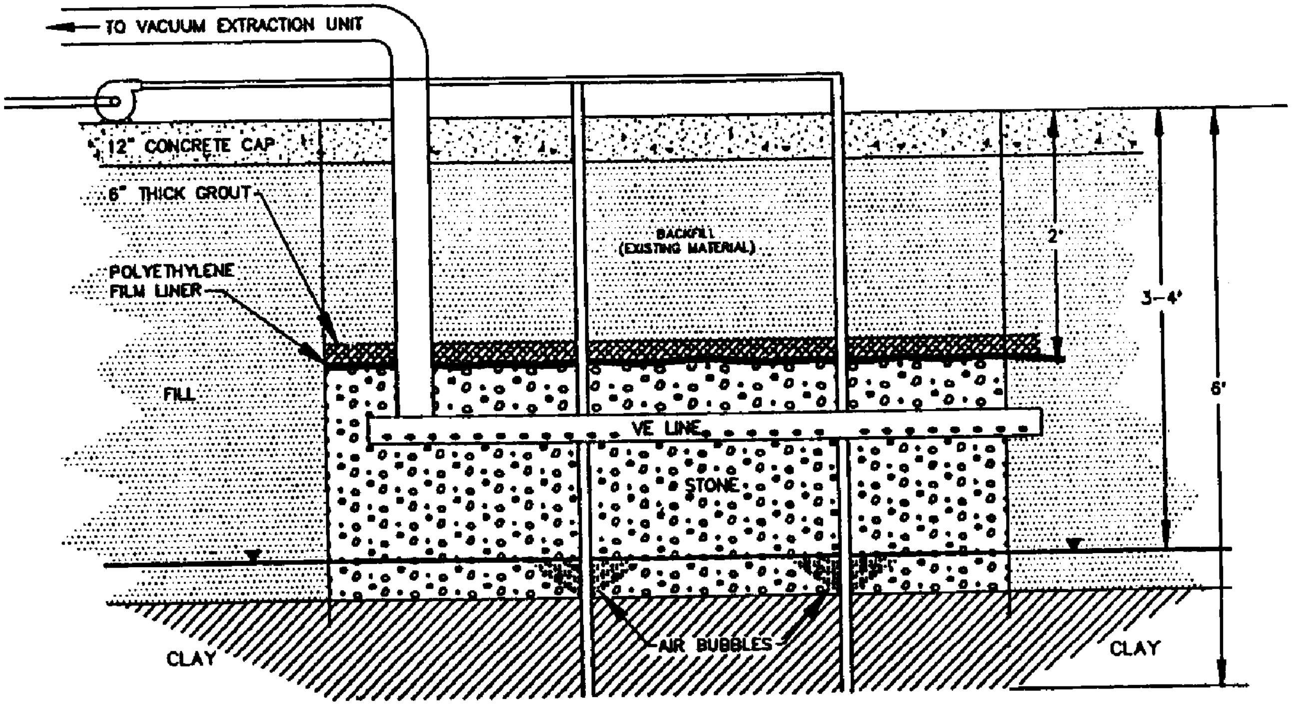
TYPICAL VES PILOT PROCESS
AND INSTRUMENTATION DIAGRAM

Dames & Moore, Inc.
CRANFORD, NEW JERSEY

FIGURE
10



PLAN VIEW



SECTION VIEW

NOTES:

1. TRENCH APPROXIMATELY 20 FEET LONG.
2. V.E. LINE WILL BE INSTALLED THE LENGTH OF THE TRENCH AND CONSTRUCTED OF 4" PVC WITH PERFORATED HOLES AT 45° ANGLES.

INDUSTRIAL PETROCHEMICAL, INC.
NEWARK, NEW JERSEY

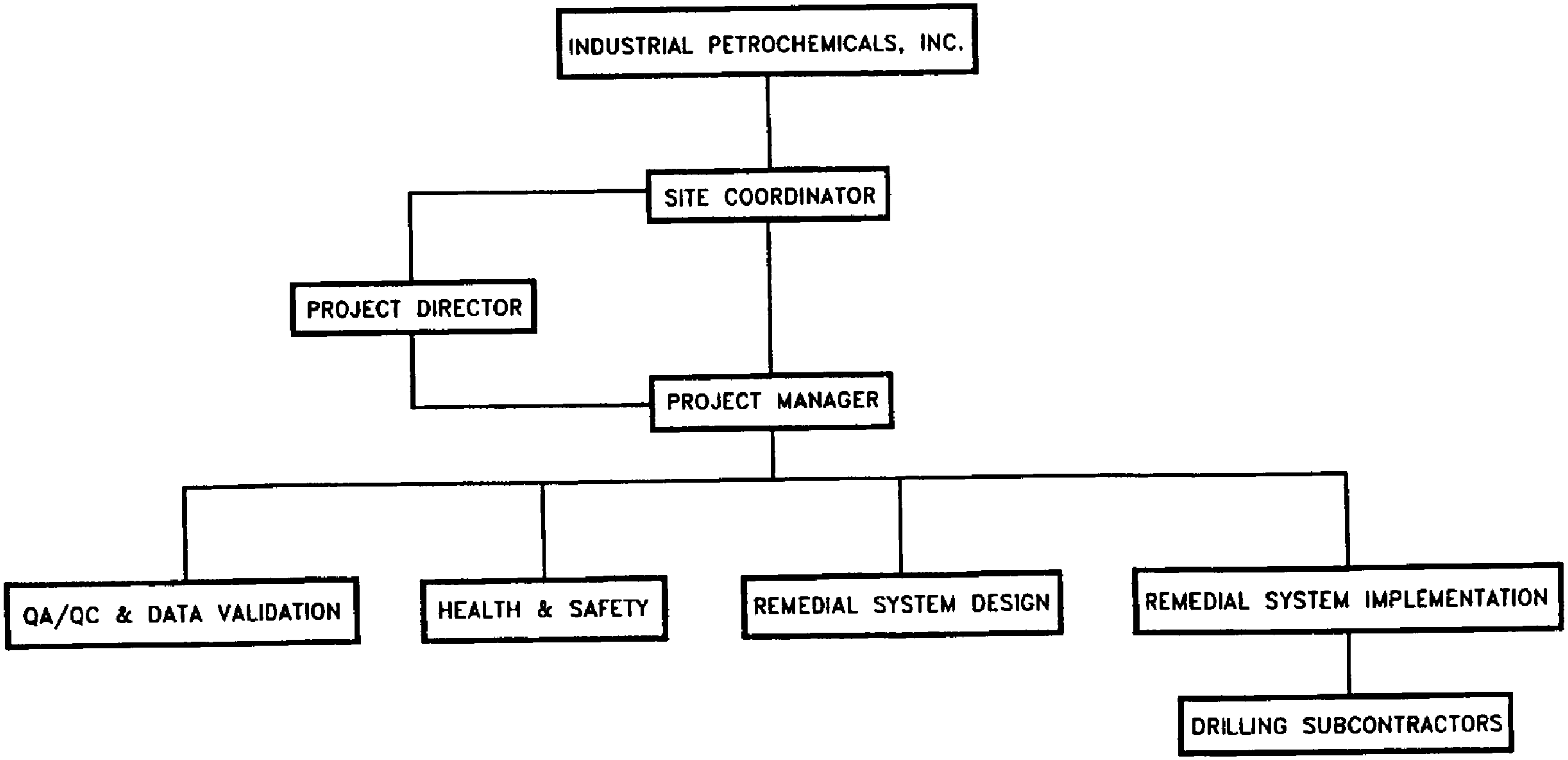
HORIZONTAL VACUUM EXTRACTION/
AIR SPARGE WELLS

Dames & Moore, Inc.
CRANFORD, NEW JERSEY

FIGURE
11

PROJECT ORGANIZATION CHART

INDUSTRIAL PETROCHEMICALS INC.
NEWARK, NEW JERSEY
ECRA CASE NO. 86317



Dames & Moore, Inc.
CRANFORD, NEW JERSEY

FIGURE
12

DAMES & MOORE

WATER SAMPLING LOG

Project No. ______ Page ______ of ______

Site Location ______

Site Well No. ______ Coded/ Replicate No. ______ Date ______

Weather ______ Time Sampling Began ______ Time Sampling Completed ______

EVACUATION DATA

Description of Measuring Point (MP) ______

Height of MP Above/Below Land Surface ______ MP Elevation ______

Total Sounded Depth of Well Below MP ______ Water-Level Elevation ______

Depth to Water Below MP ______ Diameter of Casing ______

Water Column in Well ______ Gallons Pumped/Bailed Prior to Sampling ______

Gallons per Foot ______ Sampling Pump Intake Setting (feet below land surface) ______

Gallons in Well ______

Evacuation Method ______

SAMPLING DATA/FIELD PARAMETERS

Color ______ Odor ______ Appearance ______ Temperature ______ °F/°C

Other (specific ion; OVA; HNu; etc.) ______

______

Specific Conductance, umhos/cm ______ pH ______

Sampling Method and Material ______

Constituents Sampled	Preservative
______	______
______	______
______	______

Remarks ______

Sampling Personnel ______

WELL CASING VOLUMES

GAL/FT	2" = 0.16	4" = 0.65
	3" = 0.37	6" = 1.47

FIGURE 13

DAMES & MOORE

CHAIN OF CUSTODY RECORD

PROJECT NO.

PROJECT NAME

INDUSTRIAL HYGIENE SAMPLE Y ☐ N ☐

SAMPLERS: *(Signature)*

(Printed)

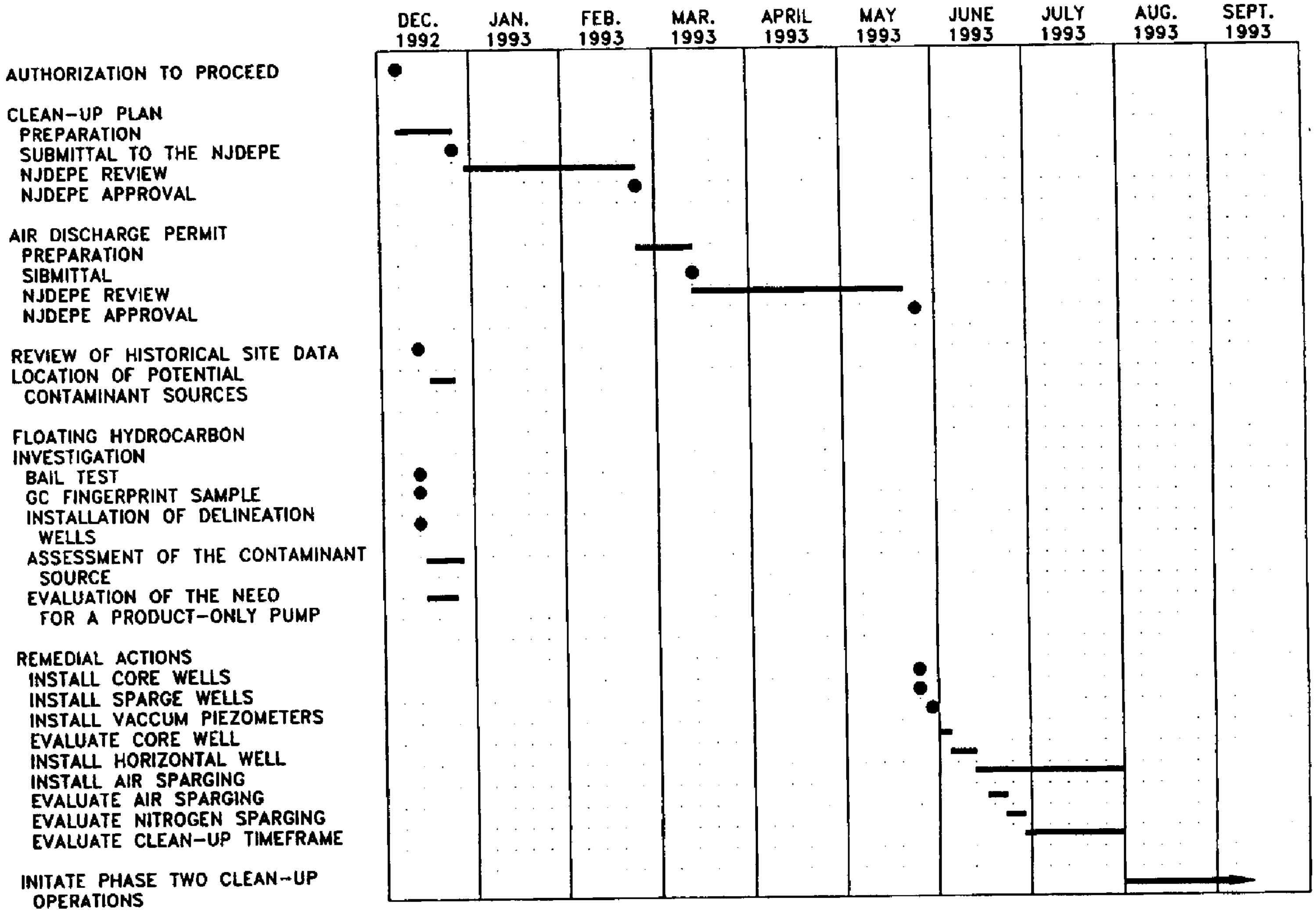
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PARAMETERS								REMARKS

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
(Printed)		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
(Printed)		(Printed)		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

FIGURE 14



PROJECT SCHEDULE
INDUSTRIAL PETROCHEMICALS, INC.

\25496\001-6

Dames & Moore, Inc.
CRANFORD, NEW JERSEY

FIGURE
15

APPENDIX A

BORING NO. S-1

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

ID NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP			ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS	DRILLER CMC		INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800	BIT TYPE 6'' AUGER	DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER	HAMMER WEIGHT ----- / DROP -----	TOTAL DEPTH 2.5'	WATER LEVEL NA

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-2'' Black Top	
					2-6'' Trap Rock	
			1		6''-1' gry gravelly SAND	
					1-1.5' brn CLAY	
					1.5-2' Trap Rock w/ Sand	
			2		2-2.5' gry gravelly SAND	
					Sample 2-2.5'	
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

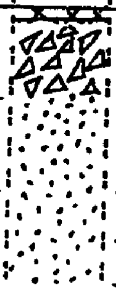
BORING NO. B-2

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

ID NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL	PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP		ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS	DRILLER CMC	INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800	BIT TYPE 6'' AUGER	DATE STARTED 6-1-89 / DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER	HAMMER WEIGHT ------ / DROP ------	TOTAL DEPTH 3' / WATER LEVEL NA

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-2'' Black Top	
					2''-1' Trap Rock	
			1		1-1.5' rd brn silty SAND	
					1.5-3' blk gravelly SAND	
			2			
					SAMPLE 2.5-3'	
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

BORING NO. B-3

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

ID NO.

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE 6'' AUGER
DATE STARTED 6-1-89
DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT ------
DROP ------
TOTAL DEPTH 2.5'
WATER LEVEL 2.5'

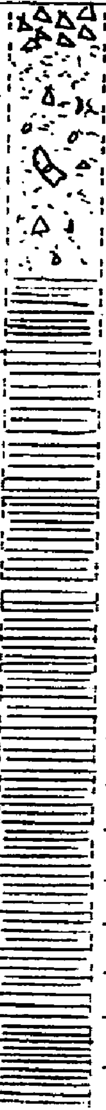
SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-6'' Trap Rock	
					6''-2.5' blk gravelly SAND	
			1			
					Sample 2-2.5'	
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

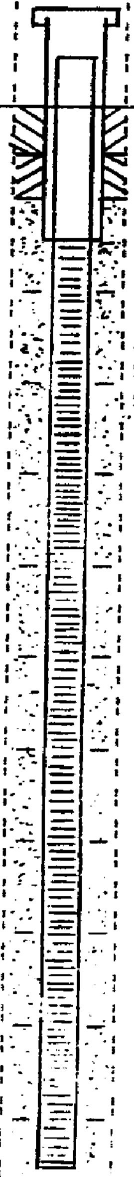
RECON SYSTEMS, INC.
THREE BRIDGES, NJ

MONITORING WELL NO. MW-3
(Boring No. B-4)
PERMIT NO. 26-16040-4
SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NEW JERSEY
LOCATION OF WELL 18' N of TANK FARM N WALL & 6' W of E WALL			ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR EDI	DRILLER SCOTT		INSPECTOR BM
DRILLING RIG TYPE MOBILE B-80	BIT TYPE 12''	DATE STARTED 6-19-89	DATE COMPLETED 6-19-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON	HAMMER WEIGHT 140lb / DROP 30''	TOTAL DEPTH 11.5'	WATER LEVEL 2.5'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT. 6.67	WATER	LITHOLOGY	WELL CONSTRUCTION
					TRAPROCK 0-0.5'	Cap
					FILL 0.5-3.0' sandy w/ concrete and traprock.	Master lock # 2010
			1 5.67			Casing : steel : 3.5' ag : 1.5' bg :4 inch ID.
			2 4.67			Cement grout 0-0.5'
			3 3.67		CLAY 3-13' gray to black clay, wet and saturated with oil.	Bento. seal 0.5-1.0'
						Sand pack 1-11.5'
			4 2.67			Screen : 1.5-11.5' : 4 inch ID. : 0.020 slot : STAINLESS - STEEL
			5 1.67		DRILLED TO 13'	ag = above grade bg = below grade
			6			
			7			
			8			
			9			
			10			
			11			
			12			





RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. B-3

ID NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL	PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP		ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS	DRILLER CMC	INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800	BIT TYPE 6'' AUGER	DATE STARTED 6-1-89 / DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER	HAMMER WEIGHT ------ / DROP ------	TOTAL DEPTH 1' / WATER LEVEL 1'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-12'' blk silty CLAY visible oil	
			1		Sampled 6-12''	
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

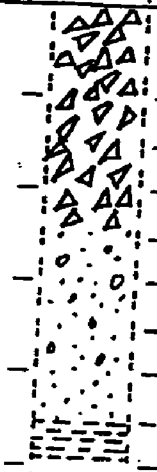
RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. B-2

ID NO.

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE 6'' AUGER
DATE STARTED 5-31-89
DATE COMPLETED 5-31-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT ------
DROP ------
TOTAL DEPTH 5'
WATER LEVEL NA

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-2.5' Trap Rock	
			1			
			2			
					2.5-4' blk gravelly SAND	
			3			
			4		4-4.5' brn SAND	
					4.5-5' blk CLAY	
			5			
					Sampled 4.5-5'	
			6			
			7			
			8			
			9			
			10			
			11			
			12			

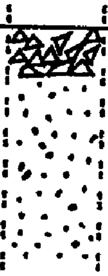
BORING NO. B-7

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

ID NO.

SHEET 1 OF 1

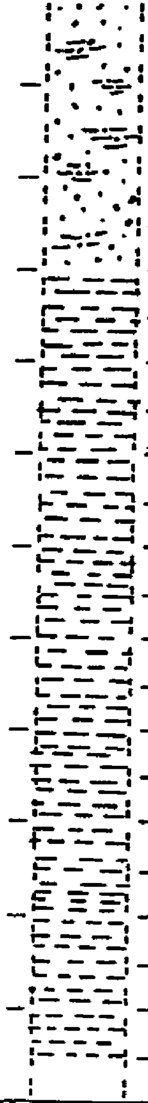
JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE 6'' AUGER
DATE STARTED 6-1-89
DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT ------
DROP ------
TOTAL DEPTH 2.5'
WATER LEVEL 1'

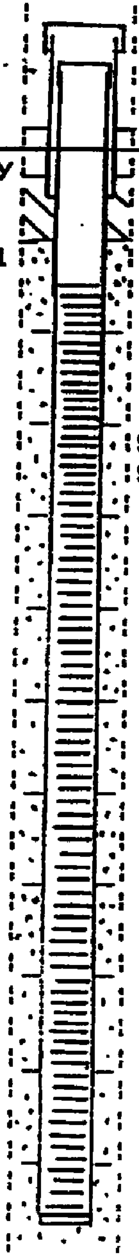
SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-6'' Trap Rock Petroluem Odor 6''-2.5' blk gravelly SAND	
			1	∇	Sample taken 1' below grade in side wall	
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

MONITORING WELL NO. MW-2
(Boring No. B-8)
PERMIT NO. 2616039-1
SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF WELL 11' W and 24' N of the SE corner
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR ENVIRONMENTAL DRILLING INC
DRILLER BOB
INSPECTOR DRG
DRILLING RIG TYPE MOBILE B-60
BIT TYPE 10'' auger
DATE STARTED 6-1-89
DATE COMPLETED 6-1-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON
HAMMER WEIGHT 140lb
DROP 30''
TOTAL DEPTH 12'
WATER LEVEL 2.8'





SAMPLE NO.	SAMPLE BLOWS	DEPTH FT. 6.88	WATER	LITHOLOGY	WELL CONSTRUCTION
				0-3' Grey-Pink silty Sandy FILL with 6-12'' Concrete and Trap rock, 1'' steel cable etc.	1.5'to 3.5' Carbon Steel Riser
		1 5.88			1' to 6'' Bentonite
		2 4.88	▽		12' to 1' Sand
		3 3.88		3-12' Grey Black CLAY wet, saturated with thick oil OVA 20-30 1' above hole.	1.5' to 11.5' Stainless Steel Screen
		4			
		5			
		6			
		7			
		8			
		9			
		10			
		11			
		12			

RECON SYSTEMS. INC.
THREE BRIDGES. NJ

MONITORING WELL NO. B-9

PERMIT NO.

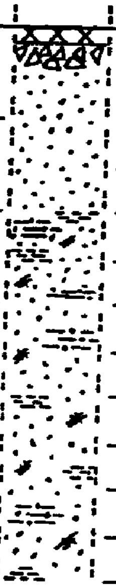
SHEET 1 OF

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL	PROJECT LOCATION NEWARK, NJ
LOCATION OF WELL SEE MAP		ELEVATION AND DATUM GRADE

DRILLING CONTRACTOR RECON SYSTEMS INC	DRILLER CMC	INSPECTOR BM

DRILLING RIG TYPE SIMCO 2800	BIT TYPE auger	DATE STARTED 5-31-89	DATE COMPLETED 5-31-89

SAMPLER TYPE 2''x 24'' SPLIT SPOON	HAMMER WEIGHT 140lb	DROP 30''	TOTAL DEPTH 6.0'	WATER LEVEL 3.0'



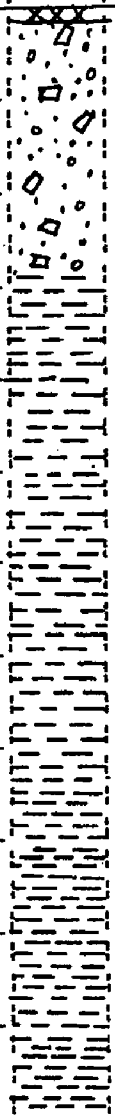
SAMPLE NO.	BLOWS	LITH TYPE	DEPTH FT. 6.26	WATER	LITHOLOGY	WELL CONSTRUCTION
					0-3'' Black Top oil stained	-1' to +4' Riser 0 to 1' Bentonite
			1		3''-6'' Trap Rock 6''-2' brown sandy FILL	1' to 6' Sand
			2 4.26		2'-3' clayey silty SAND w/ organics and Petroleum Odor	1'to 6' Screen
			3	∇	3'-6' as above with WATER	
			4		Sample 30-36''	
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

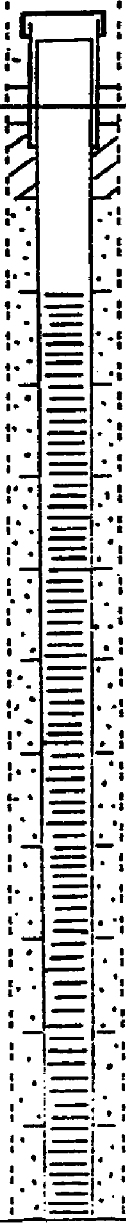
CON SYSTEMS, INC.
REE BRIDGES, NJ

MONITORING WELL NO. MW-1
(Boring No. B-11)
PERMIT NO. 2616038-2
SHEET 1 OF 1

OB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL	PROJECT LOCATION NEWARK, NJ	
OCATION OF WELL 10'N and 3' E of NE crn of Office Bld		ELEVATION AND DATUM GRADE	
RILLING CONTRACTOR ENVIRONMENTAL DRILLING INC	DRILLER BOB	INSPECTOR DRG	
RILLING RIG TYPE MOBILE B-60	BIT TYPE 10 auger	DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
AMPLER TYPE 2''x 24'' SPLIT SPOON	HAMMER WEIGHT 140lb / DROP 30''	TOTAL DEPTH 12'	WATER LEVEL 3'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
			7.33			
					0-2'' BLACK TOP	-2' to +3' Carbon Steel Riser
			1 6.33		2''-3'6''FILL, brick ash, coal frags, sand Strong Odor of diesel	1' to 6'' Bentonite
			2 5.33			12' to 1' Sand
			3 4.33	▽		12' to 2' Stainless Steel Screen
					3'6''-12' Grey CLAY w/ 10% organic fragments	
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			





APPENDIX II

BORING NO. B-12

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

ID NO.

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE 6'' AUGER
DATE STARTED 5-31-89
DATE COMPLETED 5-31-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT -----
DROP -----
TOTAL DEPTH 2.5'
WATER LEVEL NA

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-2'' Black Top 2-6'' Trap Rock	
			1		6''-2' brn gravelly SAND	
			2		2-2.5' blk SAND Petroleum Odor Sample 24''-30''	
			3			
			4			
			5			
			6			-
			7			
			8			
			9			
			10			
			11			
			12			

MONITORING WELL NO. B-13

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

PERMIT NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ
LOCATION OF WELL SEE MAP			ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS INC		DRILLER CMC	INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800		BIT TYPE auger	DATE STARTED 5-31-89 / DATE COMPLETED 5-31-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON		HAMMER WEIGHT 140lb / DROP 30''	TOTAL DEPTH 6.0' / WATER LEVEL 2.0'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
			7.25			
					0-6'' Trap Rock 6''-3' lt br sandy FILL strong odor organic rich	-1' to +4' Riser 0 to 1' Bentonite 1' to 6' Sand
			1 6.25			
			2 5.25	∇		1'to 6' Screen
			3 4.25		3' Water stablized at 2'	
			4		Sample 30-36''	
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. B-14

ID NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP			ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS	DRILLER CMC		INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800	BIT TYPE 6'' AUGER	DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER	HAMMER WEIGHT ------ / DROP ------	TOTAL DEPTH 0.5'	WATER LEVEL 0.5'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-6'' blk SAND visible oil with organics	
			1			
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

APPENDIX II

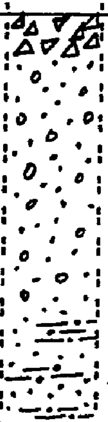
BORING NO. B-15

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

ID NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP			ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS	DRILLER CMC		INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800	BIT TYPE 6'' AUGER	DATE STARTED 5-31-89	DATE COMPLETED 5-31-89
SAMPLER TYPE SCS BUCKET AUGER	HAMMER WEIGHT ------ / DROP ------	TOTAL DEPTH 3.5'	WATER LEVEL 3.5'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-6'' Trap Rock 6-3'3'' brn SAND darkening w/ depth w/ gravel	
			1			
			2			
			3	∇	3'3''-4' blk sandy SILT with Petroleum Odor	
	21		4		4-6' drk SAND w/ Petroleum Odor Water at 4'4''	
	3 4		5		Sample 3'10'' - 4'4''	
	8		6			
			7			
			8			
			9			
			10			
			11			
			12			

MONITORING WELL NO. B-16

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

PERMIT NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ
LOCATION OF WELL SEE MAP			ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS INC		DRILLER CMC	INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800		BIT TYPE auger	DATE STARTED 5-31-89 / DATE COMPLETED 5-31-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON		HAMMER WEIGHT 140lb / DROP 30''	TOTAL DEPTH 7.66' / WATER LEVEL 4.0'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
			9.11		0-2'' Black Top 2-6'' Trap Rock	-2'9''to +2'3''Riser 0 to 1' Bentonite
			1 8.11		6-12'' grey sandy FILL w/ gravel 1-3.5' brn SAND	1'to 7'9'' Sand
			2 7.11			2'9''to 7'9'' Screen
			3 6.11		3.5-4.5' silty SAND wet throughout	
			4 5.11	∇	water at 4' 4.5-7.6' black CLAY tight Strong Odor	
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

MONITORING WELL NO. B-17

PERMIT NO. 26-16459-7

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, N.J.
LOCATION OF WELL SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800 HOLLOW STEM AUGER
BIT TYPE 6 IN. AUGER
DATE STARTED 6-1-89
DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT
DROP
TOTAL DEPTH 6.0 FT.
WATER LEVEL 2.5 FT.

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
			6.82			
					TRAPROCK 0.0-0.5' SAND 0.5'-2.5' black gravelly sand.	riser -1.0 to +4.0' sand 0.5'-1.0' screen 1.0'-6.0'
			1 5.82			
			2 4.82	▽	sample 2.0-2.5'	
			3 3.82			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

APPENDIX II

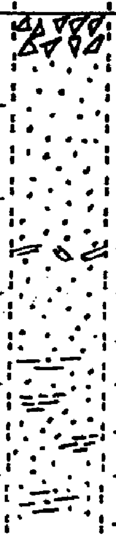
MONITORING WELL NO. B-18

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

PERMIT NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ	
LOCATION OF WELL SEE MAP			ELEVATION AND DATUM GRADE	
DRILLING CONTRACTOR RECON SYSTEMS INC	DRILLER CMC		INSPECTOR BM	
DRILLING RIG TYPE SIMCO 2800	BIT TYPE auger		DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON	HAMMER WEIGHT 140lb	DROP 30''	TOTAL DEPTH 6.25'	WATER LEVEL 3.5'



SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT. 7.12	WATER	LITHOLOGY	WELL CONSTRUCTION
			–		0-6'' Black Top 6''-2.5' Grey & black SAND.	-1'3''to +3'9''Riser 0 to 1' Bentonite
			1 6.12		w T	1'to 6'3''Sand
			2 5.12		2.5-2.7' Concrete slab.	1'3'' to 6'3''Screen
			3 4.12	▽	2.7-3.6' Black SAND. 3.6-5.5'Black clayey silty SAND	
			4		Sample 3-3.5'	
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING OR TRENCH

ID NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ	
LOCATION OF BORING SEE MAP			ELEVATION AND DATUM GRADE	
DRILLING CONTRACTOR		DRILLER	INSPECTOR	
DRILLING RIG TYPE		BIT TYPE	DATE STARTED	DATE COMPLETED
SAMPLER TYPE	HAMMER WEIGHT ------	DROP ------	TOTAL DEPTH 3.5'	WATER LEVEL 3.5'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-2'' Black Top	
					2-6'' Trap Rock	
			1		6-10'' drk brn silty sand FILL	
					10-15'' red brn silty sand FILL	
					15-19'' Trap Rock with OIL	
			2		19-25'' drk brn FILL	
					25''-3'6'' drk brn CLAY with organics, OIL SEEPS	
			3			
				▽		
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

Project LPC-Newark **Site** 128 Doremus Ave., Newark **BORING** PZ-1 **Sh 1 of** 1

Date Started 6/13/91 **Completed** 6/13/91 **Ground Elevation**

Total Depth **Location** W of trench **Logged by** MIKE FEDOSH

Casing I.D. 2" PVC **Contractor** Jersey Boring + Drilling

Remarks

Standing surface water entered boring, no PID reading

Elev. Feet	Depth Feet	Sample				Graphic Log	Sample Description	ANALYSIS PERFORMED
		Type & Number	Blows per 6 in.	Depth Range	Rec.			
	1					6"	concrete 0'-6"	
	2		A			2'	red-brown sand, little silt, little 3/4" aggregate 2'-0"	
	3		U			3'	black sand, little silt, little 3/4" aggregate 3'-0"	
	4					3'6"	red-brown sand, some silt 3'-6"	
	5		G				brown peat over black-brown organic clay	
	6		E					
	7							
	8		R					
	9					9'	9'-0"	
	10						Bottom	
	11							
	12							
	13							
	14							
	15						7' of 10 slot screen 1.5'-8.5'	
	16							
	17							
	18							
	19							
	20							

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Project IPC - Newark **Site** 128 Doremus Ave., Newark **BORING** PZ-2 **Sh 1 of** 1

Date Started 6/13/91 **Completed** 6/13/91 **Ground Elevation**

Total Depth **Location** NW corner, fill shed **Logged by** MIKE FEDOSH

Casing I.D. 2" PVC **Contractor** Jersey Boring + Drilling

Remarks

Elev. Feet	Depth Feet	Sample				Graphic Log	Sample Description	ANALYSIS PERFORMED
		Type & Number	Blows per 6 In.	~~Depth Range~~	Rec.			
	1		A	PID Reading (ppm)		6"	concrete 0'-6"	
	2		U	0		2'	black sand, little silt, little aggregate, dry 2'-0"	
	3					3'	red sand, little silt, moist 3'-0"	
	4		G	.2		4'	red silt, little sand, wet 4'-0"	
	5			190				
	6		E	52			black sand, little silt, trace clay, moist	wet @6'
	7							
	8		R			8'	8'-0"	
	9					9'	black clay, little silt 9'-0"	
	10						Bottom	
	11							
	12							
	13						7' of 10 slot screen 1.5'-8.5'	
	14							
	15							
	16							
	17							
	18							
	19							
	20							

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Project *IPC - Newark* Site *128 Doremus Ave. Newark* **BORING** *PZ-3* Sh 1 of *1*

Date Started *6/13/91* Completed *6/13/91* Ground Elevation ______

Total Depth ______ Location *NE corner @ Fence* Logged by MIKE FEDOSH

Casing I.D. *2" PVC* Contractor *Jersey Boring + Drilling*

Remarks ______

		Sample						
Elev. Feet	Depth Feet	Type & Number	Blows per 6 in.	~~Depth Range~~	Rec.	Graphic Log	Sample Description	ANALYSIS PERFORMED
	1			PID Reading (ppm)		6"	concrete 0'-6"	
	2		A	0			black-brown 3/4" aggregate, some fine-coarse sand, little silt, fill, 3'-0"	moist @ 2' wet @ 3'
	3					3'		
	4		U	1			black fine-coarse sand, little silt, little aggregate, wet 6'-0"	
	5		G	2				
	6					6'		
	7		E	2			black silt, some sand, wet 8'-0"	
	8					8'		
	9		R	4		9'	black silt 9'-0"	
	10					9'6"	black-brown clay 9'-6" Bottom	
	11							
	12							
	13						8' of 10 slot screen 1.5'-9.5'	
	14							
	15							
	16							
	17							
	18							
	19							
	20							

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Project IPC-Newark **Site** 128 Doremus Ave, Newark **BORING** MW-4 **Sh 1 of** 1
Date Started 6/10/91 **Completed** 6/11/91 **Ground Elevation**
Total Depth **Location** S fence line **Logged by** MIKE FEDOSH
Casing I.D. 4" steel **Contractor** Jersey Boring + Drilling
Remarks

Elev. Feet	Depth Feet	Sample: Type & Number	Sample: Blows per 6 in.	Sample: ~~Depth Range~~ PID Reading (ppm)	Sample: Rec.	Graphic Log	Sample Description	ANALYSIS PERFORMED
	1					6"	Concrete 0'-6"	
	2		Auger	48			Black-brown sand, little silt, little clay, bricks	wet @ 3'
	3		17/20					
	4		11/10	.29	18"	3'6"	3'-6"	
	5		6/3	99	2"		Black silt, little fine sand, moist	
	6		2/3				6'-6"	
	7					6'6"	Bottom	
	8							
	9							
	10							
	11						5' of 10-slot steel screen	
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							

EcolSciences, Inc.
Environmental Management & Regulatory Complianc

Project IPC-Newark Site 129 Doremus Ave, Newark **BORING** MW-5 Sh 1 of 1
Date Started 6/11/91 Completed 6/11/91 Ground Elevation
Total Depth Location NW property corner Logged by MIKE FEDOSH
Casing I.D. 4" steel Contractor Jersey Boring & Drilling
Remarks

Elev. Feet	Depth Feet	Sample Type & Number	 Blows per 6 In.	 ~~Depth Range~~	 Rec.	Graphic Log	Sample Description	ANALYSIS PERFORMED
	1					1'	concrete 1'-0"	
	2		Auger	PID Reading (ppm)				
	3		50/15	1.9			brown fine-coarse sand, some gravel, dry, fill	
	4		4/2	.0	12"			
	5		4/3	0			5'-6"	
	6		2/2		12"	5'6"		wet @ 5'6"
	7		3/2	0			black fine-coarse sand, some <½" aggregate, little silt, ash, wet, fill	
	8		2/2	0	6"			
	9		1/1			9'	9'-0"	
	10		1/1	0	12"	10'	black organic clay, moist 10'-0"	
	11						Bottom	
	12							
	13							
	14							
	15						5' of 10 slot steel screen	
	16							
	17							
	18							
	19							
	20							

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Project IPC - Newark **Site** 128 Doremus Ave. Newark **BORING** MW-6 **Sh 1 of** 1

Date Started 6/12/91 **Completed** 6/12/91 **Ground Elevation**

Total Depth **Location** NW dike corner **Logged by** MIKE FEDOSH

Casing I.D. 4" steel **Contractor** Jersey Boring + Drilling

Remarks

Elev. Feet	Depth Feet	Sample: Type & Number	Sample: Blows per 6 In.	Sample: ~~Depth Range~~	Sample: Rec.	Graphic Log	Sample Description	ANALYSIS PERFORMED
	1		A U	PID Reading (ppm)			concrete 1'-6"	
	2		G E	120		1'6"	3/4" aggregate, dry 2'-6"	
	3		R/1	36		2'6" 3'	black sand, little silt, trace aggregate, damp 3'-0"	
	4		2/2	27	24"			
	5		2/4	16			black organic clay, trace silt, damp	
	6		2/2	55	18"			
	7		1/1	4		7'	7'-0"	
	8						Bottom	
	9							
	10							
	11						5' of 10 slot steel screen	
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Project IPC - Newark **Site** 128 Doremus Ave., Newark **BORING** MW- 7 **Sh 1 of** 1
Date Started 6/14/91 **Completed** 6/14/91 **Ground Elevation**
Total Depth **Location** W side of dike **Logged by** MIKE FEDOSH
Casing I.D. 4" steel **Contractor** Jersey Boring + Drilling
Remarks

Elev. Feet	Depth Feet	Sample				Graphic Log	Sample Description	ANALYSIS PERFORMED
		Type & Number	Blows per 6 In.	~~Depth Range~~	Rec.			
	1		AUGER	PID Reading (ppm)		6"	concrete 0'-6"	
	2			0			dark gray-brown sand, some silt	wet @2'
	3		1/1	2		3'	3'-0"	
	4		WOR	16	24"	4'	dark gray silt, little clay, little sand 4'-0"	
	5		1/1	41		5'	black sand, little silt, trace aggregate 5'-0"	
	6		1/3	5	12"		dark black-brown silt, little clay, little sand 6'-6"	
	7					6'6"	Bottom	
	8							
	9							
	10							
	11							
	12						5' of 10 slot steel screen	
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							

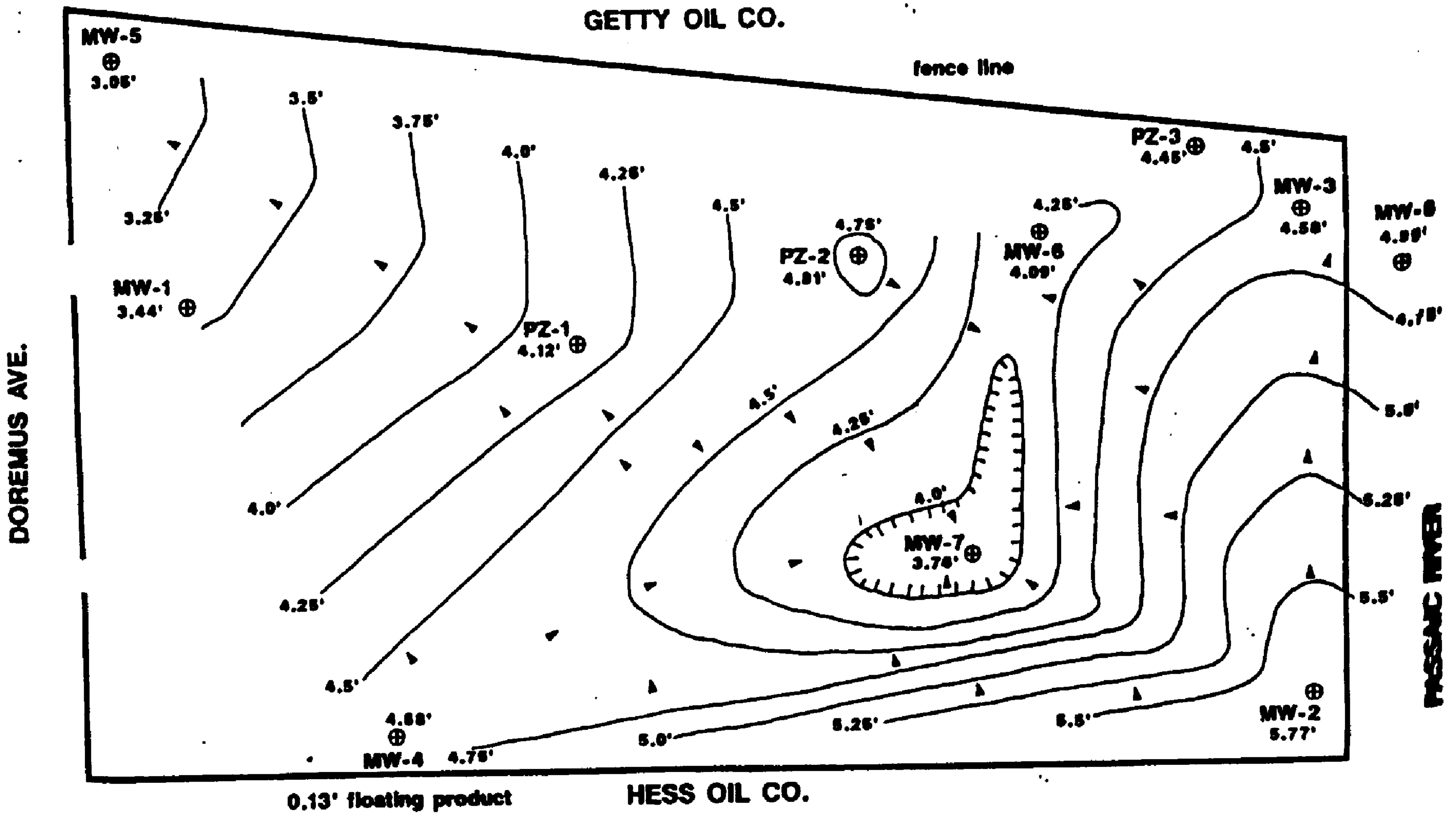
EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Project IPC-Newark **Site** 128 Doremus Ave. Newark **BORING** MW-8 **Sh 1 of** 1
Date Started 6/12/91 **Completed** 6/12/91 **Ground Elevation**
Total Depth **Location** river bank, NE dike **Logged by** MIKE FEDOSH
Casing I.D. 4" steel **Contractor** Jersey Boring + Drilling
Remarks

Elev. Feet	Depth Feet	Sample: Type & Number	Sample: Blows per 6 In.	Sample: ~~Depth Range~~ PID Reading (ppm)	Sample: Rec.	Graphic Log	Sample Description	ANALYSIS PERFORMED
	1		AUGER					
	2	--						
	3		3/6				Black sand, some silt, little aggregate, cinders, brick, wet	
	4		4/3	3.8	6"			wet @4'
	5		AUGER	100				
	6		12/5	5.7	18"			
	7		8/6	11				
	8		15/7	15	12"			
	9		6/3	0		8'10"	8'-10"	
	10						Black-brown clay, damp	
	11							
	12					12'	12'-0"	
	13						Bottom	
	14							
	15							
	16						10' of 10 slot steel screen	
	17							
	18							
	19							
	20							

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

APPENDIX B

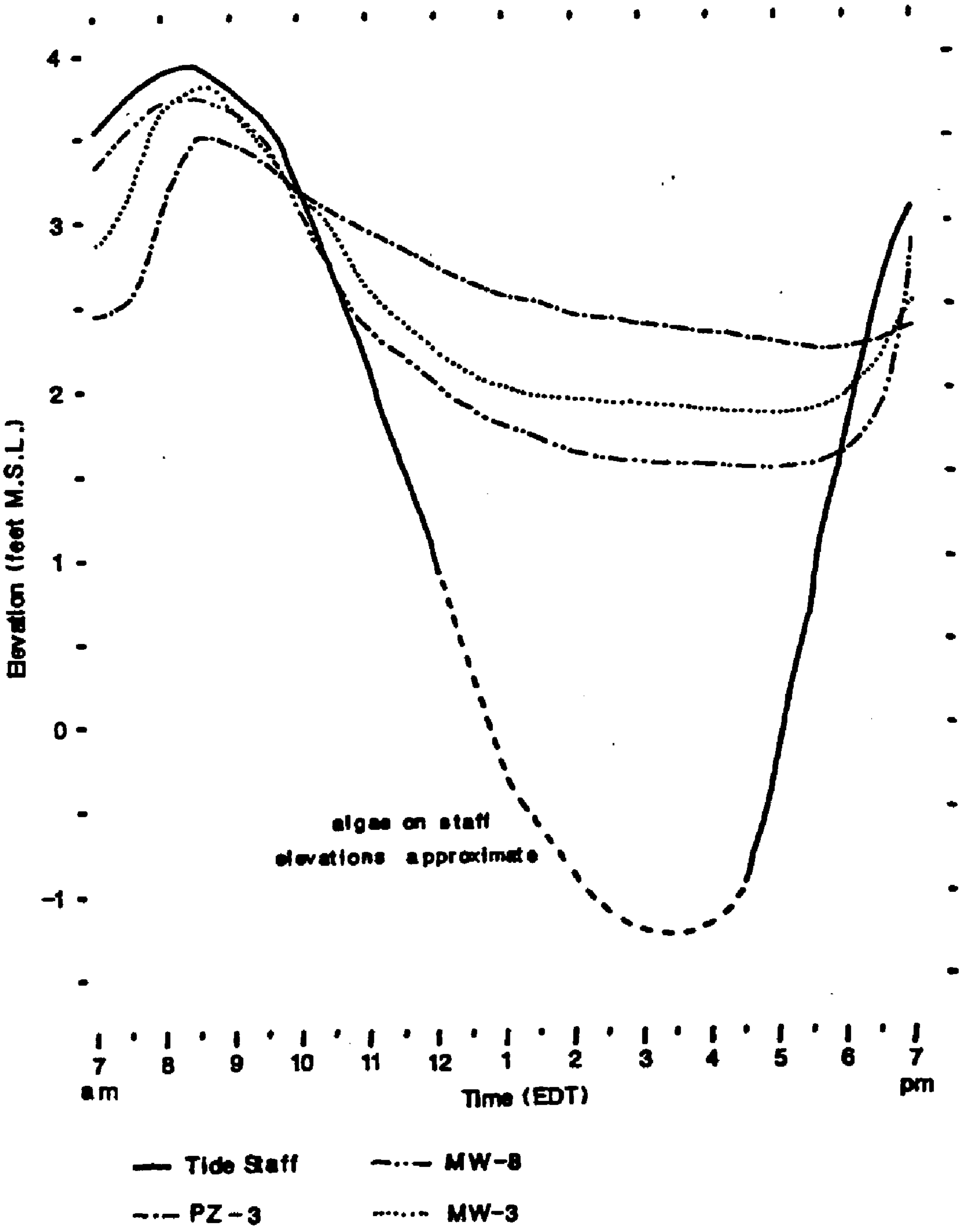


GROUND WATER GRADIENT MAP

7/31/92

LOCAL HIGH TIDE

EcolSciences, Inc.



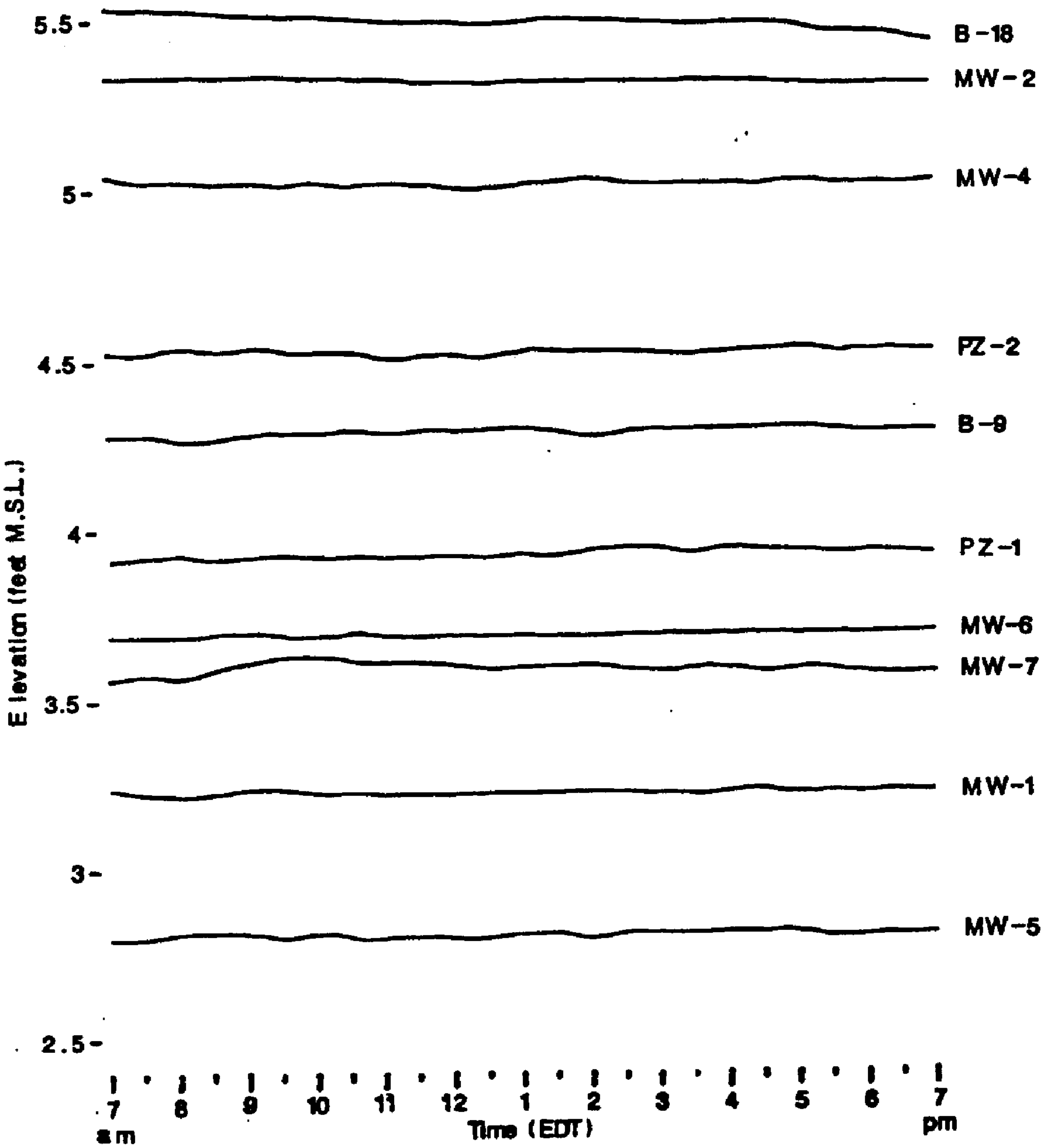
12 HOUR PERIOD GROUND WATER ELEVATIONS

9/23/91

TIDAL INFLUENCE

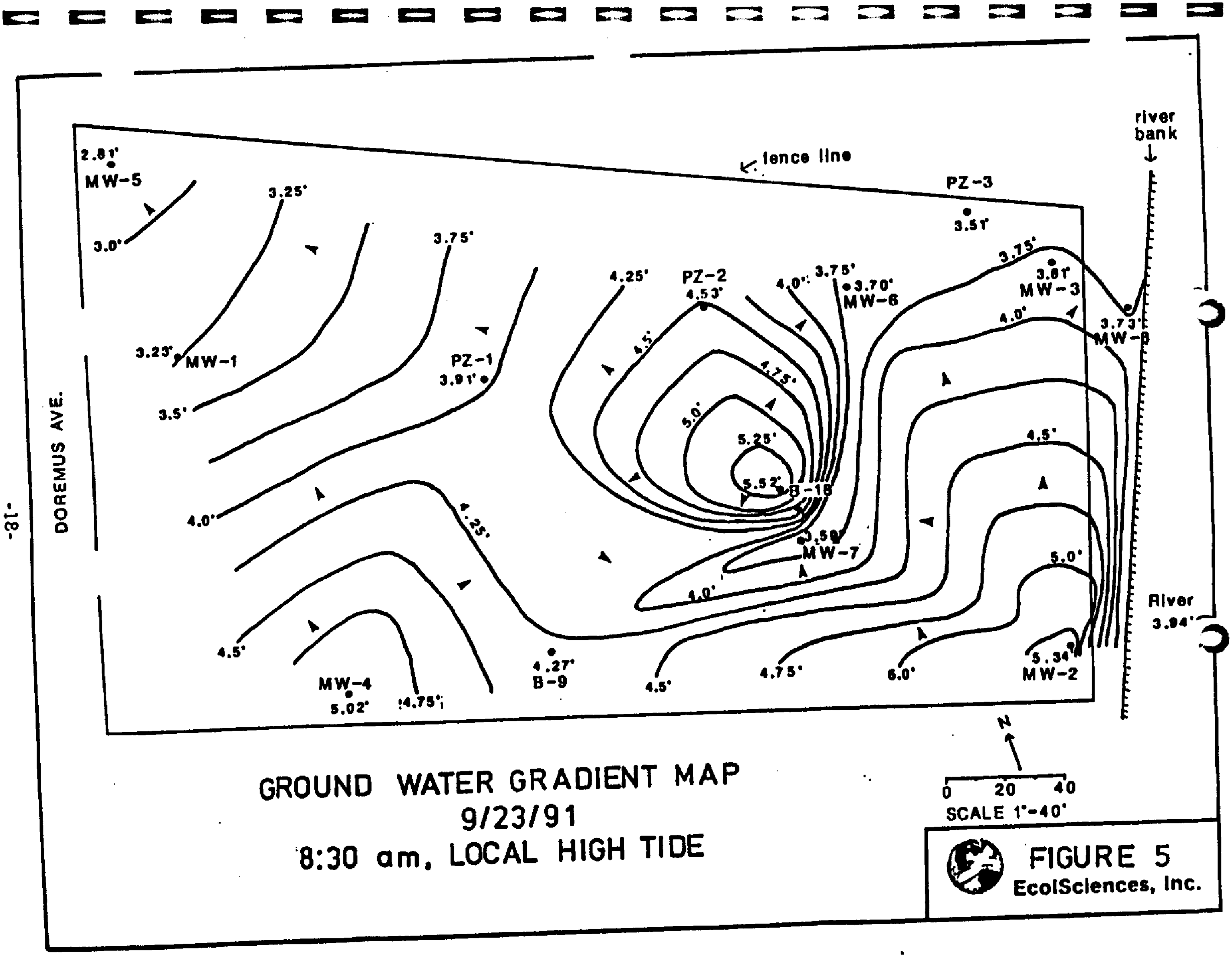
FIGURE 3

EcolSciences, Inc.



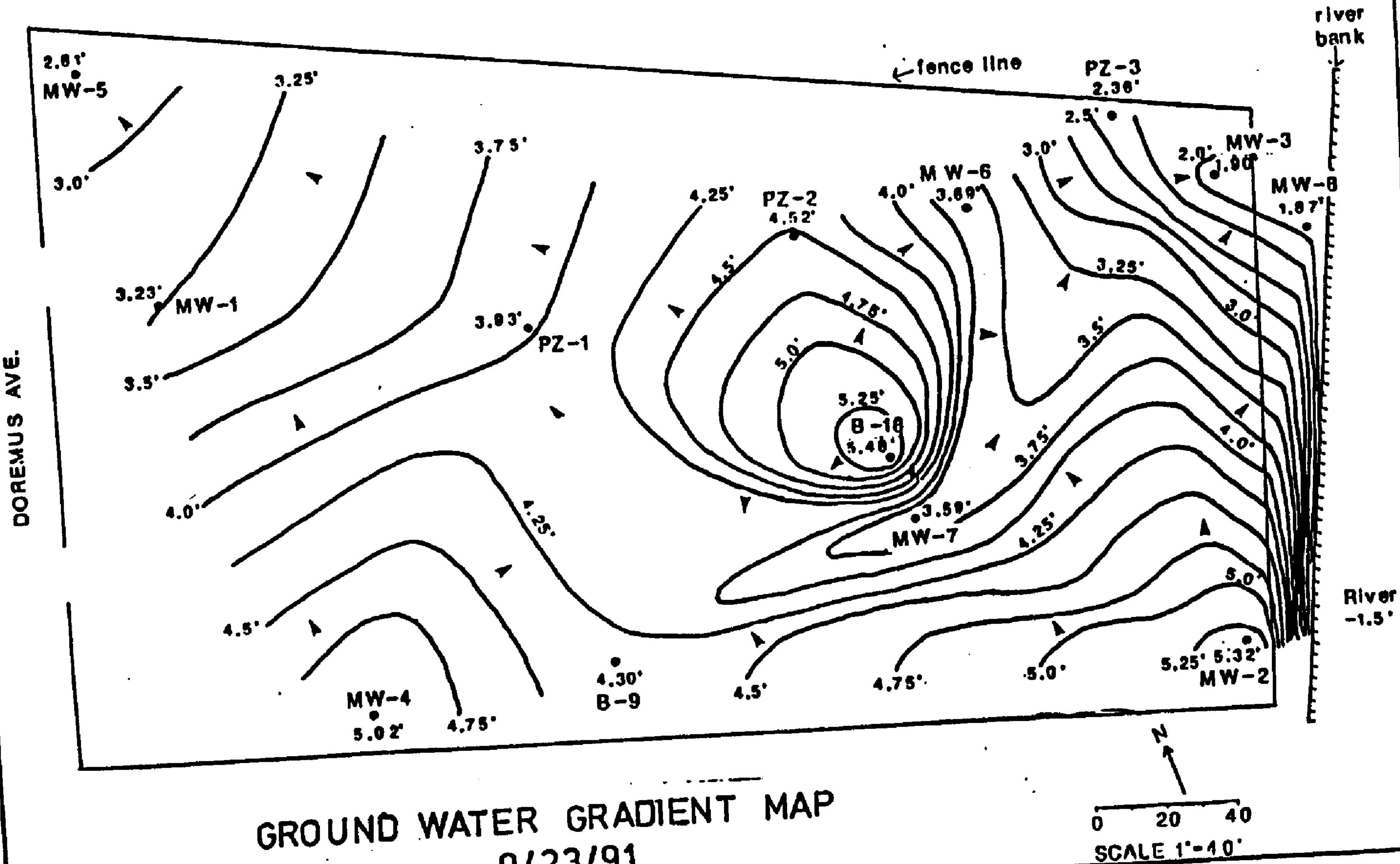
12 HOUR PERIOD GROUND WATER ELEVATIONS
9/23/91
NO TIDAL INFLUENCE

FIGURE 4
EcolSciences, Inc.



GROUND WATER GRADIENT MAP
9/23/91
8:30 am, LOCAL HIGH TIDE

FIGURE 5
EcolSciences, Inc.



GROUND WATER GRADIENT MAP
9/23/91
3:30 pm, LOCAL LOW TIDE

FIGURE 6
EcolSciences, Inc.

APPENDIX C

QUALITY ASSURANCE REVIEW
PROJECT: INDUSTRIAL PETROCHEMICALS
DATE SAMPLES COLLECTED: MAY 31 - JUNE 19, 1989

LAB REPORT No. E9914

INTRODUCTION

Eighteen (18) soil samples, three (3) groundwater samples, and two (2) field blanks and two (2) trip blank samples were collected by and submitted to Recon Systems, Inc. Laboratories of Three Bridges, New Jersey (NJ Cert. No.18196). The groundwater samples were analyzed for priority pollutant volatile organic compounds and semi-volatile organic compounds plus mass-spectral library searches for extraneous chromatographic peaks, methyl-tert-butyl ether (MTBE), di-isopropyl ether (DIPE), tertiary butyl alcohol (TBA) and methanol (MeOH) by GC-FID, organochlorine pesticides and polychlorinated biphenyls (PCB), priority pollutant metals, total cyanides, total phenols and total petroleum hydrocarbons (TPHC). The soil samples were analyzed for priority pollutant volatile organics and semi-volatile organics plus mass-spectral library searches for extraneous chromatographic peaks. The priority pollutant volatile and semi-volatile organics were subcontracted to Accutest Laboratories of Dayton, New Jersey (NJ certification No. 10196). All samples were analyzed following USEPA SW-846 and 600 series methodologies.

Numerous transcriptional errors were noted between the laboratory raw data provided and the historical summary tables reported by the previous consultant. However, it should be noted that the tables developed during the review are taken directly from the laboratory reports and not from other summary tables provided.

A preliminary quality assurance review was performed on all data prepared under the New Jersey Department of Environmental Protection and Energy (NJDEPE) ECRA-deliverable format. Data were examined to assess the usability and compliance relative to NJDEPE data-package deliverable requirements. The data quality review is based upon a review of the hold times, reported surrogate recoveries, matrix spike and duplicate recoveries and blank contaminants.

This review has been performed in accordance with the requirements specified in the NJDEPE Division of Hazardous Waste Management "Remedial Investigation Guide", dated March 1990.

Overall, the data quality is good. Based upon the preliminary review, some data have been qualified. Summary tables have been provided with data qualifiers placed next to the results so that data user can quickly assess the qualitative and/or quantitative reliability of the reported results. Based upon our finding, the following comments are offered:

- The analytical data summarized by Recon Systems, Inc. are inconsistent with the laboratory summary results. All organic target concentrations quantitated below the detection limits are reported as non-detected (below minimum detection limit).

- On the groundwater analytical data summarized by the previous consultants, the volatile compound, tert-butyl alcohol was transcribed incorrectly as tert-butyl ether.

- Although no volatile target compound concentration was identified in sample B-10, a 1:300 dilution was performed due to high concentrations of tentatively identified compounds (TICs) found in the samples.

- Due to the presence of methylene chloride in the method (laboratory) and/or field blank samples, positive results in all field samples are qualitatively questionable and have been flagged (B) on the summary table.

- Due to the presence of bis(2-ethylhexyl)phthalate in the semi-volatile soil field blank, positive results of this compound in all soil samples are qualitatively questionable. However, since the concentration of bis(2-ethylhexyl)phthalate in all soil samples are greater than 10 times the concentration found in the field blank sample, the positive results are regarded as "real" values and no qualifier has been applied.

- Due to the presence of naphthalene in the method blank associated with the semi-volatile groundwater samples, the positive result of this compound in sample MW-1 is qualitatively questionable and has been flagged (B) on the summary table. However, since the naphthalene concentration in sample MW-3 is greater than 5 times the concentration found in the field blank, this result is regarded as a "real" value and no qualifier has been applied.

- Trace presence of zinc has been identified in the soil field blank sample. Positive zinc results in all soil samples that are less than 5 times the concentration found in the field blank are qualitatively questionable and have been flagged (B) on the summary table. Positive results greater than five times the concentration found in the field blank are regarded as "real" values and no qualifier has been applied.

- As per the requirements, all values calculated below the method detection limit should be considered estimated and have been flagged (J) on the data table.

QUALITY ASSURANCE REVIEW
PROJECT: INDUSTRIAL PETROCHEMICALS
DATE SAMPLES COLLECTED: JULY 1, 1991 & AUGUST 8, 1991

LAB REPORT Nos. 9326 & 8842

INTRODUCTION

Nine (9) soil samples, six (6) groundwater samples, two (2) field blank samples and one (1) trip blank sample were collected by EcolSciences, Inc. of Rockaway, New Jersey and submitted to Nytest Environmental, Inc. (NEI) of Port Washington, New York (NJ certification No. 73469) for the analysis of target compound list volatile organic compounds and semi-volatile organic compounds plus mass-spectral library searches for extraneous chromatographic peaks, priority pollutant metals and total petroleum hydrocarbons (TPHC). All samples were analyzed following USEPA SW-846 and 600 series methodologies.

Numerous transcriptional errors were noted between the laboratory raw data provided and the historical summary tables reported by the previous consultants. However, it should be noted that the summary tables developed during the review are taken directly from the laboratory reports and not from other summary tables provided.

A preliminary quality assurance review was performed on all laboratory data prepared under New Jersey Department of Environmental Protection and Energy (NJDEPE) ECRA-deliverable format. Data were examined to assess the usability and compliance relative to NJDEPE data-package deliverable requirements. The data quality review is based upon a review of the hold times, reported surrogate recoveries, matrix spike and duplicate recoveries and blank contaminants.

This review has been performed in accordance with the requirements specified in the NJDEPE Division of Hazardous Waste Management "Remedial Investigation Guide," dated March 1990.

Overall, the data quality is good. Based upon the preliminary review, some data have been qualified. Summary tables have been provided with data qualifiers placed next to the results so that the data user can quickly assess the qualitative and/or quantitative reliability of the reported results. Based upon our finding, the following comments are offered:

- The analytical data summarized by EcolSciences, Inc. are inconsistent with the laboratory summary results. For all soil organic analytical results reported by the previous consultants, the (J) qualifier was not included for those compounds quantitated below the method detection limits. The (J) qualifier indicates that the reported values are estimated because the compound meets the mass-spectral identification criteria but the quantitated result is less than the method detection limit (but greater than the instrument detection limit).

- For laboratory report No. 9326, the majority of the volatile organics samples were analyzed at medium level dilutions, resulting in elevated method detection limits. This is due to target compound concentrations exceeding the linear calibration range requirements.

- Due to the presence of methylene chloride and toluene in the method (laboratory) and/or field blank samples for both data sets, positive results of these analytes in all field samples are qualitatively questionable and have been flagged (B) on the summary table.

- Due to the presence of the base/neutral compound bis(2-ethylhexyl)-phthalate in the groundwater field blank sample of data set 8842, positive results in all groundwater samples with the exception of MW-3 are qualitatively questionable and have been flagged (B) on the summary table.

- For the semi-volatile sample of MW-3 (report No. 8842), the concentration of bis(2-ethylhexyl) phthalate is 10 times greater than concentration found in the field blank sample. Therefore, this positive result is regarded as a "real" value and no qualifier has been applied.

- In the semi-volatile analyses of report No. 9326, di-n-butyl phthalate and bis(2-ethylhexyl)phthalate were identified in the associated field blank. However, since the concentrations of these compounds in all soil samples are greater than 10 times the concentration found in the field blank sample, the positive results are regarded as "real" values and no qualifier has been applied.

- As per the requirements, all values calculated below the method detection limit should be considered estimated and have been flagged (J) on the data table.

APPENDIX D

DAMES & MOORE
HEALTH AND SAFETY PLAN

Project Name:	Industrial Petrochemicals, Inc. Chemicals Transshipment Facility
Project Number:	25946-001-175
Project Site Location:	Newark, New Jersey
Project Manager:	Nick Emandi
Site Safety Officer:	To be provided
Plan Preparer:	Kathryn A. Sova
Preparation Date:	December 1992

APPROVED:

Regional Health & Safety Manager:

12/18/92
(Date)

Office Safety Coordinator:

12/18/92
(Date)

Managing Associate:

12/29/92
(Date)

Project Manager:

Nick Emandi 12/20/92
(Date)

TABLE OF CONTENTS

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(continued)

1.0 PURPOSE

The purpose of this Plan is to assign responsibilities, establish personnel protection standards and mandatory safety practices and procedures, and provide for contingencies that may arise while conducting sampling and other on-site activities at the Industrial Petrochemicals, Inc., Chemicals Transshipment Facility in Newark, New Jersey.

2.0 APPLICABILITY

The provisions of the plan are mandatory for all on-site Dames & Moore employees who are engaged in hazardous material management activities including, but not limited to, initial site reconnaissance, preliminary field investigations, mobilization, project operations, and demobilization. This plan has been developed under U.S. Environmental Protection Agency (EPA) guidelines and complies with applicable regulations, including Occupational Safety and Health Administration (OSHA) standards [29 Code of Federal Regulations (CFR) 1910 and 1926].

Dames & Moore will insist on the following health and safety requirements from its subcontractors:

- Subcontractor employees must have appropriate training [*i.e.*, either a 40-hour or 24-hour OSHA-required (29 CFR 1910.120) health and safety course for hazardous waste work, or certified equivalent training].

- Personnel working at hazardous waste sites must have had an annual physical (or physician's waiver for biennial physical) and be certified "fit for duty" and "fit for respirator use," if necessary, by a qualified physician.

- Dames & Moore will insist on obtaining proof of both training and a physical before site work may begin.

- Personnel must have appropriate personal protective equipment (PPE) for the specific job. At a minimum, personnel should have the following equipment, which will be inspected by Dames & Moore:

    - Hard hat
    - Safety shoes
    - Gloves
    - Goggles/safety glasses
    - Hearing protection, if appropriate
    - Respiratory protection, if appropriate (with fit test)
    - Other equipment as specified by the HSP.

- Drilling equipment and field operations must meet applicable safety standards and satisfy Dames & Moore's field inspection. Unsafe equipment or operations will necessitate shut down of the job at a cost to the subcontractor.

Before field activities begin, the subcontractor must develop a health and safety plan and have it approved by Dames & Moore. Dames & Moore will provide a copy of its health and safety plan, but this is not a substitute for an independent plan by the subcontractor. If the subcontractor has not developed a site-specific health and safety plan, Dames & Moore will assist the subcontractor in preparing its own separate, site-specific HSP for implementation by the subcontractor. The subcontractor must agree to comply with at least the minimum requirements of its own site-specific HSP, be responsible for the health and safety of its own employees, and sign the Subcontractor Statement of Compliance for all on-site employees before site work begins. The subcontractor also must agree that it will take any additional measures it deems necessary to meet at least minimum applicable health and safety standards if unforeseen circumstances arise.

The subcontractor will provide at least minimum safety equipment as required by the site-specific HSP. When respirators are necessary, the subcontractor will provide a respirator fit test certificate and a physician's "fit for respirator use" declaration.

3.0 RESPONSIBILITIES

3.1 PROJECT MANAGER

The Project Manager (PM) shall direct on-site investigations and operational efforts. The PM, assisted by the Site Safety Officer (SSO), has primary responsibility for:

1. Assuring that appropriate personnel protective equipment and monitoring equipment are available and properly utilized by all on-site personnel;
2. Assuring that personnel are aware of the provisions of this plan, are instructed in the work practices necessary to ensure safety, and are familiar with planned procedures for dealing with emergencies;
3. Assuring all field personnel have had a minimum of 40 hours training and have been fit-tested for the appropriate respirators;
4. Assuring that personnel are aware of the potential hazards associated with the site operations;

5. Monitoring the safety performance of all personnel to ensure that the required work practices are employed;

6. Correcting any work practices or conditions that may result in injury or exposure to hazardous substances;

7. Preparing any accident/incident reports (see Attachments);

8. Assuring the completion of Plan Acceptance Forms by Dames & Moore personnel (see Attachments); and

9. Halting site operations, if necessary, to correct unsafe work practices.

3.2 SITE SAFETY OFFICER

The Site Safety Officer (SSO) shall:

1. Implement the project Health and Safety Plan and report to the PM for action if there are any deviations from the anticipated conditions described in the plan; the SSO has the authorization to stop work at any time;

2. Ensure that all monitoring equipment is calibrated on a daily basis and record results on the appropriate forms (see Attachments);

3. Ensure that all monitoring equipment is operating correctly and provide maintenance if it is not;

4. Be responsible for identifying all site personnel with special medical problems or restrictions.

5. Be responsible for conducting daily safety meetings and completing the Site Safety Briefing Form (see Attachments);

6. Be responsible for reviewing daily use of personal protective equipment; and;

7. Be responsible that decontamination procedures are followed.

3.3 REGIONAL HEALTH AND SAFETY MANAGER

The Northeast Region Health and Safety Manager will:

1. Provide health and safety support as requested by the SSO and PM.

3.4 PROJECT PERSONNEL

Project personnel involved in on-site investigations and operations are responsible for:

1. Taking all reasonable precautions to prevent injury to themselves and to their fellow employees;

2. Performing only those tasks that they believe they can do safely, and immediately reporting any accidents and/or unsafe conditions to the SSO or PM; and

3. Notifying the PM and SSO of any special medical problems (i.e., allergies or medical restrictions) and making certain that all on-site personnel are aware of any such problems.

4.0 SITE DESCRIPTION

4.1 GENERAL INFORMATION

Site: Industrial Petrochemicals, Inc., Chemicals Transshipment Facility,
Newark, New Jersey
Job No.: 25946-001-175
Objectives: To implement an ECRA Cleanup Plan.
Background Review of the Site: Complete ___ Preliminary _X_
Documentation/Summary: Overall Hazard: Serious ___ Moderate _X_
Low _X_ Unknown ___

4.2 SITE HISTORY

Industrial Petrochemicals, Inc. is located on a 200-foot by 400-foot site in a highly industrialized section of Newark, New Jersey, between Doremus Avenue and the west bank of the Passaic River, and is bounded by existing petroleum tank farms (Getty on the north and Hess to the south). The site is currently operated as a chemical transshipment facility, wherein bulk chemicals are delivered, stored, repackaged into smaller containers and shipped out. The site is used for ongoing transshipment operations, bulk tanker parking, and drum/tote storage.

The entire site, except for the tank farm, is covered by a recently-installed, 12-inch thick concrete pad, which is generally level at a surface elevation of +7.5 feet (National Geodetic Vertical Datum). The concrete pad is underlain by 2 to 8 feet of porous miscellaneous fill, including brick and rock, rubble, silty sand, cinders and ash. The fill is underlain by relatively impermeable black organic silty clay, a former natural marsh whose surface generally slopes down toward a former tidal creek along the northern border, where the fill stratum is thickest.

The site groundwater is perched on the marsh deposits, and generally ranges from depths of 2 to 4 feet below the existing surface grade. Water-level observations on-site indicate only the northeast corner of the site (near the mouth of the former tidal stream) is tidally affected by the river, although during storm surges, the eastern portion of the site has been reported to become flooded by the river.

Prior site investigations revealed contaminants throughout the site soils and groundwater, which include petroleum constituents, chlorinated solvents and heavy metals. The contamination is believed to have originated from prior releases (before site paving) in the site vicinity. Additionally, free-floating product observed near the southern property boundary (at MW-4) may have originated from upgradient off-site petroleum releases. Dames & Moore understands that the results of these previous site investigations are considered to have adequately characterized the nature and extent of the site contamination issues, and have recently been submitted to NJDEPE for review and approval. An appropriate Site Cleanup Plan must now be developed for addressing these issues, which will then be submitted to NJDEPE for review and approval prior to implementation.

4.2.1 Dames & Moore Activities

Dames & Moore will initiate a program to remove the floating hydrocarbon product at MW-4, characterize the composition of the hydrocarbon product, and determine whether the potential source of this product is on-site or off-site. Initially, the floating product will be removed with hand bailers. Floating product has been observed in MW-4 only.

Dames & Moore will monitor the drilling of up to six soil borings by a subcontractor, and the conversion of up to three of the borings to monitoring wells, to delineate the boundaries of the floating-product plume. Dames & Moore personnel will collect soil samples from the borings and groundwater samples from the developed wells.

Site remediation (Phase I) may include:

- Core vacuum extract point;
- Install sparging and vapor monitoring wells;
- Baseline soil and groundwater sampling;
- Install vacuum extraction system;
- Evaluate effectiveness of vacuum extraction point;
- Install horizontal extraction wells; and
- Sparging with air, then nitrogen.

4.3 FACILITY DESCRIPTION

Waste Types: Soil _X_ Groundwater _X_ Sludge ___
Drums ___ Other (specify) ___
Characteristics: Corrosive ___ Ignitable _X_ Radioactive ___
Volatile _X_ Toxic _X_ Reactive ___ Unknown ___
Unusual Site Features (dike integrity, power lines, terrain, etc.):
None
Site Status: (active, inactive, unknown) _Active_

4.4 HAZARD EVALUATION

Chemical Hazards

Prior site investigations revealed contaminants on-site to include petroleum hydrocarbons, chlorinated solvents and heavy metals. The exposure limits, recognition qualities, acute and chronic effects and first-aid treatment for these contaminants are presented in Tables 1 and 2.

The following potential exposures may exist at the site:

- Skin contact with contaminated soil or water;

- Inhalation of vapors and dusts;
- Ingestion of contaminated soil dusts, especially if poor personal hygiene is practiced.

Skin contact with potentially contaminated soil or water will be minimized by wearing personal protective clothing. Inhalation of vapors and dusts during drilling will be minimized by use of dust controls and use of respiratory protection if action levels are exceeded. Ingestion of contaminated materials will be minimized by good personal hygiene during decontamination, *i.e.* thoroughly washing face and hands with soap and water before eating and drinking.

A minimum of Level D+ protection is recommended to perform work on-site with the potential to upgrade to Level C if organic vapors exceed action levels and/or if dry or dusty conditions exist. A minimum of Level C protection will be required during any activities which involve contact with free product. Tables 3 and 4 provide hazard monitoring methods, action levels and protective equipment required for on-site activities.

Underground Utilities

The Dames & Moore PM or SSO will locate all underground utilities prior to commencement of drilling and excavation operations.

Drilling

Standard Safe Work Practices for drilling are included in Section 10.2 of this Plan. Actual drill rig safety is the sole responsibility of the drill rig operator.

Installation and Operation of the Vapor Extraction System

Dames & Moore will prepare health and safety procedures for the installation and operation of the vapor extraction system as part of the Phase I Site Remediation. These will include:

- Establishment of site work zones during field operations;
- Developing a vapor emissions response plan;
- Monitoring system start-up and the initial operating period;
- Continued operations and monitoring.

Excavations

The scope of work for this project may include excavation to install the vacuum extraction system. The responsibility for excavation operations being conducted in a safe manner rests with the contractor performing this task. The following standard safety procedures should be employed for all excavation procedures:

1. Excavation contractor shall conduct excavation operations in strict accordance with OSHA's 1926.650, Subpart P regulations.

2. The regulation covers all open excavations and defines excavation to include trenches.

3. It requires protection of employees in excavations against cave-ins, except when the excavation is in stable rock, or less than 5 feet deep, or deemed safe by a competent person.

4. Workers must be protected from loose rock or soil, and material or equipment that may fall into the excavation.

5. Underground utility installations must be identified and located.

6. Inspection of the site by a competent person is required daily, or following a natural or man-made event that may alter conditions. If there is evidence of possible cave-ins, protective system failure, hazardous atmospheres, or other hazardous conditions, employees at risk must be removed until corrective steps have been taken.

7. Safe and accessible means of access and egress must be provided.

8. Warning systems for mobile equipment are required (barricades, hand or mechanical signals, or stop logs).

9. The standard requires testing for hazardous atmospheres and controls (including daily inspection by a competent person).

10. Any of four options for sloping and benching systems may be implemented to ensure the stability of adjacent structures. These include:

    - A slope of 34 degrees or less in lieu of soil classification;
    - Maximum allowable slopes according to Appendices A and B of the standard;
    - Sloping or benching designs in accordance with stated criteria;
    - Excavations designed by a registered professional engineer.

11. Any of four options for support and shield systems. These include:

    - Designs for timber shoring in trenches in accordance with set criteria;
    - Designs using manufacturers' tabulated data in accordance with set criteria;
    - Designs using other tabulated data;
    - Other approved designs by a registered professional engineer.

12. Excavation shall stop during inclement weather (i.e., high winds, heavy rainfall, lightning, etc.).

Heat Stress Recognition and Control

Wearing Personal Protective Equipment (PPE) can place a hazardous waste worker at considerable risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, work load, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites, regular monitoring and other preventative precautions are vital.

Heat stress monitoring should commence when personnel are wearing PPE, including Tyvek-type coveralls, and the ambient temperature exceeds 70°F. If impermeable garments are not worn, monitoring should commence at 85°F. Heat stress monitoring and control guidelines can be found in the Attachments.

5.0 EMERGENCY RESPONSE PLAN

5.1 EMERGENCY CONTACTS

In the event of an emergency, the following numbers can be called for assistance:

CONTACT	PERSON OR AGENCY	TELEPHONE
Police	Newark PD	911
Fire	Newark FD	911
Ambulance	Newark EMS	911
Hospital	St. James Hospital	(201) 589-1300
Poison Control		(800) 962-1253
Client Contact	Gerald Poss (Poss & Rotella)	(201) 762-6400
D&M Project Manager	Nick Emandi	(908) 272-8300
D&M MPIC/Group Leader	Joel Landes	(908) 272-8300
Office Safety Coordinator	Kathryn A. Sova	(908) 272-8300
Regional H&S Manager	Kathryn A. Sova	(908) 272-8300

5.2 LOCATION OF SITE RESOURCES (for emergency use)

Water Supply: Available on-site.
Telephone: Available on-site.

The location of site resources for emergency use will be identified by the SSO prior to initiation of on-site activities. The list of emergency numbers will be posted at the telephone designated for emergency use.

5.3 EMERGENCY ROUTE TO HOSPITAL

From the site, turn left onto Doremus Avenue and continue on to Wilson Avenue. On Wilson Avenue, turn right; proceed to Lafayette Street and turn left. Stay on Lafayette Street to Jefferson Street and turn left. St. James Hospital is located at 155 Jefferson Street in Newark, New Jersey.

A map of the route to the hospital is included with the Attachments.

5.4 ADDITIONAL ARTICLES TO BE TAKEN INTO FIELD

1. First Aid Kit (for minor injuries)

2. Disposal Eye Wash (1 liter or more) with a minimum of two additional bottles of eye wash.

5.5 ACCIDENT REPORT

In the event of an injury or illness, work will cease until the SSO and PM have examined the cause of the incident and have taken the appropriate action. Any injury or illness, regardless of extent, is to be reported on the Accident Report Form (see Attachments).

6.0 SITE SAFETY WORK PLAN

6.1 AIR MONITORING

6.1.1 Air Monitoring Requirements

The SSO will conduct air monitoring for the hazards present in Table 1. Equipment necessary for air monitoring at this site consists of an OVA/PID and an explosimeter. The type of monitoring instruments specified by the hazard and the action levels to upgrade personal protection are shown in Table 3. All monitoring equipment shall be maintained following procedures outlined in the owner's manual for the specified monitoring equipment.

6.1.2 Air Monitoring Schedule

6.1.2.1 Instrument Calibration

All applicable instruments shall be calibrated daily. Readings shall be recorded on the Instrument Calibration Check-Out Sheet provided in the Attachments.

6.1.2.2 Background Readings

Before any field activities commence, the background levels of the site will be read and noted on the Air Monitoring Data Sheets in the Attachments. Daily background readings shall take place away from areas of potential contamination to obtain accurate results.

6.1.2.3 Air Monitoring Frequency

All site readings may be noted on the Air Monitoring Data Sheet provided in the Attachments along with the date, time, weather conditions, wind direction and speed, if possible, and location where the background level was recorded.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 LEVELS OF PROTECTION

A minimum of Level D+ protection is needed to perform work on-site. Level C protection may be required, as described in Table 4, and will be available on-site. Level C protection will be required when free product is being recovered with hand bailers.

7.2 RESPIRATORY PROTECTION

7.2.1 Types of Cartridges/Limits of Cartridges

If air purifying respirators are required, organic vapor cartridge(s) with high efficiency dust and mist filters will be used.

Sampling activities will be initiated in Level D+. If organic vapors as measured in the breathing zone by the OVA/PID exceed 3 ppm, don respirators. However, if organic vapors exceed 50 ppm, evacuate the area and notify the Project Manager. A re-assessment of personal protective equipment (PPE), including respiratory protection, will be made.

All ambient air measurements which are taken to evaluate personnel exposure will be taken within the individual's breathing zone and shall be fairly frequent or constant for a duration of at least 30 seconds.

If dry or dusty conditions exist, implement dust suppression measures or Level C. If dusty conditions continue following dust suppression, don respirator.

8.0 SITE CONTROL

8.1 GENERAL

Barricades and barricade tape should be used to delineate an exclusion zone around the active work area, e.g., drill rig, excavation, etc. The barriers should be set in a 25-foot radius (as practical) around the operation. A 5-foot opening in the barricade at the support zone (upwind of the operation) will serve as the personnel and equipment entry and exit point. The personal decontamination station will be established at this point. All entry to and exit from the drilling work area will be made at this opening in order to control potential sources of contamination (i.e., leave contaminated soil and debris in the exclusion area).

At the end of the work shift, all boring/sampling holes must be covered or otherwise secured.

The PM or SSO will determine an upwind evacuation area prior to each shift and secure a short piece of barricade tape to the drill rig's mast to indicate wind direction.

The PM or SSO will ensure that all site visitors are provided site hazard and emergency information before they enter the site by providing a copy of this Health and Safety Plan to the visitor.

The PM or SSO will also ensure that all personnel who enter the work zones have completed the appropriate training program and are participating in a medical surveillance program as per the requirements of this Plan.

8.2 WORK ZONES

- **Exclusion Zone** - A 25-foot (as practical) circle around work areas will be defined before drilling starts. The encircled area will constitute the

"Exclusion Zone". This zone is where potentially hazardous contaminants and physical hazards to the workers will be contained. Full personal protection will be required in this area. The size of the Exclusion Zone may be altered to accommodate site conditions and to ensure contaminant containment.

- **Contamination Reduction Zone (CRZ)** - A corridor leading from the Exclusion zone will be defined, and will lead from the work area to a break area. All decontamination activities will occur in this area. A waste container will be placed at the end of the corridor so contaminated disposal equipment can be placed inside and covered. Surface/soil contamination in this area should be controlled using plastic sheeting. No Dames & Moore personnel will be permitted into the Contamination Reduction Zone or Exclusion Zone unless they are in full compliance with this Plan.

- **Support Zone** - A Support Zone, the outermost part of the site, must be defined for each field activity. Support equipment is located in this uncontaminated or clean area. Normal work clothes are appropriate within this zone. The location of this zone depends on factors such as accessibility, wind direction (upwind of the operation), and resources (i.e., roads, shelter, utilities).

9.0 DECONTAMINATION PROCEDURES

9.1 GENERAL

Personnel should follow the decontamination procedures outlined below.

1. Locate a decontamination area between the Exclusion Zone and the Support Zone.

2. Establish a personnel decontamination station consisting of a basin with soapy water, a rinse basin with plain water and a can with a plastic bag.

3. Wash boots, scrub with stiff bristle brush and rinse.

4. Remove outside gloves and discard in plastic bag.

5. Remove disposable suit and discard in plastic bag.

6. Remove hard hat and eye protection.

7. Remove respirator, if applicable.

8. Remove inner gloves.

9. Wash hands and face.

10. Upon leaving the contamination area, all personnel will proceed through the appropriate Contamination Reduction Sequence as described above.

11. All protection gear should be left on-site during lunch break following decontamination procedures.

A schematic of a Minimum Decontamination Layout is provided in the Attachments.

Each employee will be responsible for cleaning, sanitizing and storing his/her own respirator in accordance with the manufacturer's directions (i.e., washing in warm water and detergent or sanitizing solution, air drying and storing in a plastic storage bag).

10.0 STANDARD SAFE WORK PRACTICES

10.1 GENERAL

1. Eating, drinking, chewing gum or tobacco and smoking are prohibited in the contaminated or potentially contaminated area or where the possibility for the transfer of contamination exists.

2. Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid, whenever possible, kneeling on the ground, leaning or sitting on equipment or ground. Do not place monitoring equipment on potentially contaminated surface (i.e., ground, etc.).

3. Prevent, to the extent possible, spillage. In the event that a spillage occurs, contain liquid, if possible.

4. Prevent splashing of contaminated materials.

5. All field crew members shall make use of their senses (***all senses***) to alert them to potentially dangerous situations in which they should not become involved (i.e., presence of strong, irritating or nauseating odors).

6. Field crew members shall be familiar with the physical characteristics of investigations, including:

   - Wind direction in relation to ground zero area;,
   - Accessibility to associates, equipment, vehicles;
   - Communications;
   - Hot zone (areas of known or suspected contamination);
   - Site access;
   - Nearest water sources.

7. The number of personnel and equipment in the contaminated area should be minimized, but only to the extent consistent with work force requirements of safe site operations.

8. All wastes generated during Dames & Moore and/or subcontractor activities at the site will be disposed of as directed by the PM.

9. All personal protective equipment will be used as specified.

10.2 DRILLING AND SAMPLING PROCEDURES

For all drilling and sampling activities, the following standard safety procedures shall be employed.

1. All drilling and sampling equipment shall be cleaned before proceeding to the site.

2. At the drilling or sampling site, sampling equipment shall be cleaned after each use.

3. Work in "cleaner" areas should be conducted first where practical.

4. The minimum number of personnel necessary to achieve the objectives shall be within 25 feet of the drilling or sampling activity.

5. If emergency and back-up subcontracted personnel are at the site, they should remain 25 feet from the drilling or sampling activity, where practical.

6. All unauthorized personnel will remain outside the Exclusion Zone at all times.

11.0 TRAINING AND MEDICAL SURVEILLANCE

All Dames & Moore site personnel will have met the requirements of 29 CFR 1910.120(e), including 40-hour hazardous waste operations training or its recognized equivalent. All Dames & Moore site personnel are participating in a medical surveillance program that meets the requirements of 29 CFR 1910.120.

In addition, all Dames & Moore site personnel will sign a copy of the Plan Acceptance Form, which is found in the Attachments.

Prior to the start of site operations, the SSO will conduct a tailgate safety meeting, which will include all personnel involved in site operations. At this meeting, the SSO will discuss:

- Contents of this Health and Safety Plan;
- Types of hazards at the site and means for minimizing exposure to them;
- Air monitoring requirements;
- Personal protective equipment used for site work;
- Location of emergency equipment; and
- Evacuation signals and procedures.

Subsequent site safety briefing will be conducted each day or prior to each shift to review pertinent safety issues and discuss any problems.

12.0 RECORDKEEPING

The PM and SSO are responsible for site recordkeeping. Prior to the start of work, they will review this Plan; if there are no changes to be made, they will sign the cover sheet and forward a copy to the RHSM.

Site Safety Briefing Form
Plan Acceptance Form
Plan Feedback Form (optional)
Accident Report Form (Submit within 24 hours of accident.)
Air Monitoring Data Sheet

The Site Safety Briefing Form will be completed on a daily basis prior to initiation of on-site activities. The Plan Acceptance Form should be filled out by all Dames & Moore employees working on the site. The Plan Feedback Form should be filled out by the SSO and any other on-site employee who wishes to fill one out. The Accident Report Form should be completed by the PM in the event that an accident occurs and forwarded to the office administrative manager and RHSM.

ALL COMPLETED FORMS SHOULD BE RETURNED TO THE CRANFORD HEALTH AND SAFETY OFFICER

/jhm

TABLE 1

EXPOSURE LIMITS AND RECOGNITION QUALITIES

Compound	Exposure Limits$^{(a)}$ (ppm Unless Otherwise Indicated)	STEL$^{(b)}$	IDLH Level$^{(c)}$ (ppm Unless Otherwise Indicated)	Skin Designation$^{(d)}$	Odor	Warning Concentration (ppm)	LEL$^{(e)}$ (%)	Ionization Potential (EV)
Benzene	$1^{(1)}$ $0.1^{(2)}$	$5^{(1)}$	Ca (3,000)	--	Aromatic	1.5-5	1.3	9.25
Chromium	0.5 mg/m$^{3(1)}$	--	None Specified	--	Odorless	--	NA	--
Copper	1 mg/m$^{3(1)}$	--	None Specified	--	Odorless	--	NA	--
1,2-Dichlorobenzene	50 Ceil $^{(1)(2)}$	--	1,700	Yes	Pleasant, aromatic	2-50 (20-30)	2.2	9.06
1,1-Dichloroethane	$100^{(1)}$ $200^{(2)}$		4,000		Chloroform-like	120	6	11.12
1,2-Dichloroethylene	$200^{(1)(2)}$		4,000		Sightly acrid	0.085-500	9.7	9.96
Ethyl Benzene	$100^{(1)(2)}$	125	2,000	--	Aromatic	0.25-200 (200)	1.0	8.76
Lead	0.05 mg/m$^{3(1)}$ 0.15 mg/m$^{3(2)}$	--	700 mg/m^3	--	Odorless	--	NA	NA
Naphthalene	$10^{(1)(2)}$	15	500	--	Mothballs	0.003-0.3 (15)	0.9	8.12
Nickel	1 mg/m$^{3(1)}$	--	Ca (None Specified)	--	Odorless	--	NA	--
Tetrachloroethylene	$25^{(1)}$ $50^{(2)}$	200	Ca		Chloroform-like	4.68-50 (106-690)	Not Combustible	9.32
Toluene	$100^{(1)(2)}$	$150^{(1)(2)}$	2,000	--	Aromatic	0.17-40 Fatigue (300-400)	1.3	8.82
1,1,1-Trichloroethane	$350^{(1)(2)}$		1,000		Chloroform-like	20-500	7	11.3
Trichloroethylene	$50^{(1)(2)}$	200	Ca (1,000)	--	Sweet-like	21.4-400	11	9.47
Xylenes (o-, m- and p-isomers)	$100^{(1)(2)}$	$150^{(1)(2)}$	1,000	--	Aromatic	1.8/1.1-3.7/0.47-0.53 (R)	1/1.1/1.1	8.56/8.56/8.44

<u>NOTES</u>:

(a) • OSHA Permissible Exposure Limit or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value.
(b) STEL - Short-term Exposure Limit averaged over a 15-minute period.
(c) Immediately Dangerous to Life or Health Level.
(d) Skin designation indicates the potential contribution to overall exposure, particularly by direct contact with the substance.
(e) Lower Explosive Limit
(1) OSHA Time Weighted Average
(2) ACGIH Time Weighted Average
Ceil Ceiling concentration not to be exceeded at any time.
Ca Potential human carcinogen.
The odor warning concentrations given are generally odor thresholds with irritation thresholds given in parenthesis.

TABLE 2

ACUTE AND CHRONIC EFFECTS AND FIRST-AID TREATMENT

Compound	Routes of Entry	Eye Irritant	Acute Effects	Target Organs
Benzene	Inhalation, Skin Absorption, Ingestion, Skin and/or Eye Contact	Yes	Giddy, headache, nausea, staggered gait, fatigue, lassitude	Blood, CNS, skin, bone marrow, eyes, respiratory system, leukemia
Chromium	Inhalation, Ingestion,	–	Histologic fibrosis of lungs	Respiratory system, Chromium VI carcinogen
Copper	Inhalation, Ingestion, Skin and/or Eye Contact	Yes	Irritates nasal mucous membranes, metallic taste, dermatitis	Respiratory system, skin, liver, kidneys, increased risk with Wilson's disease
1,2-Dichlorobenzene	Inhalation, Ingestion, Skin and/or Eye Contact	Yes	Irritates eyes, nose; skin blister	Liver, eyes, kidneys, skin
1,1-Dichloroethane	Inhalation, Ingestion, Skin and/or Eye Contact	–	Drowsiness, unconsciousness, skin irritation	Skin, liver, kidneys
1,2-Dichloroethylene	Inhalation, Ingestion, Skin and/or Eye Contact	Yes	Irritates eyes, respiratory system, CNS, depression	Eyes, CNS, respiratory system
Ethyl Benzene	Inhalation, Ingestion, Skin and/or Eye Contact	Yes	Headache, narcotic, coma	Eyes, upper respiratory system, skin, CNS
Lead	Inhalation, Ingestion, Skin and/or Eye Contact	–	Lassitude, insomnia, eye grounds, abdominal pain, gingival lead line, weakness, facial pallor, tremors	GI tract, CNS, kidneys, blood, gingival tissue
Naphthalene	Inhalation, Ingestion, Skin and/or Eye Contact	Yes	Headache, confusion, excitement, nausea, vomiting, profuse sweating, dermatitis	Liver, kidneys, eyes, blood, skin, red blood cells, CNS
Nickel	Inhalation, Ingestion, Skin and/or Eye Contact	–	Headache, vertigo, nausea, vomiting, substernal pain, cough, weakness, cyanosis	Lungs, paranasal sinus, CNS
Tetrachloroethylene	Inhalation, Ingestion, Skin and/or Eye Contact	Yes	Irritates nose, throat; flushed face and neck, vertigo, dizziness	Liver, kidneys, eyes, upper respiratory system, CNS
Toluene	Inhalation, Ingestion, Skin Absorption, Skin and/or Eye Contact	–	Fatigue, weakness, confusion, euphoria, dizziness, headache, photophobia	CNS, kidneys, liver, skin
1,1,1-Trichloroethane	Inhalation, Ingestion, Skin and/or Eye Contact	Yes	Headache, lassitude, dermatitis, cardiac arrhythmia, poor equilibrium	Skin, CNS, CVS, eyes
Trichloroethylene	Inhalation, Ingestion, Skin and/or Eye Contact	Yes	Headache, vertigo, visual disturbances, nausea, vomiting	Respiratory system, heart, liver, kidneys

TABLE 2
(continued)

Compound	Routes of Entry	Eye Irritant	Acute Effects	Target Organs
Xylenes (o-, m- & p-isomers)	Inhalation, Ingestion, Skin Absorption, Skin and/or Eye Contact	Yes	Dizziness, excitement, drowsiness, incoordination, staggering gait, nausea, vomiting	CNS, eyes, GI tract, blood, liver, kidneys, skin

General First-Aid Treatment (A first-aid kit will be kept in the site vehicle.

Eye	- Irrigate immediately a portable eye-wash unit will be kept in the site vehicle).
Skin	- Soap wash promptly.
Inhalation	- Move to fresh air.
Ingestion	- Get medical attention.

NOTE: CNS - Central Nervous System
CVS - Cardiovascular System
PNS - Periferal Nervous System

TABLE 3

HAZARD MONITORING METHOD, ACTION LEVELS, AND PROTECTIVE MEASURES

Hazard	Monitoring Method	Action Level	Protective Measures	Monitoring Schedule
Toxic Vapors	OVA/PID (10.2 EV lamp)	(1)Measurable Above Background In the Breathing Zone up to 3 ppm	Level D+ (see Table 4)	• Continue working • Continue monitoring every 15 minutes/ every sample retrieved
	OVA/PID (10.2 EV lamp)	(1)Measurable Above Background In the Breathing Zone 3-50 ppm	Level C (see Table 4)	• Continue working • Continuous monitoring
	OVA/PID (10.2 EV lamp)	(1)Measurable Above Background In the Breathing Zone >50 ppm	STOP WORK EVACUATE AREA NOTIFY PROJECT MANAGER	
Toxic Dust	Visual Observation	No dry or dusty conditions	Level D+ (see Table 4)	• Continuous monitoring
		Dry or dusty conditions	*Implement dust suppression measures. Level C (see Table 4)	• Continuous monitoring
Explosive Atmosphere	Explosimeter	0-10% LEL		• Continue monitoring every 15 minutes/ every sample retrieved
		10-25% LEL		• Continuous monitoring
		>25% LEL	**EVACUATE AREA EXPLOSION HAZARD NOTIFY PROJECT MANAGER	

NOTES:

(1) The above action levels are not solely based on the criteria for selecting levels of protection by the 1984 EPA Standard Operating Procedures, but also on the professional judgement and experience of the Site Safety Officer (SSO).

* Super windy or dusty conditions exist. The area should be hosed down to try to minimize the potential for the inhalation of contaminated dust.

** If >25% LEL persists, abandon boring and evacuate area temporarily. After at least 1/2 hour, re-approach borehole from an upwind direction while continuously monitoring with explosimeter. If levels are still unsafe, backfill hole and abandon.

TABLE 4

PROTECTIVE EQUIPMENT FOR ON-SITE ACTIVITIES

Activity	Level	Protective Equipment
All Activities*	D+	• Hard hat • Safety goggles • Coveralls(1) • Outer chemical-resistant (nitrile or neoprene) gloves and inner latex gloves • Outer chemical-resistant (neoprene) steel-toe/steel-shank boots • Hearing protection (foam ear plugs or ear muffs)(2) • Joints between gloves, boots and suit must be taped.
All Activities*	C	• Same as above plus • Full-face respirator with organic vapor cartridges/high-efficiency dust and mist filters(3)

* Any site work involving free product will require Level C protection.

(1) The choice of coveralls will include Tyvek, polyethylene-coated Tyvek or Saranex, depending on job function and field conditions.

(2) Required during noise-intensive activities.

(3) If the OVA/PID reading is measurable above background up to 3 ppm or <u>dusty</u> conditions exist.

ATTACHMENT A

FORMS

SITE SAFETY BRIEFING FORM

ON-SITE SAFETY MEETING

Project

Date Time Job No.

Address

Specific Location

Type of Work

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment

Chemical Hazards

Emergency Procedures

Hospital/Clinic Phone

Hospital Address

Special Equipment

Other

ATTENDEES

Name Printed	Signature

Meeting Conducted by: Name Printed Signature

Site Safety Officer Team Leader

PLAN ACCEPTANCE FORM

PROJECT HEALTH AND SAFETY PLAN

<u>INSTRUCTIONS</u>: This form is to be completed by each person to work on the subject project work site and returned to the Office Safety Coordinator.

Job No. __________________________

Client/
Project____

Date ____________________________

I represent that I have read and understand the contents of the above Plan and agree to perform my work in accordance with it.

____
Signature

____
Print Name

____
Company/Office

____
Date

AIR MONITORING DATA SHEET

Page ___ of ___

SAMPLED BY: ____________________

DATE: ____________________

INSTRUMENT USED: ____________________

PROJECT NAME: ____________________

PROJECT NUMBER: ____________________

CALIBRATION DATE: ____________________

ESTIMATED WIND DIRECTION: ☐ N ☐ S ☐ E ☐ W ☐ NE ☐ NW ☐ SE ☐ SW

ESTIMATED WIND SPEED: ☐ CALM ☐ MODERATE ☐ STRONG

FIELD ACTIVITIES: ____________________

BACKGROUND LEVEL: ____________________ LOCATION: ____________________

SAMPLE NUMBER	TIME	DURATION (MINUTES)	LOCATION	READING(1)	COMMENTS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

(1) Specify units, e.g., ppm, % LEL, % O_2, etc.

PLAN FEEDBACK FORM

Job Number ____________________

Job Name ____________________

Date ____________________

Problems with plan requirements:

Unexpected situations encountered:

Recommendations for future revisions:

ACCIDENT/EXPOSURE FORM

Employee Name ______________________ Date of Birth ______________

Home Address ______________________ Phone No. ______________

Sex: Male ___ Female ___ Job Title ______________ Social Security No. ______________

Office No. ___ Office Location ______________ Date of Hire ______________

Hours Usually Worked: Hours per day _____ Hours per Week _____ Total Hours Weekly _____

Where did accident or exposure occur? (include address) ______________________

____

County ______________ On employer's premises? Yes ___ No ___

What was employee doing when injured? (be specific) ______________________

____

How did the accident or exposure occur? (describe fully) ______________________

____

____

____

What steps could be taken to prevent such an occurrence? ______________________

____

____

Object or substance that directly injured employee ______________________

____

Describe the injury or illness ______________ Part of body injured ______________

Name and address of physician ______________________

If hospitalized, name and address of hospital ______________________

Date of injury/illness __________ Time of day _____ Loss of one or more day of work? Yes/No ___

If yes, date last worked ______________

Has employee returned to work? ___ If yes, date returned ______________

Did employee die? ___ If yes, date ______________

Completed by (print) ______________________ Signature ______________

Title ______________________ Date ______________

An Accident/Exposure Report must be completed by the Supervisor or Site Safety Officer immediately upon learning of the incident. The completed report must be immediately transmitted to the Office Administrative Manager.

ATTACHMENT B

HEAT STRESS/COLD STRESS

HEAT STRESS/COLD STRESS

HEAT STRESS

If site work is to be conducted during the summer or in other hot environments, heat stress is a concern in the health and safety of personnel. For workers wearing permeable clothing, follow recommendations for monitoring requirements and suggested work/rest schedules in the current American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values for Heat Stress. For workers wearing semi-permeable or impermeable clothing, the ACGIH standard cannot be used. For those situations, workers should be monitored when the temperature in the work are is above 70°F (21°C).

To monitor the worker, measure:

- *Heart rate.* Count the radial pulse during a 30-second period as early as possible in the rest period.

  If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

  If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third.

- *Oral temperature.* Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

  If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period.

If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third.

Do not permit a worker to wear a semi-permeable or impermeable garment when his/her oral temperature exceeds 100.6°F (38.1°C).

- *Body water loss*, if possible. Measure weight on a scale accurate to ± 0.25 pound at the beginning and end of each work day to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing or, ideally, is nude. The body water loss should not exceed 1.5 percent total body weight loss in a work day.

Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and the level of physical work (see following Table). The length of the work cycle will be governed by the frequency of the required physiological monitoring.

SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING FOR FIT AND ACCLIMATIZED WORKERS

Adjusted Temperature[(1)]	Normal Work Ensemble	Impermeable Ensemble
90°F (32.2°C) or above	After each 45 min of work	After each 15 min of work
87.5°F - 90°F) (32.8°C - 32.2°C)	After each 60 min of work	After each 30 min of work
82.5°F - 87.5°F) (28.1°C - 30.8°C)	After each 90 min of work	After each 60 min of work
77.5°F - 82.5°F) (25.3°C - 28.1°C)	After each 120 min of work	After each 90 min of work
72.5°F - 77.5°F) (22.5°C - 25.3°C)	After each 150 min of work	After each 120 min of work

(1) Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine - no cloud cover and a sharp, distinct shadow; 0 percent sunshine - no shadows.)

If workers are not monitored for heat stress, work activities in hot environments can result in dehydration, heat exhaustion, heat stress or even heat stroke.

Signs and Symptoms of Heat Stress

- *Heat rash* may result from continuous exposure to heat or humid air.

- *Heat cramps* are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:
  - muscle spasms
  - pain in the hands, feet and abdomen.

- *Heat exhaustion* occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:
  - pale, cool, moist skin
  - heavy sweating
  - dizziness
  - nausea
  - fainting

- *Heat stroke* is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are:
  - red, hot, usually dry skin
  - lack of or reduced perspiration
  - nausea
  - dizziness and confusion
  - strong, rapid pulse
  - coma

COLD STRESS

Frost Bite

Frostbite is an injury resulting from exposure to cold. The extremities of the body (fingers, toes) are most often affected. The signs of frostbite are:

- Skin turns white or grayish-yellow.
- Pain is sometimes felt early, but subsides later. Often there is no pain.
- The affect part feels intensely cold and numb.

Hypothermia

If site work is to be conducted during the winter, cold stress is a concern in the health and safety of the personnel. Additional insulated clothing will be provided to field personnel. Of special note for cold stress on this site is the wearing of Tyvek suits. Disposable clothing does not breath; therefore, perspiration is not provided with a means of evaporation. During strenuous physical activity, an employee's clothes can become wet. Wet clothes combined with cold temperatures can lead to hypothermia. If the air temperature is less than 40°F and an employee becomes wet, the employee must change to dry clothes. The on-site heated trailer facility or a personnel vehicle may be utilized as a change area.

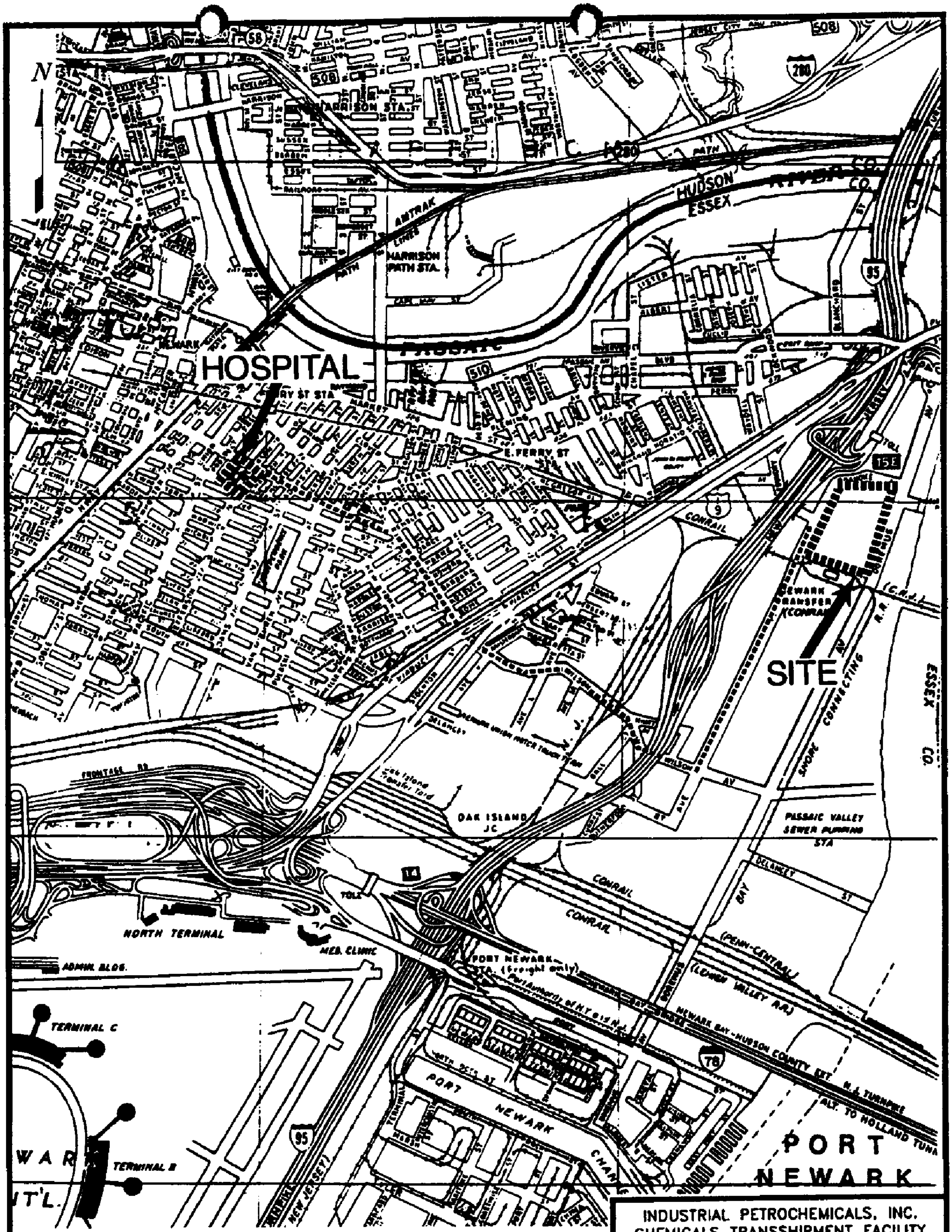
Hypothermia is characterized by shivering, numbness, drowsiness, muscular weakness and a low internal body temperature when the body feels warm externally. This can lead to unconsciousness and death.

In either case (frostbite or hypothermia), seek immediate medical attention.

To prevent these effects from occurring, persons working in cold environments should war adequate clothing and reduce the time spent in the cold area.

ATTACHMENT C

MAP OF EMERGENCY ROUTE TO HOSPITAL



INDUSTRIAL PETROCHEMICALS, INC.
CHEMICALS TRANSSHIPMENT FACILITY
NEWARK, NEW JERSEY

MAP OF
EMERGENCY ROUTE
TO HOSPITAL

Dames & Moore, Inc.
CRANFORD, NEW JERSEY

FIGURE
16

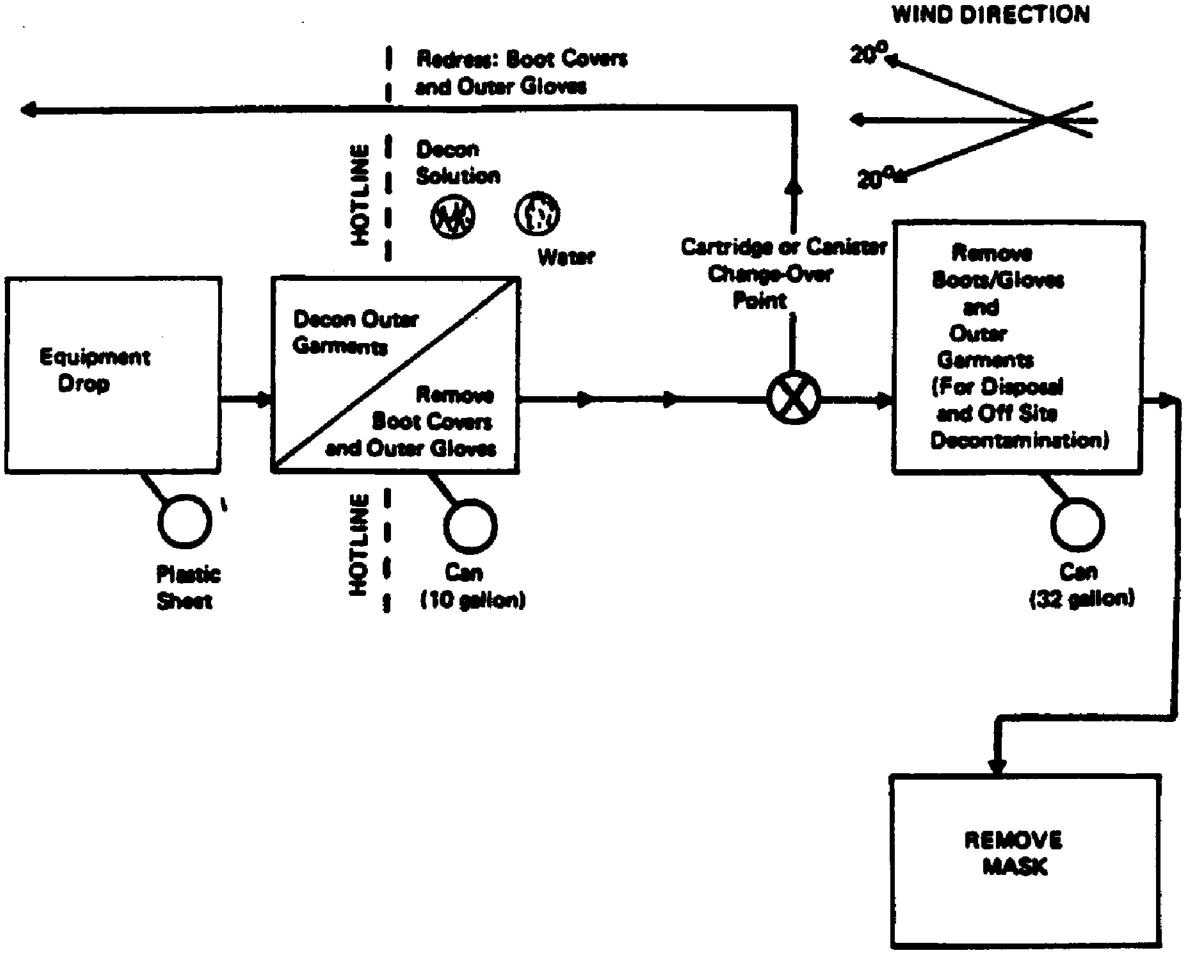
ST. JAMES HOSPITAL
155 JERFFERSON STREET
NEWARK, NEW JERSEY
(201) 589-1300

ATTACHMENT D

MINIMUM DECONTAMINATION LAYOUT

MINIMUM DECONTAMINATION LAYOUT

LEVEL C PROTECTION



Industrial Site Evaluation Element
Bureau of Environmental Evaluation and Cleanup Responsibility Assessment
Environmental Cleanup Responsibility Act

Report of Inspection

ECRA Case #86317 Date of Inspection 3/25/87
Inspection Category: Preliminary
Inspector: Ravi Gupta

Industrial Establishment: Industrial Petrochemicals, Inc.

Location: Newark City, Essex County

Individuals Involved: Gregory A. Pikul - Storch Engineers
Robert Lux - BGWQM, DEP

NARRATIVE DESCRIPTION

Industrial Petrochemicals, Inc. has been operating at the Newark facility since 1983 as a wholesale distributor of various liquid products, predominantly organic solvents. The Industrial Petrochemical facility has gone through major renovations, expansions, operational changes ever since American Oil Company first developed the site in 1946 and used it as a tank farm.

The exterior portion of the facility was inspected and it could be noted that until recently there has been poor housekeeping at the site.

DEFICIENCIES NOTED

1. The majority of the site is gravelled and heavy staining of unpaved surfaces was noted near the Truck Parking Area, mixing tank, around the "Metal Shed" and near the dry wells.
2. An underground storage tank (UGST) and an above ground storage tank (AGST) not mentioned in the Sampling was located behind the corrugated metal frame building.
3. A sealed floor drain was noted inside the "Metal Shed" building and the discharge point of this drain was not determined.
4. The AGST's in the "tank 25 farm" have valves at the bottom which have been possibly used to discharge condensate on to the grounds. Red colored caked material was noticed under tank #12.
5. Tank #34 was used to store resin at sometime. Heavy resin staining was observed near the valves.
6. Tank #24 is empty and was probably used for storing fuel oil. Heavy staining was noted near valves and around filling pipes. The AGST's in "Tank #24 farm" area were stored on wooden pallets and there were signs of and continued potential for overflow on to the unpaved surface.
7. Very heavy soil staining was noted between the wall next to the "Metal Shed" and AGST #3.
8. Spillage was noted from drums near the pallet storage and drummed product storage area.
9. Discharge from the dry well located on the southern portion of the property was directly onto the ground while the discharge point from the northern dry well was directed to the Passaic River.

10. Within the diked area around tank #25 an in ground wooden structure possibly an old drainage system of some kind was noted. Small depressions showing erosional features, possibly avenues for flow out of the diked area were also noted.
11. During site inspection it could not be established whether the facility was serviced by a septic system or connected to the PVSC.

ACTIONS REQUIRED ON THE PART OF THE APPLICANT

1. There are obvious signs of spillage and poor housekeeping at the facility. Industrial Petrochemicals, Inc. (IPI) shall propose a detailed Sampling/Remedial Plan to characterize and delineate extent of contamination. This amended Sampling Plan should be able to generate enough data to develop a complete Cleanup Plan and shall include all areas of concern as mentioned in the original Sampling Plan of June 25, 1986 and the areas as noted in the above section.
2. Obtain and submit aerial photographs of this facility dating back to the early 1950's.
3. Determine if any of the underground tanks located on the northwest portion of the facility were ever repaired or replaced.
4. Determine if a septic system was ever used at this site. Submit date and proof of connection to the PVSC.
5. A proposal to determine integrity of the UGST located behind the corrugated metal shed area shall be included in the amended Sampling Plan.
6. A determination of the discharge point of the metal shed floor drain shall be made and shown on a scaled map.
7. The use and design of the in-ground structure shall be determined by possibly exposing it. IPI shall also investigate the depressions mentioned in deficiency #10 of this report.
8. IPI shall contact Bureau of Industrial Waste Management to apply for a NJPDES Discharge to surface water permit and to apply for a treatment works approval for the dry well systems. The discharge onto the ground from the south side dry well shall be immediately discontinued.
9. The numbering of the proposed monitoring wells shall be corrected and the parameters for ground water sampling shall be expanded in the amended Sampling Plan to include analysis for Base Neutrals +15 (BN+15), Volatile Organics +15 (VO+15) (including o,m,p xylenes) and MEK.
10. The proposal to install monitoring well #1 next to UGST's #1 and 2 is acceptable provided ground water samples are taken and analyzed for VO+15 (including xylenes) BN+15, Petroleum Hydrocarbon (PHC) and the analysis shall include MTBE, DIPE, PBA, Methanol and Lead regardless of the Petro-tite test results.
11. In an amended Sampling Plan include a proposal to install an upgradient monitoring well in addition to the three proposed monitoring wells.
12. IPI shall install a piezometer adjacent to tank 26 and two (2) piezometers in the diked area around tank #25. These piezometers shall be used to collect water level elevation data and to detect the presence of free product.

RECON SYSTEMS, INC.

Route 202 North, P.O. Box 460
Three Bridges, N.J. 08887
201-782-5900

New England 617-752-4217 Pennsylvania 215-433-5511

April 20, 1990

Mr. Sal Balakrishnan
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Hazardous Waste Management
Bureau of Environmental Evaluation, Cleanup,
and Responsibility Assessment
401 East State Street, Fifth Floor
CN 028
Trenton, New Jersey 08625

RE: INDUSTRIAL PETROCHEMICALS, INC.
128 Doremus Avenue
Newark, Essex County
ECRA Case No. 86317

RECON Project No. 1493

Dear Mr. Balakrishnan:

We have been instructed by our clients to submit the Sampling and Analyses Plan documentation report for the above referenced industrial facility. Please find enclosed three (3) copies of the report titled "Results of Implementation of Revised Sampling and Analysis Plan".

Yours very truly,

Abraham Platt

Abraham Platt
Manager, Site Investigation/
Decontamination

Reviewed by

Robert M. Wolfertz
Vice President
Site Investigation/Remediation

AP/ab
enclosure
cc: G. Poss, Esq.
W. J. Positan, Esq.
S. Schnitzer, Esq.
S. Eisenstein, Esq.

ENGINEERING, CONSULTING, LABORATORY,
PILOT PLANT, PLANT TEST SERVICES

POLLUTION CONTROL, WASTE DISPOSAL
RESOURCE RECOVERY, CHEMICAL PROCESS SYSTEMS

RECON SYSTEMS INC.
ROUTE 202N, P.O. BOX 460, THREE BRIDGES, N.J. 08887-0460
201-782-5900 FAX 201-782-0072

RESULTS OF IMPLEMENTATION

of

REVISED SAMPLING AND ANALYSIS PLAN

for

INDUSTRIAL PETROCHEMICALS, INC.
128 Doremus Avenue
Newark, New Jersey

Prepared for

INDUSTRIAL PETROCHEMICALS, INC. TRUST FUND

Lum, Hoens, Conant, and Danzig
103 Eisenhower Parkway
Roseland, New Jersey

and

RUDD and POSS
58 Voss Avenue
South Orange, New Jersey

Prepared by

RECON SYSTEMS, INC.
Route 202 North, P. O. Box 460
Three Bridges, New Jersey

ECRA Case No. 86317

RECON Project No. 1493

April 20, 1990

1493.RI 4.18.90

RECON SYSTEMS, INC.
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FIGURES

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1.0 INTRODUCTION

Industrial Petrochemicals, Inc. (IPC) is located in the City of Newark in Essex County, New Jersey. IPC is in a heavily industrialized area with the Passaic River as its eastern boundary, Hess Tank Farm on the southern perimeter, Getty Tank Farm to the north and Doremus Avenue with more industrial property on the western side. The facility stores and distributes liquid industrial chemicals, most commonly organic solvents and petroleum products. The surrounding properties are used primarily as tank farms for petroleum product storage.

The work performed for this report was in accordance with the conditionally approved Sampling and Analysis Plan submitted to the NJ DEP's Bureau of Environmental Evaluation, Cleanup and Responsibility Assessment (BEECRA) on March 28, 1989, the Addendum submitted May 10, 1989 as well as the NJ DEP letter sent January 4, 1990. RECON received verbal conditional approval on May 26, 1989 from the case manager (at that time, Mr. Ravi Gupta).

Included are the description of soil sampling activities, the groundwater investigation and analytical results. Also included in this report is a review of available data on soil and groundwater contamination at other local Environmental Cleanup Responsibility Act (ECRA) and New Jersey Pollution Discharge Elimination System (NJPDES) sites. This data is compared to contaminants found in the soil and groundwater at IPC.

Various State and local agencies were also contacted as part of this study (see the Memorandums in Appendix XI). Copies of files for sites within a mile radius of IPC were obtained from BEECRA and the Division of Water Resources (DWR). Figures 2 and 3 of this report help the reader locate the referenced sites discussed in the text.

The location of the site and surrounding roads and highways are shown on Figures 1A and 1B. RECON Drawing No. 1493-100-C, Revision No. 1, is the Plot Plan of the facility.

2.0 DESCRIPTION OF SOIL SAMPLING ACTIVITIES

Soil sampling was conducted on the IPC site on May 31 and June 1, 1989. In all, a total of nineteen (19) soil samples were obtained from eighteen (18) boring locations and submitted for laboratory analyses. Most of the borings were advanced using a mechanically driven six inch diameter continuous flight auger. Six inch core samples of soil were recovered using 3 inch diameter stainless steel SCS bucket augers. A 12 inch continuous flight auger was used to advance three (3) of the borings. These soil samples were taken with a 2 inch diameter, 24 inch stainless steel split spoon samplers. All core samples were placed into appropriate sample containers for transport to the analytical laboratory. See RECON Drawing Nos. 1493-101-C, Revision No. 1 for the initially proposed boring locations and 1493-201-D for the actual boring locations.

For the following reasons boring locations had to be shifted. Borings 8, 9, and 11 were moved to comply with the conditions addressed by Mr. Ravi Gupta, Case Manager. The locations of borings 13 and 18 were also moved slightly to avoid the metal bases of the previous on site 400,000 to 500,000 gallon tanks. The initial location of boring 10 fell under a non-movable trailer. Drummed and palletized inventory blocked borings 2 and 3. The drill rig hit refusal three times before a successful location was chosen for boring 1. Boring 17 was moved due to overhead electrical wires.

As the groundwater was encountered in borings 4 and 8 at 2.5-3′, the soil sample was collected from 24-30". This corresponds with the 6" interval above groundwater. Consequently, only one (1) sample was obtained at each location rather than the proposed two (2) samples per boring. See Appendix I of this report for the soil boring logs.

3.0 ON SITE GROUNDWATER INVESTIGATION

Three (3) groundwater monitoring wells and six (6) well points were installed per the Revised Sampling and Analysis Plan. Installation and development of these wells occurred on May 31, June 1, and June 19, 1989. The wells were installed according to the NJ DEP Specifications for Monitoring Wells in Unconsolidated Formations. The well points followed the same construction techniques. Table 6, Summary of Monitoring Well Data, lists information on well construction, water levels, permit numbers, etc. The location of these wells and well points are shown on RECON Drawing No. 1493-200-D. See Appendix I for the well point and monitoring well lithologic/construction logs and Appendix II for the Groundwater Monitoring Well Certification - Form B - Location Certification. The location survey was conducted by Johnson Engineering Inc. of Morristown, New Jersey on August 7, 1989. A copy of the Permit to Drill Well(s) issued by the Division of Water Resources is also enclosed in Appendix II as are copies of Monitoring Well Certification - Form A - As Built Certification.

The well points were installed by RECON, utilizing a 6 inch hollow stem auger, while the monitoring wells were constructed through a 12 inch hollow stem auger by Environmental Drilling, Inc. of West Creek, New Jersey. Bucket auger sampling at the well point locations and split spoon sampling for the monitoring wells proceeded to the water table to determine depth to groundwater prior to the construction of the well points and monitoring wells.

After installation and development of the well points and monitoring wells, the water was examined for visual and olfactory evidence of contamination. Although no free product was found in any of the wells, the water had a noticeable discoloration. It was yellow-green in color but translucent. The water also had a noticeable "caustic" odor. During groundwater sampling (fourteen days later), free product was detected in MW-3.

4.0 DISCUSSION OF HEALTH AND SAFETY PLAN IMPLEMENTATION

Sampling Date:	May 31, 1989
Site Supervisor:	Abraham Platt
Safety Technician:	Amy L. Henderson
Driller:	Craig M. Caldwell
Field Geologist:	Bernhard Meyer

Field operations began with all personnel in Level "D" respiratory protection. The instruments used to monitor the concentration of organics in the air were two (2) HNU PI 101; the 10.2 eV lamp and the 11.7 eV lamp calibrated for phenol. The breathing zones above borings B-1, B-10, B-15, B-16, and B-9 showed readings of less than 5 ppm total hydrocarbons above background levels. Therefore, drilling of these borings was continued in Level "D". While drilling at location B-13, the 11.7 eV lamp read 30 ppm above background six inches above the boring and an unidentifiable odor was entering the breathing zone. Respiratory protection was upgraded to Level "C" protection and B-13 was completed while monitoring continued. Level "C" protection was also donned by all personnel after a reading of 55 ppm total hydrocarbons in the breathing zone of boring B-6.

Sampling Date:	June 1, 1989
Site Supervisor:	Abraham Platt
Safety Technician:	Amy L. Henderson
Driller:	Craig M. Caldwell
Field Geologist:	Bernhard Meyer
Senior Geologist:	J. Douglas Reid-Green
Driller:	R. Atvinson (Environmental Drilling, Inc.)
Assistant Driller:	N. A. Fallucca (Environmental Drilling, Inc.)

Due to rainy weather conditions, the two (2) HNU PI 101's used to monitor the air became wet and were not operational. A Century OVA 128 monitor was used for the duration of the day. Due to the apparent high background concentrations, from both the onsite and offsite sources, zeroing the OVA 128 was very difficult. Eventually, the site supervisor and the safety technician chose to complete drilling of borings B-8, B-17, and B-11 in Level "C" respiratory protection while continually monitoring the areas. The following borings measured zero above background for total hydrocarbons and were completed in Level "D" protection; B-1, B-2, B-3, B-5, B-7, B-14, and B-18.

Sampling Date:	June 19, 1989
Site Supervisor:	Bernhard Meyer
Driller:	Scott Hauge (Environmental Drilling, Inc.)
Assistant Driller:	Ralph Pisano (Environmental Drilling, Inc.)

The HNU PI 101 instrument was again used to monitor the concentrations of organics in the air. The breathing zone above boring B-4 during drilling and installation of monitoring well MW-3 measured zero above background for total hydrocarbons. The balance of the field activities for the day was completed in Level "D" personal protection.

5.0 SOIL SAMPLING STUDY

5.1 Discussion of Soil Sampling Results

Nineteen (19) soil samples were obtained from the eighteen (18) boring locations and analyzed for total petroleum hydrocarbons and volatile organic plus library search compounds.

The analytical results for petroleum hydrocarbons (PHCs) for the nineteen (19) soil samples range from 1,350 to 117,000 ppm.

The laboratory data for volatile organic compounds (VOCs) indicate concentrations of VOCs range from 1.28 to 12,010 ppm. The highest concentrations were detected in soils from the tank farms, the metal shed area, and the drum and tanker storage areas. Basically these areas comprise the eastern half of the property plus the area around boring B-10 which is a drum and tanker storage area. The majority of the VOC compounds that showed up in the laboratory analyses are aromatic and chlorinated hydrocarbons.

Several of the soil samples (B-1, B-4, B-7, B-8, B-10, B-12 and B-17) were also analyzed for base neutral plus library search compounds (BN). The seven (7) samples were selected to screen the entire facility. The laboratory analyses for all seven (7) samples indicate BN concentrations range from 30 to 425 ppm. The majority of the compounds detected consists of benzene, naphthalene and other straight chained hydrocarbons.

6.0 HYDROGEOLOGIC STUDY

In order to initially assess the potential impact to groundwater beneath this site, six (6) well points and three (3) monitoring wells were installed. Information obtained from these wells can be used to investigate contaminant concentration distribution and groundwater flow characteristics.

6.1 Groundwater Sampling and Analysis Results

Water samples were collected on July 7, 1989, from each of the three (3) monitoring wells (MW-1, MW-2, and MW-3). Analytical results indicate that concentrations above NJPDES limitations for petroleum hydrocarbons (PHC), cadmium, chromium, lead, total volatile organic compounds (TVOC) (specifically benzene, toluene, and xylenes), total base neutrals (TBN), and acid extractables (AE) were detected. Free product, described as a thick black oily substance, was detected in MW-3 after it was purged.

Analyses of the water taken from MW-1 indicate elevated levels of petroleum hydrocarbons, benzene, toluene, xylenes, lead, and tertiary-butyl alcohol and the relatively low levels of base neutral compounds suggest gasoline or another light fuel such as diesel as being the contaminant source. This well is located adjacent to the underground gasoline and diesel tanks.

Water from MW-3 contained elevated levels of base neutrals, normally those associated with heavier fuel product. This coupled with the presence of free product suggests that the source is a heavier fuel oil such as no. 4 or no. 6 fuel oil. Lower concentrations (<100 ppb) of chlorinated volatile compounds indicate other sources have had an impact on the groundwater.

Acid extractables found exclusively in MW-2 do not appear to be related to any of the on site activities but may be associated with adjacent sites.

6.2 **Aquifer Characteristics**

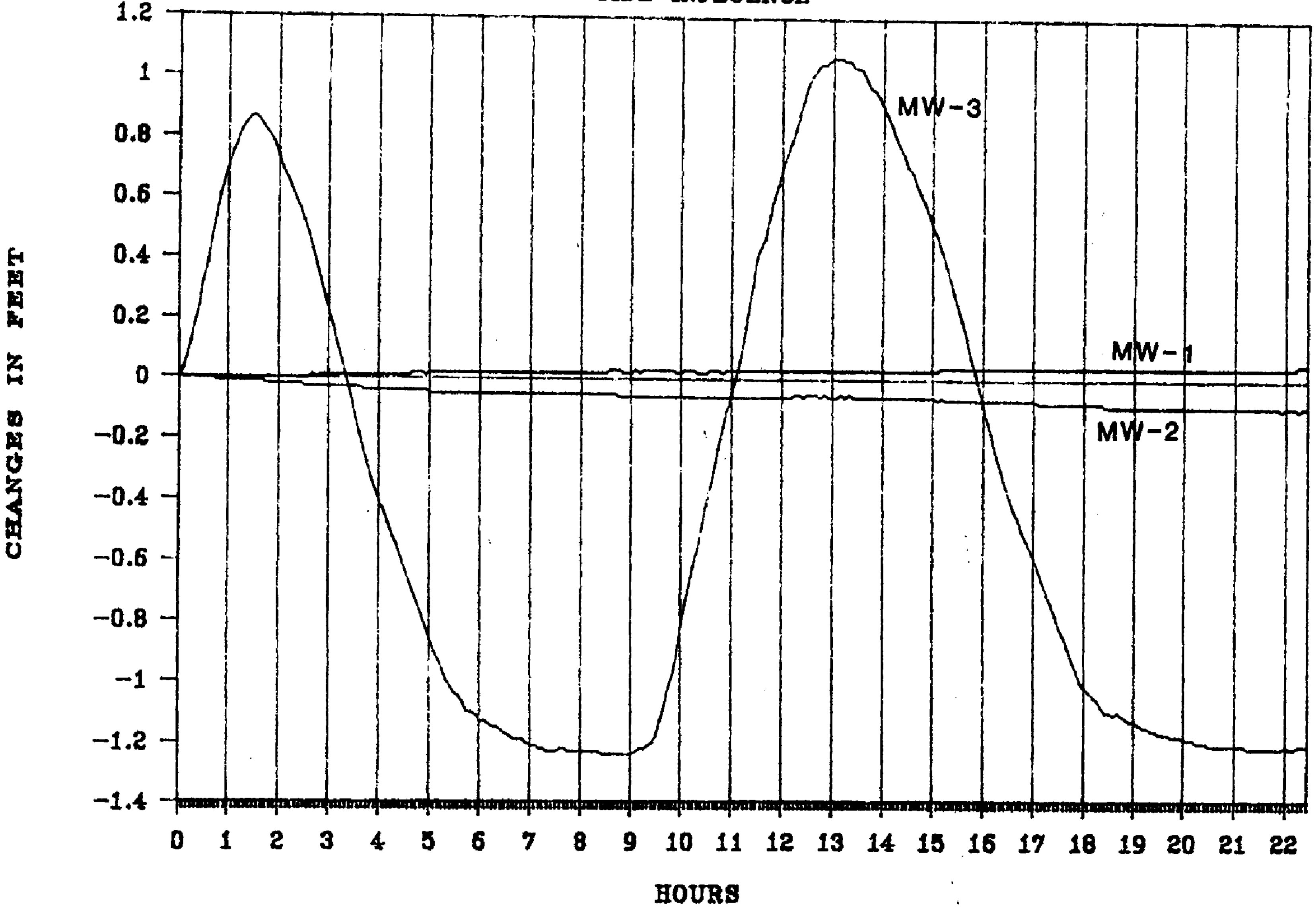
Two (2) factors controlling the flow of groundwater on the site have been investigated to date. Hydraulic gradients across the site were determined by measuring the depth to groundwater on June 5, 1989 in the six well points, MW-1 and MW-2 (see RECON Drawing No. 1493-300-D, Water Table Map). The hydraulic gradients were determined again on February 1, 1990 by measuring the depth to groundwater in five (5) of the well points and the three (3) monitoring wells. See RECON Drawing No. 1493-303-D. A general flow direction to the northeast was again determined. A hydraulic low was also noted north of the aboveground tank farm. This area had apparently been a small stream or inlet. Sometime during the expansion of the site it was backfilled using coarser fill materials than the rest of the area.

The tidal influence on the movement of groundwater was investigated by measuring fluctuations in the water level over a 24-hour period. Pressure transducers were placed in MW-1, MW-2, and MW-3. Water levels were recorded every 15 minutes by means of a data logger. The data was down loaded to a microcomputer and plotted on a graph titled, Water Table Fluctuation (attached to this section). No tidal influence was noted in MW-1 or MW-2. MW-3 showed typical tidal oscillations.

RECON Drawing Nos. 1493-301-D and 1493-302-D show the effect of tidal variations on the water table at high and low tide on July 7, 1989. The flow direction shifts only slightly with the change in river elevation. During high tide the water flows north - northeast and has no evidence of the hydraulic low noted on the earlier map. Low tide shows a shift in the water table contours toward the higher hydraulic conductivity area of the fill around MW-3. The filled inlet appears to act as a "drain" for the site (water enters and leaves easier through the northeast corner of the site). Even though the river reverses flow directions with the tides, the groundwater flow direction seems to be only slightly affected.

WATER TABLE FLUCTUATIONS

TIDE INFLUENCE



7.0 LOCAL ENVIRONMENTAL CONDITIONS

Analysis of site conditions within a one mile radius of IPC (ECRA Site Contaminants - RECON Drawing No. 1493-204C) indicates that the entire area has significant concentrations of many chemical compounds. The most widely found soil and groundwater contaminants were petroleum hydrocarbons, volatile organics and base neutrals. In addition, priority pollutant metals (mainly lead) were found in the groundwater at a concentration of about 1 ppm. Soils at IPC have not been analyzed for priority pollutant metals.

One potential contributory source of the petroleum hydrocarbon (PHC) contamination appears to be the adjacent Getty Refining and Marketing facility, where the concentration of PHCs in the soil are more than ten (10) times higher than at IPC. This observation is based on the configuration of the petroleum hydrocarbon plumes shown by the isopleths on RECON Drawing No. 1493-210-D. Another plume of higher PHC concentration appears to originate from an area to the west of IPC.

The concentrations of priority pollutant metals (mainly lead) in the soil and groundwater are also about ten (10) times higher at Getty than those found at IPC. Concentrations of other contaminants (acid extractables, base neutrals, priority pollutant metals, polychlorinated biphenyls and cyanide) are similar to those of contaminated sites in the area.

Listings of contaminants found on adjacent sites are contained in Appendix IX. A Well Record Search for IPC was conducted, which included information on facilities within a 1/2 mile radius. Details of this search are contained in Figure 3 and Appendix X.

7.1 Local History

A long history of industrial use is documented:

1. The meadowlands have been filled by many parties since the 19th century including municipal, federal and state governments, railroads, and industry.

2. Many industries can trace their origins to Newark (e.g. plastics, smelting, and malleable cast iron). The resulting patterns of soil and groundwater degradation indicate a problem of a regional scope and nature.

3. Both shallow groundwater and the Brunswick aquifer have been seriously impacted, although neither has been used as a potable water supply in many years.

4. Groundwater in the region of the Meadows and Ironbound Sections of Newark is not considered as a potable water source.

5. Continued and sustained pumping at any location may "pull in" or influence adjacent plumes or accelerate saltwater intrusion.

6. During interviews with long term employees it was determined that Number 4 and 6 fuel oils were not used on the site.

7.2 Soil/Groundwater Conditions: Comparison of IPC vs Other Local Sites

After comparing site-specific contaminants at the IPC facility with those known to exist on some of the other industrial facilities within a mile radius, it appears that the following conclusions can be put forth:

<u>Soils</u>

a. Petroleum Hydrocarbons* - IPC's level is comparable to the entire area, except for the Getty site, which is ten (10) times higher.

b. Base Neutral Compounds - Sites in the area have both ten (10) times greater, as well as ten (10) times less of this contaminant.

c. Volatile Organic Compounds - The concentrations of these compounds at other sites were found to both greater than and less than those at IPC.

d. Polychlorinated Biphenyls - All sites in the area have greater concentrations than the IPC level.

Groundwater

a. Petroleum Hydrocarbons* - IPC and Getty contain similar levels of petroleum hydrocarbons in the groundwater.

b. Base Neutral Compounds - IPC and Getty contain similar levels of base neutrals in the groundwater.

c. Volatile Organic Compounds - Sites in the area have 10 times greater to 100 times less of this contaminant.

d. Acid Extractable Compounds - The IPC and Getty sites contain similar levels.

e. Priority Pollutant Metals - These compounds are 10 times higher at Getty than at IPC, which is comparable to the rest of the area.

f. Total Cyanide - This compound is 10 times higher at Getty and IPC than at the other sites.

*Heavier fuel oils were not reported to be used at this facility.

TABLE 1

SUMMARY OF LABORATORY RESULTS FOR SOLIDS

Petroleum Hydrocarbon Analyses
(via US EPA Method 418.1)

All Results in mg/kg unless otherwise noted.

Sample ID No.	Boring Location	Sample Depth	Sample Date	Petroleum Hydrocarbon Concentration
16320	B-1	2-2.5′	6/1/89	5,730
16321	B-2	2.5-3′	6/1/89	4,480
16322	B-3	2-2.5′	6/1/89	12,600
16521	B-4 (MW-3)	2-2.5′	6/19/89	1,380
16323	B-5	6-12"	6/1/89	4,480
16271	B-6	4.5-5′	5/31/89	2,490
16324	B-7	12" (Sidewall)	6/1/89	19,400
16325	B-8 (MW-2)	3-3.5′	6/1/89	8,670
16272	B-9	2.5-3′	5/31/89	7,980
16273	B-10	19-25"	5/31/89	9,650
16326	B-11/1 (MW-1)	2-2.5′	6/1/89	18,700
16327	B-11/2 (MW-1)	2.5-3′	6/1/89	25,200
16274	B-12	2-2.5′	5/31/89	18,000+
16275	B-13	2.5-3′	5/31/89	1,350
16328	B-14	0-6"	6/1/89	117,000
16276	B-15	3′10" - 4′4"	5/31/89	2,060
16277	B-16	4-4.5′	5/31/89	11,300
16329	B-17	2-2.5′	6/1/89	8,200
16330	B-18	2.5-3′	6/1/89	2,170
16278	Field Blank*	---	5/31/89	<0.5
16331	Field Blank*	---	6/1/89	ND
16522	Field Blank*	---	6/1/9/89	ND

+ = Average of Two (2) Runs
* = Results in mg/l
ND = None Detected
MW = Monitoring Well

TABLE 2

SUMMARY OF LABORATORY RESULTS FOR SOLIDS

Pesticide/PCB Analyses
(via US EPA Method 608/8080)

All Results in mg/kg unless otherwise noted.

Sample ID No.	Boring Location	Sample Depth	Sample Date	Pesticide/PCB Concentration
16521	B-4 (MW-3)	2-2.5′	6/19/89	0.07 (PCB - 1254)
16271	B-6	4.5-5′	5/31/89	ND
16272	B-9	2.5-3′	5/31/89	ND
16328	B-14	0-6"	6/1/89	ND
16278	Field Blank*	---	5/31/89	ND
16331	Field Blank*	---	6/1/89	ND
16522	Field Blank*	---	6/19/89	ND

* = Results in mg/l.

ND = None Detected

1493.RI 4.18.90

T A B L E 3

SUMMARY OF LABORATORY RESULTS FOR SOLIDS

(via US EPA Method 625B +15/8270B +15)

Base Neutral plus Library Search Analyses

All results in mg/kg unless otherwise noted.

Sample No.	16320	16521	16324	16325	16273
Boring Location	B-1	B-4 (MW-3)	B-7	B-8 (MW-2)	B-10
Depth	2-2.5'	2-2.5'	12" (Sidewall)	3-3.5'	19-25"
Date	6/1/89	6/19/89	6/1/89	6/1/89	5/31/89
Base Neutral Compounds					
Acenaphthene	0.81	ND	2.9	ND	1.8
Acenaphthlyene	ND	ND	2.2	ND	ND
Anthracene	ND	ND	2.7	ND	ND
benzo(a) Anthracene	ND	ND	2.4	ND	ND
benzo(a) Pyrene	ND	ND	2.1	ND	ND
benzo(b) Fluoranthene	ND	ND	ND	ND	ND
benzo(k) Fluoranthene	ND	ND	1.6	ND	ND
benzo(g,h,i) Perylene	ND	ND	3.5	ND	ND
bis (2-ethylhexyl) Phthalate	13	7	170	1.5	ND
Chrysene	ND	ND	ND	ND	ND
dibenzo(a,h) Anthracene	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	3.2	ND	ND
di-n-Butyl Phthalate	ND	ND	110	ND	ND
2,5-Dinitrotoluene	ND	ND	ND	ND	ND
di-n-Octyl Phthalate	ND	ND	ND	ND	8.4
Fluoranthene	ND	ND	3.4	ND	ND
Fluorene	1.3	ND	6.4	ND	ND
Naphthalene	3.2	ND	46	ND	ND
n-Nitrosodiphenylamine	ND	ND	ND	1.3	ND
Phenanthrene	2.8	ND	16	ND	3.5
Pyrene	ND	ND	10	ND	2.8
Total Tentatively Identified Compounds	42	71.5	43.1	27	150
Total Semi-Volatile Compounds (Base Neutrals) (J and + compounds not included in totals)	63.11	78.5	425.5	29.8	166.5

ND = None Detected
* = Results in mg/l
\+ = This compound (or similar spectra) found in laboratory blank.
J = Indicates an estimated value below the reporting limit.

1493.TAB 4.11.90

TABLE 3 (cont'd)

SUMMARY OF LABORATORY RESULTS FOR SOLIDS

Base Neutral plus Library Search Analyses

(via US EPA Method 625B +15/8270B +15)

All results in mg/kg unless otherwise noted.

Sample No.	16274	16329	6278*	16331*	16522*
Boring Location	B-12	B-17	Field	Field	Field
Depth	2-2.5'	2-2.5'	Blank	Blank	Blank
Date	5/31/89	6/1/89	5/31/89	6/1/89	6/19/89
Base Neutral Compounds					
Acenaphthene	12	ND	ND	ND	ND
Acenaphthlyene	10	ND	ND	ND	ND
Anthracene	16	ND	ND	ND	ND
benzo(a) Anthracene	ND	ND	ND	ND	ND
benzo(a) Pyrene	12	ND	ND	ND	ND
benzo(b) Fluoranthene	13	ND	ND	ND	ND
benzo(k) Fluoranthene	4.8	ND	ND	ND	ND
benzo (g,h,i) Perylene	6.3	ND	ND	ND	ND
bis (2-ethylhexyl) Phthalate	19	19	27	19	ND
Chrysene	18	ND	ND	ND	ND
dibenzo(a,h) Anthracene	4.2	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND
di-n-Butyl Phthalate	ND	16	ND	ND	ND
2,5-Dinitrotoluene	ND	ND	ND	ND	ND
di-n-Octyl Phthalate	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND
Fluorene	38	12	ND	ND	ND
Naphthalene	64	ND	ND	ND	ND
n-Nitrosodiphenylamine	4.7	ND	ND	ND	ND
Phenanthrene	66	1.4	ND	ND	ND
Pyrene	1.2	ND	ND	ND	ND
Total Tentatively Identified Compounds	55.2	88.4	ND	ND	ND
Total Semi-Volatile Compounds (Base Neutrals) (J and + compounds not included in totals)	344.4	136.8	27	19	ND

ND	=	None Detected
*	=	Results in mg/l
+	=	This compound (or similar spectra) found in laboratory blank.
J	=	Indicates an estimated value below the reporting limit.

1493.TAB 4.11.90

TABLE 4

(Sheet 1 of 5)

SUMMARY OF LABORATORY RESULTS FOR SOLIDS

Volatile Organic Compounds plus Library Search Analyses
(via US EPA Method 624 +15/8240 +15)

All Results in mg/kg unless otherwise noted.

Sample No.	16320	16321	16322	16521	16323
Boring Location	B-1	B-2	B-3	B-4 (MW-3)	B-5
Depth	2-2.5'	2.5-3'	2-2.5'	2-2.5'	6-12"
Date	6/1/89	6/1/89	6/1/89	6/19/89	6/1/89
Volatile Organic Compounds					
Benzene	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
trans 1,2-Dichloroethylene	ND	ND	ND	ND	ND
Ethylbenzene	ND	0.71	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	0.014	ND
Tetrachloroethylene	ND	ND	ND	ND	ND
Toluene	ND	0.8	ND	ND	780
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
Trichlorethylene	ND	ND	ND	ND	ND
m-Xylene	0.11	3.2	17	0.052	ND
p,o-Xylene	0.13	1.8	25	0.05	ND
Total Tentatively Identified Compounds	1.966	2.95	39.8	2.946	---
Total Volatile Organic Compounds (J and + Compounds not included in totals)	2.2	9.46	81.8	3.1	780

1493.RI 4.11.90

TABLE 4 (sheet 2 of 5) (cont'd)

Sample No.	16271	16324	16325	1627216273
Boring Location	B-6	B-7	B-8 (MW-2)	B-9 B-10
Depth	4.5-5'	12" (SIDEWALL)	3-3.5'	2.5-3'19-25"
Date	5/31/89	6/1/89	6/1/89	5/31/895/31/89
Volatile Organic Compounds				
Benzene	ND	ND	ND	ND ND
1,2-Dichlorobenzene	ND	9.2	ND	ND ND
1,1-Dichloroethane	ND	2.3	ND	ND ND
trans 1,2-Dichloroethylene	ND	2.1	ND	ND ND
Ethylbenzene	11	5.1	ND	50 ND
Methylene Chloride	ND	ND	ND	ND ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND ND
Tetrachloroethylene	38	ND	ND	ND ND
Toluene	11	53	0.86	600 ND
1,1,1-Trichloroethane	ND	2.8	ND	ND ND
Trichlorethylene	ND	ND	ND	ND ND
m-Xylene	83	65	ND	280 ND
p,o-Xylene	120	61	ND	150 ND
Total Tentatively Identified Compounds	264.8	164.6	3.848	532. 89.7
Total Volatile Organic Compounds (J and + Compounds not included in totals)	527.8	365	4.708	1,617.789.7

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TABLE 4 (sheet 3 of 5) (cont'd)

Sample No.	16326	16327	16274	16275	16328
Boring Location	B-11/1 (MW-1)	B-11/2 (MW-1)	B-12	B-13	B-14
Depth	2-2.5'	2.5-3'	2-2.5'	2.5-3'	0-6"
Date	6/1/89	6/1/89	5/31/89	5/31/89	6/1/89
Volatile Organic Compounds					
Benzene	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
trans 1,2-Dichloroethylene	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	2.7	ND	ND
1,1,2,2-Tetrachloroethane	0.8	1.6	ND	ND	470
Tetrachloroethylene	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	370
1,1,1-Trichloroethane	ND	ND	0.19	1,600	1,500
Trichlorethylene	ND	ND	ND	ND	210
m-Xylene	ND	ND	ND	ND	160
p,o-Xylene	ND	ND	3.6	ND	4,700
				ND	2,100
Total Tentatively Identified Compounds	6.857	99.1	16.79	436	2,500
Total Volatile Organic Compounds (J and + Compounds not included in totals)	7.657	100.7	23.28	2,036	12,010

1493.RI 4.11.90

T A B L E 4 (sheet 4 of 5) (cont'd)

Sample No.	16276	16277	16329	16330	16278*
Boring Location	B-15	B-16	B-17	B-18	Field
Depth	3'10"-4'4"	4-4.5'	2-2.5'	2.5-3'	Blank
Date	5/31/89	5/31/89	6/1/89	6/1/89	5/31/89
Volatile Organic Compounds					
Benzene	ND	4.2	9.2	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	64	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
trans 1,2-Dichloroethylene	ND	ND	ND	11	ND
Ethylbenzene	0.1	15	40	35	ND
Methylene Chloride	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
Tetrachloroethylene	ND	ND	ND	1,100	ND
Toluene	0.13	ND	58	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	110	ND
Trichlorethylene	ND	ND	6.6	300	ND
m-Xylene	ND	ND	280	130	ND
p,o-Xylene	0.083	ND	150	81	ND
Total Tentatively Identified Compounds	0.967	255.3	689.6	25	---
Total Volatile Organic Compounds (J and + Compounds not included in totals)	1.28	274.5	1,233.4	1,856	ND

1493.RI 4.11.90

TABLE 4 (sheet 5 of 5) (cont'd)

Sample No. Boring Location Depth Date	16279* Trip Blank 5/29/89 for 5/31/89	16331* Field Blank 6/1/89	16332* Trip Blank 5/31/89 for 6/1/89	16522* Field Blank 6/19/89	16523* Trip Blank 6/18/89 for 6/19/89
Volatile Organic Compounds (mg/kg)					
Benzene	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
trans 1,2-Dichloroethylene	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
Tetrachloroethylene	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
Trichlorethylene	ND	ND	ND	ND	ND
m-Xylene	ND	ND	ND	ND	ND
p,o-Xylene	ND	ND	ND	ND	ND
Total Tentatively Identified Compounds	---	0.025	---	---	---
Total Volatile Organic Compounds (J and + Compounds not included in totals)	ND	0.025	ND	ND	ND

* = Results in mg/l.
\+ = This compound (or similar spectra) found in laboratory blank.
ND = None Detected
J = Indicates an estimated value below reporting limit.

TABLE 5

SUMMARY OF LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS SAMPLED JULY 7, 1989: INORGANIC AND ORGANIC ANALYSES

All results in ug/l unless otherwise noted.

RECON Sample No. Sample Identification	16781 Trip Blank	16782 Field Blank	16783 MW-1	16784 MW-2	16785 MW-3
Petroleum Hydrocarbons (via US EPA Method 418.1)	NA	1.2	3,100	2,900	619,000
Pesticides/PCBs (via US EPA Method 608)	NA	ND	0.1 (Pesticide)	ND	ND
Priority Pollutant Metals (via US EPA Method SW846)					
Antimony	NA	ND	BMDL	200	300
Arsenic	NA	BMDL	BMDL	BMDL	BMDL
Beryllium	NA	ND	ND	ND	ND
Cadmium	NA	BMDL	24	11	13
Chromium	NA	ND	ND	140	60
Copper	NA	ND	ND	110	BMDL
Lead	NA	BMDL	130	290	465
Mercury	NA	BMDL	BMDL	BMDL	BMDL
Nickel	NA	ND	190	150	60
Selenium	NA	BMDL	BMDL	BMDL	BMDL
Silver	NA	ND	ND	ND	ND
Thallium	NA	ND	ND	ND	70
Zinc	NA	7	46	144	62
Cyanide (via US EPA Method 9010)	NA	BMDL	BMDL	11	BMDL
Phenols (via US EPA Method 9065, 9066 or 9067)	NA	BMDL	BMDL	170	130

NA = Non-Applicable
ND = None Detected
BMDL = Below Minimum Detection Limit
MW = Monitoring Well

1493.RI 4.18.90

TABLE 6

SUMMARY OF LABORATORY RESULTS FOR GROUNDWATER MONITORING WELL SAMPLES JULY 7, 1989: VOLATILE AND SEMIVOLATILE ANALYSES

All Results in ug/l unless otherwise noted.

RECON Sample No. Sample Identification	16781 Trip Blank	16782 Field Blank	16783 MW-1	16784 MW-2	16785 MW-3
Specifically Requested Compounds (via US EPA Method SW846)					
Methy Alcohol	ND	ND	ND	ND	ND
Diisopropyl Ether	ND	ND	ND	ND	ND
Tertiary-Butyl Ether	ND	ND	3,200	ND	ND
Methyl-Tertiary-Butyl Ether	ND	ND	ND	ND	ND
Volatile Organic Compounds					
Benzene	ND	ND	78	ND	24
1,1-Dichloroethane	ND	ND	ND	ND	17
trans-1,2-Dichloroethylene	ND	ND	ND	ND	11
Ethyl Benzene	ND	ND	ND	ND	28
Tetrachloroethylene	ND	ND	ND	ND	12
Toluene	ND	ND	13	36	37
m-Xylene	ND	ND	BMDL	ND	44
p,o-Xylene	ND	ND	5.0	ND	250
Total Tentatively Identified Compounds (via US EPA Method 624 +15)	...	...	2,305	277	973
Total Volatile Organic Compounds (J and + Compounds not included in totals)	...	...	2,401	313	1,396
Base Neutral Compounds					
Acenaphthene	NA	ND	BMDL	BMDL	23
bis (2-Ethyl Hexyl) Phthalate	NA	ND	BMDL	BMDL	1,800
Chrysene	NA	ND	ND	ND	11
di-Ethyl Phthalate	NA	ND	ND	49	ND
di-n-Butyl Phthalate	NA	ND	ND	ND	35
Flouranthene	NA	ND	ND	ND	29
Naphthalene	NA	ND	BMDL	ND	59
Phenanthrene	NA	ND	BMDL	BMDL	43
Pyrene	NA	ND	ND	BMDL	25
Total Tentatively Identified Compounds	NA	...	403	449	3437
Total Base Neutral Compounds (via US EPA Method 625B +15) (J and + Compounds not included in totals)	NA	...	403	498	5,462
Acid Extractable Compounds					
Phenol	NA	ND	ND	52	ND
Total Tentatively Identified Compounds	NA	ND	ND	522	ND
Total Acid Extractable Compounds (via US EPA Method 625A +10) (J and + Compounds not included in totals)	NA	ND	ND	574	ND

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TABLE 6 (cont'd)

Total Unknown Tentatively Identified Compounds from Base Neutral/Acid Extractable Scan	NA	ND	174	187	ND

NA = Non- Applicable
ND = None Detected
BMDL = Below Minimum Detection Limit
MW = Monitoring Well

TABLE 7

SUMMARY OF MONITORING WELL DATA

Monitoring Well No.	MW-1	MW-2	MW-3
Purge Date	7/7/89	7/7/89	7/7/89
Time	0858	1055	1210
Sample Date	7/7/89	7/7/89	7/7/89
Time	1115	1210	1300
Permit No.	26-16038-2	26-16039-1	26-16040-4
Total Depth	12'	11.5'	11.5'
Screened Level	2-12'	1.5-11.5'	1.5-11.5'
Static Water Level	6.68'	5.33'	7.53'
Water Level Before Sampling	6.80'	6.02'	5.85'
Height of Riser	2'8"	4'	3.2'
Estimated Volume Purged (Gallons)	~30	~15	~20
Water Level	3'	2.8'	2.5'
pH	6.23	7.90	6.55
Free Product	None	None	Black Oily Substance
Color of Water	Clear	Grey	Grey

NOTE: See Appendix VIII for original Monitoring Well Purge/Sampling Field Forms.

T A B L E 8

SUMMARY OF SAMPLING AND ANALYSIS PLAN

Sample Location	Depth		Analytical Parameter			
	24-30"	6" Interval	PHC	VOC +15	BN +15	OTHER
SOIL						
B-1	X		X	X	X	
B-2	X		X	X		
B-3	X		X	X		
B-4 (MW-3)	X		X	X	X	X*
B-5	X		X	X		
B-6	X		X	X		X*
B-7	X		X	X	X	
B-8 (MW-2)	X		X	X	X	
B-9	X		X	X		X*
B-10	X		X	X	X	
B-11 (MW-1)	X	X	X	X		
B-12	X		X	X	X	
B-13	X		X	X		
B-14	X		X	X		X*
B-15	X		X	X		
B-16	X		X	X		
B-17	X		X	X	X	
B-18	X		X	X		
GROUNDWATER						
MW-1			X			X-PP+40
MW-2			X			X-PP+40
MW-3			X			X-PP+40

1493.RI 4.11.90

TABLE 8 (cont'd)

KEY

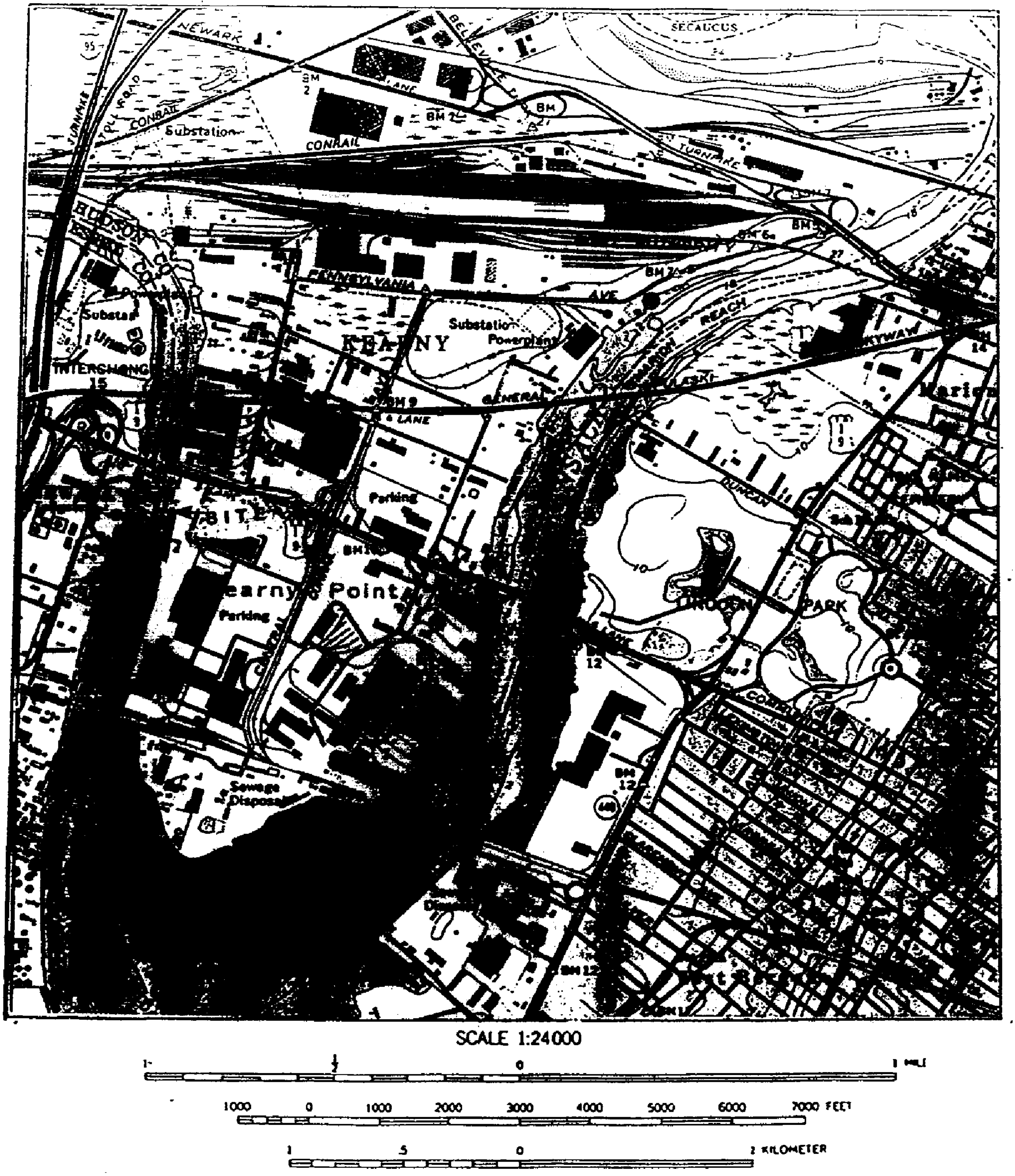
PHC = Petroleum Hydrocarbons via US EPA Method 418.1

VOC +15 = Volatile Organic Compounds plus Library Search via US EPA Methods 624 +15 (water) and 8240 +15 (soil).

BN +15 = Base Neutral Compounds plus Library Search via US EPA Methods 625 +15 (water) and 8270 +15 (soil.

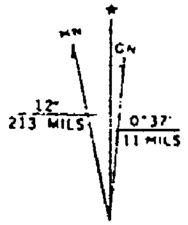
* = Pesticides/Polychlorinated Biphenyls via US EPA Methods 608 (water) and 8080 +15 (soil).

PP +40 = Priority Pollutant +40 analyses which includes VOC +15 via US EPA Method 624 +15; A/E, B/N +25 via US EPA Method 625 +25; Priority Pollutant Metals (13); Pesticide/ PCB via US EPA Method 608; Total Cyanide via US EPA Method 335.2 and Total Phenols via US EPA Method 420.1. Plus the following analyses, Methyl-tertiary-butyl-ether (MTBE) and Diisopropylether (DIPE) via VOC +15, Tertiary-butyl alcohol (TBA) and Methanol via GC/FID and Lead via US EPA - SW846 "Test Methods of the Evaluation of Solid Waste".



CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

FIGURE 1A

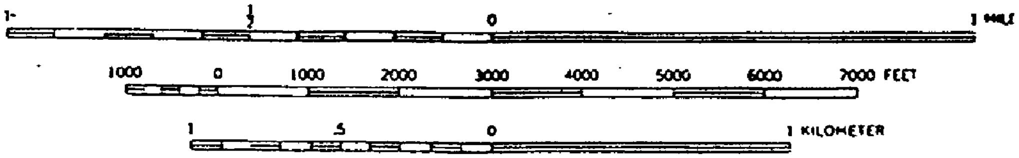


RECON SYSTEMS, INC.
ROUTE 202 NORTH, THREE BRIDGES, N.J. 08887

TITLE SITE LOCATION MAP

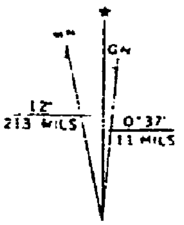
CLIENT INDUSTRIAL PETROCHEMICALS INC.
128 DOREMUS AVE., NEWARK, NJ

SCALE 1:24000



CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

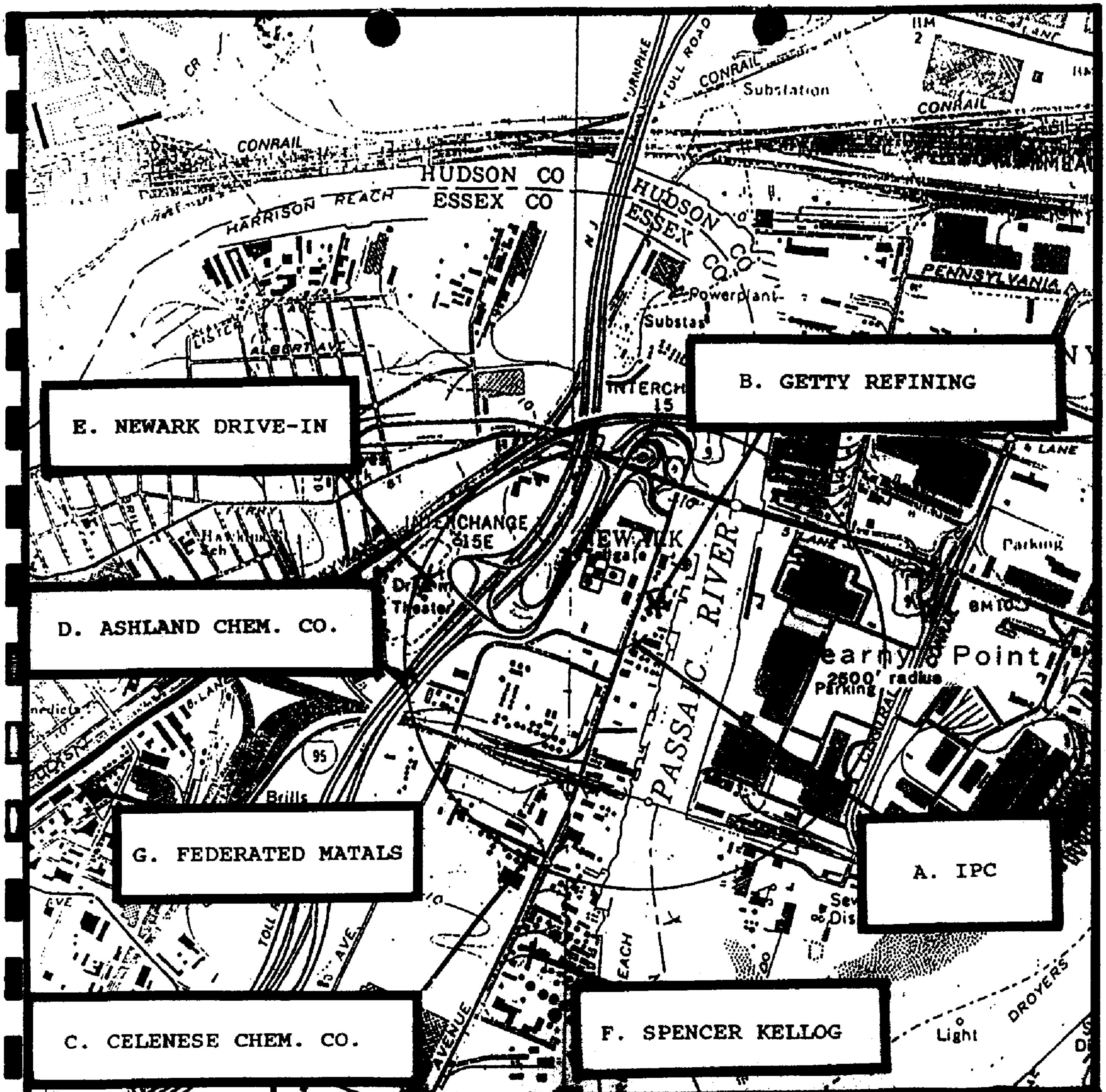
FIGURE 1B



RECON SYSTEMS, INC.
ROUTE 202 NORTH, THREE BRIDGES, N.J. 08887

TITLE SITE LOCATION MAP

CLIENT INDUSTRIAL PETROCHEMICALS INC.
128 DOREMUS AVE., NEWARK, NJ



RECON SYSTEMS, INC.

ROUTE 202 NORTH, THREE BRIDGES, N.J. 08887

TITLE ECRA SITE LOCATIONS

CLIENT INDUSTRIAL PETROCHEMICALS

SCALE 1''= 1600'

DRAWN SDR

CHECKED AP

APPROVED AP

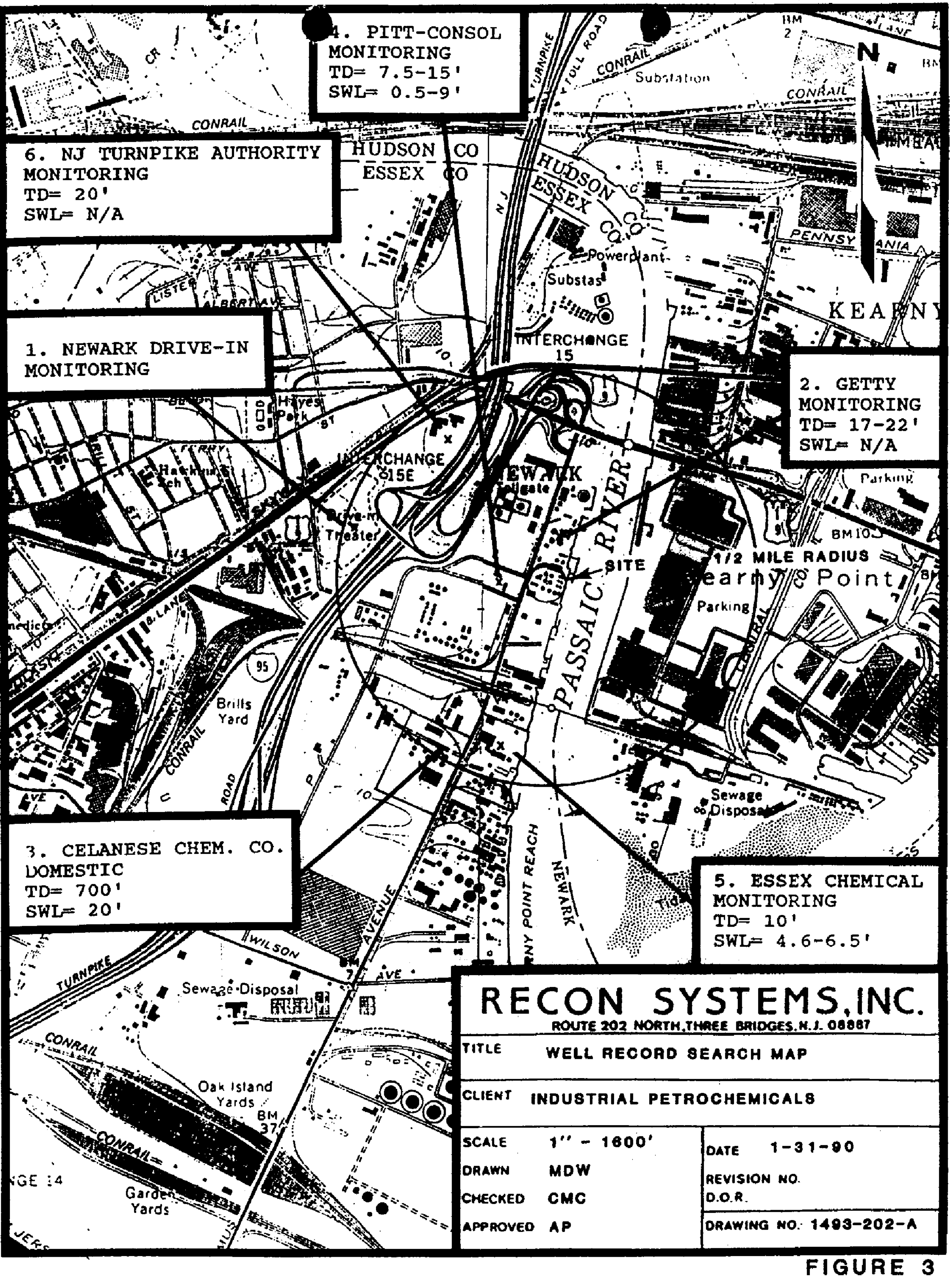
DATE 1-31-90

REVISION NO.

D.O.R.

DRAWING NO. 1493-203-A

FIGURE 2



4. PITT-CONSOL
MONITORING
TD= 7.5-15'
SWL= 0.5-9'

6. NJ TURNPIKE AUTHORITY
MONITORING
TD= 20'
SWL= N/A

1. NEWARK DRIVE-IN
MONITORING

2. GETTY
MONITORING
TD= 17-22'
SWL= N/A

3. CELANESE CHEM. CO.
DOMESTIC
TD= 700'
SWL= 20'

5. ESSEX CHEMICAL
MONITORING
TD= 10'
SWL= 4.6-6.5'

RECON SYSTEMS, INC.
ROUTE 202 NORTH, THREE BRIDGES, N.J. 08887

TITLE WELL RECORD SEARCH MAP

CLIENT INDUSTRIAL PETROCHEMICALS

SCALE 1" - 1600'
DRAWN MDW
CHECKED CMC
APPROVED AP

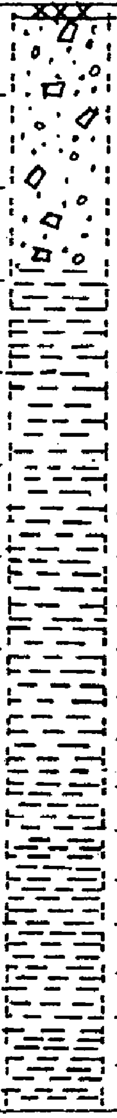
DATE 1-31-90
REVISION NO.
D.O.R.
DRAWING NO. 1493-202-A

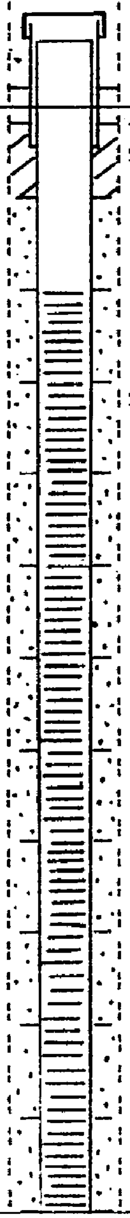
FIGURE 3

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

MONI[illegible]RING WELL NO. MW-1
(Boring No. B-11)
PERMIT NO. 2616038-2
SHEET 1 OF 1

JOB NO.: 1493
CLIENT: INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION: NEWARK, NJ
LOCATION OF WELL: 10'N and 3' E of NE crn of Office Bld
ELEVATION AND DATUM: GRADE
DRILLING CONTRACTOR: ENVIRONMENTAL DRILLING INC
DRILLER: BOB
INSPECTOR: DRG
DRILLING RIG TYPE: MOBILE B-60
BIT TYPE: 10 auger
DATE STARTED: 6-1-89
DATE COMPLETED: 6-1-89
SAMPLER TYPE: 2''x 24'' SPLIT SPOON
HAMMER WEIGHT: 140lb
DROP: 30''
TOTAL DEPTH: 12'
WATER LEVEL: 3'





SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
					0-2'' BLACK TOP	-2' to +3' Carbon Steel Riser
			1		2''-3'6''FILL, brick ash, coal frags, sand Strong Odor of diesel	1' to 6'' Bentonite
			2			12' to 1' Sand
			3	∇		12' to 2' Stainless Steel Screen
			4		3'6''-12' Grey CLAY w/ 10% organic fragments	
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. B-12

ID NO.

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE 6'' AUGER
DATE STARTED 5-31-89
DATE COMPLETED 5-31-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT ------
DROP ------
TOTAL DEPTH 2.5'
WATER LEVEL NA

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-2'' Black Top	
					2-6'' Trap Rock	
			1		6''-2' brn gravelly SAND	
			2		2-2.5' blk SAND Petroleum Odor	
					Sample 24''-30''	
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

APPENDIX I

Soil Boring, Well Point, and Monitoring Well Logs

BORING NO. B-1

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

ID NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ	
LOCATION OF BORING SEE MAP			ELEVATION AND DATUM GRADE	
DRILLING CONTRACTOR RECON SYSTEMS		DRILLER CMC	INSPECTOR BM	
DRILLING RIG TYPE SIMCO 2800		BIT TYPE 6'' AUGER	DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER	HAMMER WEIGHT ------	DROP ------	TOTAL DEPTH 2.5'	WATER LEVEL NA

SAMPLE		LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
NO.	BLOWS					
					0-2'' Black Top	
					2-6'' Trap Rock	
			1		6''-1' gry gravelly SAND	
					1-1.5' brn CLAY	
					1.5-2' Trap Rock w/ Sand	
			2		2-2.5' gry gravelly SAND	
					Sample 2-2.5'	
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

BORING NO. B-2

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

ID NO.

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE 6'' AUGER
DATE STARTED 6-1-89
DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT ------
DROP ------
TOTAL DEPTH 3'
WATER LEVEL NA

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-2'' Black Top	
					2''-1' Trap Rock	
			1		1-1.5' rd brn silty SAND	
					1.5-3' blk gravelly SAND	
			2			
					SAMPLE 2.5-3'	
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

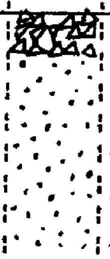
BORING NO. B-3

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

ID NO.

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE 6'' AUGER
DATE STARTED 6-1-89
DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT -----
DROP -----
TOTAL DEPTH 2.5'
WATER LEVEL 2.5'

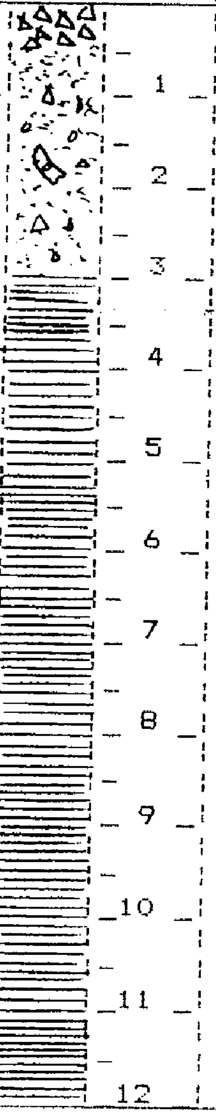
SAMPLE		LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
NO.	BLOWS					
					0-6'' Trap Rock 6''-2.5' blk gravelly SAND	
			1			
					Sample 2-2.5'	
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

MONITORING WELL NO. MW-3
(Boring No. B-4)
PERMIT NO. 26-16040-4
SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NEW JERSEY
LOCATION OF WELL 18' N of TANK FARM N WALL & 6' W of E WALL
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR EDI
DRILLER SCOTT
INSPECTOR BM
DRILLING RIG TYPE MOBILE B-80
BIT TYPE 12''
DATE STARTED 6-19-89
DATE COMPLETED 6-19-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON
HAMMER WEIGHT 140lb
DROP 30''
TOTAL DEPTH 11.5'
WATER LEVEL 2.5'

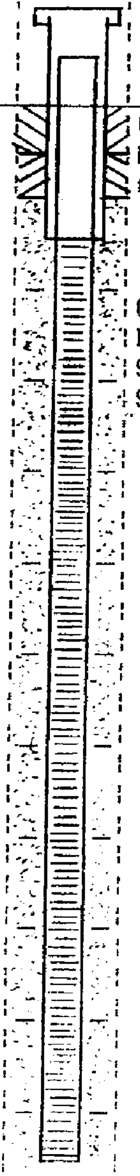
SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION



TRAPROCK 0-0.5'
FILL 0.5-3.0'
sandy w/ concrete and traprock.

CLAY 3-13' gray to black clay, wet and saturated with oil.

DRILLED TO 13'



Cap
Master lock # 2010
Casing : steel
: 3.5' ag
: 1.5' bg
:4 inch ID.
Cement grout 0-0.5'
Bento. seal 0.5-1.0'
Sand pack 1-11.5'
Screen : 1.5-11.5'
: 4 inch ID.
: 0.020 slot
: STAINLESS - STEEL

ag = above grade
bg = below grade

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. B-5

ID NO.

SHEET 1 OF 1

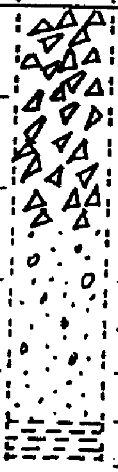
JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP			ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS	DRILLER CMC		INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800	BIT TYPE 6'' AUGER	DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER	HAMMER WEIGHT ----- / DROP ------	TOTAL DEPTH 1'	WATER LEVEL 1'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
		▨			0-12'' blk silty CLAY visible oil	
		▨	1		Sampled 6-12''	
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. B-6
ID NO.
SHEET 1 OF 1

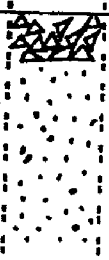
JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE 6'' AUGER
DATE STARTED 5-31-89
DATE COMPLETED 5-31-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT ------
DROP ------
TOTAL DEPTH 5'
WATER LEVEL NA

SAMPLE		LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
NO.	BLOWS					
					0-2.5' Trap Rock	
			1			
			2			
					2.5-4' blk gravelly SAND	
			3			
			4		4-4.5' brn SAND	
					4.5-5' blk CLAY	
			5			
					Sampled 4.5-5'	
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. B-7
ID NO.
SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL	PROJECT LOCATION NEWARK, NJ	
LOCATION OF BORING SEE MAP		ELEVATION AND DATUM GRADE	
DRILLING CONTRACTOR RECON SYSTEMS	DRILLER CMC	INSPECTOR BM	
DRILLING RIG TYPE SIMCO 2800	BIT TYPE 6'' AUGER	DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER	HAMMER WEIGHT ------ / DROP ------	TOTAL DEPTH 2.5'	WATER LEVEL 1'

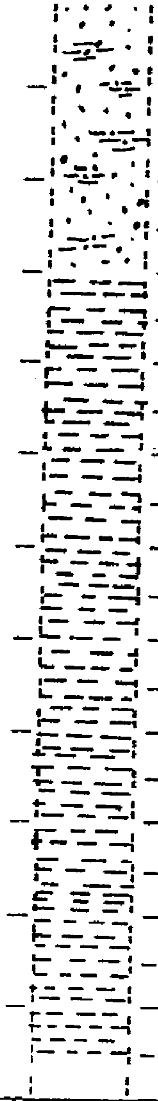
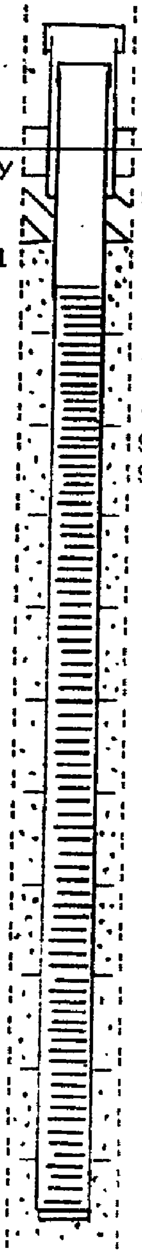
SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-6'' Trap Rock Petroluem Odor 6''-2.5' blk gravelly SAND	
			1	▽		
					Sample taken 1' below grade in side wall	
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

MONITORING WELL NO. MW-2
(Boring No. B-8)
PERMIT NO. 2616039-1
SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL	PROJECT LOCATION NEWARK, NJ
LOCATION OF WELL 11' W and 24' N of the SE corner		ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR ENVIRONMENTAL DRILLING INC	DRILLER BOB	INSPECTOR DRG

DRILLING RIG TYPE MOBILE B-60	BIT TYPE 10'' auger	DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON	HAMMER WEIGHT 140lb / DROP 30''	TOTAL DEPTH 12'	WATER LEVEL 2.8'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
			1 2	▽ (2.8)	0-3' Grey-Pink silty Sandy FILL with 6-12'' Concrete and Trap rock, 1'' steel cable etc.	 1.5' to 3.5' Carbon Steel Riser 1' to 6'' Bentonite 12' to 1' Sand 1.5' to 11.5' Stainless steel Screen
			3 4 5 6 7 8 9 10 11 12		3-12' Grey Black CLAY wet, saturated with thick oil OVA 20-30 1' above hole.	

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

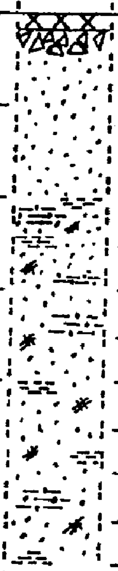
MONITORING WELL NO. B-9

PERMIT NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ
LOCATION OF WELL SEE MAP			ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS INC	DRILLER CMC		INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800	BIT TYPE auger	DATE STARTED 5-31-89	DATE COMPLETED 5-31-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON	HAMMER WEIGHT 140lb	DROP 30''	TOTAL DEPTH 6.0'
			WATER LEVEL 3.0'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
					0-3'' Black Top oil stained	-1' to +4' Riser 0 to 1' Bentonite
			1		3''-6'' Trap Rock 6''-2' brown sandy FILL	1' to 6' Sand
			2		2'-3' clayey silty SAND w/ organics and Petroleum Odor	1'to 6' Screen
			3	∇	3'-6' as above with WATER	
			4		Sample 30-36''	
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			



RECON SYSTEMS, INC.
THREE BRIDGES, NJ

MONITORING WELL NO. B-10

PERMIT NO.

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF WELL SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS INC
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800 HOLLOW STEM AUGER
BIT TYPE auger
DATE STARTED 5-31-89
DATE COMPLETED 5-31-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON
HAMMER WEIGHT 140lb
DROP 30''
TOTAL DEPTH 5.5'
WATER LEVEL 2.1'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
					0-5'' Trap Rock oil stained	-0.5 to +4.5' Riser
			1		5''-25'' FILL sand and gravel black	5.5 to 0.5' Screen
			2	∇	25'' WATER	
			3		Sample 19-25''	
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

MONITORING WELL NO. B-13

PERMIT NO.

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF WELL SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS INC
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE auger
DATE STARTED 5-31-89
DATE COMPLETED 5-31-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON
HAMMER WEIGHT 140lb
DROP 30''
TOTAL DEPTH 6.0'
WATER LEVEL 2.0'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY		WELL CONSTRUCTION
					0-6'' Trap Rock 6''-3' lt br sandy FILL strong odor organic rich		-1' to +4' Riser 0 to 1' Bentonite 1' to 6' Sand
			1				
			2	∇			1'to 6' Screen
			3		3' Water stablized at 2'		
			4		Sample 30-36''		
			5				
			6				
			7				
			8				
			9				
			10				
			11				
			12				

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. B-14

ID NO.

SHEET 1 OF 1

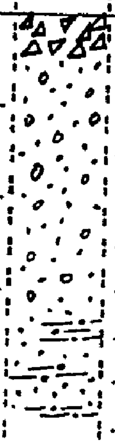
JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL		PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP			ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS	DRILLER CMC		INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800	BIT TYPE 6'' AUGER	DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER	HAMMER WEIGHT -----	DROP -----	TOTAL DEPTH 0.5'
			WATER LEVEL 0.5'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
		░			0-6'' blk SAND visible oil with organics	
			1			
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. B-15
ID NO.
SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF BORING SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE 6'' AUGER
DATE STARTED 5-31-89
DATE COMPLETED 5-31-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT -----
DROP -----
TOTAL DEPTH 3.5'
WATER LEVEL 3.5'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
					0-6'' Trap Rock 6-3'3'' brn SAND darkening w/ depth w/ gravel	
			1			
			2			
			3		3'3''-4' blk sandy SILT with Petroleum Odor	
				▽		
	21		4		4-6' drk SAND w/ Petroleum Odor Water at 4'4''	
	3 4		5		Sample 3'10'' - 4'4''	
	8		6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

MONITORING WELL NO. B-16

PERMIT NO.

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, NJ
LOCATION OF WELL SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS INC
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800
BIT TYPE auger
DATE STARTED 5-31-89
DATE COMPLETED 5-31-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON
HAMMER WEIGHT 140lb
DROP 30''
TOTAL DEPTH 7.66'
WATER LEVEL 4.0'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY		WELL CONSTRUCTION
					0-2'' Black Top 2-6'' Trap Rock 6-12'' grey sandy FILL w/ gravel		-2'9''to +2'3''Riser 0 to 1' Bentonite
			1		1-3.5' brn SAND		1'to 7'9'' Sand
			2				
			3				2'9''to 7'9'' Screen
					3.5-4.5' silty SAND wet throughout		
			4	∇	water at 4'		
					4.5-7.6' black CLAY tight Strong Odor		
			5				
			6				
			7				
			8				
			9				
			10				
			11				
			12				

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

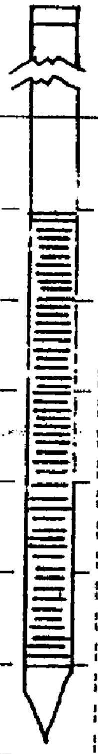
MONITORING WELL NO. 3-17

PERMIT NO. 26-16459-7

SHEET 1 OF 1

JOB NO. 1493
CLIENT INDUSTRIAL PETROCHEMICAL
PROJECT LOCATION NEWARK, N.J.
LOCATION OF WELL SEE MAP
ELEVATION AND DATUM GRADE
DRILLING CONTRACTOR RECON SYSTEMS
DRILLER CMC
INSPECTOR BM
DRILLING RIG TYPE SIMCO 2800 HOLLOW STEM AUGER
BIT TYPE 6 IN. AUGER
DATE STARTED 6-1-89
DATE COMPLETED 6-1-89
SAMPLER TYPE SCS BUCKET AUGER
HAMMER WEIGHT
DROP
TOTAL DEPTH 6.0 FT.
WATER LEVEL 2.5 FT.

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
					TRAPROCK 0.0-0.5' SAND 0.5'-2.5' black gravelly sand.	riser -1.0 to +4.0' sand 0.5'-1.0' screen 1.0'-6.0'
			1			
			2		sample 2.0-2.5'	
				▽		
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			



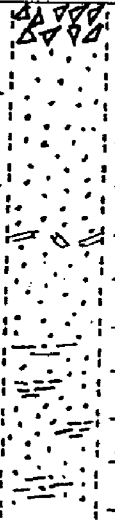
RECON SYSTEMS, INC.
THREE BRIDGES, NJ

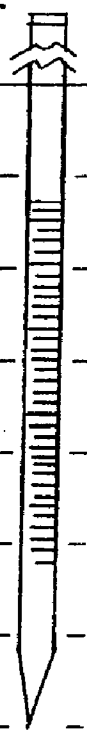
MONITORING WELL NO. B-18

PERMIT NO.

SHEET 1 OF 1

JOB NO. 1493	CLIENT INDUSTRIAL PETROCHEMICAL	PROJECT LOCATION NEWARK, NJ	
LOCATION OF WELL SEE MAP		ELEVATION AND DATUM GRADE	
DRILLING CONTRACTOR RECON SYSTEMS INC	DRILLER CMC	INSPECTOR BM	
DRILLING RIG TYPE SIMCO 2800	BIT TYPE auger	DATE STARTED 6-1-89	DATE COMPLETED 6-1-89
SAMPLER TYPE 2''x 24'' SPLIT SPOON	HAMMER WEIGHT 140lb DROP 30''	TOTAL DEPTH 6.25'	WATER LEVEL 3.5'





SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	LITHOLOGY	WELL CONSTRUCTION
					0-6'' Black Top 6''-2.5' Grey & black SAND.	-1'3''to +3'9''Riser 0 to 1' Bentonite
			1			1'to 6'3''Sand
			2		2.5-2.7' Concrete slab.	1'3'' to 6'3''Screen
			3		2.7-3.6' Black SAND.	
				∇	3.6-5.5'Black clayey silty SAND	
			4		Sample 3-3.5'	
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			

RECON SYSTEMS, INC.
THREE BRIDGES, NJ

BORING NO. TRENCH

ID NO.

SHEET 1 OF 1

JOB NO. 1493

CLIENT INDUSTRIAL PETROCHEMICAL

PROJECT LOCATION NEWARK, NJ

LOCATION OF BORING SEE MAP

ELEVATION AND DATUM GRADE

DRILLING CONTRACTOR

DRILLER

INSPECTOR

DRILLING RIG TYPE

BIT TYPE

DATE STARTED

DATE COMPLETED

SAMPLER TYPE

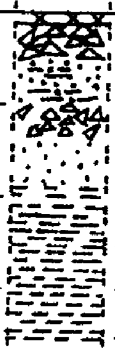
HAMMER WEIGHT ------

DROP ------

TOTAL DEPTH 3.5'

WATER LEVEL 3.5'

SAMPLE NO.	SAMPLE BLOWS	LITH TYPE	DEPTH FT.	WATER	DESCRIPTION OF SOIL	% RECOVERY AND REMARKS
			1 2 3 4 5 6 7 8 9 10 11 12		0-2'' Black Top 2-6'' Trap Rock 6-10'' drk brn silty sand FILL 10-15'' red brn silty sand FILL 15-19'' Trap Rock with OIL 19-25'' drk brn FILL 25''-3'6'' drk brn CLAY with organics, OIL SEEPS	



APPENDIX II

Monitoring Well Survey Reports and Permits for Monitoring Wells and Well Points

DWR-133 (5/85)

Mail to
Water Allocation
CN 029
Trenton, N.J. 08625

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
TRENTON, N.J.

16038
16039
Permit No. 16040

PERMIT TO DRILL WELL

VALID ONLY AFTER APPROVAL BY THE D.E.P.

COORD#: 26.93.1.1

Owner Henry Borda
Address One Rolling Hill Drive
Chatham, NJ 07923

Name of Facility INDUSTRIAL PETROCHEMICAL
Address 128 Doremus Avenue
Newark, NJ

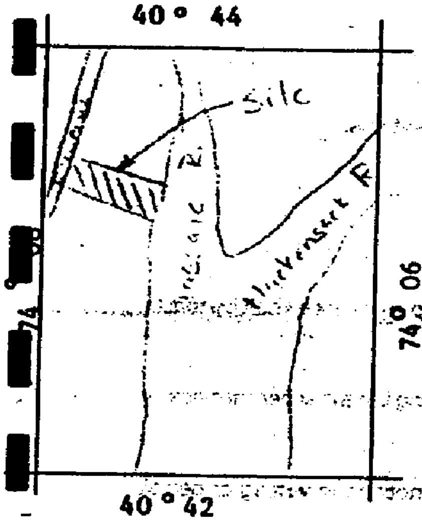
Driller RECON SYSTEMS, INC.
Address Route 202 N., P.O. Box 460
Three Bridges, NJ 08887

Diameter of Well	$ 4 Inches	Proposed Depth of Well	15 Feet
Proposed Capacity of Pump	— GPM	Method of Drilling (cable-tool, rotary, etc.)	Auger
Use of Well *(See Reverse)*	3 Monitoring Wells		

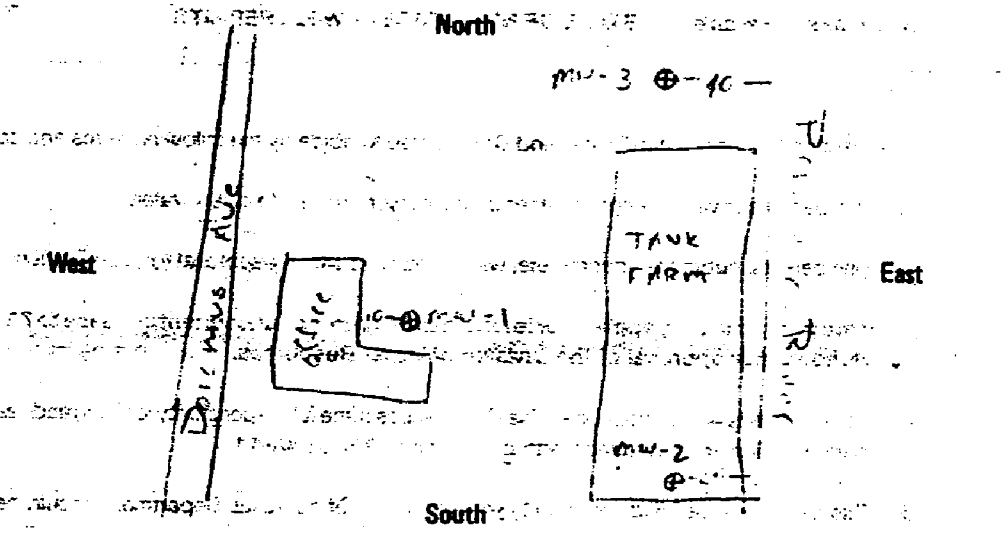
LOCATION OF WELL

Lot #	Block #	Municipality	County
10 & 10A	5011	Newark	Essex

State Atlas Map No. 26



Draw sketch showing distance and relations of well site to nearest public roads, streets, septic systems, etc.



SEE REVERSE SIDE for IMPORTANT PROVISIONS AND REGULATIONS pertaining to this permit. APPROVAL of this permit is made SUBJECT TO acceptance of and compliance with the following ADDITIONAL CONDITIONS.

- ☐ Pinelands - Well must be drilled over 100' deep or a clay layer at least 4' in thickness must be encountered.
- ☐ It is necessary that Geophysical Logs of this well be made. Permanent pumping equipment SHALL NOT be installed until such logs are made.
- ☐ Authorization by rule under N.J.A.C. 7:14A-1 et seq.
- ☐ Samples of cuttings required every ______ feet or change in material.
- ☐ The results of a volatile organic scan mut be obtained prior to using the water and submitted to ______.
- ☐ Domestic Potable Water Supply - The service line for water from the public community water supply system shall be turned off at the curb cock, and the meter shall be removed by the water purveyor.
- ☐ Domestic Irrigation Supply - No piping from the well for which the permit applies shall enter any building.
- ☐ Industrial/Commercial Supply - A physical connection permit shall be obtained pursuant to the provisions of N.J.A.C. 7:10-10-1 et seq., and a vigorous cross connections control program shall be instituted and maintained within the premises.
- ☐ Heat Pump Wells - Wells must be 50 feet apart and the water must be returned to the same aquifer as the production well.
- ☑ ______

Water
A766
[illegible]
[illegible] house
ROK-3545

This Space for Approval Stamp

WELL PERMIT APPROVED
Dept. of Environmental Protection
Water Resources (Water Allocation)
APR 04 1989

In compliance with R.S. 58:4A-14, application is made for a permit to drill a well as described above.

Date ______ Signature of Owner ______

COPIES: Water Allocation – White Health Dept. – Yellow Owner – Blue Driller – White

DWR-133 (5/85)

Mail to

Water Allocation
CN 029
Trenton, N.J. 08625

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
TRENTON, N.J.

PERMIT TO DRILL WELL

14

VALID ONLY AFTER APPROVAL BY THE D.E.P.

Permit No. [illegible] 6
[illegible] 4
[illegible] 2
[illegible] 1
[illegible] 9
[illegible] 10 445- 7

26.23.1.18

Owner Henry Borda
Address One Rolling Hill Drive
Chatham, NJ 07923

Driller RECON SYSTEMS, INC.
Address RT. 202 North, P.O. Box 460
Three Bridges, NJ 08887

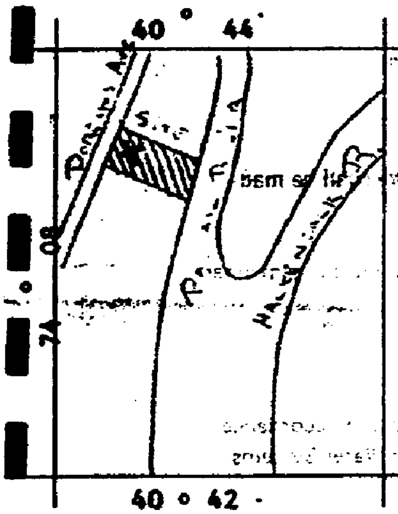
Name of Facility INDUSTRIAL PETROCHEMICALS
Address 128 Doremus Ave.
Newark, NJ

Diameter of Well	2 Inches	Proposed Depth of Well	10 Feet
Proposed Capacity of Pump	-- GPM	Method of Drilling (cable-tool, rotary, etc.)	auger
Use of Well *(See Reverse)* Well Points - observation (6)			

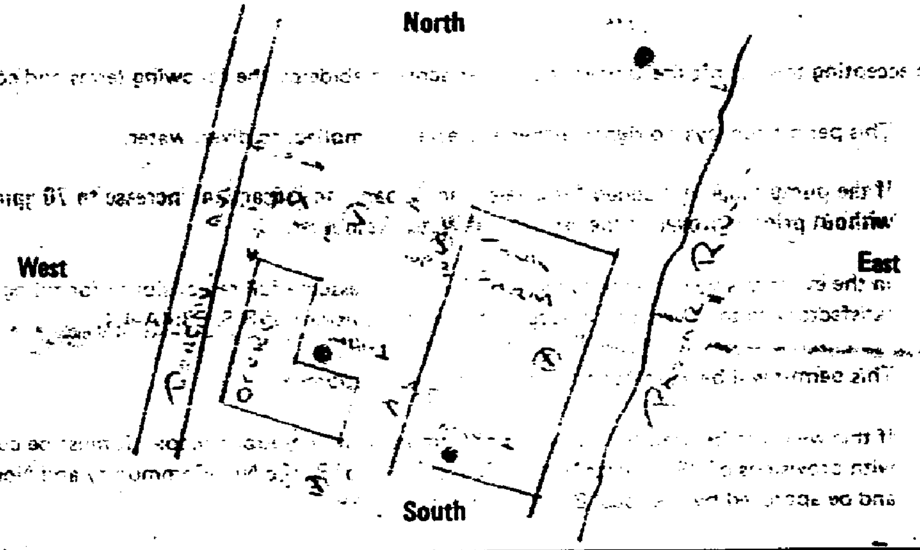
LOCATION OF WELL

Lot #	Block #	Municipality	County
10 & 10A	5011	Newark	Essex

State Atlas Map No. 26



Draw sketch showing distance and relations of well site to nearest public roads, streets, septic systems, etc.



SEE REVERSE SIDE for IMPORTANT PROVISIONS AND REGULATIONS pertaining to this permit. APPROVAL of this permit is made SUBJECT TO acceptance of and compliance with the following ADDITIONAL CONDITIONS.

- ☐ Pinelands - Well must be drilled over 100' deep or a clay layer at least 4' in thickness must be encountered.
- ☐ It is necessary that Geophysical Logs of this well be made. Permanent pumping equipment SHALL NOT be installed until such logs are made.
- ☐ Authorization by rule under N.J.A.C. 7:14A-1 et seq.
- ☐ Samples of cuttings required every ______________ feet or change in material.
- ☐ The results of a volatile organic scan mut be obtained prior to using the water and submitted to ______________________________.
- ☐ Domestic Potable Water Supply - The service line for water from the public community water supply system shall be turned off at the curb cock, and the meter shall be removed by the water purveyor.
- ☐ Domestic Irrigation Supply - No piping from the well for which the permit applies shall enter any building.
- ☐ Industrial/Commercial Supply - A physical connection permit shall be obtained pursuant to the provisions of N.J.A.C. 7:10-10-1 et seq., and a vigorous cross connections control program shall be instituted and maintained within the premises.
- ☐ Heat Pump Wells - Wells must be 50 feet apart and the water must be returned to the same aquifer as the production well.
- ☒ ______________________________

This Space for Approval Stamp

WELL PERMIT APPROVED
Dept. of Environmental Protection
Water Resources/Water Allocation
MAY 30 1989

In compliance with R.S. 58:4A-14, application is made for a permit to drill a well as described above.

Date 5-30-89 Signature of Owner

COPIES: *Water Allocation — White* *Health Dept. — Yellow* *Owner — Blue* *Driller — White*

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

GROUND WATER
MONITORING WELL CERTIFICATION - FORM A - AS-BUILT CERTIFICATION

(One form must be completed for each well)

Name of Permittee: INDUSTRIAL PETROCHEMICALS, INC.
Name of Facility: INDUSTRIAL PETROCHEMICALS, INC.
Location: 128 Doremus Avenue, Newark, NJ

NJPDES Permit No: NJ NA

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831): This number must be permanently affixed to the well casing. 26–16038–2

Owner's Well Number (As shown on the application or plans): MW-1
Well Completion Date: 6/1/89
Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot): 3'
Total Depth of Well (one-tenth of a foot): 12'
Depth to Top of Screen From Top of Casing (one-tenth of a foot): 5'
Screen Length (feet): 10'
Screen or Slot Size: 0.020
Screen Material: stainless steel 2-12'
Casing Material: (PVC, Steel or Other-Specify) carbon steel
Casing Diameter (Inches): 4" ID
Static Water Level From Top of Casing at The Time of Certification (one-hundredth of a foot): 6'
Yield (Gallons per Minute): <5 gpm
Length of time Well Pumped or Bailed: **Hours Minutes**
Lithologic Log: **ATTACH ON BACK**

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Stephen E. Laney
Certified Professional Geologist's Signature

Stephen E. Laney
Professional Geologist's Name
(Please type or print)

SEAL

CPG #7519
Professional Geologist's Certification #

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION -FORM B- LOCATION CERTIFICATION

Name of Permittee: Industrial Petrochemicals

Name of Facility: Industrial Petrochemicals

Location: 128 Doremus Avenue, Newark, New Jersey

NJPDES Number: ___ ___ ___ ___ ___ ___ ___

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (as assigned by NJDEP's Water Allocation Section 609-984-6831: 2 6 1 6 0 3 8 - ___

This number must be permanently affixed to the well casing.

Longitude (1/100 of a second): West 7 4 / 0 7 / 1 9 / 5 2

Latitude (1/100 of a second): North 4 0 / 4 3 / 4 2 / 6 6

Elevation of Top of Casing (1/100 of a foot - cap off): ___ ___ 1 0 . 3 3

Owners Well Number (as shown on the application or plans): M W - 1

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

William E Thomas

PROFESSIONAL LAND SURVEYOR'S SIGNATURE

WILLIAM E. THOMAS

PROFESSIONAL LAND SURVEYOR'S NAME
(please print or type)

P.L.S. #30109

PROFESSIONAL LAND SURVEYOR'S LICENSE NO.

forms\WellCert.B
12/9/88:mcf

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

GROUND WATER
MONITORING WELL CERTIFICATION - FORM A - AS-BUILT CERTIFICATION

(One form must be completed for each well)

Name of Permittee: INDUSTRIAL PETROCHEMICALS, INC.
Name of Facility: INDUSTRIAL PETROCHEMICALS, INC.
Location: 128 Doremus Avenue, Newark, NJ

NJPDES Permit No: NJ NA

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831): This number must be permanently affixed to the well casing. 26-16039-1

Owner's Well Number (As shown on the application or plans): MW-2
Well Completion Date: 6/1/89
Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot): 3.5'
Total Depth of Well (one-tenth of a foot): 11.5'
Depth to Top of Screen From Top of Casing (one-tenth of a foot):
Screen Length (feet): 5.0'
Screen or Slot Size: 10'
Screen Material: 0.020
Casing Material: (PVC, Steel or Other-Specify): stainless steel 1.5-11.5'
Casing Diameter (Inches): carbon steel
Static Water Level From Top of Casing at The Time of Certification (one-hundredth of a foot): 4" ID
Yield (Gallons per Minute): 6.3'
Length of time Well Pumped or Bailed: <5 gpm
Hours Minutes
Lithologic Log: ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Stephen E. Laney
Certified Professional Geologist's Signature

Stephen E. Laney
Professional Geologist's Name
(Please type or print)

CPG #7519
Professional Geologist's Certification #

SEAL

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION -FORM B- LOCATION CERTIFICATION

Name of Permittee: Industrial Petrochemicals

Name of Facility: Industrial Petrochemicals

Location: 128 Doremus Avenue, Newark, New Jersey

NJPDES Number: ____ ____ ____ ____ ____ ____ ____

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (as assigned by NJDEP's Water Allocation Section 609-984-6831: 2 6 1 6 0 3 9 - __

This number must be permanently affixed to the well casing.

Longitude (1/100 of a second): West 7 4 / 0 7 / 1 5 / 8 7

Latitude (1/100 of a second): North 4 0 / 4 3 / 4 0 / 6 8

Elevation of Top of Casing (1/100 of a foot - cap off): __ __ 1 0 . 3 8

Owners Well Number (as shown on the application or plans): M W - 2

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately-responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

William E. Thomas

PROFESSIONAL LAND SURVEYOR'S SIGNATURE

WILLIAM E. THOMAS

PROFESSIONAL LAND SURVEYOR'S NAME
(please print or type)

P.L.S. #30109

PROFESSIONAL LAND SURVEYOR'S LICENSE NO.

forms\WellCert.B
12/9/88:mcf

THIS FORM MUS BE COMPLETED BY THE PERMITT OR HIS/HER AGENT

GROUND WATER
MONITORING WELL CERTIFICATION - FORM A - AS-BUILT CERTIFICATION

(One form must be completed for each well)

Name of Permittee: INDUSTRIAL PETROCHEMICALS, INC.
Name of Facility: INDUSTRIAL PETROCHEMICALS, INC.
Location: 128 Doremus Avenue, Newark, NJ

NJPDES Permit No: NJ NA

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831): This number must be permanently affixed to the well casing. 26-160404

Owner's Well Number (As shown on the application or plans): MW-3
Well Completion Date: 6/19/89
Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):
Total Depth of Well (one-tenth of a foot): 3.5'
Depth to Top of Screen From Top of Casing 11.5'
(one-tenth of a foot):
Screen Length (feet): 5'
Screen or Slot Size: 10'
Screen Material: 0.020
Casing Material: (PVC, Steel or Other-Specify) stainless steel 1.5-11.5'
Casing Diameter (Inches): carbon steel
Static Water Level From Top of Casing at The 4" ID
Time of Certification (one-hundredth of a foot): 6.0'
Yield (Gallons per Minute): <5 gpm
Length of time Well Pumped or Bailed: Hours Minutes
Lithologic Log: ATTACH OR BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Stephen E. Laney
Certified Professional Geologist's Signature

Stephen E. Laney
Professional Geologist's Name
(Please type or print)

CPG #7519
Professional Geologist's Certification #

SEAL

THIS FORM MUST BE COMPLETED BY THE PERMITTEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION -FORM B- LOCATION CERTIFICATION

Name of Permittee: Industrial Petrochemicals

Name of Facility: Industrial Petrochemicals

Location: 128 Doremus Avenue, Newark, New Jersey

NJPDES Number: __ __ __ __ __ __ __

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (as assigned by NJDEP's Water Allocation Section 609-984-6831: 2 6 1 6 0 4 0 - __

This number must be permanently affixed to the well casing.

Longitude (1/100 of a second):West 7 4 / 0 7 / 1 5 / 2 5

Latitude (1/100 of a second):North 4 0 / 4 3 / 4 2 / 0 2

Elevation of Top of Casing (1/100 of a foot - cap off): __ __ 1 0 . 1 7

Owners Well Number (as shown on the application or plans): M W - 3

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

William E. Thomas

PROFESSIONAL LAND SURVEYOR'S SIGNATURE

WILLIAM E. THOMAS

PROFESSIONAL LAND SURVEYOR'S NAME
(please print or type)

P.L.S. #30109

PROFESSIONAL LAND SURVEYOR'S LICENSE NO.

forms\WellCert.B
12/9/88:mcf

RECON SYSTEMS INC
[illegible] BRIDGE [illegible]
[illegible] FAX 20[illegible]

ANALYSIS REPORT

July 7, 1989

TO: LUM, HOENS, CONANT & DANZIS Project

Attn: A. Platt
RECON Project No. 1493

SAMPLE: Soil and Water, sampled on 5/31/89 at Newark, NJ

Method: via Modified 418.1

RECON Sample No.	Sample Description (Soil)	Petroleum Hydrocarbons (mg/kg)
16271	B-6, 54-60"	2490
16272	B-9, 30-36"	7980
16273	B-10, 19-25" BELOW GRADE	9650
16374	B-12, 24-30"	18000+
16275	B-13, 30-36"	1350
16276	B-15, 46-52"	2060
16277	B-16, 48-54"	11300
Minimum Detection Limit (Soil)		25
	(Water)	**(mg/l)**
16278	Field Blank	<0.5
Minimum Detection Limit (Water)		0.5

QA/QC DATA

RECON Sample No.	Sample Description	Petroleum Hydrocarbons (mg/kg)	
16274	Soil	18,300	
Duplicate		17,600	3.5 % Difference
Method Blank #1		ND	

Spike Recovery 96.0%

ND = none detected

< = less than value shown

* average sample weight used to calculate concentration

+ average of two runs

Samples from this project will be retained for sixty days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney
Patrick J. Mulrooney, B.S.
Acting Laboratory Director

Lester C. Wolfe
per Lester C. Wolfe, B.S.
Chemist

LCW/lej (AR#19)
AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.
[illegible] THREE BRIDGES [illegible]
FAX 20[illegible]

ANALYSIS REPORT

July 11, 1989

TO: LUM, HOENS, CONANT & DANZIS
PROJECT

Attn: Abe Platt
RECON Project No. 1493

SAMPLE: Soil and Water sampled on 6/1/89, Newark, N.J.

Method: via Modified 418.1

RECON Sample No.	Sample Description (Soil)	Petroleum Hydrocarbons (mg/kg)
16320	B-1, 2-2.5'	5730
16321	B-2, 2.5-3'	4480
16322	B-3, 24-30"	12600
16323	B-5, 6-12"	4480
16324	B-7, 12" Side Wall	19400
16325	B-8, 36-42"	8670
16326	B-11, 24-30"	18700
16327	B-11, 30-36"	25200
16328	B-14, 0-6"	117000
16329	B-17, 24-30"	8220
16330	B-18, 30-36"	2170
Minimum Detection Limit (Soil)		25
	(Water)	(mg/l)
16331	Field Blank	ND
Minimum Detection Limit (Water)		0.5

QA/QC DATA

RECON Sample No.	Sample Description	Petroleum Hydrocarbons (mg/kg)
16274	Soil	20900
Duplicate	Soil	18800 9.8% Difference
Method Blank #1		ND
Method Blank #2		<25
Method Blank #3		ND

Spike Recovery 100%

ND = none detected

< = less than value shown

Samples from this project will be retained for sixty days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Acting Laboratory Director

Lester C. Wolfe

per Lester C. Wolfe, B.S.
Chemist

LCW/lej (AR#19)
AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC

ANALYSIS REPORT

July 27, 1989

To: LUM, HOENS, CONANT, AND DANZIS
Project

Attn: A. Platt
RECON Project No. 1493

SAMPLE: Soil and Water, sampled 6/19/89 at Newark, NJ

Method: via Modified 418.1

RECON Sample No.	Sample Description	Petroleum Hydrocarbons
	(Soil)	(mg/kg)
16521	MW-3 (B-4), 24-30"	1380
Minimum Detection Limit (Soil)		25
	(Water)	(mg/l)
16522	Field Blank	ND
Minimum Detection Limit (Water)		0.5

QA/QC DATA

RECON Sample No.	Sample Description	Petroleum Hydrocarbons (mg/kg)
16666	Soil	762
Duplicate	Soil	635 16.6 % Difference
Method Blank*		ND
Spike Recovery	99.6%	

ND = none detected
* average sample weight used to calculate concentration

Samples from this project will be retained for sixty days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney
Patrick J. Mulrooney, B.S.
Laboratory Director

LCW/lej (SUB-DIR)AR.REP\AR1493

Lester C. Wolfe
per Lester C. Wolfe, B.S.
Chemist

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.
[illegible] THREE BRIDGES, N J [illegible]
[illegible] FAX [illegible]

ANALYSIS REPORT

July 19, 1989

To: LUM, HOENS, CONANT, AND DANZIS
Project

Attn: A. Platt
RECON Project No. 1493

SAMPLE: Soils, sampled 5/31/89 at Newark, NJ

via EPA 8080

Sample ID. **Parameter**	**B-6 4.5-5' 16271**	Duplicate **B-6 4.5-5' 16271**	**% Recovery 16271-Spike**	**Detection Limit**
	ug/kg (dry weight basis)			
BHC-alpha isomer	ND	ND	89	0.3
BHC-gamma isomer	ND	ND	74	0.1
BHC-beta isomer	ND	ND	11	0.1
Heptachlor	ND	ND	38	0.3
BHC-delta isomer	ND	ND	26	0.9
Aldrin	ND	ND	87	0.4
Heptachlor epoxide	ND	ND	103	8.3
Endosulfan I	ND	ND	36	1.4
4,4'-DDE	ND	ND	129	0.4
Dieldrin	ND	ND	44	0.2
Endrin	ND	ND	87	0.6
4,4'-DDD	ND	ND	15	1.1
Endosulfan II	ND	ND	34	0.4
4,4'-DDT	ND	ND	87	1.2
Endrin aldehyde	ND	ND	73	2.3
Endosulfan sulfate	ND	ND	87	6.6
Chlordane	ND	ND	73	1.4
Toxaphene	ND	ND	87	24
PCB-1016	ND	ND	-	10
PCB-1221	ND	ND	-	10
PCB-1232	ND	ND	-	10
PCB-1242	ND	ND	-	10
PCB-1248	ND	ND	-	10
PCB-1254	ND	ND	-	10
PCB-1260	ND	ND	-	10
% Surrogate Recovery	124	200	86	

ND = none detected

Samples from this project will be retained for sixty days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

John R. Geissl

per John R. Geissler, B.S.
Manager, Organic Laboratory

JRG/lej (SUB-DIR)AR.REP\AR1493

Notebook: ECD-1 pg.10-11

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.

[illegible] BOX [illegible] THREE BRIDGES N J [illegible]
[illegible] 908 [illegible] FAX [illegible]
[illegible]

ANALYSIS REPORT

July 19, 1989

To: LUM, HOENS, CONANT, AND DANZIS
Project

Attn: A. Platt
RECON Project No. 1493

SAMPLE: Soils, sampled at Newark, NJ

via EPA 8080

Sample Date: **Sample ID.** **Parameter**	**5/31/89** **B-9, 30-36"** **16272**	**6/01/89** **B-14, 0-6"** **16328**	**Detection Limit**
	ug/kg		
BHC-alpha isomer	ND	ND	0.3
BHC-gamma isomer	ND	ND	0.1
BHC-beta isomer	ND	ND	0.1
Heptachlor	ND	ND	0.3
BHC-delta isomer	ND	ND	0.9
Aldrin	ND	ND	0.4
Heptachlor epoxide	ND	ND	8.4
Endosulfan I	ND	ND	1.4
4,4'-DDE	ND	ND	0.4
Dieldrin	ND	ND	0.2
Endrin	ND	ND	0.6
4,4'-DDD	ND	ND	1.1
Endosulfan II	ND	ND	0.4
4,4'-DDT	ND	ND	1.2
Endrin aldehyde	ND	ND	2.3
Endosulfan sulfate	ND	ND	6.6
Chlordane	ND	ND	1.4
Toxaphene	ND	ND	24
PCB-1016	ND	ND	10
PCB-1221	ND	ND	10
PCB-1232	ND	ND	10
PCB-1242	ND	ND	10
PCB-1248	ND	ND	10
PCB-1254	ND	ND	10
PCB-1260	ND	ND	10
% Surrogate Recovery	NA	NA	

NA = contaminant peak(s) coeluting with DBC, % Recovery Data not available.

ND = none detected

Samples from this project will be retained for sixty days from the date of this report unless otherwise directed.

Submitted By

Patrick J. Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

Wayne K. Halozan / P

per Wayne K. Halozan, B.S.
Senior Chemist

WKH/lej (SUB-DIR)AR.REP\AR1493

Notebook: ECD-1 pg.10-11

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.
[illegible] BOX 460 THREE BRIDGES N.J. [illegible]
[illegible] 5900 FAX 20[illegible] 782 067[illegible]

ANALYSIS REPORT

July 19, 1989

To: LUM, HOENS, CONANT, AND DANZIS
Project

Attn: A. Platt
RECON Project No. 1493

SAMPLE: Water blanks, sampled at Newark, NJ

via EPA 608

Sample Date:	**5/31/89**	**6/01/89**	
Sample ID.	**Field Blank**	**Field Blank**	**Detection**
Parameter	**16278**	**16331**	**Limit**
		ug/l	-
BHC-alpha isomer	ND	ND	0.03
BHC-gamma isomer	ND	ND	0.01
BHC-beta isomer	ND	ND	0.01
Heptachlor	ND	ND	0.03
BHC-delta isomer	ND	ND	0.09
Aldrin	ND	ND	0.04
Heptachlor epoxide	ND	ND	0.83
Endosulfan I	ND	ND	0.14
4,4'-DDE	ND	ND	0.04
Dieldrin	ND	ND	0.02
Endrin	ND	ND	0.06
4,4'-DDD	ND	ND	0.11
Endosulfan II	ND	ND	0.04
4,4'-DDT	ND	ND	0.12
Endrin aldehyde	ND	ND	0.23
Endosulfan sulfate	ND	ND	0.66
Chlordane	ND	ND	0.14
Toxaphene	ND	ND	2.4
PCB-1016	ND	ND	1
PCB-1221	ND	ND	1
PCB-1232	ND	ND	1
PCB-1242	ND	ND	1
PCB-1248	ND	ND	1
PCB-1254	ND	ND	1
PCB-1260	ND	ND	1
% Surrogate Recovery	62	52	-

ND = none detected

Samples from this project will be retained for sixty days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

John R. Geissler

per John R. Geissler, B.S.
Manager, Organic Laboratory

JRG/lej (SUB-DIR)AR.REP\AR1493

Notebook: ECD-1 pg.11

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.

[illegible] THREE BRIDGE[illegible] N J [illegible]

Non-Conformance Summary

Field blanks with sample numbers 16278 and 16331 were extracted one week beyond NJ-ECRA suggested holding period.

RECON SYSTEMS INC
[illegible] THREE BRIDGES [illegible]

ANALYSIS REPORT

July 27, 1989

To: LUM, HOENS, CONANT, AND DANZIS
Project

Attn: A. Platt
RECON Project No. 1493

SAMPLE: Soil, sampled on 6/19/89 at Newark, NJ

via EPA 8080

Sample ID. Parameter	MW-3 B-4 2-2.5' 16521	Dupl. 16521	% Recovery 16521-Spike	Detection Limit
	ug/kg (dry weight basis)			
BHC-alpha isomer	ND	ND	26	0.3
BHC-gamma isomer	ND	ND	37	0.1
BHC-beta isomer	ND	ND	23	0.1
Heptachlor	ND	ND	D	0.3
BHC-delta isomer	ND	ND	11	0.9
Aldrin	ND	ND	D	0.4
Heptachlor epoxide	ND	ND	21	8.3
Endosulfan I	<1.4	<1.4	29	1.4
4,4'-DDE	ND	ND	22	0.4
Dieldrin	ND	ND	26	0.2
Endrin	ND	ND	11	0.6
4,4'-DDD	ND	ND	13	1.1
Endosulfan II	ND	ND	7.3	0.4
4,4'-DDT	ND	ND	D	1.2
Endrin aldehyde	ND	ND	24	2.3
Endosulfan sulfate	ND	ND	29	6.6
Chlordane	ND	ND	-	1.4
Toxaphene	ND	ND	-	24
PCB-1016	ND	ND	-	10
PCB-1221	ND	ND	-	10
PCB-1232	ND	ND	-	10
PCB-1242	ND	ND	-	10
PCB-1248	ND	ND	-	10
PCB-1254	70	60	-	10
PCB-1260	ND	ND	-	10
* % Surrogate Recovery	38	37	16	

* Dibutylchlorendate (DBC) was used as surrogate spiking compound, ECRA does not require sample reanalysis based on poor recovery of DBC.

D = Analyte presence detected, % recovery less than 5%

ND = none detected

Samples from this project will be retained for sixty days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

per John R. Geissler, B.S.
Manager, Organic Laboratory

JRG/lej (SUB-DIR)AR.REP\AR1493

Notebook: ECD-1 pg.12-14

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.
[illegible] THREE BRIDGES N J [illegible]
FAX 201 782 007
[illegible]

ANALYSIS
REPORT

July 27, 1989

To: LUM, HOENS, CONANT, AND DANZIS
Project

Attn: A. Platt
RECON Project No. 1493

SAMPLE: Water, sampled on 6/19/89 at Newark, NJ

via EPA 608

Sample ID. **Parameter**	**Field Blank 16522**	**Detection Limit**
	ug/l	
BHC-alpha isomer	ND	0.03
BHC-gamma isomer	ND	0.01
BHC-beta isomer	ND	0.01
Heptachlor	ND	0.03
BHC-delta isomer	ND	0.09
Aldrin	ND	0.04
Heptachlor epoxide	ND	0.83
Endosulfan I	ND	0.14
4,4'-DDE	ND	0.04
Dieldrin	ND	0.02
Endrin	ND	0.06
4,4'-DDD	ND	0.11
Endosulfan II	ND	0.04
4,4'-DDT	ND	0.12
Endrin aldehyde	ND	0.23
Endosulfan sulfate	ND	0.66
Chlordane	ND	0.14
Toxaphene	ND	2.4
PCB-1016	ND	1
PCB-1221	ND	1
PCB-1232	ND	1
PCB-1242	ND	1
PCB-1248	ND	1
PCB-1254	ND	1
PCB-1260	ND	1
% Surrogate Recovery	128	

ND = none detected

Samples from this project will be retained for sixty days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

John R. Geisse

per John R. Geissler, B.S.
Manager, Organic Laboratory

JRG/lej (SUB-DIR)AR.REP\AR1493

Notebook: ECD-1 pg. 12-14

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.
[illegible] THREE BRIDGES, NJ [illegible]
[illegible] FAX 201 732 0072
[illegible] PENNSYLVANIA [illegible] CONNECTICUT [illegible]

ANALYSIS
REPORT

July 19, 1989

TO: LUM, HOENS, CONSANT & DANZIS

ATTN: A Platt
RECON Project No. 1493

Sample: Soil, sampled 5/31/89 at Newark, NJ

Sample ID.	**B-13**	**B-15**	**B-16**
Sample Depth	**2.5-3'**	**3'10"-4'4"**	**4-4.5'**
RECON Sample No.	**16275**	**16276**	**16277**
Parameter			
Volatile Organics (EPA 8240+15)*	*	*	*

* see attached Accutest report

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

PJM/lej (SUB-DIR)AR.REP\AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

[illegible]ON SYSTEMS INC.
[illegible] THREE BRIDGES, N[illegible]
[illegible] FAX 20[illegible]

ANALYSIS REPORT

July 19, 1989

TO: LUM, HOENS, CONSANT & DANZIS

ATTN: A Platt
RECON Project No. 1493

Sample: Water, sampled 5/31/89 at Newark, NJ

Sample ID.	**Field Blank**	**Trip Blank**
RECON Sample No.	**16278**	**16279**
Parameter		
Volatile Organics (EPA 624+15)*	ND	+
Base Neutral (EPA 625+15)*	*	-

ND = none detected
\+ = compounds with similar spectra found in laboratory blank
* see attached Accutest report

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

PJM/lej (SUB-DIR)AR.REP\AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.
[illegible] THREE BRIDGES, N.J. [illegible]
FAX [illegible]

ANALYSIS
REPORT

July 19, 1989

TO: LUM, HOENS, CONSANT & DANZIS

ATTN: A Platt
RECON Project No. 1493

Sample: Soil, sampled 5/31/89 at Newark, NJ

Sample ID.	**B-6**	**B-9**	**B-10**	**B-12**
Sample Depth	**4-4.5'**	**30-36"**	**19-25'**	**24-30"**
RECON Sample No.	**16271**	**16272**	**16273** **Below Grade**	**16274**
Parameter				
Volatile Organics (EPA 8240+15)*	*	*	*	*
Base Neutral (EPA 8270+15)*	-	-	*	*

* see attached Accutest report

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise directed.

Submitted By

Patrick J. Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

PJM/lej (SUB-DIR)AR.REP\AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

[illegible] ON SYSTEMS INC
[illegible] THREE BRIDGE [illegible]

ANALYSIS
REPORT

July 19, 1989

TO: LUM, HOENS, CONSANT & DANZIS

ATTN: A Platt
RECON Project No. 1493

Sample: Soil, sampled 6/01/89 at Newark, NJ

Sample ID.	**B-1**	**B-2**	**B-3**	**B-5**
Sample Depth	**2-2.5'**	**2.5-3'**	**24-30"**	**6-12"**
RECON Sample No.	**16320**	**16321**	**16322**	**16323**
Parameter				
Volatile Organics (EPA 8240+15)*	*	*	*	*
Base Neutral (EPA 8270+15)*	*	-	-	-

* see attached Accutest report

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

PJM/lej (SUB-DIR)AR.REP\AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

ON SYSTEMS INC.
[illegible] THREE BRIDGE[illegible]
FAX 201-[illegible]
[illegible]

**ANALYSIS
REPORT**

July 19, 1989

TO: LUM, HOENS, CONSANT & DANZIS

ATTN: A Platt
RECON Project No. 1493

Sample: Soil, sampled 6/01/89 at Newark, NJ

Sample ID.	B-7	B-8	B-11	B-11
Sample Depth	12"	36-42"	24-30"	30-36"
RECON Sample No.	16324 Sidewall	16325	16326	16327
Parameter				
Volatile Organics (EPA 8240+15)*	*	*	*	*
Base Neutral (EPA 8270+15)*	*	*	-	-

* see attached Accutest report

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

PJM/lej (SUB-DIR)AR.REP\AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.
[illegible] THREE BRIDGES, N.J. [illegible]
FAX 201 782 00[illegible]

ANALYSIS REPORT

July 19, 1989

TO: LUM, HOENS, CONSANT & DANZIS **ATTN: A Platt**
RECON Project No. 1493

Sample: Soil, sampled 6/01/89 at Newark, NJ

Sample ID.	**B-14**	**B-17**	**B-18**
Sample Depth	**0-6"**	**24-30"**	**30-36"**
RECON Sample No.	**16328**	**16329**	**16330**
Parameter			
Volatile Organics (EPA 8240+15)*	*	*	*
Base Neutral (EPA 8270+15)*	-	*	-

*** see attached Accutest report**

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise directed.

Submitted By

Patrick J Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

PJM/lej (SUB-DIR)AR.REP\AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.
THREE BRIDGES, N J [illegible]
FAX [illegible]

ANALYSIS REPORT

July 19, 1989

TO: LUM, HOENS, CONSANT & DANZIS

ATTN: A Platt
RECON Project No. 1493

Sample: Water, sampled 6/01/89 at Newark, NJ

Sample ID.	**Field Blank**	**Trip Blank**
RECON Sample No.	**16331**	**16332**
Parameter		
Volatile Organics (EPA 624+15)*	*	ND
Base Neutral (EPA 625+15)*	*	-

ND = none detected
* see attached Accutest report

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise directed.

Submitted By

Patrick J. Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

PJM/lej (SUB-DIR)AR.REP\AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

ON SYSTEMS INC.
HREE BRIDGES, N J 088
AX 20 [illegible] 082

ANALYSIS REPORT

July 27, 1989

TO: LUM, HOENS, CONSANT & DANZIS

ATTN: A Platt
RECON Project No. 1493

Sample: Soil, sampled 6/19/89 at Newark, NJ

Sample ID.	**MW-3 (B-4)**
Depth	**2-2.5'**
RECON Sample No.	**16521**
Parameter	
Volatile Organics (EPA 8240+15)*	*
Base Neutrals (EPA 8270+15)*	*

* see attached Accutest report

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise directed.

Submitted By

Patrick J. Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

PJM/lej (SUB-DIR)AR.REP\AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

RECON SYSTEMS INC.
BOX [illegible] THREE BRIDGES, N.J. [illegible]
[illegible] FAX 201 782-0072
[illegible]

**ANALYSIS
REPORT**

July 27, 1989

TO: LUM, HOENS, CONSANT & DANZIS

ATTN: A Platt
RECON Project No. 1493

Sample: Water, sampled 6/19/89 at Newark, NJ

Sample ID.	**Field Blank**	**Trip Blank**
RECON Sample No.	**16522**	**16523**
Parameter		
Volatile Organics (EPA 624+15)*	ND	+
Base Neutrals (EPA 625+15)*	ND	-

ND = none detected
\+ = peak on chromatogram probable background due to solvent or CO_2
* see attached Accutest report

Samples for this project will be retained for sixty (60) days from the date of this report unless otherwise directed.

Submitted By

Patrick J. Mulrooney

Patrick J. Mulrooney, B.S.
Laboratory Director

PJM/lej (SUB-DIR)AR.REP\AR1493

New Jersey State Certified Water Laboratory
Certification No. 10196

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2235 ROUTE 130, BLDG. B • DAYTON, N.J. 08810 • (201) 329-0200

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911404
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/28/89
DATA FILE : >B0883

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACROLEIN	ND	62000	
2)	ACRYLONITRILE	ND	62000	
3)	BENZENE	ND	3100	
4)	BROMOFORM	ND	3100	
5)	BROMODICHLOROMETHANE	ND	3100	
6)	BROMOMETHANE	ND	6200	
7)	CARBON TETRACHLORIDE	ND	3100	
8)	CHLOROBENZENE	ND	3100	
9)	CHLOROETHANE	ND	6200	
10)	2-CHLOROETHYL VINYL ETHER	ND	6200	
11)	CHLOROFORM	ND	3100	
12)	CHLOROMETHANE	ND	6200	
13)	cis-1,3-DICHLOROPROPENE	ND	3100	
14)	DIBROMOCHLOROMETHANE	ND	3100	
15)	1,2-DICHLOROBENZENE	ND	3100	
16)	1,3-DICHLOROBENZENE	ND	3100	
17)	1,4-DICHLOROBENZENE	ND	3100	
18)	1,1-DICHLOROETHANE	ND	3100	
19)	1,2-DICHLOROETHANE	ND	3100	
20)	1,1-DICHLOROETHYLENE	ND	3100	
21)	trans-1,2-DICHLOROETHYLENE	ND	3100	
22)	trans-1,3-DICHLOROPROPENE	ND	3100	
23)	1,2-DICHLOROPROPANE	ND	3100	
24)	ETHYLBENZENE	11000	3100	
25)	METHYLENE CHLORIDE	ND	3100	
26)	1,1,2,2-TETRACHLOROETHANE	ND	3100	
27)	TETRACHLOROETHYLENE	38000	3100	
28)	TOLUENE	11000	3100	
29)	1,1,1-TRICHLOROETHANE	ND	3100	
30)	1,1,2-TRICHLOROETHANE	ND	3100	
31)	TRICHLOROETHYLENE	ND	3100	
32)	TRICHLOROFLUOROMETHANE	ND	3100	
33)	VINYL CHLORIDE	ND	6200	
34)	m-XYLENE	83000	3100	
35)	p,o-XYLENE	120000	3100	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911404

Date Analyzed: 6/28/89 20:52

Lab File ID: >B0883

Matrix: SOIL FOR VOA

Number TICs found: 7 CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	21.12	3400.	
2. 98828	Benzene, (1-methylethyl)- (9	34.68	110000.	
3.	Unknown	27.67	11000.	
4. 74511516	1-Octane, 3,3-dimethyl- (9CI	31.41	30000.	
5.	Unkown	33.06	8400.	
6. 622968	Benzene, 1-ethyl-4-methyl- (	35.92	90000.	
7. 25155151	Benzene, methyl(1-methylethy	37.93	12000.	
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

7

R.T

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2235 ROUTE 130, BLDG. B • DAYTON, N.J. 08810 • (201) 329-0200

ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911405
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/28/89
DATA FILE : >B0884
>B0911

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACROLEIN	ND	65000	
2)	ACRYLONITRILE	ND	65000	
3)	BENZENE	ND	3200	
4)	BROMOFORM	ND	3200	
5)	BROMODICHLOROMETHANE	ND	3200	
6)	BROMOMETHANE	ND	6500	
7)	CARBON TETRACHLORIDE	ND	3200	
8)	CHLOROBENZENE	ND	3200	
9)	CHLOROETHANE	ND	6500	
10)	2-CHLOROETHYL VINYL ETHER	ND	6500	
11)	CHLOROFORM	ND	3200	
12)	CHLOROMETHANE	ND	6500	
13)	cis-1,3-DICHLOROPROPENE	ND	3200	
14)	DIBROMOCHLOROMETHANE	ND	3200	
15)	1,2-DICHLOROBENZENE	ND	3200	
16)	1,3-DICHLOROBENZENE	ND	3200	
17)	1,4-DICHLOROBENZENE	ND	3200	
18)	1,1-DICHLOROETHANE	ND	3200	
19)	1,2-DICHLOROETHANE	ND	3200	
20)	1,1-DICHLOROETHYLENE	ND	3200	
21)	trans-1,2-DICHLOROETHYLENE	ND	3200	
22)	trans-1,3-DICHLOROPROPENE	ND	3200	
23)	1,2-DICHLOROPROPANE	ND	3200	
24)	ETHYLBENZENE	50000	3200	
25)	METHYLENE CHLORIDE	ND	3200	
26)	1,1,2,2-TETRACHLOROETHANE	ND	3200	
27)	TETRACHLOROETHYLENE	5700	3200	
28)	TOLUENE	600000	26000	
29)	1,1,1-TRICHLOROETHANE	ND	3200	
30)	1,1,2-TRICHLOROETHANE	ND	3200	
31)	TRICHLOROETHYLENE	ND	3200	
32)	TRICHLOROFLUOROMETHANE	ND	3200	
33)	VINYL CHLORIDE	ND	6500	
34)	m-XYLENE	280000	26000	
35)	p,o-XYLENE	150000	3200	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911405

Date Analyzed: 6/28/89 21:36

Lab File ID: >B0884

Matrix: SOIL FOR VOA

Number TICs found: 14

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 96140	Pentane, 3-methyl- (8CI9CI)	18.12	7600.	
2. 2549679	Aziridine, 2-ethyl- (8CI9CI)	18.81	6800.	
3. 565593	Pentane, 2,3-dimethyl- (8CI9	19.90	9400.	
4. 123751	Pyrrolidine (DOT)(8CI9CI)	20.23	3900.	
5. 589344	Hexane, 3-methyl- (8CI9CI)	21.11	44000.	
6. 591764	Hexane, 2-methyl- (8CI9CI)	21.47	4200.	
7. 6876239	Cyclohexane, 1,2-dimethyl-,	24.81	4100.	
8. 526738	Benzene, 1,2,3-trimethyl- (8	26.69	23000.	
9. 3788327	Cyclopentane, (2-methylpropy	27.57	21000.	
10. 95636	Benzene, 1,2,4-trimethyl- (8	31.28	190000.	
11. 74421355	1,6-Heptadiene, 2,3,6-trimet	33.16	38000.	
12. 611143	Benzene, 1-ethyl-2-methyl- (	34.65	34000.	
13. 611143	Benzene, 1-ethyl-2-methyl- (	35.94	110000.	
14. 99876	Benzene, 1-methyl-4-(1-methy	37.88	36000.	
15.------------	--------------------------	---------	-------------	-----

QUALIFIERS(Q);
(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911406
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/29/89
DATA FILE : >B0912

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	31000	
2) ACRYLONITRILE	ND	31000	
3) BENZENE	ND	1500	
4) BROMOFORM	ND	1500	
5) BROMODICHLOROMETHANE	ND	1500	
6) BROMOMETHANE	ND	3100	
7) CARBON TETRACHLORIDE	ND	1500	
8) CHLOROBENZENE	ND	1500	
9) CHLOROETHANE	ND	3100	
10) 2-CHLOROETHYL VINYL ETHER	ND	3100	
11) CHLOROFORM	ND	1500	
12) CHLOROMETHANE	ND	3100	
13) cis-1,3-DICHLOROPROPENE	ND	1500	
14) DIBROMOCHLOROMETHANE	ND	1500	
15) 1,2-DICHLOROBENZENE	ND	1500	
16) 1,3-DICHLOROBENZENE	ND	1500	
17) 1,4-DICHLOROBENZENE	ND	1500	
18) 1,1-DICHLOROETHANE	ND	1500	
19) 1,2-DICHLOROETHANE	ND	1500	
20) 1,1-DICHLOROETHYLENE	ND	1500	
21) trans-1,2-DICHLOROETHYLENE	ND	1500	
22) trans-1,3-DICHLOROPROPENE	ND	1500	
23) 1,2-DICHLOROPROPANE	ND	1500	
24) ETHYLBENZENE	ND	1500	
25) METHYLENE CHLORIDE	ND	1500	
26) 1,1,2,2-TETRACHLOROETHANE	ND	1500	
27) TETRACHLOROETHYLENE	ND	1500	
28) TOLUENE	ND	1500	
29) 1,1,1-TRICHLOROETHANE	ND	1500	
30) 1,1,2-TRICHLOROETHANE	ND	1500	
31) TRICHLOROETHYLENE	ND	1500	
32) TRICHLOROFLUOROMETHANE	ND	1500	
33) VINYL CHLORIDE	ND	3100	
34) m-XYLENE	ND	1500	
35) p,o-XYLENE	ND	1500	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

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ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911406
MATRIX : SOIL

METHOD : SW84
ANALYSIS DATE: 06/2
DATA FILE : >E53

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*
1)	ACENAPHTHENE	1800	1500
2)	ACENAPHTHYLENE	ND	1500
3)	ANTHRACENE	ND	1500
4)	BENZIDENE	ND	7400
5)	BENZO(A)ANTHRACENE	450	1500
6)	BENZO(A)PYRENE	450	1500
7)	BENZO(B)FLUORANTHENE	450	1500
8)	BENZO(K)FLUORANTHENE	ND	1500
9)	BENZO(G,H,I)PERYLENE	ND	1500
10)	BIS(2-CHLOROETHOXY)METHANE	ND	1500
11)	BIS(2-CHLOROETHYL)ETHER	ND	1500
12)	BIS(2-CHLOROISOPROPYL)ETHER	ND	1500
13)	BIS(2-ETHYLHEXYL)PHTHALATE	520	1500
14)	4-BROMOPHENYL PHENYL ETHER	ND	1500
15)	BUTYL BENZYL PHTHALATE	ND	1500
16)	2-CHLORONAPHTHALENE	ND	1500
17)	4-CHLOROPHENYL PHENYL ETHER	ND	1500
18)	CHRYSENE	650	1500
19)	DIBENZO(A,H)ANTHRACENE	ND	1500
20)	1,2-DICHLOROBENZENE	ND	1500
21)	1,3-DICHLOROBENZENE	ND	1500
22)	1,4-DICHLOROBENZENE	ND	1500
23)	3,3'-DICHLOROBENZIDENE	ND	2900
24)	DIETHYL PHTHALATE	ND	1500
25)	DIMETHYL PHTHALATE	ND	1500
26)	DI-N-BUTYL PHTHALATE	ND	1500
27)	2,4-DINITROTOLUENE	ND	1500
28)	2,6-DINITROTOLUENE	ND	1500
29)	DI-N-OCTYL PHTHALATE	8400	1500
30)	1,2-DIPHENYLHYDRAZINE	ND	1500
31)	FLUORANTHENE	890	1500
32)	FLUORENE	ND	1500
33)	HEXACHLOROBENZENE	ND	1500
34)	HEXACHLOROBUTADIENE	ND	1500
35)	HEXACHLOROCYCLOPENTADIENE	ND	1500
36)	HEXACHLOROETHANE	ND	1500
37)	INDENO(1,2,3-CD)PYRENE	ND	1500
38)	ISOPHORONE	ND	1500
39)	NAPHTHALENE	ND	1500
40)	NITROBENZENE	ND	1500
41)	N-NITROSODIMETHYLAMINE	ND	1500
42)	N-NITROSODI-N-PROPYLAMINE	ND	1500
43)	N-NITROSODIPHENYLAMINE	ND	1500
44)	PHENANTHRENE	3500	1500
45)	PYRENE	2800	1500
46)	1,2,4-TRICHLOROBENZENE	ND	1500

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911406

Date Analyzed: 6/29/89 23:51

Lab File ID: >B0912

Matrix: SOIL FOR VOA

Number TICs found: 12

CONCENTRATION UNITS: ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	3.06	1500.	
2.	1073116	2(3H)-Furanone, 5-ethenyldih	25.41	18000.	
3.	691383	2-Pentene, 4-methyl-, (Z)- (	31.40	12000.	
4.		Unknown	32.11	3400.	
5.	22606877	Azetidine, 2,2,3,3-tetrameth	33.11	8100.	
6.	493027	Naphthalene, decahydro-, tra	35.42	32000.	
7.	14916804	3-Octyn-1-ol (8CI9CI)	29.49	3000.	
8.	563804	2-Butanone, 3-methyl- (8CI9C	14.97	1500.	
9.	107835	Pentane, 2-methyl- (8CI9CI)	16.56	2500.	
10.		Unknown	18.26	1600.	
11.	51756184	5-Hexen-2-one, 5-methyl-3-me	23.22	3300.	
12.	932569	Cycloheptanone, 2-methyl- (8	26.70	2800.	
13.	------------	-------------------------	--------	------------	-----
14.	------------	-------------------------	--------	------------	-----
15.	------------	-------------------------	--------	------------	-----

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Batch Number: MS-S-475

Lab Sample ID: E911406

Extraction Date: 6/07/89

Lab File ID: >E5350

Date Analyzed: 6/21/89 0:26

Matrix: SOIL FOR BN

Number TICs found: 15

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 62016197	Octane, 6-ethyl-2-methyl- (9	15.96	4500.	
2. 1002433	Undecane, 3-methyl- (8CI9CI)	16.14	3100.	
3. 874351	1H-Indene, 2,3-dihydro-5-met	17.22	3600.	
4. 62238124	Decane, 2,3,6-trimethyl- (9C	17.68	2600.	
5. 62108263	Decane, 2,6,8-trimethyl- (9C	18.19	6600.	
6. 4292755	Cyclohexane, hexyl- (9CI)	18.94	4800.	
7. 62016346	Octane, 2,3,7-trimethyl- (9C	19.38	7000.	
8. 4923777	Cyclohexane, 1-ethyl-2-methy	19.92	3400.	
9. 54340873	1H-Indene, 2,3-dihydro-1,4,7	20.13	4500.	
10. 74645980	Dodecane, 2,7,10-trimethyl-	21.36	19000.	
11. 563166	Hexane, 3,3-dimethyl- (8CI9C	21.93	17000.	
12. 17312822	Undecane, 4,6-dimethyl- (8CI	22.87	34000.	
13. 62108263	Decane, 2,6,8-trimethyl- (9C	25.94	24000.	
14. 54105678	Heptadecane, 2,6-dimethyl- (	26.84	10000.	
15. 74645980	Dodecane, 2,7,10-trimethyl-	28.32	5900.	

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911407
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 07/01/89
DATA FILE : >B0940

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACROLEIN	ND	3300	
2)	ACRYLONITRILE	ND	3300	
3)	BENZENE	120	170	J
4)	BROMOFORM	ND	170	
5)	BROMODICHLOROMETHANE	ND	170	
6)	BROMOMETHANE	ND	330	
7)	CARBON TETRACHLORIDE	ND	170	
8)	CHLOROBENZENE	ND	170	
9)	CHLOROETHANE	ND	330	
10)	2-CHLOROETHYL VINYL ETHER	ND	330	
11)	CHLOROFORM	ND	170	
12)	CHLOROMETHANE	ND	330	
13)	cis-1,3-DICHLOROPROPENE	ND	170	
14)	DIBROMOCHLOROMETHANE	ND	170	
15)	1,2-DICHLOROBENZENE	ND	170	
16)	1,3-DICHLOROBENZENE	ND	170	
17)	1,4-DICHLOROBENZENE	ND	170	
18)	1,1-DICHLOROETHANE	ND	170	
19)	1,2-DICHLOROETHANE	ND	170	
20)	1,1-DICHLOROETHYLENE	ND	170	
21)	trans-1,2-DICHLOROETHYLENE	ND	170	
22)	trans-1,3-DICHLOROPROPENE	ND	170	
23)	1,2-DICHLOROPROPANE	ND	170	
24)	ETHYLBENZENE	2700	170	
25)	METHYLENE CHLORIDE	ND	170	
26)	1,1,2,2-TETRACHLOROETHANE	ND	170	
27)	TETRACHLOROETHYLENE	ND	170	
28)	TOLUENE	190	170	
29)	1,1,1-TRICHLOROETHANE	ND	170	
30)	1,1,2-TRICHLOROETHANE	ND	170	
31)	TRICHLOROETHYLENE	ND	170	
32)	TRICHLOROFLUOROMETHANE	ND	170	
33)	VINYL CHLORIDE	ND	330	
34)	m-XYLENE	ND	170	
35)	p,o-XYLENE	3600	170	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

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ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911407
MATRIX : SOIL

METHOD : SW846 8270
ANALYSIS DATE: 06/22/89
DATA FILE : >C9461
>C9467

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACENAPHTHENE	12000	1200	
2) ACENAPHTHYLENE	10000	1200	
3) ANTHRACENE	16000	1200	
4) BENZIDENE	ND	5800	
5) BENZO(A)ANTHRACENE	12000	1200	
6) BENZO(A)PYRENE	13000	1200	
7) BENZO(B)FLUORANTHENE	4800	1200	
8) BENZO(K)FLUORANTHENE	6300	1200	
9) BENZO(G,H,I)PERYLENE	19000	1200	
10) BIS(2-CHLOROETHOXY)METHANE	ND	1200	
11) BIS(2-CHLOROETHYL)ETHER	ND	1200	
12) BIS(2-CHLOROISOPROPYL)ETHER	ND	1200	
13) BIS(2-ETHYLHEXYL)PHTHALATE	500	1200	J
14) 4-BROMOPHENYL PHENYL ETHER	ND	1200	
15) BUTYL BENZYL PHTHALATE	ND	1200	
16) 2-CHLORONAPHTHALENE	ND	1200	
17) 4-CHLOROPHENYL PHENYL ETHER	ND	1200	
18) CHRYSENE	18000	1200	
19) DIBENZO(A,H)ANTHRACENE	4200	1200	
20) 1,2-DICHLOROBENZENE	ND	1200	
21) 1,3-DICHLOROBENZENE	ND	1200	
22) 1,4-DICHLOROBENZENE	ND	1200	
23) 3,3'-DICHLOROBENZIDENE	ND	2300	
24) DIETHYL PHTHALATE	ND	1200	
25) DIMETHYL PHTHALATE	ND	1200	
26) DI-N-BUTYL PHTHALATE	ND	1200	
27) 2,4-DINITROTOLUENE	ND	1200	
28) 2,6-DINITROTOLUENE	ND	1200	
29) DI-N-OCTYL PHTHALATE	ND	1200	
30) 1,2-DIPHENYLHYDRAZINE	ND	1200	
31) FLUORANTHENE	500	1200	J
32) FLUORENE	38000	5800	
33) HEXACHLOROBENZENE	ND	1200	
34) HEXACHLOROBUTADIENE	ND	1200	
35) HEXACHLOROCYCLOPENTADIENE	ND	1200	
36) HEXACHLOROETHANE	ND	1200	
37) INDENO(1,2,3-CD)PYRENE	ND	1200	
38) ISOPHORONE	ND	1200	
39) NAPHTHALENE	64000	5800	
40) NITROBENZENE	ND	1200	
41) N-NITROSODIMETHYLAMINE	ND	1200	
42) N-NITROSODI-N-PROPYLAMINE	ND	1200	
43) N-NITROSODIPHENYLAMINE	4700	1200	
44) PHENANTHRENE	66000	5800	
45) PYRENE	1200	1200	
46) 1,2,4-TRICHLOROBENZENE	ND	1200	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911407

Date Analyzed: 7/01/89 1:03

Lab File ID: >B0940

Matrix: SOIL FOR VOA

Number TICs found: 10 CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 1795273	Cyclohexane, 1,3,5-trimethyl	25.37	350.	
2. 109671	1-Pentene (8CI9CI)	21.12	350.	
3. 1713333	7-Oxabicyclo[4.1.0]heptane,	24.23	270.	
4. 583608	Cyclohexanone, 2-methyl- (8C	24.78	160.	
5. 13395761	Cyclohexanone, 2,3-dimethyl-	29.42	550.	
6. 63830693	4-Nonane, 3-methyl-, (Z)- (9	31.38	870.	
7. 53778544	2-Cyclobutene-1-carboxamide	31.89	600.	
8.	Unknown	33.06	600.	
9. 496117	1H-Indene, 2,3-dihydro- (9CI	34.73	11000.	
10. 622968	Benzene, 1-ethyl-4-methyl- (	35.88	2200.	
11.				
12.				
13.				
14.				
15.				

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.

(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.

(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.

(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Batch Number: MS-S-475

Lab Sample ID: E911407

Extraction Date: 6/7/89

Lab File ID: >C9461

Date Analyzed: 6/22/89 2:02

Matrix: SOIL FOR BN

Number TICs found: 15

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 611143	Benzene, 1-ethyl-2-methyl- (	11.23	5500.	
2. 622968	Benzene, 1-ethyl-4-methyl- (	12.02	5400.	
3. 496117	1H-Indene, 2,3-dihydro- (9CI	13.10	5700.	
4. 766972	Benzene, 1-ethynyl-4-methyl-	13.32	5100.	
5. 1758889	Benzene, 2-ethyl-1,4-dimethy	14.68	1900.	
6. 14210209	4-Pyridinol, acetate (ester)	14.90	1500.	
7. 2958761	Naphthalene, decahydro-2-met	15.30	1900.	
8. 122009	Ethanone, 1-(4-methylphenyl)	15.73	3000.	
9. 65051834	Benzene, (1-methyl-2-cyclopr	15.84	2000.	
10. 6044719	Dodecane, 6-methyl- (8CI9CI)	16.77	5600.	
11. 61142209	Cyclohexane, (4-methylpentyl	17.46	1700.	
12. 62016346	Octane, 2,3,7-trimethyl- (9C	18.00	2800.	
13. 4453901	1,4-Methanonaphthalene, 1,4-	19.19	1700.	
14. 74645980	Dodecane, 2,7,10-trimethyl-	25.47	4700.	
15. 832644	Phenanthrene, 4-methyl- (8CI	29.30	6700.	

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911408
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/30/89
DATA FILE : >B0913

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	1300000	
2) ACRYLONITRILE	ND	1300000	
3) BENZENE	ND	65000	
4) BROMOFORM	ND	65000	
5) BROMODICHLOROMETHANE	ND	65000	
6) BROMOMETHANE	ND	130000	
7) CARBON TETRACHLORIDE	ND	65000	
8) CHLOROBENZENE	ND	65000	
9) CHLOROETHANE	ND	130000	
10) 2-CHLOROETHYL VINYL ETHER	ND	130000	
11) CHLOROFORM	ND	65000	
12) CHLOROMETHANE	ND	130000	
13) cis-1,3-DICHLOROPROPENE	ND	65000	
14) DIBROMOCHLOROMETHANE	ND	65000	
15) 1,2-DICHLOROBENZENE	ND	65000	
16) 1,3-DICHLOROBENZENE	ND	65000	
17) 1,4-DICHLOROBENZENE	ND	65000	
18) 1,1-DICHLOROETHANE	ND	65000	
19) 1,2-DICHLOROETHANE	ND	65000	
20) 1,1-DICHLOROETHYLENE	ND	65000	
21) trans-1,2-DICHLOROETHYLENE	ND	65000	
22) trans-1,3-DICHLOROPROPENE	ND	65000	
23) 1,2-DICHLOROPROPANE	ND	65000	
24) ETHYLBENZENE	ND	65000	
25) METHYLENE CHLORIDE	ND	65000	
26) 1,1,2,2-TETRACHLOROETHANE	ND	65000	
27) TETRACHLOROETHYLENE	ND	65000	
28) TOLUENE	1600000	65000	
29) 1,1,1-TRICHLOROETHANE	ND	65000	
30) 1,1,2-TRICHLOROETHANE	ND	65000	
31) TRICHLOROETHYLENE	ND	65000	
32) TRICHLOROFLUOROMETHANE	ND	65000	
33) VINYL CHLORIDE	ND	130000	
34) m-XYLENE	ND	65000	
35) p,o-XYLENE	48000	65000	J

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911408

Date Analyzed: 6/30/89 0:35

Lab File ID: >B0913

Matrix: SOIL FOR VOA

Number TICs found: 5

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 624293	Cyclohexane, 1,4-dimethyl-,	24.24	93000.	
2. 6876239	Cyclohexane, 1,2-dimethyl-,	24.77	64000.	
3. 10599754	Methanamine, N-pentylidene-	26.10	81000.	
4. 16778704	1H-1,2,4-Triazole, 1-ethyl-	21.15	82000.	
5. 589811	Heptane, 3-methyl- (8CI9CI)	25.61	180000.	
6.------------				
7.------------				
8.------------				
9.------------				
10.------------				
11.------------				
12.------------				
13.------------				
14.------------				
15.------------				

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911409
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 07/04/89
DATA FILE : >B0993

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	1400	
2) ACRYLONITRILE	ND	1400	
3) BENZENE	ND	68	
4) BROMOFORM	ND	68	
5) BROMODICHLOROMETHANE	ND	68	
6) BROMOMETHANE	ND	140	
7) CARBON TETRACHLORIDE	ND	68	
8) CHLOROBENZENE	ND	68	
9) CHLOROETHANE	ND	140	
10) 2-CHLOROETHYL VINYL ETHER	ND	140	
11) CHLOROFORM	ND	68	
12) CHLOROMETHANE	ND	140	
13) cis-1,3-DICHLOROPROPENE	ND	68	
14) DIBROMOCHLOROMETHANE	ND	68	
15) 1,2-DICHLOROBENZENE	ND	68	
16) 1,3-DICHLOROBENZENE	ND	68	
17) 1,4-DICHLOROBENZENE	ND	68	
18) 1,1-DICHLOROETHANE	ND	68	
19) 1,2-DICHLOROETHANE	ND	68	
20) 1,1-DICHLOROETHYLENE	ND	68	
21) trans-1,2-DICHLOROETHYLENE	ND	68	
22) trans-1,3-DICHLOROPROPENE	ND	68	
23) 1,2-DICHLOROPROPANE	ND	68	
24) ETHYLBENZENE	100	68	
25) METHYLENE CHLORIDE	ND	68	
26) 1,1,2,2-TETRACHLOROETHANE	ND	68	
27) TETRACHLOROETHYLENE	ND	68	
28) TOLUENE	130	68	
29) 1,1,1-TRICHLOROETHANE	ND	68	
30) 1,1,2-TRICHLOROETHANE	ND	68	
31) TRICHLOROETHYLENE	ND	68	
32) TRICHLOROFLUOROMETHANE	ND	68	
33) VINYL CHLORIDE	ND	140	
34) m-XYLENE	ND	68	
35) p,o-XYLENE	83	68	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911409,

Date Analyzed: 7/04/89 02:40

Lab File ID: >B0993

Matrix: SOIL FOR VOA

Number TICs found: 4

CONCENTRATION UNITS: ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	6.78	87.	
2.	35488007	4(1H)-Pyridione, 2,3-dihydro	25.42	340.	
3	13395761	Cyclohexanone, 2,3-dimethyl-	29.47	330.	
4.		Unknown	28.59	210.	
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					

QUALIFIERS(Q);
(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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R-1

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911410
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/29/89
DATA FILE : >B0889

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACROLEIN	ND	64000	
2)	ACRYLONITRILE	ND	64000	
3)	BENZENE	4200	3200	
4)	BROMOFORM	ND	3200	
5)	BROMODICHLOROMETHANE	ND	3200	
6)	BROMOMETHANE	ND	6400	
7)	CARBON TETRACHLORIDE	ND	3200	
8)	CHLOROBENZENE	ND	3200	
9)	CHLOROETHANE	ND	6400	
10)	2-CHLOROETHYL VINYL ETHER	ND	6400	
11)	CHLOROFORM	ND	3200	
12)	CHLOROMETHANE	ND	6400	
13)	cis-1,3-DICHLOROPROPENE	ND	3200	
14)	DIBROMOCHLOROMETHANE	ND	3200	
15)	1,2-DICHLOROBENZENE	ND	3200	
16)	1,3-DICHLOROBENZENE	ND	3200	
17)	1,4-DICHLOROBENZENE	ND	3200	
18)	1,1-DICHLOROETHANE	ND	3200	
19)	1,2-DICHLOROETHANE	ND	3200	
20)	1,1-DICHLOROETHYLENE	ND	3200	
21)	trans-1,2-DICHLOROETHYLENE	ND	3200	
22)	trans-1,3-DICHLOROPROPENE	ND	3200	
23)	1,2-DICHLOROPROPANE	ND	3200	
24)	ETHYLBENZENE	15000	3200	
25)	METHYLENE CHLORIDE	ND	3200	
26)	1,1,2,2-TETRACHLOROETHANE	ND	3200	
27)	TETRACHLOROETHYLENE	ND	3200	
28)	TOLUENE	1500	3200	J
29)	1,1,1-TRICHLOROETHANE	ND	3200	
30)	1,1,2-TRICHLOROETHANE	ND	3200	
31)	TRICHLOROETHYLENE	ND	3200	
32)	TRICHLOROFLUOROMETHANE	ND	3200	
33)	VINYL CHLORIDE	ND	3200	
34)	m-XYLENE	ND	6400	
35)	p,o-XYLENE	ND	3200	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911410

Date Analyzed: 6/29/89 1:15

Lab File ID: >B0889

Matrix: SOIL FOR VOA

Number TICs found: 15 CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 2415727	Cyclopropane, propyl- (9CI)	13.51	4900.	
2. 1759586	Cyclopentane, 1,3-dimethyl-,	18.81	15000.	
3. 565593	Pentane, 2,3-dimethyl- (8CI9	19.92	28000.	
4. 617787	Pentane, 3-ethyl- (8CI9CI)	20.25	11000.	
5. 589344	Hexane, 3-methyl- (8CI9CI)	21.13	37000.	
6. 591764	Hexane, 2-methyl- (8CI9CI)	21.58	5700.	
7. 36099511	7-Oxabicyclo[4.1.0]heptane,	24.83	6300.	
8. 7094260	Cyclohexane, 1,1,2-trimethyl	25.40	4700.	
9. 6236880	Cyclohexane, 1-ethyl-4-methy	26.79	8700.	
10. 1678928	Cyclohexane, propyl- (8CI9CI	27.53	3100.	
11. 1678928	Cyclohexane, propyl- (8CI9CI	29.41	16000.	
12. 6874288	3-Octene, 2,6-dimethyl- (8CI	31.35	24000.	
13.	Unknown	33.07	13000.	
14. 496117	1H-Indene, 2,3-dihydro- (9CI	34.78	56000.	
15. 611143	Benzene, 1-ethyl-2-methyl- (	35.74	25000.	

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911411
MATRIX : WATER

METHOD : EPA 624
ANALYSIS DATE: 06/05/89
DATA FILE : >F3813

COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1) ACROLEIN	ND	100	
2) ACRYLONITRILE	ND	100	
3) BENZENE	ND	5.0	
4) BROMOFORM	ND	5.0	
5) BROMODICHLOROMETHANE	ND	5.0	
6) BROMOMETHANE	ND	10	
7) CARBON TETRACHLORIDE	ND	5.0	
8) CHLOROBENZENE	ND	5.0	
9) CHLOROETHANE	ND	10	
10) 2-CHLOROETHYL VINYL ETHER	ND	10	
11) CHLOROFORM	ND	5.0	
12) CHLOROMETHANE	ND	10	
13) cis-1,3-DICHLOROPROPENE	ND	5.0	
14) DIBROMOCHLOROMETHANE	ND	5.0	
15) 1,2-DICHLOROBENZENE	ND	5.0	
16) 1,3-DICHLOROBENZENE	ND	5.0	
17) 1,4-DICHLOROBENZENE	ND	5.0	
18) 1,1-DICHLOROETHANE	ND	5.0	
19) 1,2-DICHLOROETHANE	ND	5.0	
20) 1,1-DICHLOROETHYLENE	ND	5.0	
21) trans-1,2-DICHLOROETHYLENE	ND	5.0	
22) trans-1,3-DICHLOROPROPENE	ND	5.0	
23) 1,2-DICHLOROPROPANE	ND	5.0	
24) ETHYLBENZENE	ND	5.0	
25) METHYLENE CHLORIDE	ND	5.0	
26) 1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27) TETRACHLOROETHYLENE	ND	5.0	
28) TOLUENE	ND	5.0	
29) 1,1,1-TRICHLOROETHANE	ND	5.0	
30) 1,1,2-TRICHLOROETHANE	ND	5.0	
31) TRICHLOROETHYLENE	ND	5.0	
32) TRICHLOROFLUOROMETHANE	ND	5.0	
33) VINYL CHLORIDE	ND	10	
34) m-XYLENE	ND	5.0	
35) p,o-XYLENE	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE
CI>

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ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911411
MATRIX : WATER

METHOD : EPA 625
ANALYSIS DATE: 06/10/89
DATA FILE : >D6550

COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1) ACENAPHTHENE	ND	10	
2) ACENAPHTHYLENE	ND	10	
3) ANTHRACENE	ND	10	
4) BENZIDENE	ND	52	
5) BENZO(A)ANTHRACENE	ND	10	
6) BENZO(A)PYRENE	ND	10	
7) BENZO(B)FLUORANTHENE	ND	10	
8) BENZO(K)FLUORANTHENE	ND	10	
9) BENZO(G,H,I)PERYLENE	ND	10	
10) BIS(2-CHLOROETHOXY)METHANE	ND	10	
11) BIS(2-CHLOROETHYL)ETHER	ND	10	
12) BIS(2-CHLOROISOPROPYL)ETHER	ND	10	
13) BIS(2-ETHYLHEXYL)PHTHALATE	27	10	
14) 4-BROMOPHENYL PHENYL ETHER	ND	10	
15) BUTYL BENZYL PHTHALATE	ND	10	
16) 2-CHLORONAPHTHALENE	ND	10	
17) 4-CHLOROPHENYL PHENYL ETHER	ND	10	
18) CHRYSENE	ND	10	
19) DIBENZO(A,H)ANTHRACENE	ND	10	
20) 1,2-DICHLOROBENZENE	ND	10	
21) 1,3-DICHLOROBENZENE	ND	10	
22) 1,4-DICHLOROBENZENE	ND	10	
23) 3,3'-DICHLOROBENZIDENE	ND	21	
24) DIETHYL PHTHALATE	ND	10	
25) DIMETHYL PHTHALATE	ND	10	
26) DI-N-BUTYL PHTHALATE	1.1	10	J
27) 2,4-DINITROTOLUENE	ND	10	
28) 2,6-DINITROTOLUENE	ND	10	
29) DI-N-OCTYL PHTHALATE	ND	10	
30) 1,2-DIPHENYLHYDRAZINE	ND	10	
31) FLUORANTHENE	ND	10	
32) FLUORENE	ND	10	
33) HEXACHLOROBENZENE	ND	10	
34) HEXACHLOROBUTADIENE	ND	10	
35) HEXACHLOROCYCLOPENTADIENE	ND	10	
36) HEXACHLOROETHANE	ND	10	
37) INDENO(1,2,3-CD)PYRENE	ND	10	
38) ISOPHORONE	ND	10	
39) NAPHTHALENE	ND	10	
40) NITROBENZENE	ND	10	
41) N-NITROSODIMETHYLAMINE	ND	10	
42) N-NITROSODI-N-PROPYLAMINE	ND	10	
43) N-NITROSODIPHENYLAMINE	ND	10	
44) PHENANTHRENE	ND	10	
45) PYRENE	ND	10	
46) 1,2,4-TRICHLOROBENZENE	ND	10	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911411,

Date Analyzed: 6/05/89 15:02

Lab File ID: >F3813

Matrix: WATER FOR VOA

Number TICs found: 0 CONCENTRATION UNITS: ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	NO ADDITIONAL PEAK TO SEARCH			

FORM I VOA-TIC 1/87 Rev.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Batch Number: MS-S-476

Lab Sample ID: E911411

Extraction Date: 6/7/89

Lab File ID: >D6550

Date Analyzed: 6/10/89 2:21

Matrix: WATER FOR BN

Number TICs found: 0

CONCENTRATION UNITS: ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	NO ADDITIONAL PEAK TO SEARCH			

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R.T.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911412
MATRIX : WATER

METHOD : EPA 624
ANALYSIS DATE: 06/03/89
DATA FILE : >A3494

COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1) ACROLEIN	ND	100	
2) ACRYLONITRILE	ND	100	
3) BENZENE	ND	5.0	
4) BROMOFORM	ND	5.0	
5) BROMODICHLOROMETHANE	ND	5.0	
6) BROMOMETHANE	ND	10	
7) CARBON TETRACHLORIDE	ND	5.0	
8) CHLOROBENZENE	ND	5.0	
9) CHLOROETHANE	ND	10	
10) 2-CHLOROETHYL VINYL ETHER	ND	10	
11) CHLOROFORM	ND	5.0	
12) CHLOROMETHANE	ND	10	
13) cis-1,3-DICHLOROPROPENE	ND	5.0	
14) DIBROMOCHLOROMETHANE	ND	5.0	
15) 1,2-DICHLOROBENZENE	ND	5.0	
16) 1,3-DICHLOROBENZENE	ND	5.0	
17) 1,4-DICHLOROBENZENE	ND	5.0	
18) 1,1-DICHLOROETHANE	ND	5.0	
19) 1,2-DICHLOROETHANE	ND	5.0	
20) 1,1-DICHLOROETHYLENE	ND	5.0	
21) trans-1,2-DICHLOROETHYLENE	ND	5.0	
22) trans-1,3-DICHLOROPROPENE	ND	5.0	
23) 1,2-DICHLOROPROPANE	ND	5.0	
24) ETHYLBENZENE	ND	5.0	
25) METHYLENE CHLORIDE	ND	5.0	
26) 1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27) TETRACHLOROETHYLENE	ND	5.0	
28) TOLUENE	ND	5.0	
29) 1,1,1-TRICHLOROETHANE	ND	5.0	
30) 1,1,2-TRICHLOROETHANE	ND	5.0	
31) TRICHLOROETHYLENE	ND	5.0	
32) TRICHLOROFLUOROMETHANE	ND	5.0	
33) VINYL CHLORIDE	ND	10	
34) m-XYLENE	ND	5.0	
35) p,o-XYLENE	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911412,

Date Analyzed: 6/03/89 13:10

Lab File ID: >A3494

Matrix: WATER FOR VOA

Number TICs found: 2

CONCENTRATION UNITS: ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	2.29	54.	/
2.	Unknown	17.42	14.	/
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

QUALIFIERS(Q);
- (1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
- (2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
- (3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
- (4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911413
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/22/89
DATA FILE : >B0742

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	1200	
2) ACRYLONITRILE	ND	1200	
3) BENZENE	ND	59	
4) BROMOFORM	ND	59	
5) BROMODICHLOROMETHANE	ND	59	
6) BROMOMETHANE	ND	120	
7) CARBON TETRACHLORIDE	ND	59	
8) CHLOROBENZENE	ND	59	
9) CHLOROETHANE	ND	120	
10) 2-CHLOROETHYL VINYL ETHER	ND	120	
11) CHLOROFORM	ND	59	
12) CHLOROMETHANE	ND	120	
13) cis-1,3-DICHLOROPROPENE	ND	59	
14) DIBROMOCHLOROMETHANE	ND	59	
15) 1,2-DICHLOROBENZENE	ND	59	
16) 1,3-DICHLOROBENZENE	ND	59	
17) 1,4-DICHLOROBENZENE	ND	59	
18) 1,1-DICHLOROETHANE	ND	59	
19) 1,2-DICHLOROETHANE	ND	59	
20) 1,1-DICHLOROETHYLENE	ND	59	
21) trans-1,2-DICHLOROETHYLENE	ND	59	
22) trans-1,3-DICHLOROPROPENE	ND	59	
23) 1,2-DICHLOROPROPANE	ND	59	
24) ETHYLBENZENE	46	59	J
25) METHYLENE CHLORIDE	ND	59	
26) 1,1,2,2-TETRACHLOROETHANE	ND	59	
27) TETRACHLOROETHYLENE	ND	59	
28) TOLUENE	ND	59	
29) 1,1,1-TRICHLOROETHANE	ND	59	
30) 1,1,2-TRICHLOROETHANE	ND	59	
31) TRICHLOROETHYLENE	ND	59	
32) TRICHLOROFLUOROMETHANE	ND	59	
33) VINYL CHLORIDE	ND	120	
34) m-XYLENE	110	59	
35) p,o-XYLENE	130	59	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

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ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911413
MATRIX : SOIL

METHOD : SW846 8270
ANALYSIS DATE: 06/22/89
DATA FILE : >C9462

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACENAPHTHENE	810	1100	J
2)	ACENAPHTHYLENE	ND	1100	
3)	ANTHRACENE	ND	1100	
4)	BENZIDENE	ND	5300	
5)	BENZO(A)ANTHRACENE	ND	1100	
6)	BENZO(A)PYRENE	ND	1100	
7)	BENZO(B)FLUORANTHENE	ND	1100	
8)	BENZO(K)FLUORANTHENE	ND	1100	
9)	BENZO(G,H,I)PERYLENE	ND	1100	
10)	BIS(2-CHLOROETHOXY)METHANE	ND	1100	
11)	BIS(2-CHLOROETHYL)ETHER	ND	1100	
12)	BIS(2-CHLOROISOPROPYL)ETHER	ND	1100	
13)	BIS(2-ETHYLHEXYL)PHTHALATE	13000	1100	
14)	4-BROMOPHENYL PHENYL ETHER	ND	1100	
15)	BUTYL BENZYL PHTHALATE	ND	1100	
16)	2-CHLORONAPHTHALENE	ND	1100	
17)	4-CHLOROPHENYL PHENYL ETHER	ND	1100	
18)	CHRYSENE	ND	1100	
19)	DIBENZO(A,H)ANTHRACENE	ND	1100	
20)	1,2-DICHLOROBENZENE	ND	1100	
21)	1,3-DICHLOROBENZENE	ND	1100	
22)	1,4-DICHLOROBENZENE	ND	1100	
23)	3,3'-DICHLOROBENZIDENE	ND	2100	
24)	DIETHYL PHTHALATE	ND	1100	
25)	DIMETHYL PHTHALATE	ND	1100	
26)	DI-N-BUTYL PHTHALATE	210	1100	J
27)	2,4-DINITROTOLUENE	ND	1100	
28)	2,6-DINITROTOLUENE	ND	1100	
29)	DI-N-OCTYL PHTHALATE	ND	1100	
30)	1,2-DIPHENYLHYDRAZINE	ND	1100	
31)	FLUORANTHENE	280	1100	J
32)	FLUORENE	1300	1100	
33)	HEXACHLOROBENZENE	ND	1100	
34)	HEXACHLOROBUTADIENE	ND	1100	
35)	HEXACHLOROCYCLOPENTADIENE	ND	1100	
36)	HEXACHLOROETHANE	ND	1100	
37)	INDENO(1,2,3-CD)PYRENE	ND	1100	
38)	ISOPHORONE	ND	1100	
39)	NAPHTHALENE	3200	1100	
40)	NITROBENZENE	ND	1100	
41)	N-NITROSODIMETHYLAMINE	ND	1100	
42)	N-NITROSODI-N-PROPYLAMINE	ND	1100	
43)	N-NITROSODIPHENYLAMINE	ND	1100	
44)	PHENANTHRENE	2800	1100	
45)	PYRENE	550	1100	J
46)	1,2,4-TRICHLOROBENZENE	ND	1100	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911413

Date Analyzed: 6/22/89 0:39

Lab File ID: >B0742

Matrix: SOIL FOR VOA

Number TICs found: 5 CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110543	Hexane (DOT)(8CI9CI)	18.11	66.	
2. 760203	1-Pentene, 3-methyl- (8CI9CI	31.38	240.	
3.	Unknown	32.97	220.	
4. 873494	Benzene, cyclopropyl- (8CI9C	43.75	720.	
5. 176636	Spiro[4.5]decane (8CI9CI)	35.53	720.	
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Batch Number: MS-S-475

Lab Sample ID: E911413

Extraction Date: 6/7/89

Lab File ID: >C9462

Date Analyzed: 6/22/89 3:17

Matrix: SOIL FOR BN

Number TICs found: 15

CONCENTRATION UNITS: ug/Kg

CAS NUMBER		COMPOUND NAME	RT	EST. CONC.	Q
1.	17312457	Decane, 3,4-dimethyl- (8CI9C	13.43	5900.	
2.	62016346	Octane, 2,3,7-trimethyl- (9C	17.93	1400.	
3.	112403	Dodecane (8CI9CI)	18.43	1100.	
4.	4453901	1,4-Methanonaphthalene, 1,4-	18.79	1700.	
5.	4453901	1,4-Methanonaphthalene, 1,4-	19.12	1500.	
6.	10599823	Ethylamine, N-(1-butylpentyl	19.44	2700.	
7.	54833237	Eicosane, 10-methyl- (9CI)	20.31	2600.	
8.	1127760	Naphthalene, 1-ethyl- (8CI9C	20.63	3400.	
9.	575439	Naphthalene, 1,6-dimethyl- (	20.85	3200.	
10.	569415	Naphthalene, 1,8-dimethyl- (	21.14	5600.	
11.	544763	Hexadecane (8CI9CI)	21.39	2600.	
12.	2131422	Naphthalene, 1,4,6-trimethyl	22.58	2900.	
13.	2131422	Naphthalene, 1,4,6-trimethyl	22.98	2800.	
14.	2131422	Naphthalene, 1,4,6-trimethyl	23.41	2700.	
15.	1921706	Pentadecane, 2,6,10,14-tetra	25.36	1900.	

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911414
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/22/89
DATA FILE : >B0745

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACROLEIN	ND	2300	
2)	ACRYLONITRILE	ND	2300	
3)	BENZENE	ND	110	
4)	BROMOFORM	ND	110	
5)	BROMODICHLOROMETHANE	ND	110	
6)	BROMOMETHANE	ND	230	
7)	CARBON TETRACHLORIDE	ND	110	
8)	CHLOROBENZENE	ND	110	
9)	CHLOROETHANE	ND	230	
10)	2-CHLOROETHYL VINYL ETHER	ND	230	
11)	CHLOROFORM	ND	110	
12)	CHLOROMETHANE	ND	230	
13)	cis-1,3-DICHLOROPROPENE	ND	110	
14)	DIBROMOCHLOROMETHANE	ND	110	
15)	1,2-DICHLOROBENZENE	ND	110	
16)	1,3-DICHLOROBENZENE	ND	110	
17)	1,4-DICHLOROBENZENE	ND	110	
18)	1,1-DICHLOROETHANE	ND	110	
19)	1,2-DICHLOROETHANE	ND	110	
20)	1,1-DICHLOROETHYLENE	ND	110	
21)	trans-1,2-DICHLOROETHYLENE	ND	110	
22)	trans-1,3-DICHLOROPROPENE	ND	110	
23)	1,2-DICHLOROPROPANE	ND	110	
24)	ETHYLBENZENE	710	110	
25)	METHYLENE CHLORIDE	ND	110	
26)	1,1,2,2-TETRACHLOROETHANE	ND	110	
27)	TETRACHLOROETHYLENE	ND	110	
28)	TOLUENE	800	110	
29)	1,1,1-TRICHLOROETHANE	ND	110	
30)	1,1,2-TRICHLOROETHANE	ND	110	
31)	TRICHLOROETHYLENE	ND	110	
32)	TRICHLOROFLUOROMETHANE	ND	110	
33)	VINYL CHLORIDE	ND	230	
34)	m-XYLENE	3200	110	
35)	p,o-XYLENE	1800	110	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911414

Date Analyzed: 6/22/89 2:53

Lab File ID: >B0745

Matrix: SOIL FOR VOA

Number TICs found: 3

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110543	Hexane (DOT)(8CI9CI)	18.09	150.	
2. 873494	Benzene, cyclopropyl- (8CI9C	34.62	1600.	
3. 611143	Benzene, 1-ethyl-2-methyl- (	35.74	1200.	
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.

(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.

(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.

(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911415
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/23/89
DATA FILE : >B0787

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	25000	
2) ACRYLONITRILE	ND	25000	
3) BENZENE	ND	1300	
4) BROMOFORM	ND	1300	
5) BROMODICHLOROMETHANE	ND	1300	
6) BROMOMETHANE	ND	2500	
7) CARBON TETRACHLORIDE	ND	1300	
8) CHLOROBENZENE	ND	1300	
9) CHLOROETHANE	ND	2500	
10) 2-CHLOROETHYL VINYL ETHER	ND	2500	
11) CHLOROFORM	ND	1300	
12) CHLOROMETHANE	ND	2500	
13) cis-1,3-DICHLOROPROPENE	ND	1300	
14) DIBROMOCHLOROMETHANE	ND	1300	
15) 1,2-DICHLOROBENZENE	ND	1300	
16) 1,3-DICHLOROBENZENE	ND	1300	
17) 1,4-DICHLOROBENZENE	ND	1300	
18) 1,1-DICHLOROETHANE	ND	1300	
19) 1,2-DICHLOROETHANE	ND	1300	
20) 1,1-DICHLOROETHYLENE	ND	1300	
21) trans-1,2-DICHLOROETHYLENE	ND	1300	
22) trans-1,3-DICHLOROPROPENE	ND	1300	
23) 1,2-DICHLOROPROPANE	ND	1300	
24) ETHYLBENZENE	960	1300	J
25) METHYLENE CHLORIDE	ND	1300	
26) 1,1,2,2-TETRACHLOROETHANE	ND	1300	
27) TETRACHLOROETHYLENE	ND	1300	
28) TOLUENE	ND	1300	
29) 1,1,1-TRICHLOROETHANE	ND	1300	
30) 1,1,2-TRICHLOROETHANE	ND	1300	
31) TRICHLOROETHYLENE	ND	1300	
32) TRICHLOROFLUOROMETHANE	ND	1300	
33) VINYL CHLORIDE	ND	2500	
34) m-XYLENE	17000	1300	
35) p,o-XYLENE	25000	1300	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911415

Date Analyzed: 6/23/89 20:30

Lab File ID: >B0787

Matrix: SOIL FOR VOA

Number TICs found: 9

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 109900	Ethane, isocyanato- (9CI)	21.24	3000.	
2. 624293	Cyclohexane, 1,4-dimethyl-,	24.97	1600.	
3. 3073663	Cyclohexane, 1,1,3-trimethyl	25.60	4700.	
4. 4926787	Cyclohexane, 1-ethyl-4-methy	26.97	2900.	
5. 823767	Ethanone, 1-cyclohexyl- (9CI	27.65	3000.	
6. 13427435	1-Hexene, 3,3,5-trimethyl- (	31.53	3900.	
7. 822559	1H-Imidazole-4-methanol (9CI	32.22	2900.	
8.	Unknown	33.31	3800.	
9. 493027	Naphthalene, decahydro-, tra	35.60	14000.	
10.------------	-------------------------	--------	------------	-----
11.------------	-------------------------	--------	------------	-----
12.------------	-------------------------	--------	------------	-----
13.------------	-------------------------	--------	------------	-----
14.------------	-------------------------	--------	------------	-----
15.------------	-------------------------	--------	------------	-----

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911416
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/22/89
DATA FILE : >B0758

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	730000	
2) ACRYLONITRILE	ND	730000	
3) BENZENE	ND	36000	
4) BROMOFORM	ND	36000	
5) BROMODICHLOROMETHANE	ND	36000	
6) BROMOMETHANE	ND	73000	
7) CARBON TETRACHLORIDE	ND	36000	
8) CHLOROBENZENE	ND	36000	
9) CHLOROETHANE	ND	73000	
10) 2-CHLOROETHYL VINYL ETHER	ND	73000	
11) CHLOROFORM	ND	36000	
12) CHLOROMETHANE	ND	73000	
13) cis-1,3-DICHLOROPROPENE	ND	36000	
14) DIBROMOCHLOROMETHANE	ND	36000	
15) 1,2-DICHLOROBENZENE	ND	36000	
16) 1,3-DICHLOROBENZENE	ND	36000	
17) 1,4-DICHLOROBENZENE	ND	36000	
18) 1,1-DICHLOROETHANE	ND	36000	
19) 1,2-DICHLOROETHANE	ND	36000	
20) 1,1-DICHLOROETHYLENE	ND	36000	
21) trans-1,2-DICHLOROETHYLENE	ND	36000	
22) trans-1,3-DICHLOROPROPENE	ND	36000	
23) 1,2-DICHLOROPROPANE	ND	36000	
24) ETHYLBENZENE	ND	36000	
25) METHYLENE CHLORIDE	ND	36000	
26) 1,1,2,2-TETRACHLOROETHANE	ND	36000	
27) TETRACHLOROETHYLENE	ND	36000	
28) TOLUENE	780000	36000	
29) 1,1,1-TRICHLOROETHANE	ND	36000	
30) 1,1,2-TRICHLOROETHANE	ND	36000	
31) TRICHLOROETHYLENE	ND	36000	
32) TRICHLOROFLUOROMETHANE	ND	36000	
33) VINYL CHLORIDE	ND	73000	
34) m-XYLENE	ND	36000	
35) p,o-XYLENE	ND	36000	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911416

Date Analyzed: 6/22/89 18:46

Lab File ID: >B0758

Matrix: SOIL FOR VOA

Number TICs found: 0

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	NO ADDITIONAL PEAK TO SEARCH			

FORM I VOA-TIC

1/87 Rev.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911417
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/22/89
DATA FILE : >B0759

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	28000	
2) ACRYLONITRILE	ND	28000	
3) BENZENE	840	1400	J
4) BROMOFORM	ND	1400	
5) BROMODICHLOROMETHANE	ND	1400	
6) BROMOMETHANE	ND	2800	
7) CARBON TETRACHLORIDE	ND	1400	
8) CHLOROBENZENE	ND	1400	
9) CHLOROETHANE	ND	2800	
10) 2-CHLOROETHYL VINYL ETHER	ND	2800	
11) CHLOROFORM	ND	1400	
12) CHLOROMETHANE	ND	2800	
13) cis-1,3-DICHLOROPROPENE	ND	1400	
14) DIBROMOCHLOROMETHANE	ND	1400	
15) 1,2-DICHLOROBENZENE	9200	1400	
16) 1,3-DICHLOROBENZENE	ND	1400	
17) 1,4-DICHLOROBENZENE	ND	1400	
18) 1,1-DICHLOROETHANE	2300	1400	
19) 1,2-DICHLOROETHANE	ND	1400	
20) 1,1-DICHLOROETHYLENE	ND	1400	
21) trans-1,2-DICHLOROETHYLENE	2000	1400	
22) trans-1,3-DICHLOROPROPENE	ND	1400	
23) 1,2-DICHLOROPROPANE	ND	1400	
24) ETHYLBENZENE	5100	1400	
25) METHYLENE CHLORIDE	ND	1400	
26) 1,1,2,2-TETRACHLOROETHANE	ND	1400	
27) TETRACHLOROETHYLENE	770	1400	J
28) TOLUENE	53000	1400	
29) 1,1,1-TRICHLOROETHANE	2800	1400	
30) 1,1,2-TRICHLOROETHANE	ND	1400	
31) TRICHLOROETHYLENE	ND	1400	
32) TRICHLOROFLUOROMETHANE	ND	1400	
33) VINYL CHLORIDE	ND	2800	
34) m-XYLENE	65000	1400	
35) p,o-XYLENE	61000	1400	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

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ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911417
MATRIX : SOIL

METHOD : SW846 8270
ANALYSIS DATE: 06/22/89
DATA FILE : >C9463
>C9472

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACENAPHTHENE	2900	1200	
2)	ACENAPHTHYLENE	2200	1200	
3)	ANTHRACENE	2700	1200	
4)	BENZIDENE	ND	5800	
5)	BENZO(A)ANTHRACENE	2400	1200	
6)	BENZO(A)PYRENE	2100	1200	
7)	BENZO(B)FLUORANTHENE	960	1200	J
8)	BENZO(K)FLUORANTHENE	1600	1200	
9)	BENZO(G,H,I)PERYLENE	3500	1200	
10)	BIS(2-CHLOROETHOXY)METHANE	ND	1200	
11)	BIS(2-CHLOROETHYL)ETHER	ND	1200	
12)	BIS(2-CHLOROISOPROPYL)ETHER	ND	1200	
13)	BIS(2-ETHYLHEXYL)PHTHALATE	170000	23000	
14)	4-BROMOPHENYL PHENYL ETHER	ND	1200	
15)	BUTYL BENZYL PHTHALATE	ND	1200	
16)	2-CHLORONAPHTHALENE	ND	1200	
17)	4-CHLOROPHENYL PHENYL ETHER	ND	1200	
18)	CHRYSENE	ND	1200	
19)	DIBENZO(A,H)ANTHRACENE	390	1200	J
20)	1,2-DICHLOROBENZENE	3200	1200	
21)	1,3-DICHLOROBENZENE	ND	1200	
22)	1,4-DICHLOROBENZENE	ND	1200	
23)	3,3'-DICHLOROBENZIDENE	ND	2300	
24)	DIETHYL PHTHALATE	ND	1200	
25)	DIMETHYL PHTHALATE	ND	1200	
26)	DI-N-BUTYL PHTHALATE	110000	23000	
27)	2,4-DINITROTOLUENE	ND	1200	
28)	2,6-DINITROTOLUENE	ND	1200	
29)	DI-N-OCTYL PHTHALATE	ND	1200	
30)	1,2-DIPHENYLHYDRAZINE	ND	1200	
31)	FLUORANTHENE	3400	1200	
32)	FLUORENE	6400	1200	
33)	HEXACHLOROBENZENE	ND	1200	
34)	HEXACHLOROBUTADIENE	ND	1200	
35)	HEXACHLOROCYCLOPENTADIENE	ND	1200	
36)	HEXACHLOROETHANE	ND	1200	
37)	INDENO(1,2,3-CD)PYRENE	ND	1200	
38)	ISOPHORONE	ND	1200	
39)	NAPHTHALENE	46000	23000	
40)	NITROBENZENE	ND	1200	
41)	N-NITROSODIMETHYLAMINE	ND	1200	
42)	N-NITROSODI-N-PROPYLAMINE	ND	1200	
43)	N-NITROSODIPHENYLAMINE	ND	1200	
44)	PHENANTHRENE	16000	1200	
45)	PYRENE	10000	1200	
46)	1,2,4-TRICHLOROBENZENE	ND	1200	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911417

Date Analyzed: 6/22/89 19:30

Lab File ID: >B0759

Matrix: SOIL FOR VOA

Number TICs found: 15

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110827	Cyclohexane(DOT (8CI9CI)	13.51	2600.	
2. 96140	Pentane, 3-methyl- (8CI9CI)	18.13	1900.	
3. 1759586	Cyclopentane, 1,3-dimethyl-,	18.83	1600.	
4. 72221035	Oxirane, 2-methyl-2-(1-methy	19.87	13000.	
5. 589344	Hexane, 3-methyl- (8CI9CI)	21.10	5700.	
6. 2040962	Cyclopentane, propyl- (8CI9C	22.35	1800.	
7. 74685566	Cyclopropane, (2-methylenebu	25.50	13000.	
8. 6236880	Cyclohexane, 1-ethyl-4-methy	26.79	10000.	
9. 3788327	Cyclopentane, (2-methylpropy	27.50	8900.	
10. 4057425	2-Octane, 2,6-dimethyl- (8CI	31.38	15000.	
11. 493016	Naphthalene, decahydro-, cis	32.02	5800.	
12. 28980736	3,5-Octadiene, 2,7-dimethyl-	33.04	7400.	
13. 98828	Benzene, (1-methylethyl)- (9	35.75	54000.	
14. 98876	Benzene, 1-methyl-4-(1-methy	37.82	14000.	
15. 1678939	Cyclohexane, butyl- (8CI9CI)	39.72	9900.	

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

C.T

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Batch Number: MS-S-475

Lab Sample ID: E911417

Extraction Date: 6/7/89

Lab File ID: >C9463

Date Analyzed: 6/22/89 4:33

Matrix: SOIL FOR BN

Number TICs found: 15

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 108101	2-Pentanone, 4-methyl- (8CI9	5.48	2200.	
2. 108883	Benzene, methyl- (9CI)	6.20	2100.	
3. 95476	Benzene, 1,2-dimethyl- (9CI)	8.89	3300.	
4. 111842	Nonane (8CI9CI)	9.58	4800.	
5. 16747505	Cyclopentane, 1-ethyl-1-meth	10.48	1900.	
6. 17312504	Decane, 2,5-dimethyl- (8CI9C	11.23	3300.	
7. 62016379	Octane, 2,4,6-trimethyl- (9C	12.17	4200.	
8. 17302282	Nonane, 2,6-dimethyl- (8CI9C	12.71	4400.	
9. 16747265	Hexane, 2,2,4-trimethyl- (8C	13.54	3600.	
10. 17302282	Nonane, 2,6-dimethyl- (8CI9C	14.54	810.	
11. 17312822	Undecane, 4,6-dimethyl- (8CI	16.89	1100.	
12. 17312822	Undecane, 4,6-dimethyl- (8CI	18.62	1300.	
13. 4292755	Cyclohexane, hexyl- (9CI)	19.55	3400.	
14. 1560970	Dodecane, 2-methyl- (8CI9CI)	22.11	4800.	
15. 544763	Hexadecane (8CI9CI)	23.70	3800.	

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911418 B-8
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/22/89
DATA FILE : >B0762

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACROLEIN	ND	450	
2)	ACRYLONITRILE	ND	450	
3)	BENZENE	ND	23	
4)	BROMOFORM	ND	23	
5)	BROMODICHLOROMETHANE	ND	23	
6)	BROMOMETHANE	ND	45	
7)	CARBON TETRACHLORIDE	ND	23	
8)	CHLOROBENZENE	ND	23	
9)	CHLOROETHANE	ND	45	
10)	2-CHLOROETHYL VINYL ETHER	ND	45	
11)	CHLOROFORM	ND	23	
12)	CHLOROMETHANE	ND	45	
13)	cis-1,3-DICHLOROPROPENE	ND	23	
14)	DIBROMOCHLOROMETHANE	ND	23	
15)	1,2-DICHLOROBENZENE	ND	23	
16)	1,3-DICHLOROBENZENE	ND	23	
17)	1,4-DICHLOROBENZENE	ND	23	
18)	1,1-DICHLOROETHANE	ND	23	
19)	1,2-DICHLOROETHANE	ND	23	
20)	1,1-DICHLOROETHYLENE	ND	23	
21)	trans-1,2-DICHLOROETHYLENE	ND	23	
22)	trans-1,3-DICHLOROPROPENE	ND	23	
23)	1,2-DICHLOROPROPANE	ND	23	
24)	ETHYLBENZENE	ND	23	
25)	METHYLENE CHLORIDE	ND	23	
26)	1,1,2,2-TETRACHLOROETHANE	ND	23	
27)	TETRACHLOROETHYLENE	ND	23	
28)	TOLUENE	860	23	
29)	1,1,1-TRICHLOROETHANE	ND	23	
30)	1,1,2-TRICHLOROETHANE	ND	23	
31)	TRICHLOROETHYLENE	ND	23	
32)	TRICHLOROFLUOROMETHANE	ND	23	
33)	VINYL CHLORIDE	ND	45	
34)	m-XYLENE	ND	23	
35)	p,o-XYLENE	ND	23	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

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ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911418
MATRIX : SOIL

METHOD : SW846 8270
ANALYSIS DATE: 06/22/89
DATA FILE : >C9464

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACENAPHTHENE	200	790	J
2)	ACENAPHTHYLENE	ND	790	
3)	ANTHRACENE	ND	790	
4)	BENZIDENE	ND	4000	
5)	BENZO(A)ANTHRACENE	ND	790	
6)	BENZO(A)PYRENE	ND	790	
7)	BENZO(B)FLUORANTHENE	ND	790	
8)	BENZO(K)FLUORANTHENE	ND	790	
9)	BENZO(G,H,I)PERYLENE	ND	790	
10)	BIS(2-CHLOROETHOXY)METHANE	ND	790	
11)	BIS(2-CHLOROETHYL)ETHER	ND	790	
12)	BIS(2-CHLOROISOPROPYL)ETHER	ND	790	
13)	BIS(2-ETHYLHEXYL)PHTHALATE	1500	790	
14)	4-BROMOPHENYL PHENYL ETHER	ND	790	
15)	BUTYL BENZYL PHTHALATE	ND	790	
16)	2-CHLORONAPHTHALENE	ND	790	
17)	4-CHLOROPHENYL PHENYL ETHER	ND	790	
18)	CHRYSENE	ND	790	
19)	DIBENZO(A,H)ANTHRACENE	ND	790	
20)	1,2-DICHLOROBENZENE	ND	790	
21)	1,3-DICHLOROBENZENE	ND	790	
22)	1,4-DICHLOROBENZENE	ND	790	
23)	3,3'-DICHLOROBENZIDENE	ND	1600	
24)	DIETHYL PHTHALATE	ND	790	
25)	DIMETHYL PHTHALATE	ND	790	
26)	DI-N-BUTYL PHTHALATE	ND	790	
27)	2,4-DINITROTOLUENE	ND	790	
28)	2,6-DINITROTOLUENE	ND	790	
29)	DI-N-OCTYL PHTHALATE	ND	790	
30)	1,2-DIPHENYLHYDRAZINE	ND	790	
31)	FLUORANTHENE	92	790	J
32)	FLUORENE	440	790	J
33)	HEXACHLOROBENZENE	ND	790	
34)	HEXACHLOROBUTADIENE	ND	790	
35)	HEXACHLOROCYCLOPENTADIENE	ND	790	
36)	HEXACHLOROETHANE	ND	790	
37)	INDENO(1,2,3-CD)PYRENE	ND	790	
38)	ISOPHORONE	710	790	J
39)	NAPHTHALENE	ND	790	
40)	NITROBENZENE	ND	790	
41)	N-NITROSODIMETHYLAMINE	ND	790	
42)	N-NITROSODI-N-PROPYLAMINE	ND	790	
43)	N-NITROSODIPHENYLAMINE	1300	790	
44)	PHENANTHRENE	310	790	J
45)	PYRENE	220	790	J
46)	1,2,4-TRICHLOROBENZENE	ND	790	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911418

Date Analyzed: 6/22/89 21:45

Lab File ID: >B0762

Matrix: SOIL FOR VOA

Number TICs found: 10 CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 67641	2-Propanone (9CI)	6.84	93.	
2. 3868642	Pentalene, octahydro-2-methy	25.55	390.	
3. 4844115	Bicyclo[3.3.1]non-2-en-9-one	24.51	85.	
4. 1678928	Cyclohexane, propyl- (8CI9CI	29.41	160.	
5. 4057425	2-Octane, 2,6-dimethyl- (8CI	31.33	210.	
6. 29927853	1H-Inden-1-one, octahydro- (	32.02	220.	
7. 6248880	Bicyclo[2.2.1]heptane, 1,3,3	33.10	330.	
8. 91178	Naphthalene, decahydro- (8CI	35.33	1600.	
9. 54345607	1-Oxaspiro[2.5]oct-5-ene, 8,	37.67	350.	
10. 499752	Phenol, 2-methyl-5-(1-methyl	28.63	410.	
11.				
12.				
13.				
14.				
15.				

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

R.T

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Batch Number: MS-S-475

Lab Sample ID: E911418

Extraction Date: 6/7/89

Lab File ID: >C9464

Date Analyzed: 6/22/89 5:48

Matrix: SOIL FOR BN

Number TICs found: 15

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 21078659	1-Decanol, 2-ethyl- (8CI9CI)	14.71	1200.	
2. 6044719	Dodecane, 6-methyl- (8CI9CI)	16.72	2400.	
3. 62238113	Decane, 2,3,5-trimethyl- (9C	17.73	1300.	
4. 17312764	Undecane, 6,6-dimethyl- (8CI	17.91	4100.	
5. 13151989	Cyclooctane, 1,4-dimethyl-,	18.34	1500.	
6. 6330434	Butanethioic acid, S-(1,1-di	18.67	2200.	
7. 13287213	Tridecane, 6-methyl- (8CI9CI	18.81	1200.	
8. 54832836	1H-Indene, octahydro-2,2,4,4	20.29	1400.	
9. 54832836	1H-Indene, octahydro-2,2,4,4	21.34	1500.	
10. 74645980	Dodecane, 2,7,10-trimethyl-	21.44	1400.	
11. 54832836	1H-Indene, octahydro-2,2,4,4	21.99	2200.	
12. 55402136	3-Octyne, 2,2,7-trimethyl- (	23.68	1000.	
13. 17301289	Undecane, 3,6-dimethyl- (8CI	24.51	1800.	
14. 1921706	Pentadecane, 2,6,10,14-tetra	25.38	2500.	
15. 74645980	Dodecane, 2,7,10-trimethyl-	26.90	1300.	

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911419
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/14/89
DATA FILE : >B0593

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACROLEIN	ND	1000	
2)	ACRYLONITRILE	ND	1000	
3)	BENZENE	ND	51	
4)	BROMOFORM	ND	51	
5)	BROMODICHLOROMETHANE	ND	51	
6)	BROMOMETHANE	ND	100	
7)	CARBON TETRACHLORIDE	ND	51	
8)	CHLOROBENZENE	ND	51	
9)	CHLOROETHANE	ND	100	
10)	2-CHLOROETHYL VINYL ETHER	ND	100	
11)	CHLOROFORM	ND	51	
12)	CHLOROMETHANE	ND	100	
13)	cis-1,3-DICHLOROPROPENE	ND	51	
14)	DIBROMOCHLOROMETHANE	ND	51	
15)	1,2-DICHLOROBENZENE	ND	51	
16)	1,3-DICHLOROBENZENE	ND	51	
17)	1,4-DICHLOROBENZENE	ND	51	
18)	1,1-DICHLOROETHANE	ND	51	
19)	1,2-DICHLOROETHANE	ND	51	
20)	1,1-DICHLOROETHYLENE	ND	51	
21)	trans-1,2-DICHLOROETHYLENE	ND	51	
22)	trans-1,3-DICHLOROPROPENE	ND	51	
23)	1,2-DICHLOROPROPANE	ND	51	
24)	ETHYLBENZENE	ND	51	
25)	METHYLENE CHLORIDE	ND	51	
26)	1,1,2,2-TETRACHLOROETHANE	800	51	
27)	TETRACHLOROETHYLENE	ND	51	
28)	TOLUENE	ND	51	
29)	1,1,1-TRICHLOROETHANE	ND	51	
30)	1,1,2-TRICHLOROETHANE	ND	51	
31)	TRICHLOROETHYLENE	ND	51	
32)	TRICHLOROFLUOROMETHANE	ND	51	
33)	VINYL CHLORIDE	ND	100	
34)	m-XYLENE	ND	51	
35)	p,o-XYLENE	ND	51	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911419

Date Analyzed: 6/14/89 23:50

Lab File ID: >B0593

Matrix: SOIL FOR VOA

Number TICs found: 15

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110827	Cyclohexane(DOT (8CI9CI)	13.46	660.	
2. 1759586	Cyclopentane, 1,3-dimethyl-,	18.80	87.	
3. 2511913	Cyclopropane, pentyl- (9CI)	21.05	580.	
4. 2207014	Cyclohexane, 1,2-dimethyl-,	22.39	390.	
5. 2207036	Cyclohexane, 1,3-dimethyl-,	24.74	260.	
6. 3073663	Cyclohexane, 1,1,3-trimethyl	25.35	1000.	
7. 21981226	1H-Pyrazole, 5-ethyl-4,5-dih	26.72	320.	
8. 293	1,3-Butadiene, 1,1,2,3,4,4-h	27.41	470.	
9. 41977371	Cyclopropane, 1-methyl-2-pen	28.49	220.	
10. 13609591	Cycloheptanone, 4-methyl-, (	29.37	730.	
11. 63830693	4-Nonane, 3-methyl-, (Z)- (9	31.30	660.	
12. 15869962	Octane, 4,5-dimethyl- (8CI9C	32.97	450.	
13. 1879078	Cyclohexane, 1-methyl-4-(1-m	35.56	320.	
14. 24524569	Ether,tert-butyl isopropylid	36.11	210.	
15. 62338083	3-Hexene, 3-ethyl-2,5-dimeth	37.92	500.	

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911420
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/23/89
DATA FILE : >B0789

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	31000	
2) ACRYLONITRILE	ND	31000	
3) BENZENE	ND	1600	
4) BROMOFORM	ND	1600	
5) BROMODICHLOROMETHANE	ND	1600	
6) BROMOMETHANE	ND	3100	
7) CARBON TETRACHLORIDE	ND	1600	
8) CHLOROBENZENE	ND	1600	
9) CHLOROETHANE	ND	3100	
10) 2-CHLOROETHYL VINYL ETHER	ND	3100	
11) CHLOROFORM	ND	1600	
12) CHLOROMETHANE	ND	3100	
13) cis-1,3-DICHLOROPROPENE	ND	1600	
14) DIBROMOCHLOROMETHANE	ND	1600	
15) 1,2-DICHLOROBENZENE	ND	1600	
16) 1,3-DICHLOROBENZENE	ND	1600	
17) 1,4-DICHLOROBENZENE	ND	1600	
18) 1,1-DICHLOROETHANE	ND	1600	
19) 1,2-DICHLOROETHANE	ND	1600	
20) 1,1-DICHLOROETHYLENE	ND	1600	
21) trans-1,2-DICHLOROETHYLENE	ND	1600	
22) trans-1,3-DICHLOROPROPENE	ND	1600	
23) 1,2-DICHLOROPROPANE	ND	1600	
24) ETHYLBENZENE	ND	1600	
25) METHYLENE CHLORIDE	ND	1600	
26) 1,1,2,2-TETRACHLOROETHANE	1600	1600	
27) TETRACHLOROETHYLENE	900	1600	J
28) TOLUENE	320	1600	J
29) 1,1,1-TRICHLOROETHANE	ND	1600	
30) 1,1,2-TRICHLOROETHANE	ND	1600	
31) TRICHLOROETHYLENE	ND	1600	
32) TRICHLOROFLUOROMETHANE	ND	1600	
33) VINYL CHLORIDE	ND	3100	
34) m-XYLENE	ND	1600	
35) p,o-XYLENE	ND	1600	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911420

Date Analyzed: 6/23/89 21:59

Lab File ID: >B0789

Matrix: SOIL FOR VOA

Number TICs found: 13 CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 110827	Cyclohexane(DOT (8CI9CI)	13.50	3300.	
2. 2658244	Aziridine, 2,2-dimethyl- (8C	18.15	2000.	
3. 2452995	Cyclopentane, 1,2-dimethyl-	18.82	1700.	
4. 4516692	Cyclopentane, 1,1,3-trimethy	21.11	9700.	
5. 624293	Cyclohexane, 1,4-dimethyl-,	24.81	1900.	
6. 3073663	Cyclohexane, 1,1,3-trimethyl	25.38	23000.	
7. 13395761	Cyclohexanone, 2,3-dimethy-	27.51	2500.	
8. 1678928	Cyclohexane, propyl- (8CI9CI	29.42	14000.	
9. 4057425	2-Octene, 2,6-dimethyl- (8CI	31.32	9600.	
10. 619523	Cyclohexene, 4-methyl-1-(1-m	33.06	7700.	
11. 493027	Naphthalene, decahydro-, tra	35.50	10000.	
12. 22581506	2-Pyrazoline, 1-butyl-5-meth	37.89	4600.	
13. 4923777	Cyclohexane, 1-ethyl-2-methy	26.75	9100.	
14.				
15.				

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

FORM I SV-TIC

R.T

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911421
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/28/89
DATA FILE : >B0881
>B0910

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	510000	
2) ACRYLONITRILE	ND	510000	
3) BENZENE	ND	26000	
4) BROMOFORM	ND	26000	
5) BROMODICHLOROMETHANE	ND	26000	
6) BROMOMETHANE	ND	51000	
7) CARBON TETRACHLORIDE	ND	26000	
8) CHLOROBENZENE	ND	26000	
9) CHLOROETHANE	ND	51000	
10) 2-CHLOROETHYL VINYL ETHER	ND	51000	
11) CHLOROFORM	ND	26000	
12) CHLOROMETHANE	ND	51000	
13) cis-1,3-DICHLOROPROPENE	ND	26000	
14) DIBROMOCHLOROMETHANE	ND	26000	
15) 1,2-DICHLOROBENZENE	ND	26000	
16) 1,3-DICHLOROBENZENE	ND	26000	
17) 1,4-DICHLOROBENZENE	ND	26000	
18) 1,1-DICHLOROETHANE	ND	26000	
19) 1,2-DICHLOROETHANE	ND	26000	
20) 1,1-DICHLOROETHYLENE	ND	26000	
21) trans-1,2-DICHLOROETHYLENE	ND	26000	
22) trans-1,3-DICHLOROPROPENE	ND	26000	
23) 1,2-DICHLOROPROPANE	ND	26000	
24) ETHYLBENZENE	470000	26000	
25) METHYLENE CHLORIDE	ND	26000	
26) 1,1,2,2-TETRACHLOROETHANE	ND	26000	
27) TETRACHLOROETHYLENE	370000	26000	
28) TOLUENE	1500000	130000	
29) 1,1,1-TRICHLOROETHANE	210000	26000	
30) 1,1,2-TRICHLOROETHANE	ND	26000	
31) TRICHLOROETHYLENE	160000	26000	
32) TRICHLOROFLUOROMETHANE	ND	26000	
33) VINYL CHLORIDE	ND	51000	
34) m-XYLENE	4700000	130000	
35) p,o-XYLENE	2100000	26000	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911421

Date Analyzed: 6/28/89 19:24

Lab File ID: >B0881

Matrix: SOIL FOR VOA

Number TICs found: 11 CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 5536981	Aziridine, 1-propyl- (8CI9CI	18.81	43000.	
2. 565593	Pentane, 2,3-dimethyl- (8CI9	19.95	83000.	
3. 617787	Pentane, 3-ethyl- (8CI9CI)	20.24	27000.	
4. 589344	Hexane, 3-methyl- (8CI9CI)	21.12	290000.	
5. 2207036	Cyclohexane, 1,3-dimethyl-,	24.83	31000.	
6. 111659	Octane (DOT) (8CI9CI)	27.59	65000.	
7. 13427435	1-Hexene, 3,3,5-trimethyl- (	31.45	320000.	
8. 620144	Benzene, 1-ethyl-3-methyl- (	34.66	780000.	
9. 41044648	1,5-Heptadiene, 2-methyl-, (	33.13	81000.	
10. 611143	Benzene, 1-ethyl-2-methyl- (	35.91	700000.	
11.	Unknown	38.08	80000.	
12.				
13.				
14.				
15.				

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911422
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/22/89
DATA FILE : >B0760

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACROLEIN	ND	48000	
2)	ACRYLONITRILE	ND	48000	
3)	BENZENE	9200	2400	
4)	BROMOFORM	ND	2400	
5)	BROMODICHLOROMETHANE	ND	2400	
6)	BROMOMETHANE	ND	4800	
7)	CARBON TETRACHLORIDE	ND	2400	
8)	CHLOROBENZENE	ND	2400	
9)	CHLOROETHANE	ND	4800	
10)	2-CHLOROETHYL VINYL ETHER	ND	4800	
11)	CHLOROFORM	ND	2400	
12)	CHLOROMETHANE	ND	4800	
13)	cis-1,3-DICHLOROPROPENE	ND	2400	
14)	DIBROMOCHLOROMETHANE	ND	2400	
15)	1,2-DICHLOROBENZENE	ND	2400	
16)	1,3-DICHLOROBENZENE	ND	2400	
17)	1,4-DICHLOROBENZENE	ND	2400	
18)	1,1-DICHLOROETHANE	ND	2400	
19)	1,2-DICHLOROETHANE	ND	2400	
20)	1,1-DICHLOROETHYLENE	ND	2400	
21)	trans-1,2-DICHLOROETHYLENE	1300	2400	J
22)	trans-1,3-DICHLOROPROPENE	ND	2400	
23)	1,2-DICHLOROPROPANE	ND	2400	
24)	ETHYLBENZENE	40000	2400	
25)	METHYLENE CHLORIDE	ND	2400	
26)	1,1,2,2-TETRACHLOROETHANE	ND	2400	
27)	TETRACHLOROETHYLENE	ND	2400	
28)	TOLUENE	58000	2400	
29)	1,1,1-TRICHLOROETHANE	ND	2400	
30)	1,1,2-TRICHLOROETHANE	ND	2400	
31)	TRICHLOROETHYLENE	6600	2400	
32)	TRICHLOROFLUOROMETHANE	ND	2400	
33)	VINYL CHLORIDE	ND	4800	
34)	m-XYLENE	280000	2400	
35)	p,o-XYLENE	150000	2400	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

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ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911422
MATRIX : SOIL

METHOD : SW846 8270
ANALYSIS DATE: 06/22/89
DATA FILE : >C9465
>C9473

	COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1)	ACENAPHTHENE	470	1200	J
2)	ACENAPHTHYLENE	ND	1200	
3)	ANTHRACENE	240	1200	J
4)	BENZIDENE	ND	6000	
5)	BENZO(A)ANTHRACENE	ND	1200	
6)	BENZO(A)PYRENE	ND	1200	
7)	BENZO(B)FLUORANTHENE	ND	1200	
8)	BENZO(K)FLUORANTHENE	ND	1200	
9)	BENZO(G,H,I)PERYLENE	ND	1200	
10)	BIS(2-CHLOROETHOXY)METHANE	ND	1200	
11)	BIS(2-CHLOROETHYL)ETHER	ND	1200	
12)	BIS(2-CHLOROISOPROPYL)ETHER	ND	1200	
13)	BIS(2-ETHYLHEXYL)PHTHALATE	19000	12000	
14)	4-BROMOPHENYL PHENYL ETHER	ND	1200	
15)	BUTYL BENZYL PHTHALATE	ND	1200	
16)	2-CHLORONAPHTHALENE	ND	1200	
17)	4-CHLOROPHENYL PHENYL ETHER	ND	1200	
18)	CHRYSENE	ND	1200	
19)	DIBENZO(A,H)ANTHRACENE	ND	1200	
20)	1,2-DICHLOROBENZENE	ND	1200	
21)	1,3-DICHLOROBENZENE	ND	1200	
22)	1,4-DICHLOROBENZENE	ND	1200	
23)	3,3'-DICHLOROBENZIDENE	ND	2400	
24)	DIETHYL PHTHALATE	ND	1200	
25)	DIMETHYL PHTHALATE	ND	1200	
26)	DI-N-BUTYL PHTHALATE	16000	1200	
27)	2,4-DINITROTOLUENE	ND	1200	
28)	2,6-DINITROTOLUENE	ND	1200	
29)	DI-N-OCTYL PHTHALATE	ND	1200	
30)	1,2-DIPHENYLHYDRAZINE	ND	1200	
31)	FLUORANTHENE	550	1200	J
32)	FLUORENE	640	1200	J
33)	HEXACHLOROBENZENE	ND	1200	
34)	HEXACHLOROBUTADIENE	ND	1200	
35)	HEXACHLOROCYCLOPENTADIENE	ND	1200	
36)	HEXACHLOROETHANE	ND	1200	
37)	INDENO(1,2,3-CD)PYRENE	ND	1200	
38)	ISOPHORONE	ND	1200	
39)	NAPHTHALENE	12000	1200	
40)	NITROBENZENE	ND	1200	
41)	N-NITROSODIMETHYLAMINE	ND	1200	
42)	N-NITROSODI-N-PROPYLAMINE	ND	1200	
43)	N-NITROSODIPHENYLAMINE	ND	1200	
44)	PHENANTHRENE	1400	1200	
45)	PYRENE	870	1200	J
46)	1,2,4-TRICHLOROBENZENE	ND	1200	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911422

Date Analyzed: 6/22/89 20:16

Lab File ID: >B0760

Matrix: SOIL FOR VOA

Number TICs found: 15

CONCENTRATION UNITS: ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	110827	Cyclohexane(DOT (8CI9CI)	13.51	82000.	
2.	96377	Cyclopentane, methyl- (8CI9C	14.23	18000.	
3.	1186534	Pentane, 2,2,3,4-tetramethyl	18.09	48000.	
4.	562492	Pentane, 3,3-dimethyl- (8CI9	18.71	77000.	
5.	565593	Pentane, 2,3-dimethyl- (8CI9	19.91	80000.	
6.	589344	Hexane, 3-methyl- (8CI9CI)	21.12	180000.	
7.	591764	Hexane, 2-methyl- (8CI9CI)	21.55	140000.	
8.	3769231	1-Hexene, 4-methyl- (8CI9CI)	22.32	4100.	
9.	540841	Pentane, 2,2,4-trimethyl- (8	23.41	7500.	
10.	589435	Hexane, 2,4-dimethyl- (8CI9C	23.69	3200.	
11.	592278	Heptane, 2-methyl- (8CI9CI)	24.80	18000.	
12.	619998	Hexane, 3-ethyl- (8CI9CI)	25.53	13000.	
13.	111659	Octane (DOT) (8CI9CI)	27.53	6000.	
14.	611143	Benzene, 1-ethyl-2-methyl- (	34.59	6400.	
15.	464175	Bicyclo[2.2.1]hept-2-ene, 1,	38.70	6400.	

QUALIFIERS(Q);

- (1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
- (2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
- (3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
- (4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Batch Number: MS-S-475

Lab Sample ID: E911422

Extraction Date: 6/7/89

Lab File ID: >C9465

Date Analyzed: 6/22/89 7:04

Matrix: SOIL FOR BN

Number TICs found: 15

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 17302271	Nonane, 2,5-dimethyl- (8CI9C	5.29	4300.	
2. 108883	Benzene, methyl- (9CI)	6.19	16000.	
3. 100414	Benzene, ethyl- (8CI9CI)	8.67	2900.	
4. 108383	Benzene, 1,3-dimethyl- (9CI)	8.89	9500.	
5. 95476	Benzene, 1,2-dimethyl- (9CI)	9.50	7800.	
6. 1678928	Cyclohexane, propyl- (8CI9CI	10.47	3500.	
7. 62108230	Decane, 2,5,6-trimethyl- (9C	11.19	7800.	
8. 95636	Benzene, 1,2,4-trimethyl- (8	11.40	3100.	
9. 611143	Benzene, 1-ethyl-2-methyl- (	11.69	3100.	
10. 611143	Benzene, 1-ethyl-2-methyl- (	12.05	7700.	
11. 17302282	Nonane, 2,6-dimethyl- (8CI9C	12.63	4400.	
12. 17302328	Nonane, 3,7-dimethyl- (8CI9C	12.99	4500.	
13. 1071814	Hexane, 2,2,5,5-tetramethyl-	13.46	9000.	
14. 926829	Heptane, 3,5-dimethyl- (8CI9	14.72	1900.	
15. 2958761	Naphthalene, decahydro-2-met	14.93	2900.	

QUALIFIERS(Q);
(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
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(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911423
MATRIX : SOIL

METHOD : SW846 8240
ANALYSIS DATE: 06/23/89
DATA FILE : >B0786
>B0882

COMPOUND	RESULT (ug/kg)*	MDL (ug/kg)*	Q
1) ACROLEIN	ND	210000	
2) ACRYLONITRILE	ND	210000	
3) BENZENE	ND	10000	
4) BROMOFORM	ND	10000	
5) BROMODICHLOROMETHANE	ND	10000	
6) BROMOMETHANE	ND	21000	
7) CARBON TETRACHLORIDE	ND	10000	
8) CHLOROBENZENE	ND	10000	
9) CHLOROETHANE	ND	21000	
10) 2-CHLOROETHYL VINYL ETHER	ND	21000	
11) CHLOROFORM	ND	10000	
12) CHLOROMETHANE	ND	21000	
13) cis-1,3-DICHLOROPROPENE	ND	10000	
14) DIBROMOCHLOROMETHANE	ND	10000	
15) 1,2-DICHLOROBENZENE	64000	10000	
16) 1,3-DICHLOROBENZENE	ND	10000	
17) 1,4-DICHLOROBENZENE	ND	10000	
18) 1,1-DICHLOROETHANE	ND	10000	
19) 1,2-DICHLOROETHANE	ND	10000	
20) 1,1-DICHLOROETHYLENE	ND	10000	
21) trans-1,2-DICHLOROETHYLENE	11000	10000	
22) trans-1,3-DICHLOROPROPENE	ND	10000	
23) 1,2-DICHLOROPROPANE	ND	10000	
24) ETHYLBENZENE	35000	10000	
25) METHYLENE CHLORIDE	ND	10000	
26) 1,1,2,2-TETRACHLOROETHANE	ND	10000	
27) TETRACHLOROETHYLENE	1100000	10000	
28) TOLUENE	18000	35000	J
29) 1,1,1-TRICHLOROETHANE	110000	10000	
30) 1,1,2-TRICHLOROETHANE	ND	10000	
31) TRICHLOROETHYLENE	300000	10000	
32) TRICHLOROFLUOROMETHANE	ND	10000	
33) VINYL CHLORIDE	ND	21000	
34) m-XYLENE	130000	10000	
35) p,o-XYLENE	81000	10000	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

* = REPORTED ON A DRY WEIGHT BASIS

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911423

Date Analyzed: 6/23/89 19:45

Lab File ID: >B0786

Matrix: SOIL FOR VOA

Number TICs found: 1

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76131	Ethane, 1,1,2-trichloro-1,2,	11.51	25000.	
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

QUALIFIERS(Q);

(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911424
MATRIX : WATER

METHOD : EPA 624
ANALYSIS DATE: 06/12/89
DATA FILE : >A3644

COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1) ACROLEIN	ND	100	
2) ACRYLONITRILE	ND	100	
3) BENZENE	ND	5.0	
4) BROMOFORM	ND	5.0	
5) BROMODICHLOROMETHANE	ND	5.0	
6) BROMOMETHANE	ND	10	
7) CARBON TETRACHLORIDE	ND	5.0	
8) CHLOROBENZENE	ND	5.0	
9) CHLOROETHANE	ND	10	
10) 2-CHLOROETHYL VINYL ETHER	ND	10	
11) CHLOROFORM	ND	5.0	
12) CHLOROMETHANE	ND	10	
13) cis-1,3-DICHLOROPROPENE	ND	5.0	
14) DIBROMOCHLOROMETHANE	ND	5.0	
15) 1,2-DICHLOROBENZENE	ND	5.0	
16) 1,3-DICHLOROBENZENE	ND	5.0	
17) 1,4-DICHLOROBENZENE	ND	5.0	
18) 1,1-DICHLOROETHANE	ND	5.0	
19) 1,2-DICHLOROETHANE	ND	5.0	
20) 1,1-DICHLOROETHYLENE	ND	5.0	
21) trans-1,2-DICHLOROETHYLENE	ND	5.0	
22) trans-1,3-DICHLOROPROPENE	ND	5.0	
23) 1,2-DICHLOROPROPANE	ND	5.0	
24) ETHYLBENZENE	ND	5.0	
25) METHYLENE CHLORIDE	ND	5.0	
26) 1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27) TETRACHLOROETHYLENE	ND	5.0	
28) TOLUENE	ND	5.0	
29) 1,1,1-TRICHLOROETHANE	ND	5.0	
30) 1,1,2-TRICHLOROETHANE	ND	5.0	
31) TRICHLOROETHYLENE	ND	5.0	
32) TRICHLOROFLUOROMETHANE	ND	5.0	
33) VINYL CHLORIDE	ND	10	
34) m-XYLENE	ND	5.0	
35) p,o-XYLENE	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

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ANALYSIS REPORT FOR BASE NEUTRAL EXTRACTABLES BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911424
MATRIX : WATER

METHOD : EPA 625
ANALYSIS DATE: 06/10/89
DATA FILE : >D6551

COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1) ACENAPHTHENE	ND	10	
2) ACENAPHTHYLENE	ND	10	
3) ANTHRACENE	ND	10	
4) BENZIDENE	ND	52	
5) BENZO(A)ANTHRACENE	ND	10	
6) BENZO(A)PYRENE	ND	10	
7) BENZO(B)FLUORANTHENE	ND	10	
8) BENZO(K)FLUORANTHENE	ND	10	
9) BENZO(G,H,I)PERYLENE	ND	10	
10) BIS(2-CHLOROETHOXY)METHANE	ND	10	
11) BIS(2-CHLOROETHYL)ETHER	ND	10	
12) BIS(2-CHLOROISOPROPYL)ETHER	ND	10	
13) BIS(2-ETHYLHEXYL)PHTHALATE	19	10	
14) 4-BROMOPHENYL PHENYL ETHER	ND	10	
15) BUTYL BENZYL PHTHALATE	ND	10	
16) 2-CHLORONAPHTHALENE	ND	10	
17) 4-CHLOROPHENYL PHENYL ETHER	ND	10	
18) CHRYSENE	ND	10	
19) DIBENZO(A,H)ANTHRACENE	ND	10	
20) 1,2-DICHLOROBENZENE	ND	10	
21) 1,3-DICHLOROBENZENE	ND	10	
22) 1,4-DICHLOROBENZENE	ND	10	
23) 3,3'-DICHLOROBENZIDENE	ND	21	
24) DIETHYL PHTHALATE	ND	10	
25) DIMETHYL PHTHALATE	ND	10	
26) DI-N-BUTYL PHTHALATE	1.6	10	J
27) 2,4-DINITROTOLUENE	ND	10	
28) 2,6-DINITROTOLUENE	ND	10	
29) DI-N-OCTYL PHTHALATE	ND	10	
30) 1,2-DIPHENYLHYDRAZINE	ND	10	
31) FLUORANTHENE	ND	10	
32) FLUORENE	ND	10	
33) HEXACHLOROBENZENE	ND	10	
34) HEXACHLOROBUTADIENE	ND	10	
35) HEXACHLOROCYCLOPENTADIENE	ND	10	
36) HEXACHLOROETHANE	ND	10	
37) INDENO(1,2,3-CD)PYRENE	ND	10	
38) ISOPHORONE	ND	10	
39) NAPHTHALENE	ND	10	
40) NITROBENZENE	ND	10	
41) N-NITROSODIMETHYLAMINE	ND	10	
42) N-NITROSODI-N-PROPYLAMINE	ND	10	
43) N-NITROSODIPHENYLAMINE	ND	10	
44) PHENANTHRENE	ND	10	
45) PYRENE	ND	10	
46) 1,2,4-TRICHLOROBENZENE	ND	10	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911424,

Date Analyzed: 6/12/89 11:51

Lab File ID: >A3644

Matrix: WATER FOR VOA

Number TICs found: 1 CONCENTRATION UNITS: ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 67641	2-Propanone (9CI)	6.34	26.	
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

QUALIFIERS(Q);
(1)-THIS COMPOUND (OR SIMILAR SPECTRA) FOUND IN LAB BLANK.
(2)-INTERNAL OR SURROGATE STANDARD ADDED BY LABORATORY.
(3)-THIS COMPOUND ALREADY IDENTIFIED AND REPORTED AS TARGET COMPOUND.
(4)-PROBABLE BACKGROUND DUE TO SOLVENT OR CO2.

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ANALYSIS REPORT FOR VOLATILE ORGANICS BY GC/MS

CLIENT : RECON
LAB SAMPLE #: E911425
MATRIX : WATER

METHOD : EPA 624
ANALYSIS DATE: 06/07/89
DATA FILE : >A3550

COMPOUND	RESULT (ug/L)	MDL (ug/L)	Q
1) ACROLEIN	ND	100	
2) ACRYLONITRILE	ND	100	
3) BENZENE	ND	5.0	
4) BROMOFORM	ND	5.0	
5) BROMODICHLOROMETHANE	ND	5.0	
6) BROMOMETHANE	ND	10	
7) CARBON TETRACHLORIDE	ND	5.0	
8) CHLOROBENZENE	ND	5.0	
9) CHLOROETHANE	ND	10	
10) 2-CHLOROETHYL VINYL ETHER	ND	10	
11) CHLOROFORM	ND	5.0	
12) CHLOROMETHANE	ND	10	
13) cis-1,3-DICHLOROPROPENE	ND	5.0	
14) DIBROMOCHLOROMETHANE	ND	5.0	
15) 1,2-DICHLOROBENZENE	ND	5.0	
16) 1,3-DICHLOROBENZENE	ND	5.0	
17) 1,4-DICHLOROBENZENE	ND	5.0	
18) 1,1-DICHLOROETHANE	ND	5.0	
19) 1,2-DICHLOROETHANE	ND	5.0	
20) 1,1-DICHLOROETHYLENE	ND	5.0	
21) trans-1,2-DICHLOROETHYLENE	ND	5.0	
22) trans-1,3-DICHLOROPROPENE	ND	5.0	
23) 1,2-DICHLOROPROPANE	ND	5.0	
24) ETHYLBENZENE	ND	5.0	
25) METHYLENE CHLORIDE	ND	5.0	
26) 1,1,2,2-TETRACHLOROETHANE	ND	5.0	
27) TETRACHLOROETHYLENE	ND	5.0	
28) TOLUENE	ND	5.0	
29) 1,1,1-TRICHLOROETHANE	ND	5.0	
30) 1,1,2-TRICHLOROETHANE	ND	5.0	
31) TRICHLOROETHYLENE	ND	5.0	
32) TRICHLOROFLUOROMETHANE	ND	5.0	
33) VINYL CHLORIDE	ND	10	
34) m-XYLENE	ND	5.0	
35) p,o-XYLENE	ND	5.0	

ND = NOT DETECTED
MDL= METHOD DETECTION LIMIT

QUALIFIERS (Q)

J =INDICATES AN ESTIMATED VALUE BELOW MDL
B =INDICATES COMPOUND FOUND IN THE ASSOCIATED BLANK AS WELL AS IN SAMPLE

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: RECON

Lab Sample ID: E911425,

Date Analyzed: 6/07/89 3:07

Lab File ID: >A3550

Matrix: WATER FOR VOA

Number TICs found: 0

CONCENTRATION UNITS: ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	NO ADDITIONAL PEAK TO SEARCH			

FORM I VOA-TIC 1/87 Rev.

83

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT
LANCE R. MILLER, DIRECTOR
CN 028
Trenton, N.J. 08625-0028
(609) 633-1408
Fax # (609) 633-1454

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

FEB 11 1991

Gerald Poss
Rudd & Poss
P.O. Box 267
Florham Park, New Jersey 07079-2026

Re: Industrial Petrochemicals, Inc.
City of Newark, Essex County
ECRA Case # 86317
Sampling Plan Dated: June 18, 1990
Addendum Dated: January 18, 1991

Dear Mr. Poss:

Pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection (NJDEP) by the Environmental Cleanup Responsibility Act (ECRA, N.J.S.A. 13:1K-6 et. seq.) and delegated to the Chief of the Bureau of Environmental Evaluation and Cleanup Responsibility Assessment (BEECRA) pursuant to N.J.S.A. 13:1B-4, the referenced Sampling Plan is hereby approved as conditioned herein:

I Soil Conditions

The proposed soil sampling at the site is generally acceptable provided Industrial Petrochemical (IPC) adhere to the below mentioned conditions.

1. Soil samples are proposed to be collected from 2.5' - 3.0' depth interval, within the clay layer. Soil samples shall not be collected from depth intervals below the water table.

The revised proposal complies with this condition.

2. The proposed number of sample locations does not adequately delineate contamination at the site. Additional boring locations shall be required to obtain soil samples in the vicinities of known contamination. Samples obtained from these delineation borings may be field-screened with an organic vapor analyzer (OVA) or a photo ionization detector (PID) to potentially indicate a clean zone. These clean zone samples shall be laboratory analyzed for confirmation.

The revised proposal which includes additional sampling locations is acceptable.

3. The proposed locations for the underground storage tank post-excavation sample were not provided. In general, sampling locations should be below the tank invert and along the former centerline of the tank at five feet intervals, unless ground water is encountered at a depth above the tank invert. If ground water is encountered, the sidewalls should be sampled

at the 6" interval immediately above the water table.

The revised proposal complies with this condition.

4. All soil samples obtained from the site, with exception to those at the fuel oil, diesel and gasoline tanks, shall be analyzed for total petroleum hydrocarbon compounds (TPHC), base neutral compounds plus library search (BN +15), volatile organic compounds plus library search (VO +15), acid extractables (AE +10) and priority pollutant metals (PP metals). Soil samples obtained from the fuel oil and diesel storage tanks areas shall be analyzed for TPHC and BN +15. Soil samples obtained from the gasoline storage tank area shall be analyzed for VO + xylene.

The revised proposal does not include AE +10 or PP Metals. The analysis of these parameters may be postponed at this time. However, if the source of these contaminants appears to be on-site, based on ground water data, then IPC shall obtain soil samples to be analyzed for, at a minimum, the above parameters.

5. Laboratory analysis of drill cuttings serve only as an indicator of contamination, and not representative of a specific depth interval since cuttings are composited. Further, drill cuttings are aerated which deem them unacceptable for VO analysis.

II Ground Water Conditions

1. The presence of free product was described in three soil borings, B-4, B-8 and "Trench." All free product on site shall be delineated as soon as it is discovered. Delineation can be accomplished using soil borings, piezometers or wells.

2. The monitoring well locations proposed be IPC are acceptable. However, additional wells are required. The locations of these wells are shown on the attached map. The wells inside the diked area are important since the soil appears grossly contaminated. IPC shall investigate alternate well construction methods due to the limited access. Installation of these wells will serve to both monitor and remediate ground water. Therefore, IPC shall attempt to install four inch monitoring wells. In addition, the use of stainless steel for these wells is recommended.

The revised proposal is acceptable provided that IPC install a monitoring well on the opposite side (river side) of the wall from tank 16. This was agreed upon during a telephone conference call between the NJDEP and your consultant, Ecolsciences.

3. IPC shall use a data logger to collect ground water elevation data over one complete tidal cycle for all wells and well points. Ground water elevation maps shall be generated for high, ebb and low tides. The raw data shall be plotted graphically.

The revised proposal to obtain water level measurements from all of the wells and piezometers on the site, for a period of 12 hours at 30 minute intervals, is acceptable.

4. AE +10 shall be added to the analytical parameters for ground water samples.

5. The following information shall be reported for each monitoring well sampled:

a. Depth to water, estimated water volume in well, purge date/time, purge volume, depth to water after purging, pH and total dissolved solids (TDS)

b. Sample date/time, depth to water prior to sampling, pH, TDS and comments which can include recharge rate, turbidity, odor, sheen, OVA/PID readings, etc. Any corrections made to the static water level due to the presence of free product shall be reported, along with the thickness of the product layer.

6. The purge rate for the last well volume purged from the wells shall not exceed one gallon per minute. This will insure minimal disturbance of the water to be sampled. The depth of the pump intake shall not be fixed throughout purging. Rather, the pump intake shall be raised and lowered across the entire section of open hole or screen.

7. All wells and well points shall be checked for free product. If free product is found its thickness shall be determined. Installations which contain free product do not need to be sampled for laboratory analyses. Refer to item #1, in this section, for further free product guidance.

8. Industrial Petrochemical shall collect ground water samples a minimum of two (2) weeks following development of the wells.

9. Industrial Petrochemical shall notify BEECRA at least two (2) weeks prior to the drilling of the required monitoring wells.

III Other Technical Requirements

As a result of the September 18, 1990 site visit, the following is a list of items which shall be addressed by IPC:

1. IPC shall determine and provide documentation regarding the location of the toluene spill reported at GJ Chemical.

The information provided as Attachment C to the comments to the Department's November 9, 1990 Draft Sampling Plan Approval contained some discrepancies. These were discussed during the January 6, 1991 conference call. The consultant agreed to provide further information including an affidavit from the spill's responsible party with respect to where, when and how the spill occurred and what remedial measures were taken. Scaled site plans are required.

2. IPC shall determine and provide documentation regarding the depth of the retaining wall located at the rear of the facility.

The revised proposal included this investigation.

3. IPC shall determine and provide documentation regarding the purpose of the filler cap and the discharge point of the floor drain, both located in the rest room of the maintenance shop.

The consultant agreed to provide further information including construction diagrams of what is reported to be a cleanout to a sanitary sewer overflow tank.

4. IPC shall determine and provide documentation regarding the purpose of the PVC piping located immediately west of the maintenance shop and between the maintenance shop and Doremus Avenue.

The response letter indicated that the PVC piping is used to house conduit for a truck scale located on the opposite side of Doremus Avenue. The truck scale meter is located in the maintenance shop.

This raised the question as to whether or not the parcel of property which the truck scale is located was included in the transfer which is subject to the ECRA investigation. IPC shall provide this information and if it is determined that the parcel is to be included with this investigation, IPC shall address the area in accordance with the Department's Remedial Investigation Guide.

5. IPC shall determine and provide documentation regarding the concrete trough and its discharge point located on the south side of the property, at the (rectangular) drum storage area between well point, B-9 and soil boring, B-15.

This trough is reported to be part of an emergency collection system as it leads to an "underground self-contained tank." This shall be clarified and IPC shall provide scaled construction diagrams and a narrative as to its specific historical uses.

6. IPC shall determine and provide documentation regarding the integrity, size and future use of the above ground storage tank (referred to as 36 on the RECON Systems site plan submitted by EcolSciences, Inc.) which was mentioned to have stored fuel oil for the boiler system.

If this is the 750 gallon UST and soil sampling in the revised proposal will address this, then IPC shall provide clarification as to the future plans for the above-ground 750 gallon storage tank located in the same area.

IV ECRA Guidelines for Data Presentation and Proposals

Data Requirements

1. Industrial Petrochemical shall include the following information with the results of sampling:

A. Logs for all soil borings and wells.

B. Soil profile logs for all excavations.

C. Monitoring Well Certification Forms: Form A (As-Built Certification) and Form B (Location Certification) shall be completed for each monitoring well installed. Form A shall be submitted with the results of sampling. Because additional wells are sometimes required to complete a hydrogeologic investigation, Form B may be submitted after completion of the installation of all required ground water monitoring wells, unless required prior to that time by the Department. As built diagrams of all wells shall be included with Form A.

D. A scaled site map of all well and soil boring locations.

E. A site map which lists the concentrations of all significant contamination found (above ECRA action levels) at all sampling locations. The labeling of data shall be keyed to facilitate interpretation, especially at locations where more than one type of contaminant is found. The use of contaminant isopleth maps is also encouraged.

Data/Results Presentation

Because of case management workloads and volumes of data reviewed and processed, the noted formatting requirements are essential to insure complete and timely review of the submittal.

2. The results of sampling shall be provided in a tabular format. Information shall include the sample number, location, interval and depth of sample, sample matrix and the analytical methods used.

3. Tier II deliverables shall be identified and separated from the submittals, discussion, conclusions and data summary sheets. The enclosed Laboratory Deliverables checklist shall be completed and returned with the Tier II deliverables.

4. All submittals of text/data shall be forwarded in triplicate and shall be properly paginated, bear a table of contents and be bound (1 copy may be unbound for filing purposes).

Failure to organize submittal information as outlined above may result in the returning of the submittal for correction and resubmission. Failure to address these conditions and provide documentation where required shall constitute non-compliance with ECRA. No final approvals will be issued until all issues are resolved.

The Cleanup Plan Proposal

During the course of the implementation of the sampling and the generation and evaluation of data, the consultant will be considering the development of a Cleanup Plan. To insure a complete and timely review of the submittal, the Cleanup Plan shall be a stand alone, self supporting document. As a guide to this process, the following elements shall be included in the formation of the plan:

5. Introduction

6. Table of Contents

7. Summary of Environmental Concerns. This shall include the results of previous sampling.

8. Summary of the proposed remedial actions. This shall include the evaluation of any alternative remedial actions, if appropriate.

9. Cleanup level to be achieved. Be specific with regard to media and parameters.

10. A Work Plan shall detail the specific activities that will be used to complete the proposed cleanup objectives.

11. A post-remedial sampling and monitoring plan.

12. A specific time table for implementation of the Cleanup Plan which includes milestones in the project.

13. Progress reports, dependent on the duration of the cleanup.

14. Estimate of costs for the cleanup shall include:

a. capital costs
b. operation and maintenance costs
c. monitoring system costs
d. laboratory costs
e. engineering, legal and administrative costs
f. contingency costs

Failure to submit the appropriate document as outlined above may result in the returning of the submittal for correction and resubmission.

V General Requirements

1. Industrial Petrochemical shall accomplish this investigation and any further analytical investigations by the methods outlined in this sampling plan. If any change in methods outlined in this Sampling Plan is necessary or if any delays are encountered, Industrial Petrochemical shall inform BEECRA in writing prior to implementation.

2. Industrial Petrochemical shall submit summarized analytical results in tabular form. Industrial Petrochemical shall also submit with the analytical data all documents associated with the sampling and testing, including but not limited to lab sheets, chain of custody, results of blank analyses, lab chronicles, summary of analytical instrument tuning, and analytical methods used.

3. Industrial Petrochemical shall submit the results in triplicate within ninety (90) days of the receipt of this approval.

4. Industrial Petrochemical shall notify NJDEP at least five (5) business days prior to implementation of sampling.

5. Industrial Petrochemical shall submit the appropriate fee as required by N.J.A.C. 7:26B-1.10. The enclosed Fee Submittal Form is provided for guidance to determine the fees required; this form shall be completed and returned with the submittal package.

Please be advised that the New Jersey Department of Environmental Protection (NJDEP) is not in receipt of the Data Review Fee of $1,000 due with the 6/90 submission required pursuant to N.J.A.C. 7:26B-1.10. Therefore, IPC shall submit the required review fee within fifteen (15) days of the receipt of this letter.

If IPC fails to submit the required fee within the referenced timeframe, this case will be referred to the Bureau of ECRA Applicability and Compliance (BEAC) for review and the assessment of penalties.

6. If contamination is determined to exist above a level found acceptable by NJDEP, Industrial Petrochemical shall prepare and submit a Cleanup Plan developed pursuant to N.J.A.C. 7:26B-5.3 to address said contamination. If the data from implementation of the approved Sampling Plan indicate that the presence of contamination, but is not sufficient to define the full horizontal and vertical extent, then such areal definition shall be proposed as a Sampling Plan Addendum in a form which meets the criteria of N.J.A.C. 7:26B-3.2(c)11. The horizontal and vertical extent of contamination shall be

determined before an approvable Cleanup Plan can be developed.

If you have any questions, please contact the Case Manager, Bill Patterson at (609) 633-7141.

Very truly yours,

Mark Fisher for

Dawn M. Pompeo, Acting Chief
Bureau of Environmental Evaluation
and Cleanup Responsibility Assessment

cc: Judith Morrow, BEERA
Rob Lux, BGWDC
Dr. Adewale Troutman, Health Officer
Steven Eisenstein, Esq.
Stephen Schnitzer, P.A.

STEPHEN SCHNITZER, P.A.
40 WEST NORTHFIELD ROAD
P. O. BOX 691
LIVINGSTON, NEW JERSEY 07039-0691

(201) 533-1212

STEPHEN SCHNITZER

RECEIVED
MAR 4 3 00 PM '91
INDUSTRIAL
SITE EVALUATION
ELEMENT

February 27, 1991

Mark Fisher
For Dawn M. Pompeo,
Acting Chief
Bureau of Environmental Evaluation
and Cleanup Responsibility Assessment
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CN 028
Trenton, New Jersey 08625-0028

RE: Industrial Petrochemicals, Inc.
City of Newark, Essex County
ECRA Case # 86317
Sampling Plan Dated: June 18, 1990
Addendum Dated: January 18, 1991

Dear Mr. Fisher:

I was copied on a February 11, 1991 letter to Mr. Poss which calls for certain action by all parties including those copied. From now on I suggest that Mr. Poss, myself and Mr. Eisenstein (also a copied party) be directly addressed and mailed at the same time noting the enclosure to me was forwarded February 22, 1991.

Moreover, in my letter there were no attachments in the document at all, and in Mr. Poss' letter in the ground water section, Item 2 was a location map referred to which was not enclosed to Mr. Poss presumably as his copy of the same later reaching me did not include it.

Very truly yours,

STEPHEN SCHNITZER

SS/rm
cc: Gerald R. Poss, Esq.
Steven Eisenstein, Esq.

TELECOPIER TRANSMITTAL PAGE

Date 3/6/91   Time 12:45

PLEASE DELIVER THE FOLLOWING MATERIAL AS SOON AS POSSIBLE:

TO Bill Patterson

FAX NUMBER: 609-633-1454

FROM: EcolSciences

WE ARE TRANSMITTING A TOTAL OF 2 PAGES INCLUDING THIS COVER LETTER.

IF YOU DO NOT RECEIVE ALL THE PAGES OR HAVE NOT RECEIVED THEM PROPERLY, PLEASE CALL BACK AS SOON AS POSSIBLE.

TRANSMITTED BY: Mike Fedosh

Telephone: 201-627-5726

Message: IPC, case # 86317

Bill,

Here's the IPC Facility Registration #. Doug Burry in BUST handles the Essex Co. closure plan approvals. 2 weeks ago he called me & said the IPC closure approval would be shortly coming. To date, I have not received it. I've sent him a fax asking for the approval. It's impossible to telephone into the BUST office. Maybe your inside access can get him to speed the process. Thanks.

Mike

EcolSciences, Inc. FAX Number: (201) 627-0031

EcolSciences, Inc. Telephone Number: (201) 627-5726

3/7/91

PATTERSON CONTACTED DOUG BURRY

- THE APPROVAL HAS BEEN IN TYPING SINCE MID FEB. WILL EXPEDITE AND SEND OUT TOMORROW -

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

RECEIVED
MAR 11 10 10 AM '91
BUREAU OF UNDERGROUND
STORAGE TANKS

March 7, 1991

Mr. Doug Burry
New Jersey Department of Environmental Protection
Division of Water Resources
Bureau of Underground Storage Tanks
CN 029, 401 E. State Street
Trenton, New Jersey 08625-0029

Re: Underground Storage Tank Closure Plan Approval Application
Industrial Petrochemical, Inc.
Facility Registration No. 0021322

Dear Doug:

Approximately three weeks ago you called me with questions concerning the subject closure plan submitted January 8, 1991, which you were reviewing. Having answered your questions, you told me that there were no problems with the application and that the signed approval would be coming to my office in a week.

To date, I have not received the subject closure plan approval. My daily telephone inquiry attempts to your office have been unsuccessful though I did manage to fax you my status inquiry. I have notified Mr. Bill Patterson, ECRA case manager for Industrial Petrochemical, Inc., of our inability to proceed with the tank removal program.

Mr. Patterson may be contacting you concerning the subject status. All parties wish to proceed with the tank removal program once the closure plan approval is received. Please call me concerning the closure plan status or if there are any further questions about the application package.

Very truly yours,

EcolSciences, Inc.

Michael S. Fedosh

Michael S. Fedosh
Senior Project Manager

MSF/ssn

cc: Mr. Bill Patterson, BEECRA
Mr. Steven Eisenstein
Mr. Stephen Schnitzer
Mr. Gerald Poss
Mr. Ernie Schreiner

Called 3/12/91
10:30. M.F. not in, left
message.
— Doug

30-1238

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

March 7, 1991

Mr. Doug Burry
New Jersey Department of Environmental Protection
Division of Water Resources
Bureau of Underground Storage Tanks
CN 029, 401 E. State Street
Trenton, New Jersey 08625-0029

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CEIVED
12 '91
SITE [illegible] ATION

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Very truly yours,

EcolSciences, Inc.
Michael S. Fedosh

Michael S. Fedosh
Senior Project Manager

MSF/ssn

cc: Mr. Bill Patterson, BEECRA
Mr. Steven Eisenstein
Mr. Stephen Schnitzer
Mr. Gerald Poss
Mr. Ernie Schreiner

30-1238

1 Bank Street ☐ Rockaway, New Jersey 07866 ☐ 201/627-5726 ☐ FAX: 201/627-0031

State of New Jersey
Department of Environmental Protection and E
Division of Responsible Party Site Remediation
CN 028
Trenton, NJ 08625-0028
Tel. # 609-633-1408
Fax. # 609-633-1454

Scott A. Weiner
Commissioner

Karl J. Delaney
Director

MAR 23 1992

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Gerald Poss
Rudd & Poss
58 Vose Avenue
South Orange, New Jersey 07079

Re: In the Matter of Industrial Petrochemicals (IPC)
Newark City, Essex County
ECRA Case # 86317
Results of Sampling Plan Dated: September 30, 1991
Negative Declaration Submitted: October 7, 1991

Dear Mr Poss:

Please be advised that the referenced Document, containing proposals for no further action or no proposal at all, is hereby rejected. In addition, the referenced Negative Declaration Affidavit, submitted by EcolSciences on behalf of property owner, Henry Borda, vice president of IPC, Denny Herzberg, and current operator, Giosue Masci, collectively to be referred to hereinafter as IPC, is hereby disapproved. This action is taken due to IPC 's failure to completely characterize the industrial establishment and propose an appropriate remedial technology as a next phase proposal pursuant to the Environmental Cleanup Responsibility Act (ECRA), (N.J.A.C. 7:26B). A new Negative Declaration will not be considered by this office until IPC has addressed the action described above pursuant to ECRA. In an attempt to accomplish this objective the NJDEPE has prepared this document which briefly discusses a number of outstanding issues. These issues will be the subject of a technical meeting which is in order to resolve this impasse. Therefore, this letter also serves as a general agenda for such a meeting.

Given the number of parties involved in this matter and the fact that it is imperative that all parties are present or at least represented at this meeting, five (business) days have been granted to notify the ECRA Case Manager of available dates to schedule the meeting.

I. Soil Considerations

1. All but one of the underground storage tanks were reported removed. The gasoline tank was located partially beneath the building and is reported to be abandoned in place. The tank work is reported to have been conducted following Bureau of Underground Storage Tank (BUST) guidelines. IPC is advised that the removal of the tanks, which includes investigation and remediation will be directed on the ECRA program.

In addition the following information shall be presented on a scaled site map: The former tank locations; the area and depths of soil excavation associated with tank removal; and sampling locations and depths with respect to former tank locations and excavations.

2. Former sampling location B11 is reported to have been removed with the excavation of the diesel tank, however, post-excavation sample locations do not address the further delineation or confirmation of a clean zone for the contamination reported at this location (TPHC 18,000-25,000ppm @ 2-3').

3. In the future, reporting units for contaminant concentrations shall be provided in the legend or with the results on the Figures. Figure 2 provided the results of the sampling by the prior consultant and the results of the additional sampling. However, these results were presented in different units. The results were reviewed assuming that the prior "B" series sample results were all in parts per million (ppm); and, of the "EB" series sample results, the PHC and PP Metals were in ppm and the VO and BN in ppb. These assumptions shall be clarified.

4. A PHC cleanup level of 10,000ppm may be applied to the site rather than the 15,000ppm proposed by IPC.

5. Contrary to IPC's contention, the contamination (Beryllium and Chromium) does not appear to be attributable to fill placement. The locations targetted for remediation are limited and should be considered for "hot spot" removal.

6. The presence of free product or saturated soil shall be determined and, where present, delineated especially associated with the area around and beneath the tank farm.

7. Although delineation may be incomplete, a soil cleanup plan can be proposed incorporating delineation as a part of the feasibility studies for cleanup.

II. Ground Water Considerations

1. Free Product was encountered in borings B-3, B-8 and the "trench." A free product seep was also observed adjacent to the tank farm area. Wells were required in these areas to determine the extent and thickness of the free product. A conference call was held between the consultant and the NJDEPE to discuss alternate locations for the well installations since it was determined by the consultant that some of the locations were untenable. These alternate locations do not show free product, however free product delineation is not complete.

. IPC shall determine the extent of free product and propose a strategy for remediation. Insofar as delineation is required, data generated from trench installations, borings, hydropunch or geoprobe methods are acceptable.

2. Another round of sampling will be required. Parameters shall include volatile organic compounds plus library search spiked fro xylene, methyl ethyl ketone, methyl iso-butyl ketone, methyl tertiary butyl ether, and tertiary butyl alcohol; base neutral compounds plus library search; acid extractables plus library search; total petroleum hydrocarbon compounds; metals - lead and chromium; and the indicator parameters pH dissolved oxygen, temperature and specific conductivity.

III. Miscellaneous Items

1. Report #7931 (4/15/91) - The date of sampling on the chain of custody is recorded as 4/10/91 for all samples with the final collection time of 1300. The samples were recorded as relinquished on 4/11/91 at 1300 and then again at 1700, with receipt by the laboratory on 4/11/91 at 1700. The samples appear to have been held for a day or the relinquished date was recorded as 4/11 rather than 4/10. Sample handling for the time gap or clarification shall be provided.

2. The method detection limits (MDLs) for the volatile organic (VO) results reported with not detected (ND) values for sampling locations T301 and T302 are elevated. These locations are associated with the abandoned gasoline tank partially beneath the building. The area adjacent to these sampling locations was excavated during removal of the diesel tank. It is unknown if these samples are representative of soil remaining or if the locations no longer exist as a result of the excavation. The information shall be provided.

3. Report #8843 (Groundwater) - The chain of custody indicates that the samples were received by the laboratory on 7/2/91, however, the laboratory chronicle indicates that the samples were received by the laboratory on 7/1/91. Clarification shall be provided.

4. VO Fraction - The surrogate peaks on the chromatogram for MW1 appear to be small with little to no recoveries, however, the peaks appear to be acceptable on the MW1DL (dilution) chromatogram where surrogates are usually diluted out. The surrogates are reported for both runs with acceptable recoveries within 1-2% of each other. The laboratory shall provide an explanation.

It should also be noted that the MDLs for sample MW1DL are considerably elevated at a range of 1.25ppm to 25ppm for individual analytes.

5. Report #8842 (Groundwater) - The chain of custody indicates that the samples were received by the laboratory on 7/2/91; however, the laboratory chronicle indicates that the samples were received by the laboratory on 7/1/91. Clarification shall be provided.

6. VO Fraction - The holding time for unpreserved VO samples is seven (7) days. The holding times were exceeded by two (2) to three (3) days for the samples. IPC is therfore informed that the results are qualified.

7. The MDLs were elevated for sample MW5 due to the presence of high targetted analytes.

7. The MDLs were elevated for sample MW5 due to the presence of high targetted analytes.

8. Acid Extractable (AE) Fraction - Sample MW3 was re-extracted based on non-recoverable phenolic surrogates (PHC 86mg/l); however, the re-extract exceeded the holding time. Therefore, both sets of data for the AE fraction are unacceptable.

Two of the three AE surrogates were outside the QC limits for samples MW2 and MW5 and therefore, the data are unacceptable.

9. The comments below address the response to the items in section "III. Other Technical Requirements" of the NJDEPE February 11, 1991 Sampling Plan Approval letter.

a. Scaled site plans detailing the location and extent of the historical toluene spill were required in the NJDEPE letter, however, this was not submitted.

b. The containment dike footings are reported to be above the water table, reportedly confirmed by 4/10/91 test pits. The test pit locations shall be presented on a scaled site map, indicating the depth of footings and depth to top of water table at the time.

c. A proposal to clean and grout the rest room floor drain was submitted. The discharge point of the drain, the filler cap present in the room and the "cleanout to sanitary sewer overflow tank" were not addressed as required in the NJDEPE letter.

d. The area of concrete troughs shall be placed on a scaled site map. The history regarding use of the troughs was not submitted. Based on the history of use, the integrity of ALL the trough areas may need to be addressed.

10. This parcel of property on which the truck scale is located is associated with the IPC facility and should be investigated as part of the ECRA process. IPC shall provide discussion regarding the specific use of the area and what type of contamination may be associated with it.

11. The proposed cleanup standard rules appeared in the February 3, 1992 New Jersey Register. These shall be used as guidance to determine: what concentration of contaminants need to be present at a site to consider the site contaminated: which areas of environmental concern need additional investigation; and the concentration of a contaminant allowed to remain for a site to be considered "clean".

When the person responsible for conducting a cleanup agrees to remediate a contaminated site consistent with the proposed cleanup standards, no further discussion on the identification of cleanup standards will be necessary. It must be remembered, however, that upon adoption, or at any time thereafter, if the cleanup standard for a given contaminant is revised, then remediation to achieve that adopted cleanup standard may be required.

If the person responsible for conducting a cleanup does not agree to remediate a contaminated site consistent with the proposed cleanup standards, then the NJDEPE cannot require compliance with the proposed standards at this time. In these circumstances, the responsible party shall submit a proposal to the Department that details the site specific circumstances and technical rational for proposed cleanup goals on a case-by-case basis.

If you have any questions, please contact the Case Manager, Bill Patterson, at (609) 633-7141.

Sincerely,

Douglas Stuart, Chief
Bureau of Environmental Evaluation
and Cleanup Responsibility Assessment

enclosure

c: Judith Morrow, BEERA
Rob Lux, BGWDC
Steven Eisenstein, Esq. for Henry Borda, Property Owner
Stephen Schnitzer, Esq. for Joe Masci, Current Operator
Joseph Mc Ginley, Newark Health Department
King Moy, EcolSciences, Consultant

/PC 86317

INDUSTRIAL SITE EVALUATION ELEMENT
EEC DOCUMENT TRANSMITTAL FORM

The attached correspondence has been:

APPROVED ______________ Date ______________

RETURNED for corrections ______________ Date 3/18/92

COMMENTS: See item #11. Correct + return.

MAR 23 1992

Section Chief: ______________ Date ______________

Supervisor: ______________ Date 3/18/92

Preparer: ______________ Date 3/16/92

***************************** PREPARER'S CHECKLIST **********************************
(X, N/A, NO)

	S/PL Appv'l/Disappv'l	C/PL Appv'l/Disappv'l	ND Appv'l/Disappv'l
Standard Attachments (Lab Deliverables, Fee Submittal, Implementation Schedule, etc.)			
Update AEC Sheet			
cc: H.O.			
BUST Closure Approval			
Standard Reporting Form			
RCRA Issues Addressed			
Agent: Date DRAFT Sent			
Date Responded			
Disposal Documentation			
Landfill Capacity Form			
Press Release Questionnaire			
Site Status Report			

Other Type of Document: GUIDANCE DOC. / MEETING REQUEST
(i.e. either/or, extension, threat, fees due, guidance, info request, etc.)

******************************* UPDATE TRACKING SHEET ********************************

	S/PL	C/PL	ND
Prelim. Insp.			
Insp. Rpt.			
File Review			
Contact H.O.			
Date Rec'd			
Date Ref'd to TC, GEO			
Date TC, GEO Responded			
Complete Final Comment Section			
"At-Peril" Costs			
* Fees up to date? (If not, prepare fees due letter)			

Total Days From Receipt of Proposal = ______ (If >80 days, explain delay)

COMMENTS:

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

April 23, 1991

Mr. Bill Patterson
New Jersey Department of Environmental Protection
Bureau of Environmental Evaluation and Clean-up Responsibility Assessment
CN 028
Trenton, New Jersey 08625-0028

Re: ECRA Case #86317
IPC, Newark

Dear Bill:

On April 9-11, 1991 three underground and one aboveground storage tanks were removed from the subject property. The on-site equipment was used to address comment III.2 of your office's February 11, 1991 Final Comments letter concerning the containment dike depth. Enclosed are photographs and information obtained from a test pit dug adjacent to the north containment dike around the tank farm.

The test pit was dug at the junction of the north tank farm containment dike and east wall on the Passaic River bank (Figure 1, Photo 1). Figure 2 presents the test pit along with adjacent monitoring well information. The area is capped by an eleven inch thick concrete-reinforced pad over the original grade. Underlying the concrete pad is black-brown silty sand fill material. Seven inches beneath the fill is the spread footing for the nine inch thick concrete-reinforced wall. The spread footing extends two feet laterally from the wall and is two feet thick. Beneath the footing is the sand fill material. Ground water was encountered in the fill beneath the footing bottom. Photo 2 documents the footing design and materials encountered in the test pit.

The need to find the footing elevation of the containment dike is for determining whether the dike is a barrier to ground water movement. Ground water has been observed flowing out of the river bank adjacent to tank #16 (Figure 1). Mr. Robert Lux, the DEP support geologist, has acknowledged this flow in previous telephone conversations and has stated that the flow moves underneath the containment dike from the tank farm. EcolSciences concurs with Mr. Lux's hypothesis and likewise believes that ground water also flows underneath the north containment dike.

1 Bank Street ☐ Rockaway, New Jersey 07866 ☐ 201/627-5726 ☐ FAX: 201/627-0031

The November 9, 1990 Draft Comments from the BEECRA office requested three monitoring wells within the tank farm containment area. Spatial constraints eliminated two of these locations while EcolSciences proposed well MW-6 at the third location (Figure 1). EcolSciences in telephone conversations with the BEECRA office during the week of February 4th, 1991 requested that well MW-6 be shifted immediately outside the containment area. EcolSciences' reasons were 1) the expense for specialized equipment to drill within the containment area and 2) probable uninterrupted ground water movement underneath the dike meant similar ground water conditions within and immediately outside the containment area. It was during these conversations that Mr. Lux acknowledged ground water movement underneath the containment dike. However, he stated that uninterrupted ground water flow must be documented to justify placing MW-6 outside the dike.

The footing elevation determined from the test pit and the range of tidal influenced-ground water elevations in nearby well MW-3 provide documentation that the dike footing is above the maximum ground water height and does not appear to interrupt ground water flow. Based on this information EcolSciences proposes to shift well MW-6 seven feet horizontally to outside the containment area. Ground water conditions beneath this outside location should be similar to conditions beneath the containment area. However, the cost savings for drilling MW-6 outside the dike would be 5 times the cost of drilling within the containment area.

EcolSciences had requested BEECRA personnel present during the test pit excavation so that a field determination of the MW-6 location could be made. Instead the enclosed information is presented for your office's review. No wells will be drilled until EcolSciences receives BEECRA approval for the final location of MW-6. In conclusion, ground water conditions at both MW-6 locations would be similar due to uninterrupted flow yet the cost savings for drilling outside the dike would be significant. We look forward to a quick decision from your office. If you have any questions, please feel free to call me.

Very truly yours,

EcolSciences, Inc.

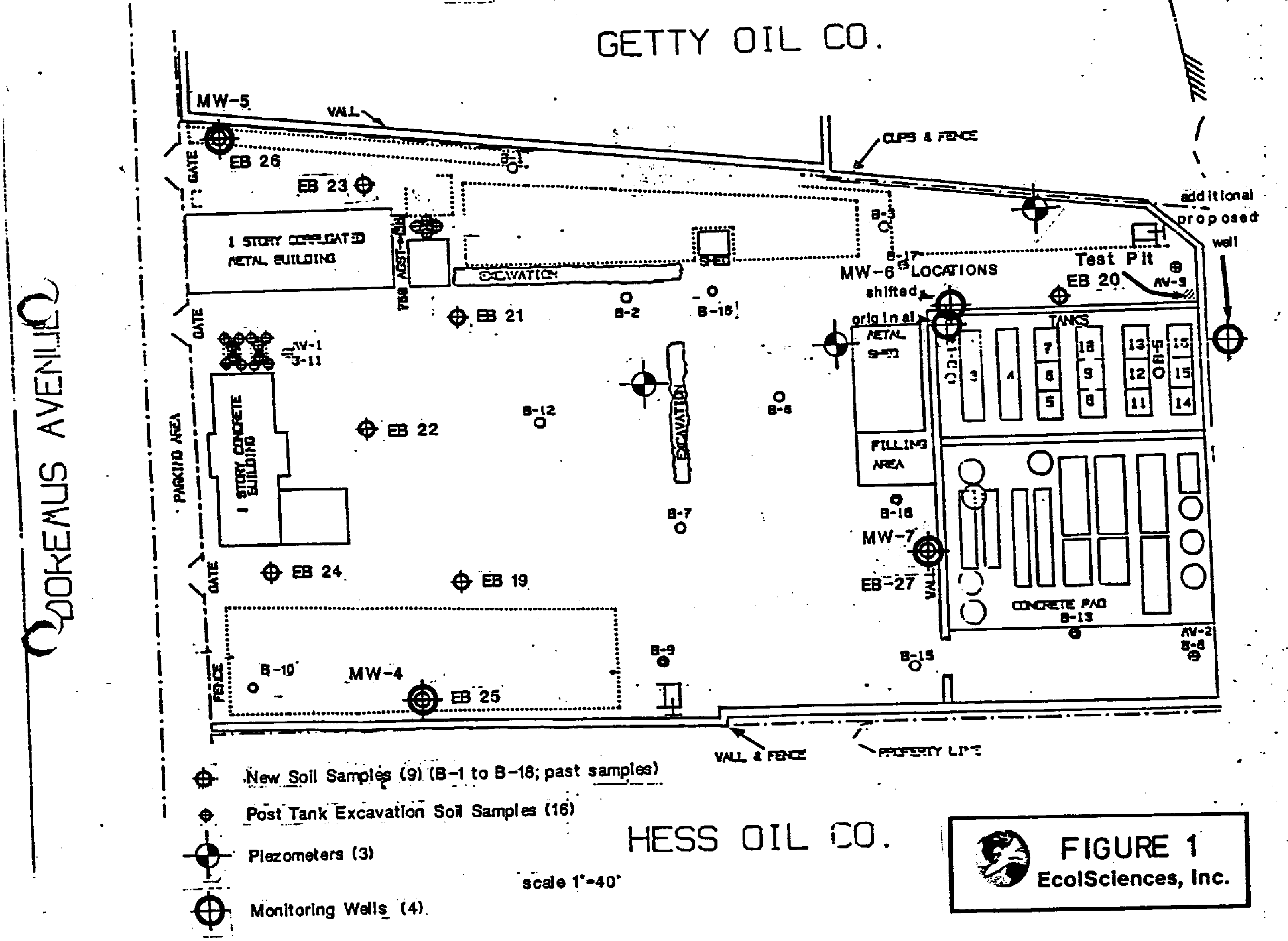
Michael S. Fedosh

Michael S. Fedosh
Senior Project Manager

MSF/tmr

cc: Steven Eisenstein, Esq
Stephen Schnitzer, Esq
Gerald Poss, Esq
Ernie Schreiner

SAMPLING LOCATION MAP



- New Soil Samples (9) (B-1 to B-18; past samples)
- Post Tank Excavation Soil Samples (16)
- Piezometers (3)
- Monitoring Wells (4)

FIGURE 1
EcolSciences, Inc.

CONTAINMENT DIKE CROSS SECTION

SCALE 1"=2.5'

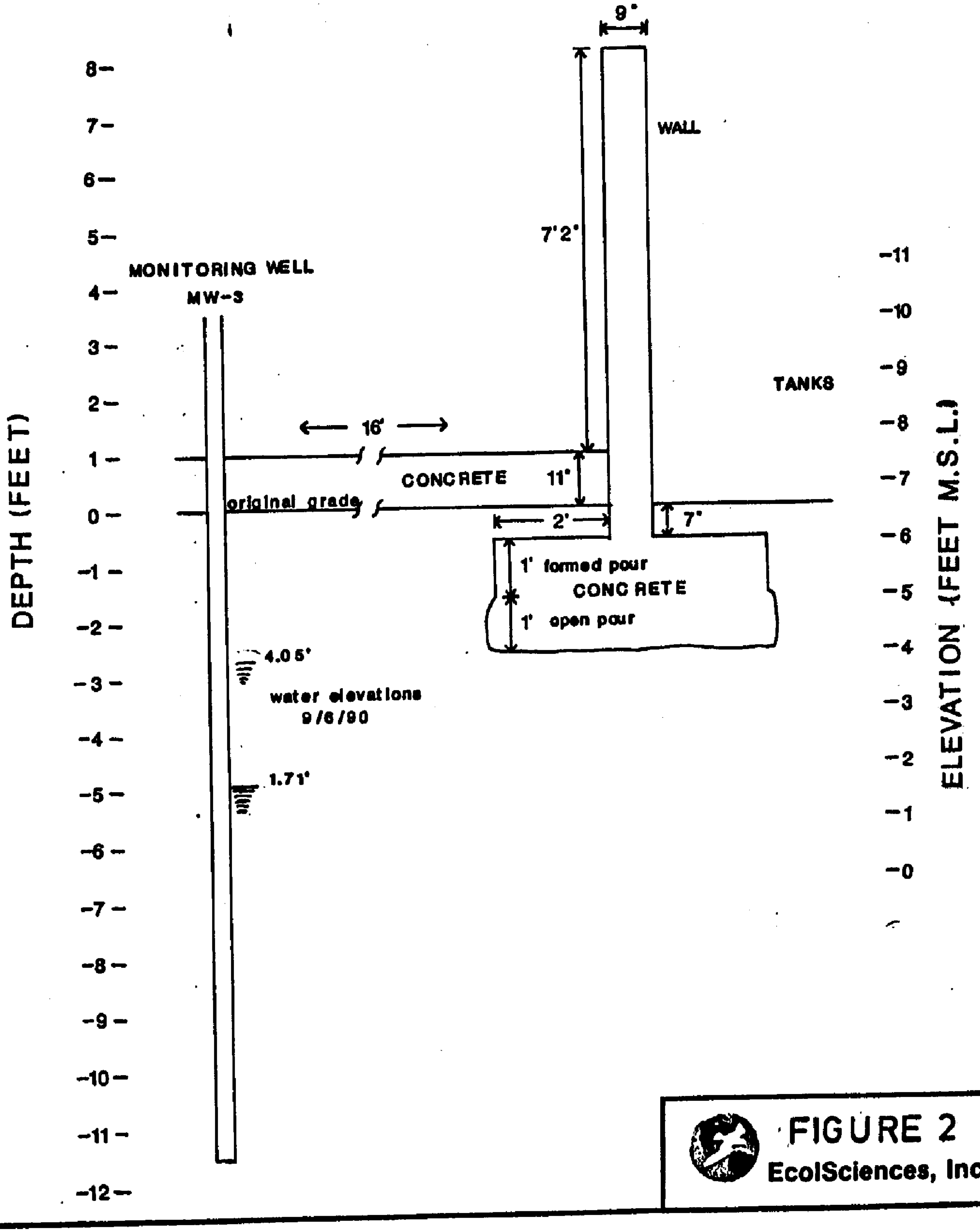


FIGURE 2

EcolSciences, Inc.

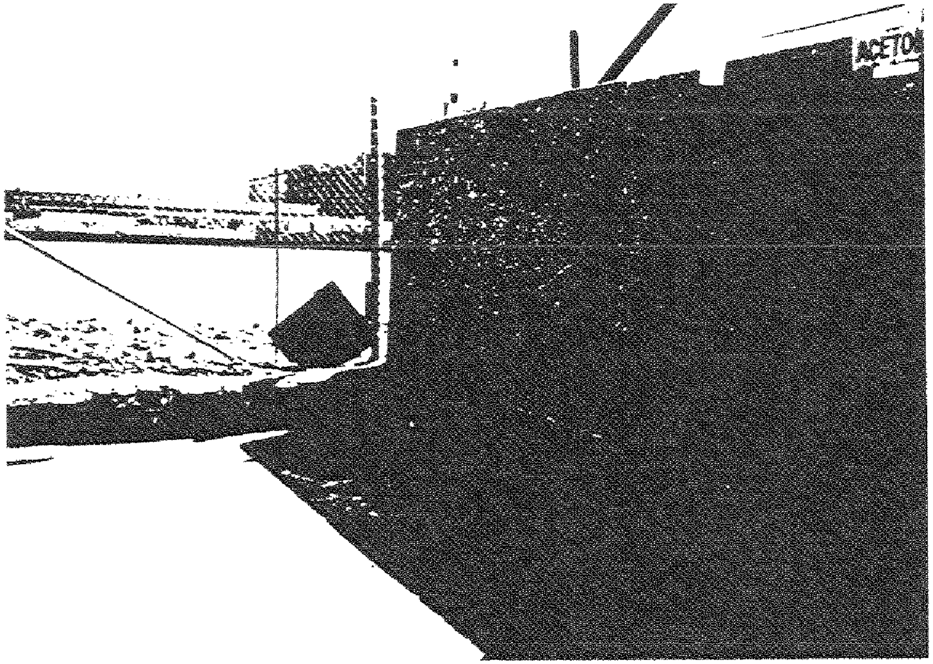


Photo 1. Test pit location along the north dike.

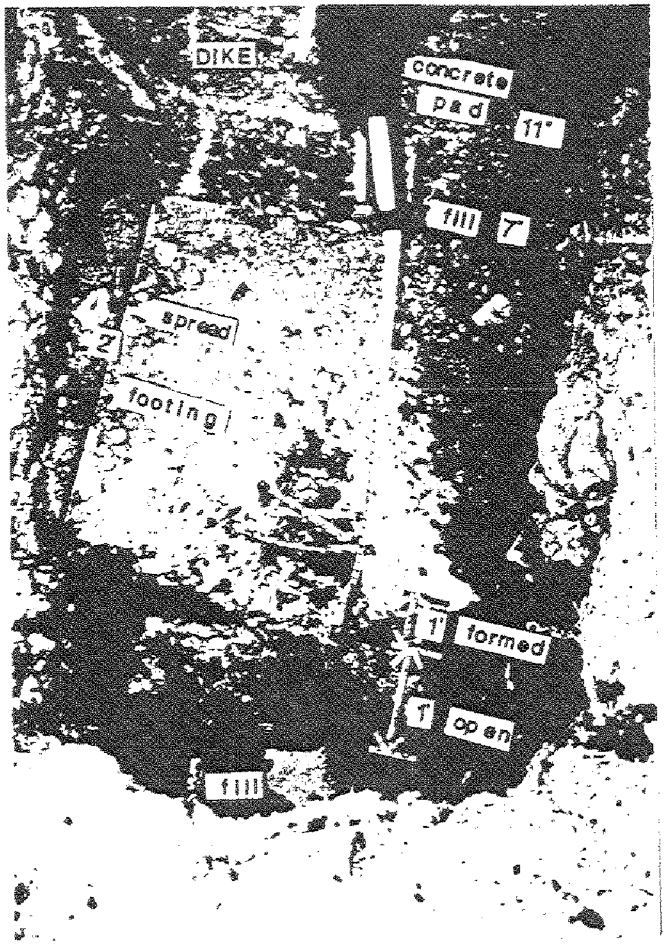


Photo 2. Test pit profile. A concrete pad and fill overlie a 2 foot wide and 2 foot deep spread footing.

EcolSciences, Inc.

AIR, LAND & SEA

Environmental Management Services, Inc.

2400 Route 88 East • Point Pleasant • New Jersey • 08742-2247
Telephone: 732 • 295•3900 • Fax: 732 • 295•3009

February 9, 2001

RECEIVED
FEB 1

Mr. Wayne Bevan, Project Manager
NJDEP - BEECRA
P.O. Box 432
401 East State St.
Trenton, NJ 08625

RE: Resubmission of RI/RAW (Volumes I & II)
Industrial Petrochemicals, Inc. (IPC)
Newark City, Essex County
ISRA Case # E86317
AL&S Project # 99400

Dear Mr. Bevan,

On February 7, 2001, Air, Land & Sea Environmental Management Services, Inc. (AL&S) had the above referenced report hand delivered to your office. Upon closer examination of this report, AL&S has noted that information critical to the report had been accidentally omitted.

To amend this problem, AL&S has enclosed a copy of the above referenced report with Field Sampling Data Sheets included as Exhibit IV, Volume I. To alleviate cost to our client, AL&S requests only that the set of site plans (Figures 3-5) from the original submission be included with this new report.

If there are any questions, please feel free to contact our office at (732) 295-3900.

Sincerely,
AIR, LAND & SEA

John Zingis, CHMM
President

REMEDIAL INVESTIGATION
REMEDIAL ACTION WORKPLAN
VOLUME I

FOR:

INDUSTRIAL PETROCHEMICALS, INC.
128 DOREMUS AVENUE
CITY OF NEWARK, ESSEX COUNTY
ISRA CASE #E86317

PREPARED BY:

John Zingis, CHMM
Principal Environmental Consultant
NJDEP Licensed Subsurface Evaluator #13118

FEBRUARY 6, 2001

AL&S
ENVIRONMENTAL MANAGEMENT SERVICES, INC.
2400 Route 88 East • Point Pleasant • New Jersey • 08742-2247
Telephone: 732 • 295•3900 • Fax: 732 • 295•3009

Remedial Investigation Report - Remedial Action Workplan

Table of Contents

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List of Exhibits-Volume I

List of Exhibits-Volume II

I. Introduction

Air, Land & Sea Environmental Management Services, Inc. (AL&S) was retained on February 1, 1999 by Industrial Petrochemicals, Incorporated (IPC), located at 128 Doremus Avenue, in the Township of Newark, Essex County (see Figures 1 and 2). In conjunction with Mr. Ernest Schreiner, President of AA Pollution Control, AL&S was contracted to review and respond to the New Jersey Department of Environmental Protection (NJDEP) letter dated December 9, 1998 (See Exhibit I, NJDEP Initial Notice). To accomplish this, AL&S reviewed historical data accumulated by other consultants, synthesized this data on new basemaps and conducted a remedial investigation of groundwater with four (4) sampling events over the past year, to assess groundwater contamination and determine potential impacts to environmental receptors.

Following receipt of ground water results and synthesis of soil remedial investigation data, AL&S and AA Pollution Control had several meetings with NJDEP representatives to discuss remedial options. During these meetings the NJDEP agreed to accept synthesized data provided it can characterize soil conditions to meet the Technical Requirements for Site Remediation (Tech Regs). The NJDEP will also consider information on historic fill, groundwater quality and potential impacts to the Passaic River before approving a Remedial Action Workplan.

As requested by Mr. Wayne Bevan of the NJDEP Bureau of Environmental Evaluation and Cleanup and Responsible Assessments (NJDEP-BEECRA) and other NJDEP representatives, this Remedial Investigation/Remedial Action Workplan (RI/RAW) is being submitted to demonstrate that remedial activities at the above referenced property are being conducted in compliance with the guidelines enumerated in the NJDEP Technical Requirements for Site Remediation (Tech Regs), and so that the Department may approve the proposed remedial action workplan described in this report.

II. Historic Soil Remedial Investigation

AL&S initiated our remedial investigation by reviewing previously published environmental reports from March 1989 through January 1996. These reports are on file with the NJDEP. These reports discuss soil and groundwater investigations that identified numerous contaminants in exceedance of the NJDEP's Residential Direct Contact Soil Cleanup Criteria (RDCSCC) and impact to groundwater standards (See Figure 3, Historic Soil Sampling Location Map). For groundwater remedial actions please see Section V of this RI/RAW. In addition to the previously published reports, AL&S also reviewed a NJDEP's correspondence dated December 9, 1998, which identified Areas of Concerns established by the NJDEP (See Exhibit I). AL&S also attended a meeting in May 2000 to discuss the extent of soil and groundwater contamination and the 2 to 6 foot thick concrete that covers the entire property.

As enumerated in past NJDEP correspondences, the remedial investigation of several areas of concern (AOC's) where contaminants exceeded NJDEP Cleanup Criteria was incomplete. AL&S agreed with the Department's opinion that Priority Pollutant Metals (PPM), polyaromatic hydrocompounds (PAH), and possibly total petroleum hydrocarbons (TPHC) were associated with "historic fill" from sources such as dredge spoils, hydraulic fill, railroad industry, and the past onsite operations as well as surrounding properties.

AL&S responded to this correspondence on behalf of IPC by stating that the continued remedial investigation activities to delineate the extent of soil contamination would be an exercise in futility due to the site history (historic filling) and historic land uses of the site (See Exhibit II, Historic Aerial Photography and Sanborn Maps). These aerials were reviewed by NJDEP and AL&S during our meeting and clearly show that the property and surrounding area was filled for over 50 years.

In addition, AL&S was able to obtain a report titled *Industrial Development, Urban Land-Use practices and Resulting Ground Water Contamination, Newark, New Jersey.*[1] This report details the land use history of the Newark area, discusses the industrialization of the area, contamination of soils and groundwater and advocates the need to establish a regional ground water cleanup standard. This report contains 43 references from other authors and sources and identifies over 107 ground water contaminated sites (it's likely that more have been added since this report was published). The report also documents that most of the area contains historic fill from industrial uses and said fill contained hazardous substances. AL&S is enclosing this report, along with the historic aerial photographs (see Exhibit II).

The documents annexed as Exhibit III within this RI/RAW identify several chemicals that were never used or stored by them. This information obtained by G.J. Chemical supports our claim that historic fill and upgradient properties are responsible for the contaminants on the site and it's extremely difficult to determine how long contaminants were at the subject property. The source and cause of historic fill contaminants is unknown.

---

[1] Undated, Zdepski, J. Mark, *Industrial Development, Urban Land-Use practices and Resulting Ground Water Contamination, Newark, New Jersey,* JMZ Geology, Flemington, NJ 15 pgs.

III. Site Geology

Soils observed at the site were sand and historic fill above a clay layer. Based on a review of the USGS Topographical Maps – Elizabeth and Jersey City Quadrangles, groundwater flows in a easterly direction towards the Passaic River, located adjacent and to the east of the site (see Figure 2). Boring logs from the recent installation of ground water monitoring wells on the property along the Passaic River identify a clay layer from nine to twelve feet (9'-12') below existing grade (See Exhibit II, Monitor Well Logs). The bottom limits of this clay layer was not defined by any of the soil borings or ground water monitoring wells. This clay layer may function as a confining layer separating the shallow contaminants from lower aquifers.

Although an Essex County Soil Survey was unavailable for public examination, Essex County is typically identified as Urban Land (UL). Urban land, (UL), consists of areas where more than 80% of the surface is covered by asphalt, concrete, buildings, or other imperious surfaces. Moreover, the NJDEP and AL&S have documented that this site was historically filled with a wide range of materials, including hazardous substances.

IV. Remedial Investigation - Soils

On April 19, 2000, AL&S mobilized at the aforementioned site to investigate the Areas of Concerns (AOC's) listed in the Department's statement on December 9, 1998 and subsequent correspondences reported to the Department on December 21, 1999 and February 10, 2000. As discussed in AL&S' meetings with the NJDEP, soil contamination throughout the site varies considerably. Additional soil borings and remedial investigations of AOC's would be an act in futility because of contaminated historic fill. The NJDEP has permitted AL&S to rely on previous data by others as long as all data was synthesized on one base map. A Remedial Action Workplan (RAW) involving soil is described in Section VII of this report.

AOC #1 - Stained Soil near the Northern Truck Parking Area

AL&S observed that the entire area was capped with 2 to 6 feet of concrete prior to AL&S involvement. AL&S synthesized historic site data and presented this data on Figure 3 accompanying this report. Based on the information synthesized on the basemap no soil investigation was warranted.

AOC #2 - Stained Soil near the Southern Truck Parking Area

AL&S observed that the entire parking area was capped with 2 to 6 feet of concrete prior to AL&S involvement. AL&S synthesized historic site data and presented this data on Figure 3 accompanying this report. Based on the information synthesized on the basemap no soil investigation was warranted.

AOC #3 & #4 - Staining Near the Mixing Tank and Metal Shed

AL&S again observed that this area was encapsulated with a varying layer of concrete prior to AL&S involvement. AL&S synthesized historic site data and presented this data on Figure 3 accompanying this report. Based on the information synthesized on the basemap, a soil investigation was not warranted.

AOC #5 - <u>3,000-gallon Diesel Underground Storage Tank (UST)</u>

According to the NJDEP's correspondence dated December 8, 1998, the UST met closure approval in March 1991. However, based on overall site contamination and "historic fill", this AOC with be considered in the final deed notice.

AOC #6 - <u>2,000-gallon Unleaded UST</u>

According to the NJDEP's correspondence dated December 9, 1998, the UST met the same closure approval as mentioned above in March 1991; however, based on overall site contamination and "historic fill", this AOC will be considered in the final deed notice.

AOC #7 - <u>UST near Corrugated Metal Shed</u>

According to IPC, Inc., this unregulated 1,000-gallon UST was removed in 1991. All sampling data was below Cleanup Criteria; however, based on overall site contamination and "historic fill", this AOC will be considered in the final deed notice.

AOC # 8 - <u>Soils Beneath the Tank Farm</u>

AL&S reviewed site conditions surrounding the above ground tank farm located along the northern portion of the subject site. Areas beneath the tank farm were sealed with concrete. Additionally, these tanks were supported by a steel structure with foundations. The concrete cap and the steel structure limit accessibility. Moreover, disturbances in the concrete and soils beneath the structures may jeopardize the stability of these tanks. Although this area was identified as a typical AOC under the Tech Regs, there has never been reported discharge of contaminates to soils. AL&S was able to gather some data and add it to the basemap (see Figure 3).

AOC #9 - Sealed Floor Drain in Metal Shed

Under a separate cover, IPC, Inc. will supply an affidavit stating that this area was always a bathroom during their occupation and no hazardous materials were stored, used, etc. in this area. No further soil investigation is warranted.

AOC #10 - Soil Staining next to the Metal Shed AGST#3

AL&S observed that the entire parking area was capped with 2 to 6 feet of concrete prior to AL&S involvement. AL&S synthesized historic site data and presented this data on Figure 3 accompanying this report. Based on the information synthesized on the basemap, a soil investigation was not warranted.

AOC #11 - Drum Storage Area

AL&S observed that the entire parking area was capped with 2 to 6 feet of concrete prior to AL&S involvement. AL&S synthesized historic site data and presented this data on Figure 3 accompanying this report. Based on the information synthesized on the basemap no soil investigation was warranted.

AOC # 12 & #13 - Northern and Southern Dry Wells

AL&S could not locate the north and south dry wells as they were filled and covered with concrete prior to AL&S involvement. AL&S synthesized historic site data and presented this data on Figure 3 accompanying this report. Based on the information synthesized on the basemap no soil investigation was warranted.

AOC #14 - Possible Septic System

Under a separate cover, IPC, Inc. will supply an affidavit stating that sanitary sewers were used throughout the historical operations of the site.

V. Historic Ground Water Remedial Investigation

As mentioned in Section II, AL&S reviewed previously published environmental reports from March 1989 through January 1996. These reports discuss groundwater investigations that identified numerous contaminants in exceedence of the NJDEP's Class II-A Groundwater Cleanup Criteria (Class II-A GCC) (See Figure 4, Historic Ground Water Sampling Location Map). After a thorough review of these documents, AL&S did not identify consistent hydraulic gradients through the site. Ground water flow through the subject property was, however, identified by EcolSciences, Inc.. Written correspondence dated September 30, 1991 from EcolSciences, Inc. to the NJDEP stated that groundwater is tidally influenced by the Passaic River and some groundwater may enter the subject site from the Hess Oil Company property to the south.

VI. Remedial Investigation – Ground Water

Sampling Event on August 12, 1999:

AL&S mobilized onsite on August 12, 1999 to monitor and sample groundwater from five (5) onsite monitoring wells (MW-2, MW-3, MW-4, MW-5, and MW – 7) as discussed in AL&S's correspondence to Mr. Bevan dated June 8, 1999. This groundwater investigation was conducted in order to confirm previous published groundwater contamination and to horizontally delineate contamination. Unfortunately, MW-5 and MW-7 were not located, being filled with or buried beneath asphalt (MW – 5 was subsequently abandoned by a licensed well driller and MW – 7 was located and redeveloped). Due to these onsite conditions, MW-1 was substituted as an up-gradient well. In addition, a groundwater sample was not collected from MW-4 due to the presence of free product.

Groundwater samples were collected from four (4) wells (MW-1, MW-2, MW-3, MW-6). These samples were transported under chain of custody to Wastex Industries, Inc., a New Jersey Certified Laboratory, and analyzed for volatile organic compounds, calibrated for xylenes with a forward library search of ten compounds (VO+10) and base neutrals with a forward library search of fifteen compounds (BN+15). Both MW-1 and MW-3 were additionally analyzed for Total Organic Content (TOC), nitrate, sulfate, sulfide, and iron-II.

As mentioned in AL&S's correspondence to the Department on September 14, 1999, results of the sampling event produced data with exceedences of the NJDEP's Class II-A Groundwater Cleanup Criteria (Class II-A GCC) for Isophorone in MW-1, Total Xylenes and Base Neutral Tentatively Identified Compounds (TIC's) in MW-2, and Volatile Organic TIC's and Base Neutral TIC's in MW-6. Sampling data for each well is summarized in Exhibit V-Summary of Volatile Organic Laboratory Results of this report. Based on the quantity of laboratory data, AL&S included the laboratory analytical results in Volume II-Exhibit II, Lab Results-August 12, 1999. The NJDEP will receive a complete copy of laboratory results as an attachment to this published report.

The result for the free product sample from MW-4 was attached and self-explanatory. Based on these results, AL&S proposed free product recovery from MW-4 on a daily basis. GJ Chemical (current operator at the site) implemented free product recovery. This daily recovery would remove a source of groundwater contamination (See Volume II-Exhibit 1, Purged Water Datasheets). AL&S also recommended additional groundwater sampling and analysis to re-evaluate the NJDEP Areas of Concern.

Sampling Event on November 12, 1999:

AL&S returned to the property on November 12, 1999 to continue delineation of groundwater contamination. AL&S mobilized to monitor and sample groundwater from five (5) onsite monitoring wells (MW-1, MW-2, MW-3, MW-4, and MW-6). Once again, a groundwater sample from MW-4 was not collected due to the presence of approximately 1"-2" of free product. Groundwater samples were collected from four (4) wells (MW-1, MW-2, MW-3, and MW-6), transported under chain of custody to Wastex Industries, Inc., and analyzed for VO+10, calibrated for xylenes, BN+15, TOC, nitrate, sulfate, sulfide, and iron-II.

Results of the sampling event on November 12, 1999 identified NJDEP's Class II-A GCC exceedences of Total xylenes in MW-2, Bis(2-ethlhexl)phthalate in MW-2 and MW-6, Benzene in MW-6, and Base Neutrals TIC's in MW-6 (See Exhibit V-Summary of Volatile Organic Laboratory Results & Volume II-Exhibit III, Laboratory Results-November 12, 1999). Based on meeting with Mr. Wayne Bevan of the NJDEP-BEECRA on December 14, 1999, Mr. Bevan recommended additional investigation of the groundwater, to assess potential impacts to the Passaic River. To address this issue, Mr. Bevan and AL&S agreed that three (3) groundwater monitoring wells be installed between the concrete retaining wall and the Passaic River.

Sampling Event on March 20, 21, and April 18, 2000:

In response to the NJDEP correspondence dated February 10, 2000, Horizon Environmental Drilling and Excavating, Inc., a New Jersey licensed well installer, under supervision of AL&S, installed three (3) monitoring wells along the Passaic River on March 20 and 21, 2000. Horizon also properly abandoned former monitoring well MW-5 and redeveloped monitoring well MW-7. After approval from Mr. Stephen E. Maybury, Chief, NJDEP-BEECRA on April 18, 2000, AL&S mobilized and sampled the 3 monitoring wells, AL&S-1 (MW-9: 2656685), AL&S-2 (MW-10:2656686), and AL&S-3 (MW-11:2656687). Groundwater samples were collected from the three (3) wells (AL&S-1, AL&S-2, and AL&S-3), transported under chain of custody to Wastex Industries, Inc., and analyzed for VO+15, calibrated for xylenes, base neutrals and acid with a forward library search of twenty-five compounds (BNA+25), EPA Priority Pollutant Metals (PPM), pesticides, phenols, cyanide and PCB's.

After laboratory results were published, a telephone consultation with Mr. Mike Brogan, President of Horizon Environmental Drilling and Excavating, Inc., AL&S noted that the published laboratory sampling results were mislabeled on the chain of custody. AL&S determined that the groundwater sampled from AL&S-1 (MW-9: 2656685) is actually AL&S-3 (MW-9:2656685) and AL&S-3 (MW-11:2656687) is actually AL&S-1 (MW-11: 2656687). AL&S-2 (MW-10:2656686) was labeled correctly.

Results of the sampling event on April 18, 2000 identified NJDEP's Class II-A GCC exceedences of arsenic, lead, and benzene in both AL&S-1 and AL&S-2. In addition, results from MW-1 for antimony, cadmium, total chromium, vinyl chloride, and 1,1 dichloroethane were in exceedence of the Class II-A (See Exhibit V, Summary of Volatile Organic Laboratory Results & Volume II-Exhibit IV, Laboratory Results-April 18, 2000). After review of this sampling round, AL&S interviewed Mr. Joseph Masci of IPC, Inc. to discuss these sampling results. Mr. Masci stated that several compounds in reported in lab results were never used, stored, or transported on the property (additional data that supports that historic fill was contaminated). A statement of chemical uses by GJ Chemical was provided to AL&S by their attorney (see Exhibit III).

Based on the above referenced information, AL&S contacted Mr. Bevan of the NJDEP-BEECRA by telephone to confer sampling results on May 23, 2000 and confirmed this conversation via written correspondence dated May 24, 2000. Mr. Bevan stated that these results might be evidence of an area wide problem due to "historic fill". In conclusion of the teleconsultation, AL&S proposed an additional round of groundwater sampling for the entire site.

Sampling Event on June 7, 2000:

AL&S returned to the subject site, Inc. on June 7, 2000 to continue to monitor existing groundwater conditions. AL&S mobilized to sample groundwater from the on-site ten (10) monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-6, MW-7, MW-8, AL&S-1, AL&S-2, and AL&S-3), one piezometer sample (PZ-3, installed by others), and a nearby up-gradient stream. Twelve (12) groundwater samples were collected and transported under chain of custody to Accredited Laboratories, Inc., a New Jersey Certified Laboratory, and ultimately analyzed for VO+10, calibrated for xylenes, methyl t-butyl ether (MTBE), and t-butyl alcohol (TBA) (See Exhibit IV, Field Sampling Datasheets). AL&S was able to obtain a sample from MW-4 due to the effectiveness of the constant oil recovery process and that no free product was observed on the date of sampling.

Analytical data from June 7, 2000 identified numerous compounds in exceedence of the Class II-A GCC from MW-4, MW-6, and MW-7. Laboratory results also identified exceedence of TBA in MW-1 and MW-2 and MTBE in PZ-3. AL&S noted elevated levels which are in exceedence of the NJDEP's Class II-A GCC of benzene and vinyl chloride in MW-8, cis- 1,2-Dichloroethene in AL&S-2 and AL&S-3, and trichloroethene (TCE) in AL&S-2. The up-gradient steam sample produced results below Class II-A GCC (See Exhibit V, Summary of Volatile Organic Laboratory Results & Volume II-Exhibit V, Laboratory Results-June 7, 2000).

AL&S reviewed the field sampling datasheets and the published well logs, noting that tidal influence is possible on-site. In addition, AL&S notes that excessive groundwater contamination is limited to MW-4, MW-6, and MW-7. Limited contamination was observed in the recently installed monitoring wells AL&S-1 through AL&S-3, exhibiting that the influence of contamination is restricted to the center of the site. Similar results were recorded in the remaining four (4) monitoring wells onsite.

VII. Remedial Action Workplan – Soil

Throughout the inspection of onsite conditions, AL&S observed that the entire property was capped with at least two (2) feet of concrete that was in good condition. AL&S noted that facility operations were extremely active with various commercial vehicles entering and exiting the subject site.

In addition, AL&S reviewed site conditions surrounding the above ground tank farm (AOC #8) located along the eastern portion of the subject site. Areas beneath the tank farm were sealed with concrete. Additionally, these tanks are supported by a steel structure anchored with a concrete foundation. The concrete cap and the steel structure limit accessibility. Moreover, disturbances in the concrete and soils beneath the structures may jeopardize the stability and integrity of these tanks. Although this area was identified as a typical AOC under the Tech Regs, there has never been reported discharge of contaminates to soils.

Considering these observations, AL&S met with Mr. Wayne Bevan of the NJDEP-BEECRA on July 26, 2000 to discuss possible remedial actions. AL&S and Mr. Bevan discussed options of Soil Gas Vapor Extraction (SGVE), soil flushing, and soil excavation. Soil excavation proved to be the most plausible; however, many problems arise when considering this option. First, the NJDEP has stated that the "historic fill" is present onsite. Excavation of this fill should not be the responsibility of the current property owner. Secondly, soils are not of a homogeneous composition (i.e. sand). Third, the access to subsurface soil for contaminant delineation purposes will be extremely difficult due to the aforementioned concrete cap. Removal and the subsequent replacement of the cap would be done at an extremely high cost. Finally, excavating the soil on-site would cause facility operations to cease, therefore shutting down the needed distribution of industrial chemicals to off site locations. Moreover, evidence gathered to date would suggest that historic fill is the primary source of contamination.

Based on these reported observations, the inaccessibility of the tank farm, and the extensive expense that the owner would accrue due to possible soil excavation, all parties, including the NJDEP, conceded that the subsurface soil on site is above the NJDEP's published

Residential Direct Contact Soil Cleanup Criteria (RDCSCC). Based on the above information, AL&S proposes to leave soils in place as there is an effective concrete cap for engineering controls. AL&S proposes a deed notice for institutional controls.

VIII. Remedial Action Workplan - Groundwater

Conceding that the subsurface soil in contaminated (historic fill), AL&S is implementing a Remedial Action Workplan (RAW) for groundwater at the site. AL&S is recommending continual monitoring of the onsite aquifer, with a focus on potential impacts to the Passaic River. Monitoring should occur on a quarterly basis for the first two years. Based on results, monitoring may be reduced to annual monitoring. AL&S also recommends the daily purging of MW – 4 with purged water containerized and properly disposed of. Purging this water will remove intermittent floating product and ground water exhibiting the highest concentrations of contaminants. The daily purging of this well has been ongoing and appears to have had a positive impact on the observations of free product.

Rationale supporting this remedial action is based on the following issues:

1) The site contains historic fill, of which some may have contained hazardous materials. This was evidenced by the technical report referenced in this report and identification of some chemicals that were never used on the property. Ground water contamination is regional and the NJDEP should consider this when establishing the site specific cleanup criteria.

2) Due to the presence of significant underground utilities (>30" gas mains, high voltage electric conduits and water lines) AL&S was unable to characterize ground water quality entering the property. However, it appears clear that over 107 reported sites having ground water contamination have been reported to the NJDEP. Some of these sites are within the area of Industrial Petrochemical, therefore, it is probable that off-site groundwater contamination impacts this site. The identification of substances never used at the property is supportive evidence of this hypothesis.

3) AL&S has demonstrated through several ground water sampling events that contaminants appears to be centered on the property. Results from AL&S wells, adjacent to the river, demonstrate a significant reduction in contaminant concentrations.

The NJDEP has requested that AL&S evaluate the vertical extent of ground water contamination at the property. AL&S disagrees this type of investigation because of the well documented nature of historic fill in the area being a long term source of ground water contamination. Moreover, there are no potable well receptors within the immediate area. To further address this particular issue, AL&S retained Ms. Carol Graf (Certified Professional Geologist #6429). According to Ms. Graf's review of site conditions, understanding of the historic use of this area and her professional opinion, she does not recommend the vertical delineation of ground water contaminants. Her report is included within this RI/RAW as Exhibit III.

IX. Conclusions

AL&S was retained to address outstanding soil and ground water issues related to the incomplete remedial investigation of the property. Over the past two years AL&S has performed services to address many items reported in a deficiency letter published by the NJDEP in December 1998. Our involvement included meetings with NJDEP representatives to review interim remedial investigation results and request feedback from NJDEP.

Based on our investigation it is clear that the site is located on an area of historic fill, some of which was contaminated by hazardous substances. This is well documented by historic aerial photographs, NJDEP's knowledge of many other contaminated sites in the area, the technical report published by Zdepski, Ms. Graf's opinion, soil and ground water testing results, and G.J Chemical's statement that their company never used many of the contaminants identified in the remedial investigation. Because historic fill is widespread through this area of Newark the remediation of soils and ground water would appear to be an exercise in futility. As long as the contaminant source is present in the area (onsite and offsite) there will be a continued impact to ground water quality. Fortunately, there are no potable well receptors within the area and the only apparent receptor is the Passaic River.

AL&S has monitored ground water quality throughout the site over two years. Our recent investigation focused on whether or not contaminated ground water was impacting the Passaic River. The results of AL&S' investigation suggest that elevated concentrations of contaminants are centrally located on the site and there is a documented reduction in contaminant concentration in wells adjacent to the river. The monitoring well reporting the highest concentration of contaminants was well MW – 4, including intermittent reports of free product. This well is located within 100 feet of Doremus Avenue.

Based on the above site history and remedial investigation results it appears that the continued pumping of monitoring well MW – 4 is warranted. AL&S also recommends the continued monitoring of ground water on a quarterly basis for the selected remedial action workplan. This quarterly monitoring will assess the potential impacts to the Passaic River. At this time it does not appear that significant quantities of hazardous substances are entering the river. If concentrations become elevated then the NJDEP may impose stricter remedial action requirements to control contaminants on the site.

AL&S proposes no remedial action for contaminated historic fill beneath the property. The implementation of the concrete cap and deed notice will function as a form of engineering and institutional controls, respectively. Continued monitoring of the property will validate the aforementioned selection of the remedial action.

Based on all the information and recommendations contained herein, AL&S request approval of the aforementioned remedial action workplan.

X. Certification

This report was prepared using published information and interviews with knowledgeable individuals. AL&S relied on this information as being accurate. If any additional information becomes available that may alter the opinions stated herein, AL&S reserves the right to issue an addendum report or revise this report accordingly.

XI. References

1. Hagstrom Roadway Map, County of Essex, 1995.
2. Sanborn Map Report. Environmental Data Resources, Inc., 2000. Inquiry # 519320.2s, Pertaining to IPC, Inc., 128 Doremus Avenue, Newark, NJ.
3. U.S.G.S., 1989, *Elizabeth and Jersey City Quadrangle*, N.J., Topographical Map.
4. NJDEP - Historic Aerial Photographs, County of Essex, City of Newark, NJ.
5. Carol Graf letter dated October 3, 2000.
6. Zdepski, J. Mark , undated, *Industrial Development, Urban Land – Use Practices and Resulting Groundwater Contamination, Newark, New Jersey.*
7. G.J. Chemical correspondence dated September 26, 2000 and October 12, 2000.

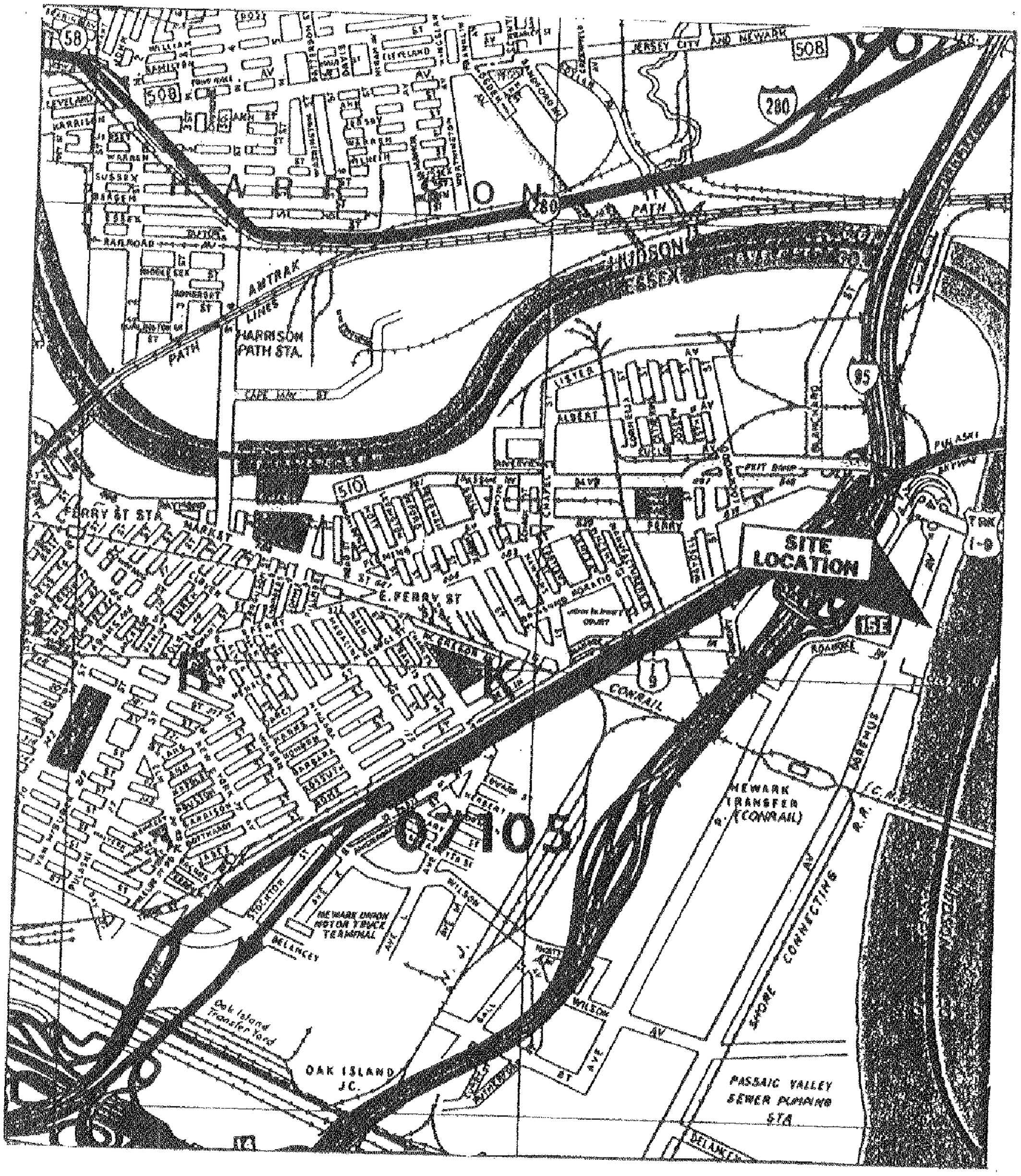

FIGURE 1

COUNTY ROADWAY MAP

ESSEX COUNTY HAGSTROM

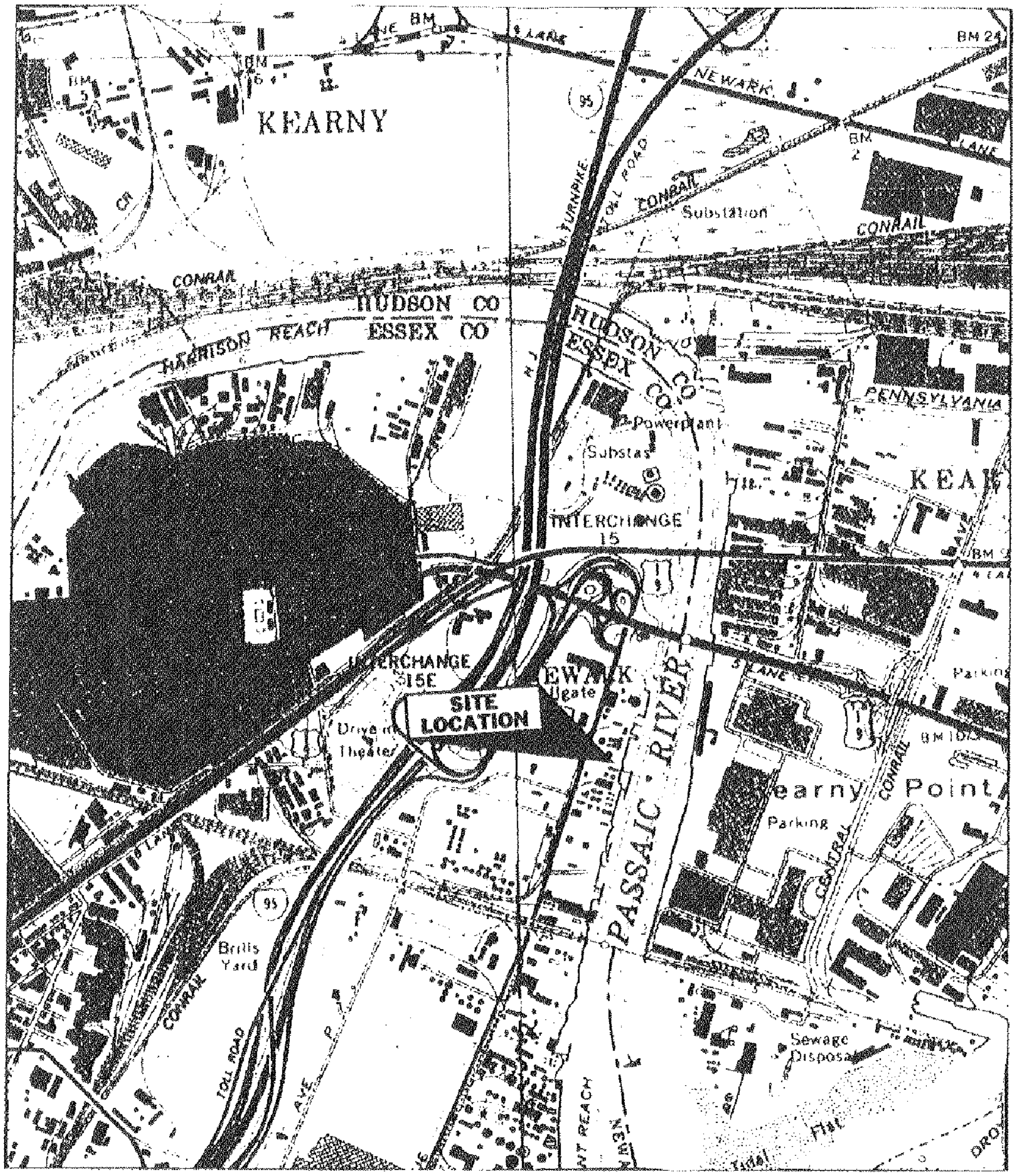

FIGURE 2

ELIZABETH and JERSEY CITY QUADRANGLES
U.S. GEOLOGICAL SURVEY MAP

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ENVIRON

May 27, 2005

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Federal Express

Mr. Andrew Dillman
New Jersey Department of Environmental Protection
Bureau of Environmental Evaluation and Cleanup Responsibility Assessment
401 East State Street, 5th floor
P.O. Box 427
Trenton, NJ 08625-0427

Re: Remedial Investigation Report and Supplemental Remedial Investigation Work Plan
Industrial Petrochemicals, Inc. (IPC)
Newark, Essex County, New Jersey
ISRA Case No. E86317

Dear Mr. Dillman:

Enclosed are three copies of a Remedial Investigation Report and Supplemental Remedial Investigation Work Plan presenting analytical results of recent additional soil and ground water sampling completed at the above-captioned site. In addition, the enclosed report proposes a conceptual remedial approach to address soil and ground water contamination, as well as recommending certain additional actions, including delineation soil and ground water sampling, that are considered necessary to support the remedial program and satisfy New Jersey Department of Environmental Protection (NJDEP) requirements. Please note that the version of this report to which the original of this cover letter is attached contains the Electronic Data Deliverables (EDDs) for the recent sampling program. Last, a complete set of laboratory data reports is being provided in paper form, per your request. The 16 specific data reports included are listed on Table 3 of the enclosed report.

Please do not hesitate to contact us with any questions or comments you have regarding the information presented in this report.

Sincerely,

Thomas V. Fusillo
Principal

William Kraft

William D. Kraft, III
Manager

TVF\WDK:srh
02-12799A:PRIN_WP\21720v1.DOC

cc: R. Brightman, Esq.
F. Hackmann, Esq.
M. Wright, Jr., Esq.

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REMEDIAL INVESTIGATION REPORT AND SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN FOR INDUSTRIAL PETROCHEMICALS, INC.

NEWARK, NEW JERSEY

ISRA Case No. E86317

Prepared for

New Jersey Department of Environmental Protection (NJDEP)

Prepared by

ENVIRON International Corporation
Princeton, New Jersey

May 2005
Project No. 02-12799A

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EXECUTIVE SUMMARY

On behalf of the Estate of Henry J. Borda, ENVIRON International Corporation implemented a remedial investigation in January and February 2005 at the former Industrial Petrochemicals, Inc. site located at 128 Doremus Avenue in Newark, Essex County, New Jersey. The scope of work consisted of collection of soil samples from multiple depths at 23 soil borings for total petroleum hydrocarbon (TPHC) and volatile organic compound (VOC) analyses, installation of eight monitoring wells in three saturated intervals, and sampling of all 18 on-site wells (ten existing wells and eight newly installed wells) for VOCs. This sampling program confirmed the primary suites of contaminants, refined knowledge regarding the extent of soil and shallow ground water impacts, and provided a better understanding of the degree of deeper ground water contamination.

For example, the soil sampling identified the same two primary suites of VOC contamination detected in prior sampling programs, including benzene, toluene, ethylbenzene and xylenes (BTEX) and chlorinated VOCs. The sampling also delineated the areas of the most elevated VOC concentrations, confirming that such contamination is limited to two areas at the site proximate to the aboveground storage tank farm near borings B-14, B-18 and B18-6. TPHC and VOC impacts identified at other locations were comparable to those for which the New Jersey Department of Environmental Protection (NJDEP) previously agreed could be addressed via a Deed Notice *in lieu* of active remediation.

The recent remedial investigation also supplemented existing ground water data, confirming that BTEX and chlorinated VOCs are the primary contaminants. In fact, the shallow monitoring well results were quite similar to those obtained in prior rounds, indicating that the highest VOC concentrations, several orders of magnitude above the Ground Water Quality Standards, are present in the shallow zone at MW7, directly downgradient of the most contaminated soils, with lesser VOC impacts evident downgradient of the tank farm at MW8 in the shallow zone and ALS3D in the intermediate zone.

Intermediate and deep ground water quality has also been affected by these VOCs, but to a lesser degree, suggesting that although there may have been some vertical migration of contaminants from the shallow zone, VOC concentrations in the intermediate and deep intervals generally would not warrant active remediation, except at intermediate zone well ALS3D. In addition, it appears that some deeper VOC impacts may result in part from off-site, upgradient sources.

Based on the soil and ground water sampling results, ENVIRON believes that sufficient data have been generated to begin an evaluation of active remedial alternatives; however, additional soil and ground water investigations are warranted to enable the final evaluation, selection, and design of the remedial approach. The overall approach of the remedial program would be to address soils near borings B-14, B-18 and B18-6, which are considered to be acting as sources of ongoing shallow ground water contamination. Shallow and intermediate-zone ground water in the area of MW7 and ALS3D would be addressed to protect surface water quality; deep ground water would not warrant such cleanup. Although an evaluation of remedial technologies has not yet been completed, to the extent feasible, the remedies selected would be *in situ* approaches to minimize site disturbance. Additional soil or ground water sampling is proposed to support development the remedial design and to further satisfy any NJDEP requirements.

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I. INTRODUCTION

A. Purpose and Scope

This Remedial Investigation (RI) Report was prepared to present the results of recent environmental investigations conducted at the Industrial Petrochemicals, Inc. ("IPC") property located at 128 Doremus Avenue in Newark, Essex County, New Jersey (the "Site"). These sampling activities were completed to satisfy certain New Jersey Department of Environmental Protection (NJDEP) requirements related to the proceeding under Industrial Site Recovery Act (ISRA) Case No. E86317. Specifically, the recent phase of the ongoing RI was conducted by ENVIRON International Corporation (ENVIRON) on behalf of the Estate of Henry J. Borda (the "Borda Estate"), the current property owner[1], to complete sampling programs that the NJDEP had previously approved, to address NJDEP recommendations for further actions, and to collect additional data considered necessary as part of evaluating the extent of active remediation that could ultimately be necessary.

The RI discussed herein was conducted in accordance with the *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E) (the "Tech Regs"), and with the scope of work proposed in ENVIRON's December 23, 2004 revised *Remedial Investigation Work Plan* (RIWP), which addressed comments and recommendations provided in the November 3, 2004 comment letter from the New Jersey Department of Environmental Protection (NJDEP) regarding the September 30, 2004 RIWP. The NJDEP approved the revised RIWP in its January 27, 2005 letter.

The remainder of this section provides pertinent information regarding the Site setting and history of industrial operations, as well as a summary of prior investigations completed pursuant to ISRA and ISRA's predecessor statute, the Environmental Cleanup Responsibility Act (ECRA). Section II of this report discusses the areas of concern (AOCs) at the Site and the historical and recent remedial investigation findings in those AOCs, including hydrogeological information. A Baseline Ecological Evaluation (BEE) is provided in Section III. Conclusions and recommendations for further action, including targeted soil and ground water remediation

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[1] This RI Report was prepared by ENVIRON on behalf of the Borda Estate pursuant to an RIWP previously approved by the NJDEP. The RI was conducted by the Borda Estate, in part, in an effort to foster settlement of the current litigation, styled Masci Doremus Enterprises Inc., et al. v. The Estate of Henry P. Borda, et al., (the "Litigation") concerning the Site. By preparing and submitting this report and recommending certain remedial actions, the Borda Estate is not admitting any liability with respect to the Site or its remediation. Several of the parties to the Litigation were invited to participate in the review and comment on the work plan and this report. To that end, certain revisions have been made, including adding sampling points and performing supplemental investigation measures at the request of at least one of the parties. The willingness of the Estate to participate in the recent phase of the ongoing remedial investigation or its preparation of this report shall not serve to prejudice the Estate relating to any potential liability for or allocation of response costs related to the Site or the Litigation.

and a supplemental RIWP proposing additional delineation sampling and confirmatory ground water monitoring, are included in Section IV.

B. Site Description

1. Site Setting

The Site, located at 128 Doremus Avenue, Newark, Essex County, New Jersey, covers approximately two acres on the eastern side of the road. A site location map is provided as Figure 1 and a layout of the facility is provided on Plate 1. The property includes two one-story office buildings, a three-bay truck washing station, an aboveground storage tank farm and a metal canopied product transfer and storage area. The property is entirely paved, primarily with concrete, with automobile parking adjacent to the southern office building. The area surrounding the Site is industrial, with a former Hess Oil Company petroleum storage depot located to the south and an active Getty Oil Company storage facility located to the north. A scrap and vehicle storage yard is located beyond Doremus Avenue to the west. The Passaic River forms the eastern side boundary.

2. Site History and Industrial Operations

The Site is located in what had been known as the Newark Meadows, a locally extensive marshland that was systematically filled beginning in the mid-19th century. In general, fill material used in this portion of the former Newark Meadows consisted of cinders and sand, with some construction debris and other materials, from New York City and other urban areas. Sampling at this and other nearby sites has shown that the historic fill has scattered concentrations of certain heavy metals and polycyclic aromatic hydrocarbons (PAHs) slightly above NJDEP soil cleanup criteria and within the range of constituent concentrations specified in Table 4-2 of the Tech Regs. Available information, including prior reports prepared for this ISRA matter and historical maps, suggests that the Site was filled in the 1920s or 1930s.

The Site was initially developed by Mexican Oil Co. for bulk petroleum storage prior to 1931. In approximately 1933-4, American Oil Company took ownership of the property, apparently continuing bulk petroleum storage operations. Prior to owning the Site, Mr. Henry Borda reportedly leased the Site in or about 1955 for solvent storage, packaging and distribution, operating as IPC. Mr. Borda later acquired the property in March 1976, continuing IPC's operations until 1983 when he sold the business to Vitusa Corporation, retaining ownership of the property. Vitusa Corporation operated the Site as IPC for similar solvent handling operations until 1986, when GJ Chemical took over the operations. GJ Chemical also operates the Site as a solvent storage, blending and distribution facility. ECRA activities were reportedly initiated following the 1986 exercise of the option to purchase the property by Vitusa. transaction by which GJ Chemical took over Site operations, ECRA activities were initiated. The subject matter is now assigned ISRA Case E86317. Mr. Borda died in April 2003 and as such, title to the property is nominally in the Estate of Henry Borda ("the Borda Estate"). GJ Chemical continues to operate the Site.

C. Previous Site Investigations

Storch Engineers conducted the first soil sampling at the Site in January 1985 and prepared the General Information Submission and Site Evaluation Submission for IPC in 1986. Recon Systems, Inc. continued the remedial investigation work in 1989, implementing a sampling program that included the installation of three monitoring wells, MW1-MW3, and the completion of 19 soil borings, B1 through B19. In 1990, EcolSciences installed five additional monitoring wells, MW4 through MW8; nine soil borings, EB-19 through EB-27; and several borings around two abandoned USTs immediately north of the office building. Air, Land & Sea Environmental Management Services, Inc. (ALS) began ground water monitoring in 1999. ALS also installed four more wells, including ALS-1, ALS-2, ALS-3 and ALS-3D. In April 2003, ALS completed a remedial investigation that included ground water monitoring and delineation soil sampling around contaminated points identified in the previous investigations.

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II. REMEDIAL INVESTIGATION RESULTS

A. Overview

A total of 14 areas of concern (AOCs) have been designated at the Site. Based on the analytical results of prior phases of the remedial investigation, ENVIRON and the Borda Estate prepared a September 2004 *Remedial Investigation Work Plan* (RIWP) proposing installation of six additional monitoring wells to further evaluate ground water quality and completion of fifteen additional soil borings to delineate the extent of contaminated soils in seven of the previously identified AOCs and one additional AOC identified by ENVIRON. The NJDEP provided its comments to that RIWP in its November 3, 2004 letter; the RIWP was revised accordingly, as well as to incorporate additional sampling recommended by JMZ Geology, Inc., consultants to GJ Chemical, the current site operator. The expanded scope of work, presented in the December 23, 2004 RIWP, included eight additional monitoring wells and 25 additional borings. The NJDEP approved that plan in its January 27, 2005 letter.

Given that the Site is capped by 0.5 to 3 feet of concrete, such that direct contact to underlying soils is highly unlikely, the focus of this remedial investigation was to identify areas where VOC concentrations in soils likely impact ground water. In addition, this approach was consistent with prior NJDEP comments regarding soil quality at the Site. Specifically, the NJDEP indicated in its December 24, 2003 letter that soils with TPHCs above 10,000 ppm and with relatively minor VOC exceedances could be included in a site-wide Deed Notice, rather than require active remediation, on the condition that further delineation determines the volume of impacted soils. The NJDEP has recognized that remediation to address each exceedance of the SCC is not feasible or practicable given the number of physical obstructions on-site and the thickness of the concrete cap. Because the ground water in the area is not used, the primary issue with respect to ground water contamination is the potential discharge of contaminants from ground water to the Passaic River.

Soil and ground water analytical results of the RI program are provided below, following a review of the criteria ENVIRON used to evaluate the data. Soils data are described by individual AOC. Ground water data are reviewed by saturated interval (i.e., shallow, intermediate and deep), with a discussion of site geology and hydrogeology also included.

B. Applicable NJDEP Soil Cleanup Criteria and Ground Water Quality Standards

ENVIRON compared soil concentrations to the NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) for volatile organic compounds (VOC), the most stringent SCC for those constituents, with the exception of vinyl chloride for which the unrestricted use SCC was most stringent. In addition, ENVIRON compared TPHC results to the 10,000-ppm criterion for total organic contaminants. Note that these SCC were used to perform an initial screening evaluation of the data to identify the areas in which the NJDEP might require additional action, and the SCC do not necessarily represent cleanup standards or indicia for and extent of further remedial actions. The NJDEP Class II-A Ground Water Quality Criteria were used in ENVIRON's evaluation of VOC concentrations in ground water at the Site, in accordance with NJDEP requirements. However, although these criteria were developed based to be protective of ground water for ultimate drinking water use, as previously discussed, there is no known ground water use at the Site or in the site vicinity. Further, the bedrock aquifer in the area of Newark near the Passaic River has been well documented as having significant salt-water intrusion (Herpers and Barksdale, 1951, and Nichols, 1968).

C. Geology and Hydrogeology

1. Geology

Based on field observations made during ENVIRON's remedial investigation, supplemented by information previously gathered for the Site during prior phases of investigation, the Site is covered by 0.5 to 3.0 feet (and possibly more) of mesh-reinforced concrete. The concrete is underlain by historic fill consisting of cinders, concrete, gravel, wood, brick, glass and metal fragments that extends to a maximum depth of 10 feet. Gray clay with relatively minor occurrences of organic material (which at certain locations are indicative of the "meadow mat" or former native swamp bed) underlies the fill, the clay extending to approximately 20 feet below grade. The abundance of organic material decreases with depth.

Alternating layers of gray fine sand and gray clay, approximately 1 to 3 feet in thickness, extend to approximately 30 feet below grade. This predominantly clayey 30-foot sequence underlying the historic fill was considered to be a confining unit for purposes of the ground water investigation discussed herein. Beneath this clay unit is a layer of gray sand and gravel that coarsens downward from fine sand at approximately 30 feet below grade to fine gravel at 45 to 46 feet below grade. This unit is primarily sand, however, with the gravel unit present over an interval of only approximately 1 foot. Alternating layers of red silty clay and fine sand extend from 46 feet to at least 62 feet below ground surface, the maximum sampling depth during the recent RI.

Cross-sections depicting the site geology are provided in Figure 2A and 2B. In developing these cross-sections, ENVIRON selected two transects, generally in the north-south and east-west directions, to capture observations at all of the deepest wells. As these cross-sections indicate, the predominantly clay and sand units appear to be continuous across the Site.

2. Hydrogeology

Synoptic rounds of ground water elevations were measured at all on-site monitoring wells on February 7 and March 18, 2005 (i.e., the measurements were collected over a timeframe of 1 to 1.5 hours). These ground water elevations are provided on Table 1. Based on its review of these data, certain February 2005 elevations appear anomalously high, particularly MW2 and ALS3D located in the southeastern property corner, both compared to other elevations obtained at that time, as well as relative to elevations collected from those wells in March 2005. Further, during the March 2005 measurement event, ENVIRON observed water levels in certain wells rising after the well cap was removed and thus, allowed the wells to equilibrate before water level measurements were collected. Because this procedure was not followed in February 2005, the elevations taken at that time have not been used to construct water table maps. As such, ENVIRON has evaluated the ground water flow regime at the Site using the March 2005 data only.

Ground water at the Site occurs between approximately 2.5 and 7.5 feet bgs. Ground water elevation measurements indicate that shallow ground water flow in the northern portion of the property is to the southeast, towards the Passaic River, as shown on Figure 3. In the southern portion of the property, shallow flow is to the north, with mounding in the southeast corner of the Site at MW2. This mounding is potentially related to standing water ENVIRON observed in this portion of the Site on several occasions between December 2004 and March 2005; a concrete spill collection sump is located within the ponded area. The consistent presence of standing water appears to have caused a mounded ground water condition. This mounded condition is also evident on historical ground water contour maps ENVIRON has reviewed.

This interpretation of shallow ground water flow does not incorporate an evaluation of the degree of any tidal influence on the ground water elevations. Based on previous investigations conducted at the Site, there appears to be a tidal influence on the shallow ground water in the northeastern corner of the site. Specifically, Recon Systems, Inc.

TABLE 1
Ground Water Elevations – February and March 2005
Industrial Petrochemicals, Inc., Newark, New Jersey

Well	Well Depth (Feet bgs)	Elevation (Feet AMSL)	February 7, 2005 Data			March 22, 2005 Data		
			Depth to Water	Ground Water Elevation	Vertical Gradient	Depth to Water	Ground Water Elevation	Vertical Gradient
MW1	12.0		NA			NA		
MW1D	40.0	8.02	5.42	2.60		5.34	2.68	
MW1XD	60.0	7.87	5.09	2.78	0.01	5.20	2.67	-0.0005
MW2	11.5	9.80	3.60	6.20		5.19	4.61	
MW2XD	62.0	6.19	3.15	3.04	-0.06	3.50	2.69	-0.04
MW3	11.5	9.92	6.92	3.00		6.92	3.00	
MW3XD	57.0	5.80	3.32	2.48	-0.01	3.42	2.38	-0.01
MW4	6.1	8.03	3.92	4.11		3.70	4.33	
MW4D	40.0	7.48	4.83	2.65	-0.04	4.76	2.72	-0.05
MW6	6.8	6.20	3.10	3.10		2.76	3.44	
MW6D	38.5	5.46	2.68	2.78	-0.01	2.79	2.67	-0.02
MW7	6.5	10.77	7.57	3.20		7.58	3.19	
MW7D	40.0	8.24	5.70	2.54	-0.02	5.68	2.56	-0.02
MW8	11.6	10.69	7.71	2.98		7.63	3.06	
MW9	7.0	7.37	3.72	3.65		3.28	4.09	
ALS1	11.0	9.96	7.21	2.75		7.09	2.87	
ALS2	12.0	10.87	8.07	2.80		7.87	3.00	
ALS3	12.0	10.19	7.28	2.91		7.16	3.03	
ALS3D	30.0	7.00	2.03	4.97	-0.07	4.96	2.04	-0.14

Note:
Vertical gradient calculated as follows: (Deeper ground water elevation – shallow ground water elevation)/(Deeper well depth - shallow well depth)

(Recon) completed a 24-hour tidal study, as reported in its April 20, 1990 *Results of Implementation of Revised Sampling and Analysis Plan*. In that report, Recon noted that there was a tidal influence at MW3 (approximately +/- 1.0' to 1.2') but none at MW1 and MW2. Similarly, as summarized in its September 1991 report, following installation of five additional monitoring wells and three piezometers, EcolSciences, Inc. completed a 12-hour ground water elevation study and found tidal fluctuations only at PZ-3, MW3 and MW8 (maximum fluctuations of 0.8' to 1.0'). Recon and EcolSciences both attributed the tidal fluctuations to a former tidal channel/inlet in the northeastern portion of the property that had been filled during site expansion. Recon noted that the area was filled with coarser material than the rest of the site. In order to further assess ground water flow and tidal influences at the site, the installation of additional monitoring wells and the completion of an appropriate tidal study are proposed as part of the next phase of work.

In the intermediate water bearing zone, ground water appears to flow to the southeast towards the Passaic River (see Figure 4). Ground water flow in the deep water bearing zone appears to be to the northeast, as shown on Figure 5, based on elevations in the three wells screened in that zone. Interpretations of ground water flow in the intermediate and deeper zones are preliminary in light of the number of wells screened in those zones, as well as the fact that an evaluation has not yet been completed of the possible tidal effects in the intermediate and deep saturated intervals. To further assess potential tidal influences on flow at the site, a tidal study in the intermediate and deep zones is proposed in Section IV.

ENVIRON also evaluated the vertical hydraulic gradient. The recent measurements from the six well clusters show a consistent downward vertical gradient between each shallow-intermediate, intermediate-deep and shallow-deep well pair. As evident from the elevations provided in Table 1, the steepest vertical gradient was evident at the MW2/ALS3D/MW2XD well cluster, potentially resulting in part from any mounding caused by standing water frequently present near the spill collection sump in that area.

D. Areas of Concern Requiring No Further Action (NFA)

In its December 24, 2003 letter, the NJDEP approved a status of no further action (NFA) for five AOCs (3, 6, 7, 9 and 14), in general agreeing that concentrations of PAHs and certain metals identified above soil cleanup criteria in these AOCs were attributable to regional historic fill and therefore require NFA.

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E. Remedial Investigation Activities in Areas Requiring Additional Delineation

1. Overview of Sampling Program and Methodologies

The RI program was completed between January 5 and February 25, 2005. Between January 5 and 20, 2005, Advanced Drilling, Inc. (Advanced Drilling) of Pittstown, New Jersey installed the monitoring wells under the supervision of an ENVIRON geologist. Advanced Drilling used a GEFCO skid-mounted drill rig for the locations beneath the metal canopy given the limited overhead clearance and a GEFCO truck-mounted rig at the other locations. The shallow monitoring wells were installed using hollow-stem auger techniques whereas the deeper, double-cased wells were installed using mud rotary methods. Further details regarding monitoring well construction is provided later in this section.

Soil borings were completed between January 21 and February 6, 2005 by Advanced Drilling generally using the drill rigs noted above. The actual sampling locations, depths and analyses are provided on Table 2. At each soil boring, continuous soil cores were collected with split-spoon samplers. Soil samples at certain locations not accessible to the drill rigs (e.g., within the tank farm) were collected with a jackhammer that was used to drive a split-spoon sampler or 4-foot macrocore sampling device to the appropriate depths. The sampling proceeded largely as proposed, with only minor modifications required based on-site conditions. These modifications are described below under the specific AOCs. Table 2 summarizes the actual sampling locations, depths and analyses.

All downhole drilling and sampling equipment was decontaminated between uses. Downhole components, including hollow-stem auger flights and drilling rods, were decontaminated using high-pressure steam at a decontamination pad constructed near the northwestern corner of the Site. Smaller equipment, including split-spoon samplers, were decontaminated with an Alconox solution followed by a tap water rinse. All decontamination residuals, including the decontamination pad, were contained on-site in drums pending off-site disposal.

Soil boring and monitoring well logs, which provide soil classification information and field screening results, are provided in Appendix A. Monitoring well permits and Form B Location Certifications are provided in Appendix B. The location and elevation of each monitoring well was surveyed by James M. Stewart, Inc., of Philadelphia, Pennsylvania.

Samples collected during the remedial investigation were placed directly into laboratory-provided glassware and stored on ice in a cooler under appropriate chain-of-custody protocol. Samples were delivered on a daily basis to Severn Trent Laboratories (STL) of

TABLE 2
Soil and Ground Water Sampling
Industrial Petrochemicals, 128 Doremus Avenue, Newark, Essex County

Area of Concern	NJDEP Delineation Requirement	Proposed Sampling	Completed Sampling[1]/Analyses[2]
AOC 2	Confirmation of basis for sampling depths at soil borings MW4-1, MW4-2 and MW4-3. Delineation samples for TCA south of EB-25/MW4.	Two soil borings: MW4-4 and MW4-5 One shallow monitoring well: MW9	Borings MW4-4 and MW4-5 were not completed because of site conditions Ground water sample for VOC+10
AOC EB19	Delineation samples for TCA surrounding EB-19	Four soil borings: EB19-1, EB19-2, EB19-3 and EB19-4	Two soil samples for VOC+10 • **EB19-1 & EB19-2** ○ 2.0-2.5' ○ 3.5-4.0' • **EB19-3** ○ 2.0-2.5' ○ 4.0-4.5' • **EB19-4** ○ 1.5-2.0' ○ 3.5-4.0' (Deeper samples were not analyzed)
AOCs 3 and 4	Delineate VOC+10 at B-18-1 Additional investigation south of the fixed drum conveyor	Two soil borings: B18-4 and B18-5 Three soil borings: B18-6, B18-7 and B18-8	Two soil samples for VOC+10 • **B18-4** ○ 3.5-4.0' ○ 7.0-7.5' • **B18-5** ○ 3.75-4.25' ○ 7.3-7.8' Soil samples for TPHCs and VOC+10 • **B18-6** ○ 4.0-4.5' ○ 4.5-5.0' ○ 7.0-7.5 • **B18-7** ○ 3.5-4.0' ○ 7.0-7.5' • **B18-8** ○ 3.5-4.0' ○ 4.5-5.0' ○ 7.0-7.5'

TABLE 2
Soil and Ground Water Sampling
Industrial Petrochemicals, 128 Doremus Avenue, Newark, Essex County

Area of Concern	NJDEP Delineation Requirement	Proposed Sampling	Completed Sampling[1]/Analyses[2]
AOC B-6	Delineate VOC+10 at B-6 and investigate potential impacts at former stained soil location	Four soil borings: B6-1 through B6-4	Two soil samples for TPHCs and VOC+10 • **B6-1** o 2.5-3.0' o 4.5-5.0' • **B6-2** o 1.5-2.0' o 4.5-5.0' • **B6-3 & B6-4** o 3.0-3.5' o 4.5-5.0'
AOC 8	Delineate TPHCs and toluene at AOC8-8	Two soil borings: AOC8-10 and AOC8-11	Soil samples for TPHCs and VOC+10 • **AOC8-10** o 3.0-3.5' o 5.5-6.0' o 7.0-7.5' • **AOC8-11** o 3.0-3.5' o 6.75-7.25'
AOC 10	Delineate TPHCs and VOC+10 at B-14	Three soil borings: AOC8-12, AOC8-13 and AOC8-14	Three soil samples for TPHCs and VOC+10 • **AOC8-12** o 2.0-2.5' o 3.0-3.5' o 7.0-7.5' • **AOC8-13** o 0.5-1.0' o 4.0-4.5' o 7.5-8.0' • **AOC8-14** o 0.5-1.0' o 4.0-4.5' o 7.5-8.0'

TABLE 2
Soil and Ground Water Sampling
Industrial Petrochemicals, 128 Doremus Avenue, Newark, Essex County

Area of Concern	**NJDEP Delineation Requirement**	**Proposed Sampling**	**Completed Sampling[1]/Analyses[2]**
AOC 11	Delineate TPHCs at B3-4	Two soil borings: B3-5 and B3-6	One soil sample for TPHCs • **B3-5 & B3-6** o 2.5-3.0'
AOC 13	Delineate TPHCs and evaluate VOC+10 per NJDEP comments at AOC13-1N	Three soil borings: AOC13-2, AOC13-3 and AOC13-4	Soil samples for TPHCs and VOC+10 • **AOC13-2** o 2.5-3.0' o 4.0-4.5' • **AOC13-3** o 1.5-2.0' • **AOC13-4** o 2.5-3.0' o 4.0-4.5'
Ground water	Evaluate on-site and off-site sources of deeper aquifer impacts	Four double-cased monitoring wells screened from 20-30 feet: MW1D, MW4D, MW6D and MW7D	Double-cased monitoring wells MW1D, MW4D, and MW7D installed with screen from 30-40 feet. Double-cased monitoring well MW6D installed with screen from 28.5 to 38.5 feet. • Ground water sampled for VOC+10
Ground water at ALS-3D	Vertical delineation of detected VOC+10	One double-cased monitoring well screened from 40-50 feet: MW2XD[3]	Double-cased monitoring well MW2XD screened from 52.0-62.0 feet • Ground water sampled for VOC+10
Deeper ground water	Further evaluation of deeper ground water quality and flow direction	Two double-cased monitoring wells screened from 40-50 feet: MW1XD and MW3XD	Double-cased monitoring wells MW1XD and MW3XD installed with screen from 50.0-60.0 feet and 47.0 to 57.0 feet, respectively. • Ground water sampled for VOC+10

Notes:
1. Borings were completed with direct-push or hollow-stem auger techniques. This scope of sampling included the sampling that the NJDEP approved in its November 3, 2004 letter to Norris McLaughlin & Marcus, as well as additional sampling included to address recommendations made by JMZ Geology, Inc. on behalf of GJ Chemical, the current site operator. For ease of review, the additional sampling has been underscored.
2. The proposed sample depths were based on the depths of prior samples, which detected contamination requiring delineation. Sampling intervals were adjusted based on the actual thickness of concrete and the presence of subsurface obstructions encountered during the drilling program. At some locations, sampling intervals were adjusted to target intervals with field evidence of contamination or to sample the six-inch interval above the water table.
3. This well, previously numbered MW3XD, has been renumbered to be consistent with the numbering scheme for the other two "XD" wells (i.e., to include the same number as the corresponding shallow well, such as MW1 and MW1XD).

Edison, New Jersey, a New Jersey-certified laboratory, for all of the required analytical services. Soil samples were analyzed for total petroleum hydrocarbons (TPHCs) by USEPA Method 418.1 and for volatile organic compounds with a 10-compound forward library search (VOC+10) by USEPA Method 8260B. Ground water samples were analyzed for VOC+10 by USEPA Method 624. The sixteen laboratory reports prepared by STL are provided separately with this report, and are listed on Table 3. Electronic Data Deliverables are included in Appendix C and summarized soil and ground water data are provided in tables included as Appendix D.

2. Tentatively Identified Compounds

Various tentatively identified compounds (TICs) were detected in soil and ground water samples collected during the RI and generally included lighter petroleum-related constituents, primarily C6 to C11 alkanes and cycloalkanes, as well as various diethylbenzene, methylbenzene and methylnaphthalene isomers. The presence of these constituents is consistent with historical petroleum fuel storage activities, including gasoline. Given the NJDEP's prior agreement that TPHC contamination will not require active cleanup, ENVIRON proposes that concentrations of petroleum-related VOC TICs similarly not require further action. Specific information regarding the occurrence of TICs is provided in the individual discussions of AOCs provided below.

3. AOC 2 – Staining Near the Southern Truck Parking Area

a) Background

Previous soil sampling activities identified VOC concentrations at sample point EB-25 above the SCC. The compound of primary concern was 1,1,1-trichloroethane (TCA), reported at a concentration of 180 ppm. In its November 3, 2004 letter, the NJDEP acknowledged that subsequent soil sampling activities confirmed that TCA impacts were not present in nearby locations to the north, west, and east but requested further delineation sampling to the south. Accordingly, ENVIRON proposed installation of two soil borings, MW4-4 and MW4-5, to delineate the horizontal extent of TCA-impacted soils in AOC 2.

b) Remedial Investigation Results

ENVIRON attempted to complete the sampling as proposed. However, underground electric lines, the thick footer from a concrete sidewalk immediately south of the proposed locations, and limited space between the concrete sidewalk and the

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Table 3
Laboratory Reports for Remedial Investigation
Industrial Petrochemicals, Inc., Newark, New Jersey

Laboratory Report	Date
R267	January 28, 2005
R379	January 31, 2005
S226	February 11, 2005
S256	February 14, 2005
S305	February 14, 2005
S306	February 14, 2005
S360	February 15, 2005
S361	February 17, 2005
S914	February 25, 2005
S915	February 24, 2005
S948	February 24, 2005
T016	February 25, 2005
T017	February 25, 2005
T031	March 3, 2005
T067	March 2, 2005
T068	March 2, 2005

fence along the adjacent property boundary prevented completion of those borings. These locations were also inaccessible to the GEFCO skid rig and GEFCO truck-mounted rig used during the drilling program, and attempts to drive macrocores with a jackhammer were also unsuccessful given access limitations. As noted below, ground water sampling confirmed that, although TCA was detected in MW4, the past two sampling rounds have shown TCA concentrations to be below the GWQS, suggesting that significant soil contamination is not present south (upgradient) of that well. Information provided by Amerada Hess, which owns the property immediately to the south of this area, indicates that a monitoring well installed on the Hess property (Hess MW-12) immediately south from this area of the Site was not found to contain any VOCs or SVOCs at concentrations above the GWQS. In addition, soil samples collected by Amerada Hess during the installation of MW-12 were not found to contain elevated concentrations of total petroleum hydrocarbons (302 mg/kg and 509 mg/kg in two samples). Given those results, and data obtained during prior phases of soil sampling in AOC 2, ENVIRON proposes that no further characterization of soil quality is necessary in AOC 2 prior to evaluating potential remedial alternatives for this area.

4. AOC EB19 – VOC Impacted Soils Upgradient of MW7

a) Background

Soil sampling completed in 1991 identified TCA at a concentration of 200 ppm at sample point EB19, above the IGWSCC. No subsequent delineation sampling had been conducted around this point.

Accordingly, ENVIRON proposed delineation sampling to obtain the complete understanding of the extent of soil contamination at the Site needed prior to developing a comprehensive remedial approach for the Site. The specific sampling included four soil borings (EB19-1 through EB19-4) at which soil samples would be collected from 1.5-2.0 feet, the interval at which the TCA impact was identified at EB-19, and 3.5-4.0 feet. The upper samples would be analyzed for volatile organic compounds with a 10-compound forward library search (VOC+10); the deeper samples would be held and analyzed only if VOCs were detected above the SCC in the upper interval.

b) Remedial Investigation Results

On January 24, 2005, ENVIRON completed four soil borings (EB19-1 through EB19-4) as proposed. Soil boring locations are provided on Plate 2.

Soil borings were completed to a depth of 6 feet bgs. Continuous soil cores were collected at each location and field screened using a photoionization detector (PID) to identify potentially impacted zones. PID readings were less than 2.0 ppm at all locations, except for readings of 21.3 and 24.5 ppm from 2.0 to 4.0 feet at sample location EB19-2. Although a petroleum hydrocarbon-like odor was noted in soils from 4.0 to 6.0 feet at boring locations EB19-2, EB19-3 and EB19-4, no visible evidence of contamination was observed during field screening activities. Ground water was encountered between 3.5 and 4.0 feet in each boring.

Two soil samples were collected from each boring; from 1.5 to 2.0 feet and 3.5 to 4.0 feet below grade. The thickness of concrete pavement required minor modifications to the sampling intervals. Specifically, at locations EB-19-1, EB19-2 and EB19-3 the concrete was 2 feet thick such that the upper samples were collected from 2.0 to 2.5 feet. The deeper interval was sampled as proposed, except at EB19-3 where brick fragments dominated the target interval. As a result, the deeper sample at EB19-3 was collected from 4.0 to 4.5 feet. The upper samples were analyzed for VOC+10 and the lower samples placed on laboratory hold pending results from the overlying sample.

Analytical results associated with the soil sampling activities in the vicinity of soil boring EB19 are presented on Plate 2. VOC concentrations in the upper interval were below NJDEP soil clean-up criteria. As a result, the underlying samples were not analyzed.

Soil sampling activities completed around EB19 during the RI demonstrated that the lateral extent of TCA-impacted soils is limited to a small area in the immediate vicinity of EB19. Given this delineation, no further soil sampling appears warranted in this area. Nonetheless, given that at-depth soil samples in this AOC have not previously been subjected to laboratory analysis, ENVIRON proposes to complete an additional boring proximate to prior boring EB19-2, where the highest PID readings had been detected in the recent RI, to confirm the absence of targeted VOC concentrations above the SCC. Further details regarding this sampling are provided in Section IV.

5. AOC 3 & 4 – Staining Near Mixing Tank and Near Metal Shed

a) Background

Soil sampling activities completed as part of a previous investigation at the Site identified VOCs in concentrations above the IGWSCC at sample point B18, with concentrations of PCE and TCE of 1,100 ppm and 300 ppm, respectively, being the focus of concern. Delineation sampling subsequently completed at borings B18-1 through B18-3 identified VOC concentrations above RDCSCC at location B18-1. The NJDEP therefore recommended further delineation sampling west of boring B18-1. ENVIRON's RIWP outlined the completion of two delineation borings (B18-4 & B18-5) near boring B18-1, with three additional borings (B18-6 through B18-8) proposed to further evaluate the extent of VOC impacts at other locations south of the fixed drum conveyor

b) Remedial Investigation Results

Between January 26, 2005 and February 6, 2005, ENVIRON completed five soil borings (B18-4 through B18-8) to delineate the horizontal extent of VOC-impacted soils in the vicinity of boring B18 and B18-1. Soil boring locations are provided on Plate 2.

Continuous soil cores were collected to depths between 8.0 and 9.0 feet bgs. All soils were screened with a PID to identify potentially impacted zones. PID readings were generally between 50 and 200 ppm. The maximum concentration detected during field screening exceeded the PID detection limit of 2000 ppm at soil boring B18-4 between 3.0 and 5.0 feet. Petroleum hydrocarbon and solvent-like odors were noted across the length of all borings with elevated PID readings at each location, with the only visible evidence of contamination being a sheen observed from 7.0 to 8.0 feet at B18-7. Ground water was encountered at depths ranging from 3.0 to 4.5 feet.

Two soil samples were collected at B18-4, B18-5 and B18-7 and three samples were collected at B18-6 and B18-8. As proposed, samples were collected from 3.5 to 4.0 feet and 7.0 to 7.5 feet (directly above the loose clay layer), the depths of previous delineation sampling or the zones of greatest apparent contamination based on field screening. Specifically, at borings B18-4 and B18-7, samples were collected from the proposed intervals whereas alternate sampling intervals were identified at borings B18-5, B18-6 and B18-8 based on PID readings. Additionally, based on an in-field evaluation of the PID readings, ENVIRON modified the scope of work to also target the six-inch interval immediately above the water table for vertical delineation purposes. At locations B18-5 and B18-6, the highest PID readings were within that six-inch interval immediately above the water table. Samples from all borings were analyzed for VOC+10. In addition, samples from borings B18-6 through B18-8 were analyzed for TPHCs. Analytical results associated with the soil sampling activities in the vicinity of soil boring B18 and B18-1 are presented on Plate 2.

The only location without at least one VOC concentration above the IGWSCC was B18-7. Although VOCs were identified at the majority of the sampling points, this remedial investigation defined an area of elevated chlorinated VOC concentrations, and largely delineated the western extent of that impacted zone. Reported concentrations of chlorinated solvents, specifically PCE, TCE, and TCA exceeded the respective SCC by more than 1,000 times in boring B18-6, with concentrations of these constituents increasing with depth. Given this vertical distribution of contamination and the VOC concentrations in ground water at nearby shallow well MW7, the soils around B18-6 are acting as a source of shallow and intermediate zone ground water impact in the vicinity. BTEX compounds were detected at concentrations below NJDEP soil cleanup criteria except for an exceedance for toluene in sample B18-4-SS01 (610 ppm) and xylenes in sample B18-6-SS03 (290 ppm).

The remedial investigation delineated the horizontal extent of the contaminated soil to the west, as the concentrations of VOCs in samples collected at B18-7 were below the SCC. The recent data, in combination with the results from previous investigations, indicate that the source area (i.e., the VOC concentrations considered to be a source of ongoing ground water impact) around B18-6 has been fully defined. As discussed below, ENVIRON believes that this AOC should be a primary focus of further remedial activities. In addition, as discussed further in Section IV, ENVIRON believes that limited additional soil sampling is appropriate in this AOC to further confirm the understanding of the extent of soil contamination for which active remediation may be warranted.

6. AOC Surrounding Boring B-6

a) Background

In its revised RIWP, ENVIRON proposed borings B6-1 through B6-4 to delineate the extent of PCE contamination identified at boring B-6 where PCE had been detected at concentration of 38 ppm from 4.5 to 5.0 feet.

b) Remedial Investigation Results

As proposed, on February 6, 2005 ENVIRON completed four soil borings (B6-1 through B6-4), as shown on Plate 2. Continuous soil cores were collected to depths between 9.0 and 9.5 feet bgs. Ground water was encountered at depths between 2.5 and 4.75 feet bgs. All soils were screened with a PID to identify potentially impacted zones. Readings generally fell between 50 and 200 ppm, with higher readings of 1,100 ppm from 1.5 to 3.5 at boring B6-2 and greater than 2,000 ppm throughout the soil core at boring B6-3. Petroleum hydrocarbon and solvent-like odors were noted across the sampled intervals in all borings, consistent with the elevated PID readings. However, no visible evidence of contamination was observed during field screening activities.

Two soil samples were collected at each boring location targeting the six-inch interval with the greatest field evidence of contamination (between 1.5 and 3.5 feet in depth) and the interval from 4.5 to 5.0 feet below existing grade. All samples were analyzed for VOC+10 and TPHCs.

Analytical results associated with the soil sampling activities in the vicinity of soil boring B6 are presented on Plate 2. Reported TPHC concentrations were above the 10,000 ppm SCC only in boring B6-1 in both intervals and in the upper interval at B6-3.

BTEX compounds were also identified in concentrations above NJDEP SCC in the area surrounding boring B-6. Specifically, at least one BTEX constituent was detected above the SCC in each sample, except the deeper sample at B6-2, with the upper sampling interval consistently having the higher constituent concentrations. It is also notable that the concentrations of xylenes and toluene are several orders of magnitude higher than concentrations of ethylbenzene and benzene, suggesting that at least a portion of the toluene and xylene contamination results from releases of those solvents, which are and have been handled at this Site, rather than from petroleum fuels (e.g., gasoline) in which the BTEX compounds are generally present.

Concentrations of chlorinated solvents were nondetectable or below the SCC in five of the eight samples. Concentrations of only three chlorinated solvents were reported above the NJDEP SCC, including vinyl chloride at 40 ppm in sample B6-4-SS01, cis-1,2-dichloroethene at 65 ppm in sample B6-3-SS01, and PCE at 1.4 ppm in sample B6-1-SS01.

Although constituents were detected above SCC at the recent delineation soil borings, further delineation sampling is not considered necessary given that samples have been collected nearby in other areas surrounding this AOC as part of previous investigations or through sampling in adjacent AOCs during this phase of the RI. ENVIRON believes that additional sampling is therefore not necessary for an evaluation of potential remedial alternatives for this area.

In addition, ground water monitoring data from nearby and downgradient shallow well MW6 (see Plate 5), which shows levels of some VOCs above GWQS but does not show the elevated concentrations of some other wells (e.g., MW-7), indicates that the B-6 area does not appear to be significantly contributing to ground water contamination. Further, at each soil boring, samples collected at the soil/ground water interface had lower VOC concentrations than in the overlying interval. The concrete cap limits surface water infiltration, reducing the migration of contaminants from unsaturated-zone soils into the ground water.

7. AOC 8 – Aboveground Storage Tank Farm

a) Background

Previous soil sampling activities at the Site identified concentrations of VOCs within AOC 8 at levels above the IGWSCC. The NJDEP previously approved NFA for AOC 8 with the inclusion of VOC-impacted soil in the area in a site-wide Deed Notice. This approval was based on the facts that most VOC concentrations were only slightly above criteria, the area is capped by concrete, VOCs were not detected in downgradient wells ASL1 and ASL2, and obstructions prevented further extensive investigation. However, the NJDEP also requested delineation sampling of TPHC concentrations to the north and west of previous boring AOC8-8. Accordingly, ENVIRON proposed to complete two additional borings, AOC8-10 and AOC8-11, to delineate the horizontal extent of TPHC- and toluene-impacted soils to the north and west of boring AOC8-8.

b) Remedial Investigation Results

On February 6, 2005, ENVIRON completed the two proposed soil borings AOC8-10 and AOC8-11. Soil boring locations are provided on Plate 4. Continuous soil cores were collected at both locations. AOC8-10 was completed to a depth of 9.5 feet below grade and AOC8-11 to a depth of 8.5 feet below grade. Ground water was encountered between 3.25 and 3.75 feet bgs. All soils were screened with a PID to identify potentially impacted zones. PID responses were highest immediately below the concrete, including a concentration of 814 ppm at AOC8-10 (1.5 to 3.5 feet) and 763 ppm at AOC8-11 (2.5 to 4.5 feet). PID responses generally ranged between 200 and 300 ppm for the remainder of both soil cores. Consistent with these readings, petroleum hydrocarbon and solvent-like odors were noted across the length of both borings with elevated PID readings at each location. However, no visible evidence of contamination was observed during field screening activities.

Soil samples were collected at each boring location targeting the interval from 3.0 to 3.5 feet bgs where previous sampling had identified contamination, and a deeper interval to vertically delineate the extent of TPHC contamination. The deeper samples were collected from the six-inch interval immediately above the clay unit; 7.0 to 7.5 feet at AOC8-10 and 6.75 to 7.25 feet at AOC8-11. In addition, a third sample was collected at AOC8-10 from 5.5 to 6.0 where field screening identified a concentration of 632 ppm. All samples were analyzed for VOC+10 and TPHC.

Analytical results associated with the soil sampling activities in AOC 8 are presented in Plate 4. The reported TPHC concentration in AOC8-10-SS01 (10,600 ppm) was only 600 ppm above the above the 10,000 ppm SCC whereas all other TPHC concentrations were well below that threshold. Toluene and xylenes were also reported in concentrations above the SCC in this sample. The only other constituent present above SCC was benzene in both sampling intervals at AOC8-11 at concentrations of 2 ppm and 3.6 ppm, only minimally above the IGWSCC of 1 ppm.

Soil sampling activities completed in AOC 8 during remedial investigation activities have largely delineated the lateral extent of TPHC impacted soils. The maximum TPHC concentration in AOC8-10-SS01 of 10,600 ppm only slightly exceeds the SCC and the deeper samples vertically delineated the extent of the TPHC contamination. As such, ENVIRON does not believe that additional TPHC delineation sampling is warranted at this location. Toluene and xylenes were detected in AOC8-10-SS01 at concentrations above the SCC, with only toluene, at 9,400 ppm, identified significantly above its IGWSCC of 500 ppm. However, given the absence of elevated BTEX concentrations in the two deeper sampling intervals at this boring, the data do not suggest that additional delineation sampling would be necessary prior to evaluating potential remedial alternatives for this area.

In fact, the soil samples collected at the soil/ground water interface demonstrate that there has been limited vertical migration of constituents in this area, such that this AOC likely does not significantly contribute to adverse impacts to ground water. Therefore, active soil remediation within this AOC is not necessary. The compounds identified in this AOC should be addressed through a site-wide Deed Notice, as previously approved by NJDEP.

8. AOC 10 – Soil Staining Next to Metal Shed and AST #3

a) Background

Soil sampling activities completed in AOC 10 at boring B-14 identified VOC concentrations above the IGWSCC, including four chlorinated solvents (TCA, TCE, PCE and methylene chloride), as well as xylenes and toluene (see Plate 4 for summarized historical sampling results). TPHC concentrations above the 10,000-ppm SCC were also detected in this AOC. More recent sampling delineated the northern and southern extent of TPHC -impacted soils, and identified BTEX and chlorobenzene only marginally exceeding the SCC. The NJDEP requested further delineation sampling to the east and west of boring B-14 but approved NFA for AOC 10 with the inclusion of VOC-impacted soil in the area in a site-wide Deed Notice.

b) Remedial Investigation Results

On January 21, 2005 ENVIRON completed soil borings AOC8-13 and AOC8-14 to delineate the eastern extent of VOC and TPHC impacted soils identified at boring B-14. Boring AOC8-12 was completed on February 6, 2005 to delineate the western extent of the contamination. Soil boring locations are provided on Plate 4.

Continuous soil cores were collected to a depth of 8.5 feet bgs at boring locations AOC8-13 and AOC8-14 with a jack-hammer and four-foot macrocore sampler and soil boring AOC8-12 was completed to a depth of 8.0 feet bgs using a split-spoon sampler. At locations AOC8-13 and AOC8-14, ground water was encountered at approximately 1.75 feet bgs. Ground water was deeper at AOC8-12, encountered at approximately 3.5 feet bgs. All soils were screened with a PID to identify potentially impacted zones. A petroleum hydrocarbon-like odor was noted in the first four foot macrocore sample (0.5 to 4.5 feet bgs) at both AOC8-13 and AOC8-14, with PID readings as high as 175.5 ppm. Organic vapors were not detected in the lower four-foot macrocore (collected from 4.5 to 8.5 feet bgs) at either location. At AOC8-12, soils from 2.0 to 4.0 feet had a solvent-like odor with PID readings above 100 ppm throughout the length of the soil core. Maximum PID readings at AOC8-12 were 842 ppm and 606 ppm at approximately 2.0 and 6.0 feet bgs, respectively. No visible evidence of contamination was observed during field screening activities.

Three soil samples were collected at each boring, targeting the six-inch interval immediately below the concrete, the six-inch interval immediately above the water table, and an interval between 7.0 and 8.0 feet bgs. At sample locations AOC8-13 and AOC8-14, these sampling depths included two samples collected at each location from within the upper four foot zone (0.5 to 4.5 feet bgs) described above as having PID readings up to 175.5 ppm. At sample location AOC8-12, one of the three samples was collected from 2.0 to 2.5 feet bgs, the depth with the highest PID reading at that location. All samples were analyzed for VOC+10 and TPHC. Analytical results associated with the soil sampling activities in AOC 10 are presented in Plate 4. Reported TPHC concentrations for the horizontal and vertical delineation soil samples were below the 10,000 ppm SCC at all locations, completing delineation of the horizontal extent of TPHC-impacted soils to the east and west of soil boring B-14.

BTEX compounds were detected at concentrations above the SCC in only two of the nine samples collected in this area. At sample location AOC8-12-SS01 , toluene and xylene concentrations were above the SCC in only the shallowest sample, which was collected from 2.0 to 2.5 feet bgs; the other two samples from that location contained no VOCs above the SCC. At AOC8-13, benzene was present above the SCC in only one sample, collected from 4.0 to 4.5 feet bgs, and there at a concentration of only 1.1 ppm, just above the criterion of 1 ppm. In addition, the toluene and xylene concentrations were lower than in many other areas on-Site, including in the boring B-6 area located immediately west of AOC 10. Notably, chlorinated solvents were only detected at boring AOC8-12, and only at concentrations below the SCC.

ENVIRON believes that the recent RI has delineated the extent of VOC and TPHC impacted soils within AOC 10. As noted above regarding AOC 8, the absence of VOC contamination in soil samples at the soil/ground water interface demonstrates that the concrete cap has limited the vertical migration of contaminants to ground water. This, in combination with the sporadic and minor exceedances of the SCC, suggests that active remediation is not necessary within this AOC. Rather, the contamination should be addressed in the site-wide Deed Notice as previously approved by the NJDEP.

9. AOC 11 – Drum Storage Area

a) Background

Initial soil sampling activities in AOC 11 identified TPHC concentrations above the 10,000 ppm SCC at borings B-16 and B-3. Since that time, ALS completed delineation sampling, installing four borings near each of the original two sample points. This sampling sufficiently delineated the TPHC impacted soils near B-16, with no TPHC contamination detected. In the area surrounding boring B-3, the reported concentration of TPHCs in delineation boring B3-4 still exceeded 10,000 ppm. As a result, the NJDEP requested further delineation sampling at that location.

In addition to the TPHC impacts, benzo(a)pyrene (BaP) was detected at location EB-26-1AR at a concentration of 0.92 ppm, slightly above the SCC of 0.66 ppm. At the request of the NJDEP in its November 3, 2004 letter, the Deed Notice will address this location *in lieu* of additional delineation sampling.

b) Remedial Investigation Results

On January 25 and 26, 2005 ENVIRON completed soil borings B3-5 and B3-6 to delineate the extent of TPHC-impacted soils reported in boring B3-4. These borings are shown on Plate 3.

Continuous soil cores were collected to a depth of 6.0 feet at both locations. Ground water was encountered between 2.0 and 4.0 feet. All soils were screened with a PID to identify potentially impacted zones. A petroleum hydrocarbon-like odor was noted through the length of both soil cores with PID readings between 5 ppm and 65 ppm. No visible evidence of contamination was observed during field screening activities.

As proposed, one soil sample was collected from each core from 2.5 to 3.0 feet bgs (targeting the interval immediately below the concrete) and analyzed for TPHCs.

Analytical results associated with the soil sampling activities in AOC 11 are presented in Plate 3. TPHC concentrations for the horizontal delineation soil samples were below the SCC, confirming that the remedial investigation delineated the horizontal extent of TPHC-impacted soils to the west of soil boring B-3. Given the NJDEP's prior approval of NFA for this area discussed above, no further sampling is needed within AOC 11.

10. AOC 13 – Northern Dry Well

a) Background

Prior soil sampling activities in AOC 13 identified TPHC concentrations above the 10,000 ppm SCC at boring AOC-13-N. In its December 24, 2003 letter, the NJDEP requested delineation sampling around that boring. Accordingly, ENVIRON proposed three delineation soil borings (AOC13-2, AOC13-3 and AOC13-4) to the east, west and south of that boring to delineate the extent of TPHC-impacted soils in AOC 13.

b) Remedial Investigation Results

On January 25, 2005, ENVIRON completed soil borings AOC13-2 through AOC13-4 in AOC 13, as shown on Plate 4. Subsurface obstructions (e.g., construction debris or other fill material) prevented the advancement of the hollow stem augers and split spoon samplers to the same depth at each boring location. As such, continuous soil cores were collected to a depth of 5.0 feet at boring AOC13-2, 2.0 feet at AOC13-3 and 5.5 feet at AOC 13-4. Ground water was encountered at 4.5 feet bgs in this area.

All soils were screened with a PID to identify potentially impacted zones. Field screening detected concentrations of organic vapors in soils from AOC13-2 and AOC13-4 between 250 and 515 ppm whereas soils from boring AOC13-3 had a maximum concentration of only 23.2 ppm. A strong petroleum hydrocarbon-like odor was noted in soils from each boring. No visible evidence of contamination was observed during field screening activities.

Samples were collected at each boring location from the interval immediately beneath the concrete. At AOC13-2 and AOC13-4, the first interval with an adequate volume of soil to sample was between 2.5 and 3.0 feet bgs. At AOC13-3, ENVIRON was able to collect the sample from 1.5 to 2.0 feet bgs. In addition, a deeper sample was collected from immediately above the water table (4.0 to 4.5 feet) in borings AOC13-2 and AOC13-4. All soil samples were analyzed for TPHC and VOC+10. Analytical results associated with the soil sampling activities in AOC 11 are presented in Plate 4.

The TPHC concentration in AOC13-2-SS01 (14,900 ppm) is above the above the SCC of 10,000 ppm whereas all other TPHC concentrations were below the SCC. As such, these soil sampling results delineated the southern and eastern extent of TPHC impacted soils in the area surrounding boring location AOC13-1N. Although the reported TPHC concentration in the upper sample from AOC13-2 exceeded the SCC, the absence of TPHC contamination in the underlying interval and in nearby soil borings (e.g., AOC8-3 and EB-20) can be used to interpret the extent of TPHC impacts associated with this AOC such that additional delineation sampling is considered unnecessary.

VOCs were also identified at concentrations above the SCC at locations AOC13-2 and AOC13-4, including an estimated concentration of benzene (1.8 ppm) in the upper sample from AOC13-2 and xylenes in the deeper samples from AOC13-2 and AOC13-4. ENVIRON believes that these VOC concentrations do not warrant further action (other than inclusion in the Deed Notice) given (1) the absence of benzene impacts in deeper soil intervals, which indicates that the near-surface benzene impacts have not migrated vertically and therefore likely do not represent a source of future ground water impact; and (2) the absence of xylene at concentrations exceeding the GWQS in any of the monitoring wells in this portion of the Site, suggesting that xylene-impacted soils in AOC 13 are not adversely impacting ground water.

F. Ground Water

1. Prior Ground Water Sampling Results and Investigation Needs

Twelve shallow monitoring wells (MW1-MW8 and ALS1-ALS3) and one deeper well (ALS3D) were installed on-site as part of previous investigations. The shallow wells were drilled to depths between 7.0 and 12.0 feet below grade and the deeper well was finished to a depth of approximately 27.0 feet. Monitoring well locations are provided on Plate 1.

Ground water samples were collected from at least one monitoring well in sampling rounds conducted in July 1989, November 1999, April 2000, June 2000, August 2002 and February 2003, with the June 2000 and February 2003 rounds being the most comprehensive. Prior ground water monitoring results are provided on Plate 5. As these data indicate, one or more VOCs were detected above the GWQS at each monitoring well in samples collected during at least one of the sampling rounds. However, only relatively minor VOC impacts were reported at the majority of the wells, with several wells (ALS1, ALS3, MW1 and MW2) having no VOC concentrations above the GWQS in the most recent historical sampling round. Concentrations of chlorinated VOCs and BTEX reported significantly above the GWQS were present most notably at MW7 and to lesser degrees at MW4, MW6 and MW8, as well as in intermediate-zone well ALS-3D. Based on an upward vertical gradient at the MW2/ALS3D well pair observed by ALS, and the absence of ground water contamination at MW2, ALS concluded that impacts evident at well ALS3D may originate from an upgradient/off-site source.

Given that assertion, the NJDEP requested in its December 24, 2003 letter that additional sampling be conducted to delineate VOC contamination in the deeper interval or to support the off-site source hypothesis through installation of deep well clusters across the Site, including at least one upgradient well. Based on the goals of evaluating site-related impacts to the deeper aquifer and understanding the nature of any contamination in that zone due to other sources, ENVIRON's September 30, 2004 RIWP proposed the installation of four double-cased intermediate-zone wells with screened intervals between 20 and 30 feet and one deeper double-cased well to be screened from 40 to 50 feet. At the request of the site operator, ENVIRON expanded the scope to include the installation of two additional deep wells, as proposed in the December 2004 revised RIWP. This scope of work ultimately included installation of seven deeper-zone wells, including four intermediate-zone wells (MWs 1D, 4D, 6D and 7D) and three deep wells (MWs 1XD, 2XD and 3XD), with the MW1D/1XD pair representing an upgradient well cluster to be installed proximate to existing shallow well MW1.

In addition, based on its review of historical soil sampling results and the distribution of shallow ground water contamination, ENVIRON proposed installation of an additional shallow well, MW9, near boring EB19 where a concentration of TCA had been detected above the IGWSCC. The well would serve to identify potential adverse ground water impacts from contaminated soils as well as document ground water quality likely upgradient of and migrating toward MW7, where the highest VOC concentrations had been detected. The NJDEP concurred with this proposal.

2. Monitoring Well Locations and Construction

The shallow monitoring well was installed with hollow-stem auger drilling methods to a depth of approximately 15 feet, and constructed with a 10-foot 0.10"-slotted Schedule 40 PVC screen. A sand filter pack of #1 sand was installed to approximately two feet above the screened interval with a seal of #00 sand placed immediately above the sand filter pack. The annular space was grouted to ground surface with Portland cement. A two-inch locking plug was placed in the PVC opening to prevent surface water intrusion. A protective steel stick-up casing was installed to finish the well.

Deeper monitoring wells installed during the investigation (i.e., those with "D" and "XD" in the well number) are double-cased, with a six-inch steel outer casing and a two-inch PVC inner casing. Installation was completed using a combination of hollow-stem auger and mud-rotary drilling techniques. The six-inch outer steel casings were installed into the upper clay unit using 10-inch hollow-stem augers to depths between 10 and 15 feet and grouted in place to prevent migration of shallow ground water below the clay. After a grout setting period of at least 24 hours, a six-inch mud-rotary drag bit was then used to drill the remainder of the well inside the steel casings. Two-inch PVC wells were inserted into the finished mud rotary holes with 10 feet of 10-slot PVC screen at the base of the wells. The wells were then constructed as noted above for the shallow well.

Subsurface conditions required the modification of the originally targeted screened intervals. Soil units from 20 to 30 feet bgs were predominately clay and fine sand. ENVIRON chose to extend the depth of the intermediate wells so that the screens were set in sands alone. As a result, the intermediate wells were screened from approximately 30 to 40 feet. The depth of the deeper wells was modified accordingly with screen from approximately 50 to 60 feet.

3. Sampling Methodologies

Ground water samples were collected between February 7 and 9, 2005. Prior to the collection of ground water samples, ENVIRON purged approximately three well volumes from each well with a peristaltic or submersible pump. Conductivity, pH, turbidity, dissolved oxygen, temperature and oxidation/reduction potential were monitored approximately once for each well volume with a Horiba U-22 fitted with a flow-through cell. Field parameter monitoring results are presented in Appendix D. Each well was purged until these parameters had stabilized (or, in the case of previously installed wells MWs 2 and 6, until the wells purged dry). The ground water samples were generally collected immediately thereafter using a disposable Teflon-coated bailer; MW6 was allowed to recover overnight so that a sufficient water volume was present for sampling, given the poor recovery rate for this well. Care was taken when lowering the bailers during the sampling so that minimal agitation occurred when the bailer entered the water column. At each well, the ground water sample was collected across the water table given that certain VOCs of concern at the Site (e.g., BTEX) are less dense than water, as well as to enable inspection of the ground water surface for evidence of free product. In addition, each well was inspected for any accumulation of dense non-aqueous-phase liquid (DNAPL) on March 2005 using an oil/water interface probe.

During the February 2005 sampling program, ENVIRON was informed that monitoring well MW5 had been abandoned in March 2000, although the reason for that closure was not available. In addition, during the sampling program, ENVIRON observed that MW1 had been filled with dirt or sand; facility personnel were unaware of how this well came to be filled. ENVIRON is arranging for restoration/redrilling of these wells so that they can be included as part of future confirmatory sampling. Additional information regarding these upcoming activities is provided below in Section IV.

4. Shallow Ground Water Quality

a) Remedial Investigation Results

Analytical results from the February 2005 ground water sampling round are summarized on Plate 5. Results from this remedial investigation were generally consistent with past studies. Specifically, the reported concentrations of VOCs, and their distribution, were comparable to past findings at most wells, with the highest VOC concentrations detected in MW7, and no VOCs detected above GWQS in MW2, ALS2 and ALS3 (with only one *de minimis* exceedance reported at ALS1).

Given the consistent distribution of VOC concentrations the recent sampling confirms is evident at the Site, it appears that the most elevated levels of shallow ground water contamination on-site are found in relatively limited areas in proximity to the most contaminated soils. Further, VOCs have generally not migrated to the downgradient wells. In particular, despite the significant VOC concentrations at MW7, no VOCs exceed the GWQS at downgradient wells MW2 and ALS3. The general absence of ground water contamination at the six wells proximate to the eastern (downgradient) boundary of the tank farm, including at MW2, MW3, ALS1, ALS2 and ALS3, indicates the soils beneath the tank farm are not a significant source of ground water impact to the shallow zone. This conclusion is consistent with the soil sampling results discussed above for AOC 8, which indicate that the most elevated levels of soil contamination are not present at the seven borings installed within the tank farm, except boring B-14, the westernmost boring.

Regarding MW9, newly installed to evaluate a TCA concentration in soil of 200 ppm at former boring EB-19, only two VOCs were detected above GWQS, including benzene at 170 µg/L and vinyl chloride at 60 µg/L. All other VOC concentrations were well below the criteria. The absence of a detectable concentration of TCA in this well, in combination with the lack of TCA soil contamination at the four recent delineation borings, indicates that the TCA formerly detected at EB-19 is not a source of adverse ground water impact. Further, these results indicate that the ground water impacts detected at MW7 likely do not result from migration of contamination from a source area near MW9.

Recommended further actions related to shallow ground water are provided below following a discussion of deeper-zone conditions.

b) Free Product in MW4

Free product was observed in monitoring well MW4 during prior ground water monitoring activities completed as part of the previous site investigations. Accordingly, the NJDEP requested in its November 3, 2004 letter that a monthly monitoring program be implemented. If free product is consistently observed in monitoring well MW4, a further course of action must be determined.

The presence of free product in monitoring well MW4 was evaluated on February 9, 2005 as part ENVIRON's ground water sampling program, and on March 23, 2005 when a confirmatory round a ground water elevation measurements was collected. Specifically, ENVIRON used an oil/water interface probe on each occasion, and also checked the ground water surface using a dedicated clear bailer. Free product was not detected in MW4 on either occasion. ENVIRON will continue to check MW4 for evidence of free product and consistent with the September 2004 RIWP; should free product continue to be absent, no active remediation would be necessary. Rather, remediation of this area would be best addressed via the institutional and engineering controls previously proposed (and conceptually approved by the NJDEP) for other historical TPHC impacts.

5. Deeper Ground Water

a) Background

Despite the scope of prior investigations, deeper ground water had not been thoroughly evaluated. As noted above, the only well previously installed on-site with a screened interval beneath the historic fill saturated zone is ALS3D, screened from 20 to 30 feet largely within the silty clay unit (whereas intermediate zone wells installed as part of this RI were screened at a depth below the silty clay unit in which well ALS3D was installed). Based on the concentrations of chlorinated VOCs in that well, ALS had concluded that ground water in this area was impacted by the upwelling of contaminated ground water from an off-site, upgradient source. However, because of the limited data available to support this assertion, the NJDEP requested that additional wells be installed to delineate the VOC contamination in deeper saturated intervals.

b) Remedial Investigation Results

Between January 5, 2005 and February 9, 2005 ENVIRON completed the installation and sampling of four double-cased intermediate monitoring wells (MW1D, MW4D, MW6D and MW7D) and three double-cased deep monitoring wells (MW1XD, MW2XD and MW3XD). These wells were installed at the proposed locations, but subsurface conditions required modifications to the proposed screened intervals. Specifically, soils encountered from 20 to 30 feet bgs were predominately clay, with relatively thin fine sand lenses, and a thick primarily sand unit present below 30 feet. As such, ENVIRON extended the depth of the intermediate wells so that the screens were set from approximately 30 to 40 feet in sands alone, rather than in the overlying clays (i.e., the interval in which well ALS3D was constructed). The depth of the deeper wells was similarly modified and screened from approximately 50 to 60 feet.

Summarized information regarding the ground water quality in each of these deeper saturated intervals is provided below. The data are shown on Plate 5.

Similar to the findings for the shallow saturated zone, various VOCs were detected above the GWQS in the five intermediate zone wells but at considerably lower concentrations than in the overlying interval. At wells MWs 1D, 4D and 6D, the specific VOCs present above the GWQS included benzene, chloroform, PCE and/or TCE, with bromodichloromethane also present at MW1D. A broader suite of VOCs was identified at MW7D and ALS3D, including TCA and various byproducts of the reductive dechlorination of PCE, TCE and TCA, including primarily cis-1,2-DCE, 1,1-DCE, 1,1-DCA, 1,2-DCA, and vinyl chloride.

Deeper ground water quality evidenced fewer and less significant exceedances of the GWQS, including benzene, TCE and PCE at MW1XD and carbon tetrachloride and chloroform at MW3XD. No VOCs were present above the GWQS at MW2XD.

c) Conclusions

The presence of benzene, PCE and TCE in wells MW1D, MW1XD and MW4D at similar concentrations raises the possibility that at least a portion of this contamination may originate from an off-site source(s). Similarly, carbon tetrachloride was reported in monitoring well MW3XD at a concentration above the GWQS. However, this compound was not identified in any of the shallow -zone wells on-site, suggesting that this contaminant may have been introduced into the deep aquifer from an off-site source.

Although the source of chlorinated solvents and BTEX compounds in monitoring well ALS3D is not clear, ENVIRON does not believes that it can be readily explained by upwelling of contaminated ground water from off-site sources, as previously hypothesized. First, ground water elevations collected during this RI indicate a downward vertical gradient at the ALS3D-MW2XD well pair. Second, data collected during this RI document that VOC concentrations in MW2XD, installed adjacent to ASL3D, were below the GWQS suggesting that upwelling of ground water from the deeper aquifer cannot account for the VOC concentrations detected in ALS3D. Instead, a combination of vertical and lateral ground water flow from AOCs 3& 4, and potentially other areas, may explain the presence of these VOC impacts in ALS3D, and account for the increase in concentrations over the three sampling rounds at that well. Ground water flow and quality in this area will be further evaluated in the proposed additional Remedial Investigation activities described later in this report.

Notably, the VOCs detected at MW3XD were either not present in the overlying interval(s) (i.e., carbon tetrachloride was not present at MW3 or any other shallow well at the Site) or when present, were detected at higher concentrations than in the more shallow zone. Similar to conclusions reached regarding certain intermediate-zone ground water results, this pattern of VOC concentrations, in combination with the downward hydraulic gradient, suggests that ground water at MW3XD may have been impacted by off-site/upgradient sources rather than on-site activities and contamination present in more shallow intervals. Regional deeper ground water contamination in this region is well-documented and results from the long-term industrial use of the area.

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III. BASELINE ECOLOGICAL EVALUATION

A. Introduction

The Baseline Ecological Evaluation (BEE) for the Site was performed in accordance with the New Jersey Technical Requirements for Site Remediation (N.J.A.C.7:26E-3.11) as part of the RI recently completed by ENVIRON. The BEE was conducted to identify areas on and off-Site that may warrant a detailed evaluation of ecological risks. The BEE included a field survey, literature reviews, and an evaluation of available site characterization data and assessed the Site for the co-occurrence of the following:

- Contaminants of potential ecological concern (COPECs)

  COPECs are identified by the comparison of constituent concentrations detected at the Site against ecotoxicity screening values (ESVs), and by the identification of constituents that may exhibit significant bioaccumulation or biomagnification in food chains.

- Environmentally sensitive areas (ESAs)

  The BEE identifies ESAs within the Site as defined by N.J.A.C. 7:1E-1.8(a). ESAs were identified based on a field survey and a review of NJDEP databases including the i-MapNJ DEP environmental mapping tool (NJDEP, 2004a).

- Potential contaminant migration pathways from the Site to the ESAs

  Potential contaminant migration pathways are identified based on topographic maps, aerial photographs, and a field survey.

B. Methodology and Data Sources

This BEE is based on site characterization data collected by ENVIRON as part of the Remedial Investigation activities performed from January 2005 to March 2005, and on data generated during prior phases of the RI. These ecological site characterization data consist of soil and ground water samples collected within the Site boundaries as described above and shown on Plates 2 through 5.

Reconnaissance-level site visits were conducted by ENVIRON on December 6 and 30, 2004 and March 23, 2005. Photographs of the Site taken during the site visits are included in Appendix E. The purpose of the field visits was to characterize the habitats present in the study area, to determine whether ESAs exist at the Site, to identify potential pathways of contaminant migration from the Site to ESAs, and to observe any obvious impacts to ESAs that may be attributed to site-related discharges. The field visits encompassed the Site and the immediate surrounding area (Figure 1). The resources that were relied on for the preparation of this BEE are included in the reference section of this report.

C. Ecological Setting

The Site is approximately two acres and is located in a heavily industrialized area of Newark. As noted in Section I, there are several buildings on-site, as well as a truck washing station, an aboveground tank farm and a metal canopied product transfer and storage area. The developed portion of the Site is entirely paved primarily with concrete. The metal canopy, which has plexiglass panels extending from the roofline to the top of a concrete retaining wall along the northern, southern and western sides of the process area, prevents storm water contact to the solvent handling and dispensing areas, as well as all drums containing product. The portion of the Site east of the tank farm is unpaved ground sloping to the River. This area has been stabilized with large crushed rock (i.e., trap rock), as evident in the site photographs.

A former Hess Company petroleum storage facility borders the property to the south and an active Getty Oil Company storage facility is located to the north. A scrap automobile yard is located to the west of the facility, beyond Doremus Avenue. The Passaic River borders the Site to the east.

The soil underlying the Site is comprised of non-indigenous fill material consisting of cinders, concrete, gravel, wood, brick, metal, and glass. This historic fill material overlies the former native ground surface when the Site was part of the regionally extensive Newark Meadows. The topography of the Site is generally flat with a slight slope toward the east to the Passaic River.

Based on a review of the NJDEP's i-MapNJ DEP database (iMap database), there are no threatened or endangered species at the Site or in the vicinity. In addition, consistent with the highly industrialized setting of the Site, no ecologically important areas such as grasslands, emergent wetlands or forested habitats were identified at the Site or vicinity based on the site reconnaissance and a review of the iMap database. Further, concrete paving at the Site prevents the growth of vegetation, and fauna were not observed on-site during the RI. Only sporadic low-lying weeds (e.g., dandelion) were evident in the unpaved strip of land east of the tank farm. There was no evidence of seeps or other discharges from the Site. As noted above, there is no direct discharge of storm water from the Site, with all storm water collected and pretreated prior to discharge to the PVSC.

D. Identification of COPECs and Ecotoxicity Screening Values

To identify COPECs, the maximum detected constituent concentrations in each sampled medium (soil and ground water) were compared to ecotoxicity screening values (ESVs). Constituents with maximum concentrations that exceed ESVs are considered COPECs. This evaluation included sample interval depths (greater than 2 feet below ground surface) at which ecological exposure is unlikely to occur, thus allowing for a conservative estimate of potential risks. In addition, maximum concentrations were used for soil in recognition of the heterogeneous distribution of constituents (i.e., PAHs and metals) related to historic fill.

The maximum detected constituents in soil at any depth and the most recent constituent concentrations detected in each ground water monitoring well were compared to ESVs to identify COPECs. For the BEE, a constituent with one or more exceedances of the conservative ecotoxicity soil or ground water screening values was considered a COPEC.

The primary sources and hierarchy for soil ESVs in the BEE are consistent with those specified in N.J.A.C. 7:26E-3.11(a), and include: the NJDEP Soil Cleanup Criteria (1999)[2], Oak Ridge National Laboratory (ORNL) Preliminary Remediation Goals for Ecological Endpoints (ORNL 1997); and USEPA Region 5 RCRA Ecological Screening Levels (USEPA 2003). The primary sources and hierarchy for ground water ESVs were conservatively selected surface water criteria, given the presumed discharge of site ground water to the Passaic River, and include: New Jersey Surface Water Quality Standards (2004b); USEPA National Recommended Water Quality Criteria (2002); USEPA Region 5 RCRA Ecological Screening Levels (USEPA 2003); and ORNL Preliminary Remediation Goals for Ecological Endpoints (ORNL 1997). For each hierarchy, ENVIRON used the NJDEP sources first whenever available and scientific judgment regarding data reliability for the other sources. The ESVs for soil and ground water are presented in Tables 3 and 4, respectively.

These benchmark values are generally considered to be conservative screening tools and do not constitute remedial action levels or cleanup levels. Due to their conservative nature, exceedances of these benchmarks also do not necessarily indicate that adverse ecological effects are occurring at a specific location, but rather, that further investigation may be warranted.

In this BEE, COPECs were identified by comparing the conservative maximum constituent concentrations with the conservative chemical-specific ESVs. For those constituents not present

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[2] The Soil Cleanup Criteria for copper, zinc, and total petroleum hydrocarbons were used as ecological screening benchmarks because these criteria were developed based on ecological endpoints.

above the ESVs, adverse impacts to individual organisms are considered unlikely (U.S. EPA 1997). Conversely, an exceedance of an ESV is an indication that further evaluation may be necessary to evaluate the potential for adverse impacts to individual organisms, and ultimately wildlife populations.

The maximum concentrations of each constituent in soil are presented on Table 4. Concentrations of constituents detected in ground water at each monitoring well in February 2005, or in prior rounds for those wells not sampled in February 2005, are compared to the ESVs in Table 5 and on Plate 6.

As indicated on Table 4, certain metals, PAHs and VOCs, as well as TPHCs, were identified in soils at concentrations above the ESVs. As the NJDEP has previously noted, the elevated concentrations of PAHs and metals, and some fraction of the TPHCs, are likely attributable to the historic fill that underlies the Site. VOCs were identified in ten of the monitoring wells at concentrations about the ESVs, as shown on Table 5. The specific VOCs included predominantly BTEX, with chlorinated VOCs also evident above the ESVs at MW7, MW7D, MW8 and ALS3D. Notably, only TCA and xylenes were present above the ESVs at MW8, the only shallow monitoring well of the six along the River bank with such exceedances.

E. Environmentally Sensitive Areas

1. On-Site

No ESAs were identified on the Site in accordance with N.J.A.C.7:1E-1.8(a). In addition, the Site is situated in a highly industrialized area and provides no suitable habitat for potential ecological receptors.

2. Off-Site

As discussed above, the Passaic River borders the Site to the east. Water and sediment quality in the River have been severely degraded as a result of over 100 years of industrial activity along its banks, including at locations upstream of the Site. In addition, the presence of bulkheads along much of the River largely eliminates valuable ecological habitats such as wetlands, which typically support an abundance of organisms. According to Iannuzzi (2004), while conditions have improved somewhat in recent years, the River still suffers from relatively poor water/sediment quality, as well as an absence of key habitats such as salt marshes and tidal creeks that control biological production in estuarine rivers. Current invertebrate and fish communities in the River are not particularly diverse, and are dominated by pollution-tolerant organisms such as polychaete worms, mummichog

(*Fundulus heteroclitis*), blue crab (*Callinected sapidus*), and white perch (*Morone Americana*). Similarly, bird use of the River is relatively low compared to the nearby Meadowlands habitats. The poor ecological quality of the River notwithstanding, the River is conservatively identified as an ESA for the purposes of the BEE.

F. Potential Contaminant Migration Pathways

The developed portion of the property is paved entirely with concrete, with a small area of unpaved, stabilized ground immediately east of the tank farm. Potential exposure of ecological receptors to surface soil in the developed portion of the Site is not possible. Although unpaved ground is evident east of the tank farm, given that that strip of land has been stabilized with large crushed rock, ENVIRON considers off-site migration of historic fill to be unlikely. Further, even if such migration were occurring, albeit to a limited degree, it is likely that historic fill was emplaced in the river along its banks, even inadvertently, as part of the original municipal filling of the Newark Meadows.

Hypothetical transport mechanisms for site COPECs in ground water to the off-site ESA (Passaic River) could consist primarily of migration of VOCs in ground water to the Passaic River through ground water flow. Specifically, as shown on Figures 3 and 4, shallow and intermediate-zone ground water flow at the Site is generally to the east toward the River.

G. Summary and Conclusions

The results of the BEE indicate the following:

- Based on a comparison of maximum detected constituent concentrations in soils to conservative ESVs, the COPECs identified at the Site consist of PAHs, metals, VOCs and TPHCs.

- No ESAs were identified on-site. Although the Passaic River was identified as an off-site ESA, it is highly degraded due to chemical contamination from various historic industrial activities along the River. In addition, various activities, including riverfront development and construction of bulkheads, have largely eliminated quality ecological habitats along the River. Further, ecological studies have indicated that the River is dominated by pollution-tolerant organisms.

- Pathways for potential migration of COPECs in soils were not identified. Although COPECs were identified in ground water at shallow and intermediate-zone wells proximate to the riverbank, COPEC concentrations above the ESVs were present in only two of those eight wells, and at low concentrations relative to the ESVs. Under the circumstances, and given the relatively minor volume of ground water discharging from these well locations to the River compared to the volume of river flow, such discharges would likely not result in a material release of COPECs to the River.

Given the above, and the current degraded ecological condition and ongoing discharges of contaminants to the River from off-site and historical sources, no further ecological evaluation is warranted.

H. References

Ianuzzi, T.J. 2004. Historical and Current Ecology of the Lower Passaic River. Urban Habitats. ISSN 1541-7115. December. http://www.urbanhabitats.org/v02n01/passaicriver_full.html#cite6

New Jersey Department of Environmental Protection (NJDEP). 2004a. i-MapNJ DEP Online Environmental Mapping Tool. Revised 8/17/04. http://www.state.nj.us/dep/gis/depsplash.htm#

New Jersey Department of Environmental Protection (NJDEP). 2004b. New Jersey Surface Water Quality Standards. N.J.A.C. 7:9B. August. Oak Ridge National Laboratory (ORNL). 1997. Preliminary Remediation Goals for Ecological Endpoints. ES/ER/TM-162/R2. August.

U.S. Environmental Protection Agency (USEPA). 2003. Region 5, RCRA Ecological Screening Levels. August.

U.S. Environmental Protection Agency (USEPA). 2002. National Recommended Water Quality Criteria: 2002. Office of Water, Office of Science and Technology. EPC-822-R-02-047.

U.S. Environmental Protection Agency (USEPA). 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments. Interim Final. Solid Waste and Emergency Response. EPA 540-R-97-006.

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TABLE 4
Ecotoxicity Screening Values and Maximum Detected Constituent Concentrations for Soils
Industrial Petrochemicals, Inc., Newark, New Jersey

Constituent Class and Compound		ESV (a) (mg/kg)	Maximum Concentration (mg/kg)
VOCs	1,1,1-Trichloroethane	30 (d)	**390**
	1,1-Dichloroethane	No ESV	0.7
	1,1-Dichloroethene	No ESV	0.0007J
	1,2-Dichloroethane	21 (d)	0.19J
	Benzene	0.26 (d)	**200**
	Chlorobenzene	40 (c)	24J
	Chloroethane	No ESV	.14J
	Chloroform	1.2 (d)	**5.5J**
	cis-1,2-Dichloroethene	No ESV	79J
	Ethylbenzene	5.16 (d)	**900**
	Methylene Chloride	4.1 (d)	0.39
	Tetrachloroethene	9.92 (d)	**3,200**
	Toluene	200 (c)	**9,400**
	Trichloroethene	12 (d)	**480**
	Vinyl Chloride	0.65 (d)	**40J**
	Xylenes (total)	10 (d)	**3,600**
PAHs	Acenaphthene	20 (c)	12
	Acenaphthylene	682 (d)	10
	Anthracene	1480 (d)	16
	Benzo(a)anthracene	5.21 (d)	1.6
	Benzo(a)pyrene	1.52 (d)	**12**
	Benzo(b)fluoranthene	59.8 (d)	13
	Benzo(g,h,i)perylene	119 (d)	6.3
	Benzo(k)fluoranthene	No ESV	4.8
	bis(2-Ethylhexyl)phthalate	0.925 (d)	**170**
	Chrysene	No ESV	18
	Dibenz(a,h)anthracene	18.4 (d)	4.2
	Diethylphthalate	100 (c)	0.049
	Fluoranthene	122 (d)	2.6
	Fluorene	122 (d)	38
	Indeno(1,2,3-cd)pyrene	109 (d)	1.7
	Naphthalene	0.0994 (d)	**64**
	Phenanthrene	45.7 (d)	**66**
	Pyrene	78.5 (d)	10

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TABLE 4
Ecotoxicity Screening Values and Maximum Detected Constituent Concentrations for Soils Industrial Petrochemicals, Inc., Newark, New Jersey

Constituent Class and Compound		ESV (a) (mg/kg)	Maximum Concentration (mg/kg)
Petroleum Hydrocarbons		10,000 (b)	**25,200**
Metals	Antimony	5 (c)	**77.3**
	Arsenic	9.9 (c)	**18.6**
	Beryllium	10 (c)	**21.5**
	Chromium (total)	0.4 (c)	**787**
	Copper	600 (b)	592
	Lead	40.5 (c)	**716**
	Mercury	0.1 (d)	**2.4**
	Nickel	30 (c)	**672**
	Zinc	1500 (b)	1130

Notes:

(a) Values are selected based on the following hierarchy: New Jersey, ORNL, Region V. This is with the exception of mercury where the Region V ESV for soil invertebrates is used for the BEE because the ORNL PRG is based on woodcocks, which do not occur at the Site.

(b) NJDEP, 1999. Residential Direct Contact Soil Cleanup Criteria. Values for petroleum hydrocarbons, copper and zinc are based on ecological endpoints.

(c) ORNL, 1997. Preliminary Remediation Goals for Ecological Endpoints.

(d) USEPA Region V, 2003. Ecological Screening Levels.

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TABLE 5
Ecotoxicity Screening Values for Ground Water
Industrial Petrochemicals, Inc., Newark, New Jersey

Chemical	Region V ESLs [a] (µg/l)
1,1,1-Trichloroethane	76
1,1-Dichloroethane	470
1,1-Dichloroethene	65
1,2-Dichloroethane	910
4-Methyl-2-pentanone	170
Benzene	114
Bromodichloromethane	--
Carbon Tetrachloride	240
Chlorobenzene	47
Chloroethane	--
Chloroform	140
cis-1,2-Dichloroethene	--
Ethylbenzene	14
Methylene chloride	940
Tetrachloroethene	45
Toluene	253
Trichloroethene	47
Vinyl Chloride	930
Xylenes (Total)	27

Note:

(a) Values selected from USEPA Region V Ecological Surface Water Screening Levels.

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IV. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions Regarding Remedial Investigation

Recent remedial investigation activities have further evaluated soil quality in eight AOCs. In addition, supplemental ground water sampling, including at eight new permanent monitoring wells, furthered the understanding of ground water quality at the Site, particularly in deeper saturated intervals. Based on the sampling recently completed, ENVIRON has reached the following overall conclusions regarding the nature and extent of soil and ground water contamination at the Site:

- The soil sampling identified the same suites of contaminants previously reported on-site and in a similar distribution across the Site. Specifically, the recent RI confirmed that the most elevated VOC concentrations were identified in AOC3&4 proximate to boring B-18 and in AOC 10 near boring B-14, consistent with prior delineation sampling results. Notably, the delineation sampling performed in several areas of the site did not identify significantly elevated VOC concentrations in soils beyond the areas where such impacts had previously been identified, indicating that the primary locations of adverse soil impacts (and thus, the sources of potential ground water contamination) likely have been identified and delineated. Based on these results, ENVIRON proposes that these data are sufficient to support development of a remedial action to address contaminated soils, as proposed below. Additional delineation soil sampling is also proposed below in a supplemental Remedial Investigation Work Plan to further confirm the understanding of the extent of that soil contamination for which active remediation may be warranted.

- The February 2005 ground water sampling round confirmed prior findings regarding the distribution of elevated VOC concentrations. Specifically, the highest VOC concentrations were detected at MW7 where those levels remain, in general, several orders of magnitude above the respective GWQS. As with data obtained during prior sampling rounds, a similar suite of VOC contamination was identified at MW8 but at considerably lower concentrations. The proximity of these two wells to the areas of soil contamination noted in the preceding bullet is consistent with the conclusion that those contaminated soils in AOCs 3 & 4 and AOC 10 likely act as sources of localized ground water contamination. However, the target VOC concentrations in the other wells near and downgradient of the tank farm (i.e., wells ALS1, ALS2, ALS3, MW2 and MW3) were generally below the GWQS (MW-2, ALS-2 and ALS-3) or less than an order of magnitude above the GWQS (MW-3 and ALS-1), indicating that other contaminated soils are not extensively present in the eastern portion of the Site nor have impacted soils resulted in a widespread occurrence of VOC concentrations more than an order of magnitude above the GWQS in ground water in this area of the site. Rather, the relatively low VOC concentrations detected in other wells are more likely attributable to the long-term industrial nature of this property and the surrounding area rather than specific soil sources at the Site.

- There is no direct evidence that DNAPL is present at the Site based on field measurements and visual observations The occurrence of VOC concentrations at MW7 above the 1% solubility limits, considered by the NJDEP as an indication of potential free or residual product, appears consistent with the generally coinciding soil contamination in this area. Further, the absence of VOC concentrations even approaching the 1% solubility thresholds in ground water at the intermediate and deep zones, in conjunction with the overall absence of detectable PID readings in soils below the clay unit, suggests that DNAPL and residual source material are not present in deeper intervals.

- There is consistency in VOC concentrations in ground water at wells with historical data, with the exception of ALS3D, where VOC concentrations generally have increased since the initial sampling round in August 2002. This pattern in VOC concentrations indicates that the soil-ground water system is largely in equilibrium. This is consistent with the presence of site-wide concrete pavement, which greatly reduces surface water infiltration and, thus, slows the mobilization of VOCs in unsaturated-zone soils. The basis for the opposite pattern of VOC concentrations at ALS3D is unclear but may relate to the combined lateral and vertical migration of chlorinated VOC degradation byproducts from the MW7 source area. Additional investigation considered necessary to further evaluate this issue prior to development of a RAWP is discussed below.

- Ground water data from the intermediate and deep saturated intervals, and the downward hydraulic gradient established by ground water elevations obtained for the three monitored zones, suggest that ground water zones below the clay confining unit have been impacted by multiple sources. For example, the presence of a comparable suite of VOC contamination in a deeper well at lower concentrations than in the associated shallow well (e.g., at MW4 and MW4D, and MW7 and MW7D), is likely indicative of the downward migration of shallow-zone contamination. Conversely, certain VOCs detected in deeper wells (e.g., carbon tetrachloride at MW6D) were not detected in shallow ground water at upgradient on-site monitoring wells and thus, may originate from off-site sources. Given the relatively minor degree of VOC contamination in the deeper intervals, which would likely not require active remediation, ENVIRON believes that further evaluation is not required to assess these potential off-site contributions.

B. Recommendations for Remedial Actions

Given the above, ENVIRON believes that sufficient data have been generated to determine the conceptual scope of soil and ground water remediation at the Site. In addition, based on the nature of those remedial activities, ENVIRON has identified certain additional delineation sampling in a supplemental Remedial Investigation Work Plan that concludes this report. Specific recommendations regarding soil and ground water remediation include:

- Remediation geared towards addressing every VOC and TPHC concentration that exceeds the SCC is neither feasible for this Site given its configuration and the presence of a site-wide concrete cap, nor is such remediation required by the NJDEP. The concrete cap also prevents direct contact to contaminated soils and materially limits the further transport of the soil contaminants to ground water. In those areas where ground water is not adversely impacted by soil contamination, and at those locations where the constituent concentrations do not significantly exceed the SCC, a site-wide Deed Notice is considered the most appropriate remedy to address the compounds noted above. In fact, the NJDEP has already given its conceptual approval to a site-wide Deed Notice to address TPHC, PAH and metals contamination associated with historic fill across the Site, as well as non-area-specific TPHC contamination associated with historical petroleum handling operations. The NJDEP's concurrence with the site-wide Deed Notice concept suggests that it views active remediation at the Site to be required only to address significant ground water contamination. ENVIRON therefore proposes that a Deed Notice be developed for NJDEP review following completion of the active soil and ground water remediation activities recommended below.

- Given the NJDEP's apparent focus on soil remediation as a means to address ground water contamination, ENVIRON believes that the primary area requiring soil remediation is the adjoining portions of AOC 3 & 4 (near boring B-18 and B18-6) and AOC 10 (near boring B-14) to limit the continued migration of BTEX and chlorinated VOCs to ground water. The primary goal of this soil remediation would be to reduce VOC concentrations in soils both above and below the water table, as needed to reduce the mass of VOCs available for release into ground water. Remediation of the presumed source of shallow-zone ground water contamination is expected to not only result in improved shallow ground water quality but likely also in reduced VOC concentrations in the intermediate and deep zones, except for the contaminants in the deeper ground water that appear to potentially result from off-site sources. ENVIRON has completed a preliminary evaluation of remedial technologies and believes that several *in situ* technologies, including soil-vapor extraction, are potentially applicable to site conditions. ENVIRON therefore proposes to complete a technology review as needed to support a remediation proposal to be included in a *Remedial Action Selection Report and Remedial Action Work Plan* (RAWP) for submission to the NJDEP in accordance with the schedule provided at the end of this report section. Additional delineation sampling is proposed below to enhance development of the RAWP.

- Shallow ground water sampling has documented that significantly elevated VOC concentrations are present primarily at monitoring well MW7, located proximate to the tank farm and immediately downgradient of the zone of the most elevated VOC concentrations in soils. ENVIRON believes that active ground water remediation is appropriate in the vicinity of MW7 (including at downgradient locations) given the occurrence of significantly elevated VOC concentrations in shallow-zone ground water and the associated VOC source in soils in this area, and the degree of impact evident at MW7, and its apparent impact on deeper ground water at MW7D and potentially other locations. ENVIRON therefore proposes to complete an evaluation of potentially applicable remedial technologies, including dual-phase vapor extraction, chemical oxidation and injection of Hydrogen Release Compound®, and to propose a specific remedial approach in the RAWP. The approach ultimately selected will be designed to reduce VOC concentrations to levels that subsequently can be readily addressed via natural attenuation and biodegradation within a reasonable period of time. ENVIRON believes that lesser VOC impacts evident at MW8, located downgradient of a portion of the tank farm, will likely be reduced via the soil source remedy recommended above. Last, VOC impacts at other shallow wells are less significant and do not appear to coincide with observed soil contamination sources. During the technology review discussed above, ENVIRON would evaluate potential remedial options for these other areas with lesser ground water impacts, including natural attenuation.

- ENVIRON believes that the degree and distribution of VOC contamination in the intermediate and deep ground water zones indicate that active remediation may not be required in those intervals. Rather, because the most elevated VOC impacts likely result, at least in part, from site-related contamination in overlying soils and ground water, planned remedial measures designed to address those sources will likely result in an overall improvement in deeper ground water quality. The RAWP will further assess the need for active remedial actions to address these deeper intervals following the completion of the additional Remedial Investigation activities proposed in the following section.

C. Supplemental Remedial Investigation Work Plan

Based on the remedial investigation findings to date and the conceptual remedial approach for soil and ground water proposed above, certain additional sampling activities may be warranted to support selection of appropriate remedial technologies for the RAWP consistent with NJDEP requirements. Accordingly, ENVIRON proposes the following additional sampling as part of a supplemental RIWP:

- Although the recent soil sampling generally delineated the areas of soil contamination that appear to represent sources of ongoing ground water contamination, additional delineation sampling is proposed to further confirm areas which may require active remediation. Accordingly, ENVIRON proposes to complete seven additional soil borings at the locations shown on Figure 6. These proposed borings include: (1) additional borings B18-8 and B18-9 in AOC 3&4 south of boring B18-6 where the most elevated chlorinated VOC concentrations have been identified in Site soils; (2) borings B6-5 and B6-6 west of AOC B6-4 where BTEX contamination was detected in both sampling intervals; and (3) soil borings AOC8-15, AOC8-16 and AOC8-17 south of the AST farm (AOC 8) to further evaluate potential sources for VOC concentrations in ground water at well ALS-3D. These borings will be advanced to the first clay layer, and sampled consistent with the methodologies described above in Section II.E.1, including continuous PID screening. The scope of this proposed sampling, detailed on Table 5, includes targeting three soil intervals and will include analyses for TPHCs and

TABLE 5
Proposed Soil and Ground Water Sampling
Industrial Petrochemicals, 128 Doremus Avenue, Newark, Essex County

Area of Concern	**Objective**	**Proposed Sampling**	**Scope/Analyses**
AOCs 3 and 4	Further evaluation of VOCs south of borings B18-1 and B18-6	Two soil borings: B18-9 and B18-10	Three soil samples for VOC+10 • Six-inch interval above the water table displaying the greatest field evidence of contamination. • Six-inch interval immediately above the water table. • Six-inch interval above the clay confining unit.
AOC B-6	Further evaluation of VOCs west of boring B-4	Two soil boring: B6-5 and B6-6	Three soil samples for VOC+10 • Six-inch interval above the water table displaying the greatest field evidence of contamination. • Six-inch interval immediately above the water table. • Six-inch interval above the clay confining unit.
AOC 8	Further evaluation of VOCs south of the tank farm and southwest of AOC3&4	Three soil borings: AOC8-15 through AOC8-17	Three soil samples for VOC+10 • Six-inch interval above the water table displaying the greatest field evidence of contamination. • Six-inch interval immediately above the water table. • Six-inch interval above the clay confining unit.

TABLE 5
Proposed Soil and Ground Water Sampling
Industrial Petrochemicals, 128 Doremus Avenue, Newark, Essex County

Area of Concern	Objective	Proposed Sampling	Scope/Analyses
Ground water	Evaluate up gradient shallow groundwater quality on-site.	Replace two preexisting shallow monitoring wells screened from approximately 2-10 feet: MW1 and MW5.	Ground water sample for VOC+10
Ground water at and surrounding MW7	Supplemental vertical and horizontal delineation of detected VOCs	One double-cased monitoring well screened from ~50-60 feet: MW7XD, two shallow wells to the south and east screened from ~2-8 feet (MW10 and MW11) and two double-cased intermediate wells south and east screened from ~30-45 feet (MW10D and MW11D.)	Ground water sample for VOC+10
Intermediate zone ground water	Supplemental investigation of intermediate zone ground water quality.	Four double-cased monitoring wells screened to base of gravel layer (screen from ~30 to 45 feet).	Ground water sampling for VOC+10.
Ground water	Confirmatory ground water sampling	All existing monitoring wells	VOC+10, concurrent with the initial sampling of the wells proposed above.

Notes:
The proposed soil borings will be completed with direct-push or hollow-stem auger techniques, whichever is considered more appropriate.

- VOC+10, consistent with the January 2005 soil sampling program. The additional RI activities will be completed in accordance with the proposed implementation schedule provided in Table 6.

- ENVIRON proposes to install well cluster MW10/MW10D at a location west of MW7/MW7D, as shown on Figure 6, to confirm the upgradient extent of the VOC plume identified at MW7 as well as to further evaluate the vertical profile of VOC impacts in this area. Specifically, MW10 will be completed as a shallow well and MW10D as an intermediate-zone well. Given that existing intermediate-zone wells are not screened across the gravel layer that was encountered at depths of 45 to 46 feet, well MW10D will be advanced through and screened across that layer, if present, which appears to define the base of the intermediate zone. This represents only a slight modification to the construction of the existing wells, which are screened in the sands directly above the thin gravel layer. These wells will be otherwise completed in accordance with the well installation methodologies described above in Section II.F.2.

- ENVIRON also proposes to install well cluster MW11/MW11D south of the tank farm between wells MW7 and ALS3D, as shown on Figure 6, to supplement the understanding of the lateral and vertical distribution of VOCs in this area and to investigate potential sources of the impact in ALS3D. MW11 would be completed as a shallow well and MW11D as an intermediate well, following the well installation methodologies described above in Section II.F.2. In addition, to further evaluate the vertical profile of VOC concentrations, the boring for well MW10D will be advanced to the base of the gravel layer, if present at this location, and the screen set across that layer. As noted above, this well construction approach only slightly differs from that of the existing intermediate-zone wells.

- In addition to the above, four additional intermediate zone monitoring wells, G1 through G4, will be installed to the base of the gravel layer consistent with the methodologies noted above. These well are located west and south of the tank farm to further characterize potential ground water quality impacts at the base of the permeable intermediate zone.

- VOC concentrations above the GWQS were detected in the initial sample from MW7D. To further characterize the ground water in this area, ENVIRON therefore proposes to install deeper well MW7XD proximate to the existing wells in this area. This well

TABLE 6
Proposed Implementation Schedule

Task	**Proposed Completion Date**
Submit RI Report	May 27, 2005
Receipt of NJDEP comments to RI Report	July 27, 2005
Response to NJDEP comments	August 26, 2005
Completion of confirmatory ground water sampling and additional sampling, as necessary	October 28, 2005
Submission of *Remedial Action Selection Report and Remedial Action Work Plan*	January 20, 2006

Notes:
Schedule assumes that NJDEP comments are received within two months of report submission. The schedule also assumes that the NJDEP will agree in concept to the remedial approach outlined above, and will not require additional sampling beyond the supplemental remedial investigation proposed herein.

would be installed and constructed with a screened interval from approximately 50 to 60 feet below ground surface and consistent with the other well installation methodologies described above in Section II.F.2.

- Samples of fill, sand or gravel layers encountered during installation of the proposed wells that exhibit elevated PID readings or other evidence of potential contamination, will be collected and evaluated for the presence of residual product in accordance with the methodologies provided in the Tech Regs (N.J.A.C. 7:26E-2.1(a)11).

- As noted above, shallow well MW1 is currently partially blocked with what appears to be soil. ENVIRON proposes to abandoned that well and install a replacement well at a nearby location concurrent with installation of the wells proposed above and following similar methodologies. Abandonment will include water jetting to remove as much of the material within the casing as practicable before the well is sealed with cement grout. Rehabilitation of this well via water jetting was considered but determined to be less desirable given concerns regarding the integrity of the well and sand pack due to the unknown activities that caused its current condition.

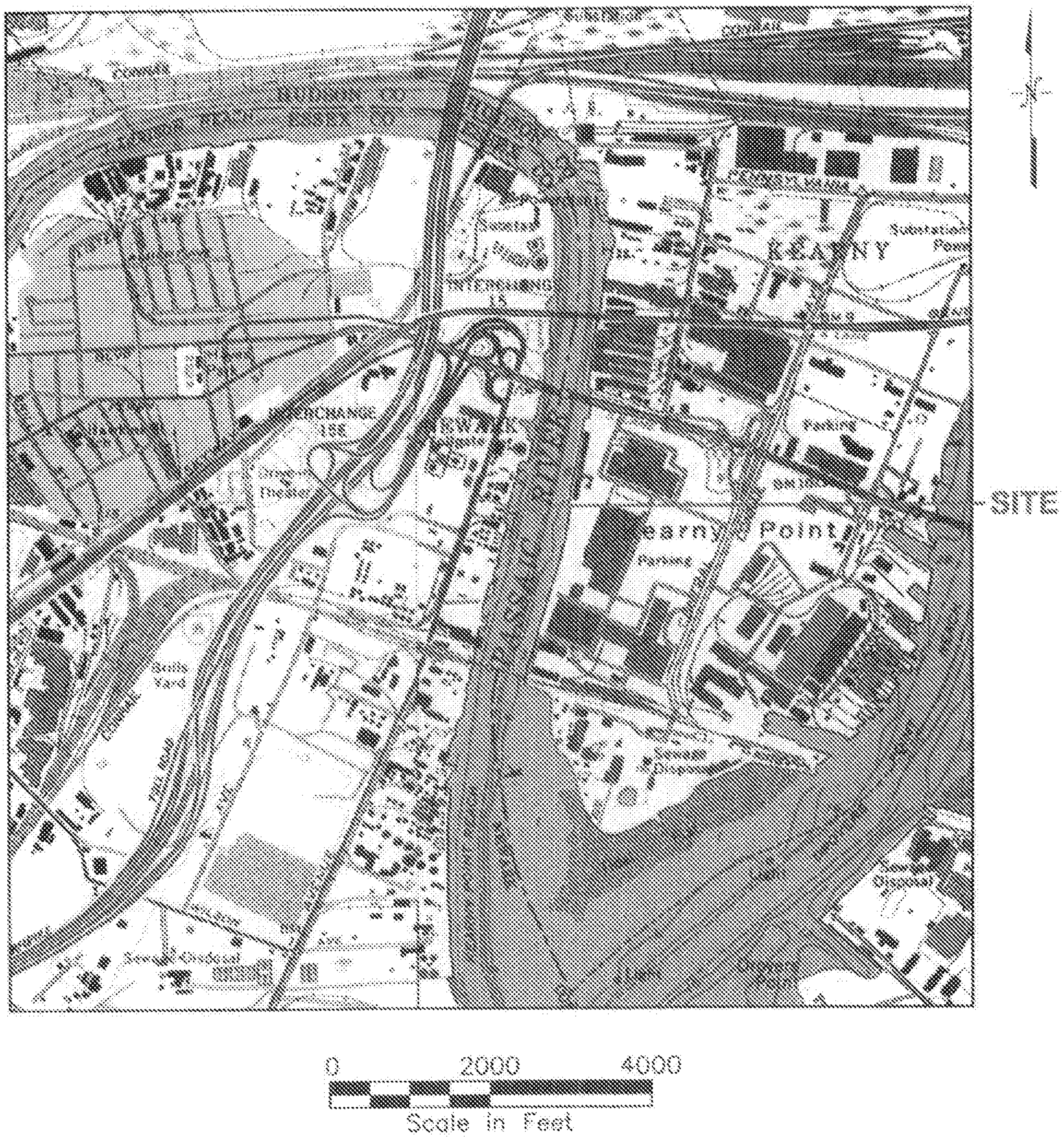
- Similarly, it appears that shallow monitoring well MW5 was abandoned by the current site operator in March 2000 after its protective casing was damaged. ENVIRON proposes to install a replacement MW5 at a nearby location following similar methodologies proposed for the other wells proposed above, to further evaluate ground water for VOCs in the vicinity of MW5.

- Following completion of the additional well installations, ENVIRON proposes to conduct a 71-hour tidal study of the intermediate and deep wells, consistent with the Tech Regs. This study will evaluate the degree of any tidal effects at intermediate wells MWs 1D, 4D, 6D, 7D, 10D, 11D and ALS-3D, as well as deep wells MWs 1XD, 2XD, 3XD and 7XD. In addition, although two preliminary tidal studies of the shallow zone were previously conducted, ENVIRON will include several shallow wells in this tidal study to provide a more complete understanding of tidal effects at the Site. The specific shallow wells include MW3, MW8 and PZ3, the only three shallow wells at which tidal effects have been identified, and wells MW2 and MW11.

- Confirmatory ground water sampling activities are proposed at the Site. These include additional rounds of ground water elevation measurements, an additional round of ground water sampling of all on-site monitoring wells for VOC analysis, and continued periodic inspection of MW4 for evidence of free product. In addition, wells MW1, MW5 and PZ3 will be included in the confirmatory sampling round.

- To provide supplemental information on the hydraulic properties of the aquifer units underlying the site to support the evaluation, selection and design of remedial alternatives, ENVIRON proposes to conduct slug tests on a selected subset of six shallow and intermediate-zone wells in accordance with standard protocols. The specific wells to be included in the slug testing program will be selected after the completion of the installation and sampling of the additional monitoring wells and the completion of the tidal study proposed above.

02-12799A:PRIN_WP\21380v1.DOC



SOURCE: TOPO! MAP PRINTED ON 03/24/05 FROM "NORTHEAST.TPO" 40.72848° N, 74.12144° W WGS84.
USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES:
JERSEY CITY, NJ, 1976.
ELIZABETH, NJ, 1995.

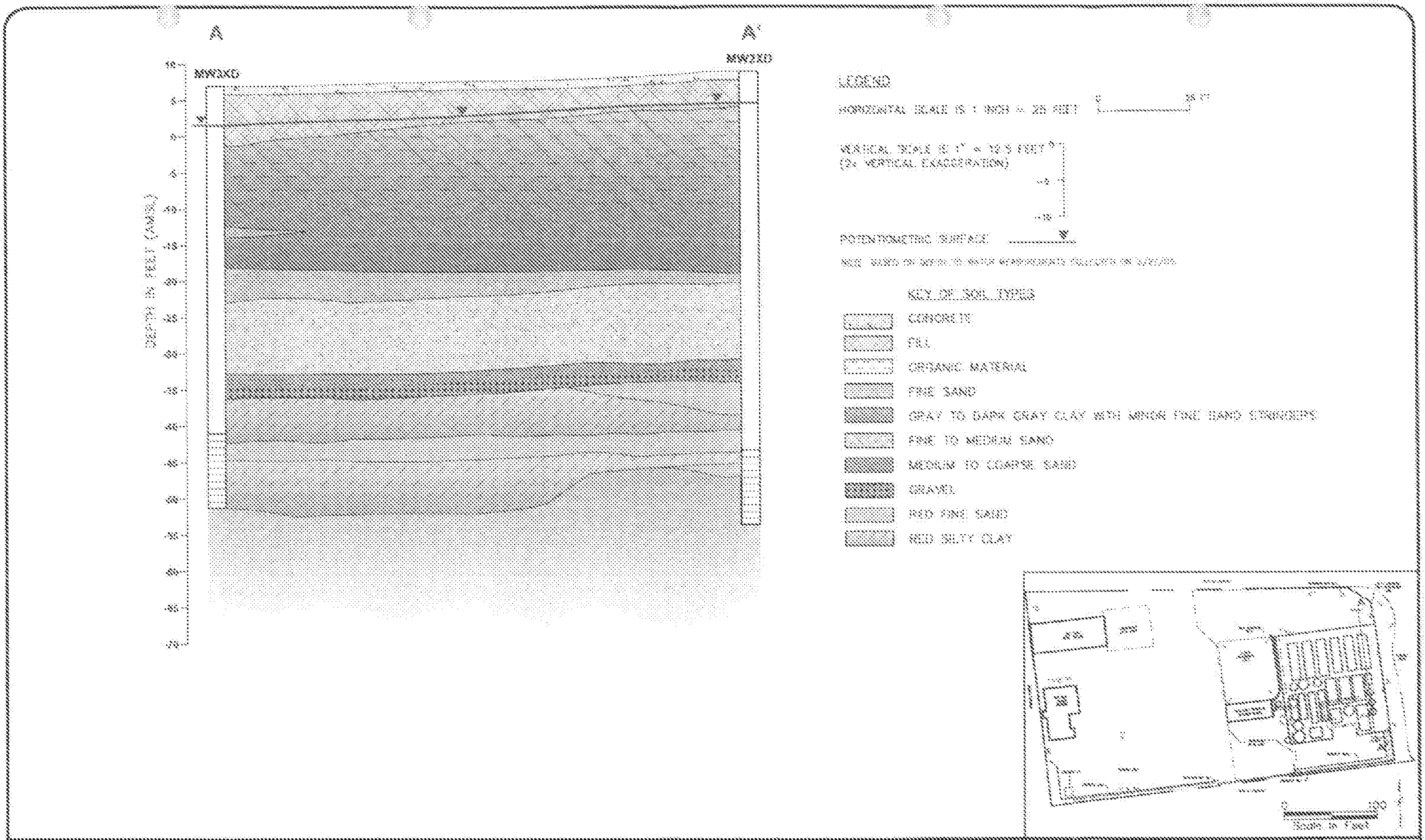
ENVIRON

GRAPHED BY: KPM/KPM | DATE: 5/27/05

SITE LOCATION MAP
INDUSTRIAL PETROCHEMICALS, INC.
128 DOREMUS AVENUE, NEWARK, NEW JERSEY

FIGURE
1

12789A/01



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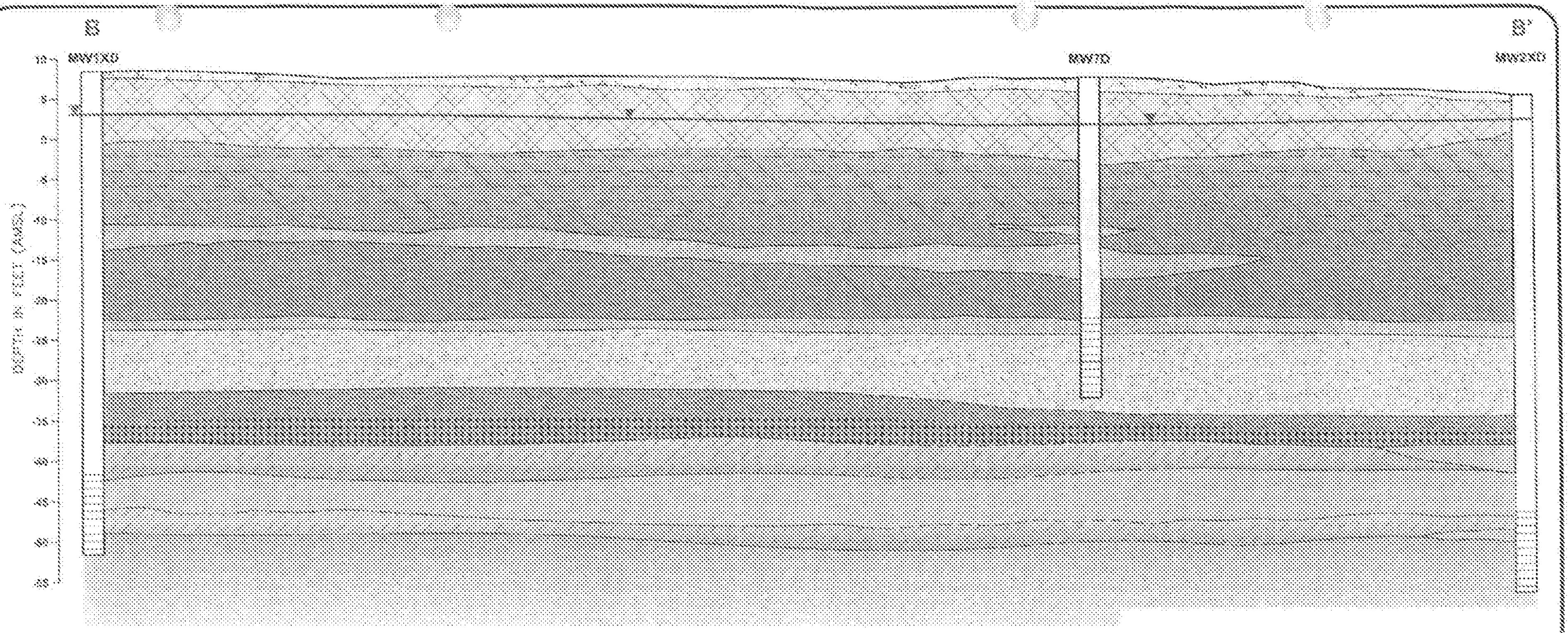
INTERPRETED GEOLOGIC CROSS–SECTION A–A'
INDUSTRIAL PETROCHEMICALS, INC.
128 DOREMUS AVENUE, NEWARK, NEW JERSEY

FIGURE
2A



LEGEND

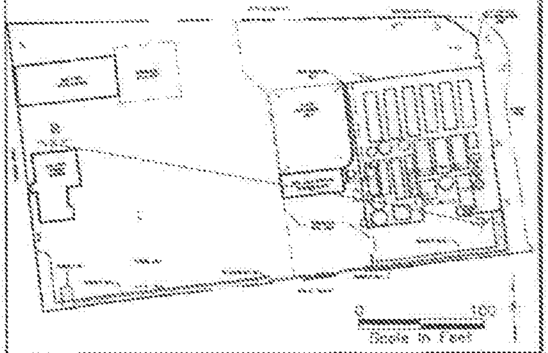
HORIZONTAL SCALE IS 1 INCH = 25 FEET

VERTICAL SCALE IS 1" = 12.5 FEET
(2x VERTICAL EXAGGERATION)

POTENTIOMETRIC SURFACE

KEY OF SOIL TYPES

▨	CONCRETE
▨	FILL
▨	ORGANIC MATERIAL
▨	FINE SAND
▨	GRAY TO DARK GRAY CLAY WITH MINOR FINE SAND STRINGERS
▨	FINE TO MEDIUM SAND
▨	MEDIUM TO COARSE SAND
▨	GRAVEL
▨	RED FINE SAND
▨	RED SILTY CLAY



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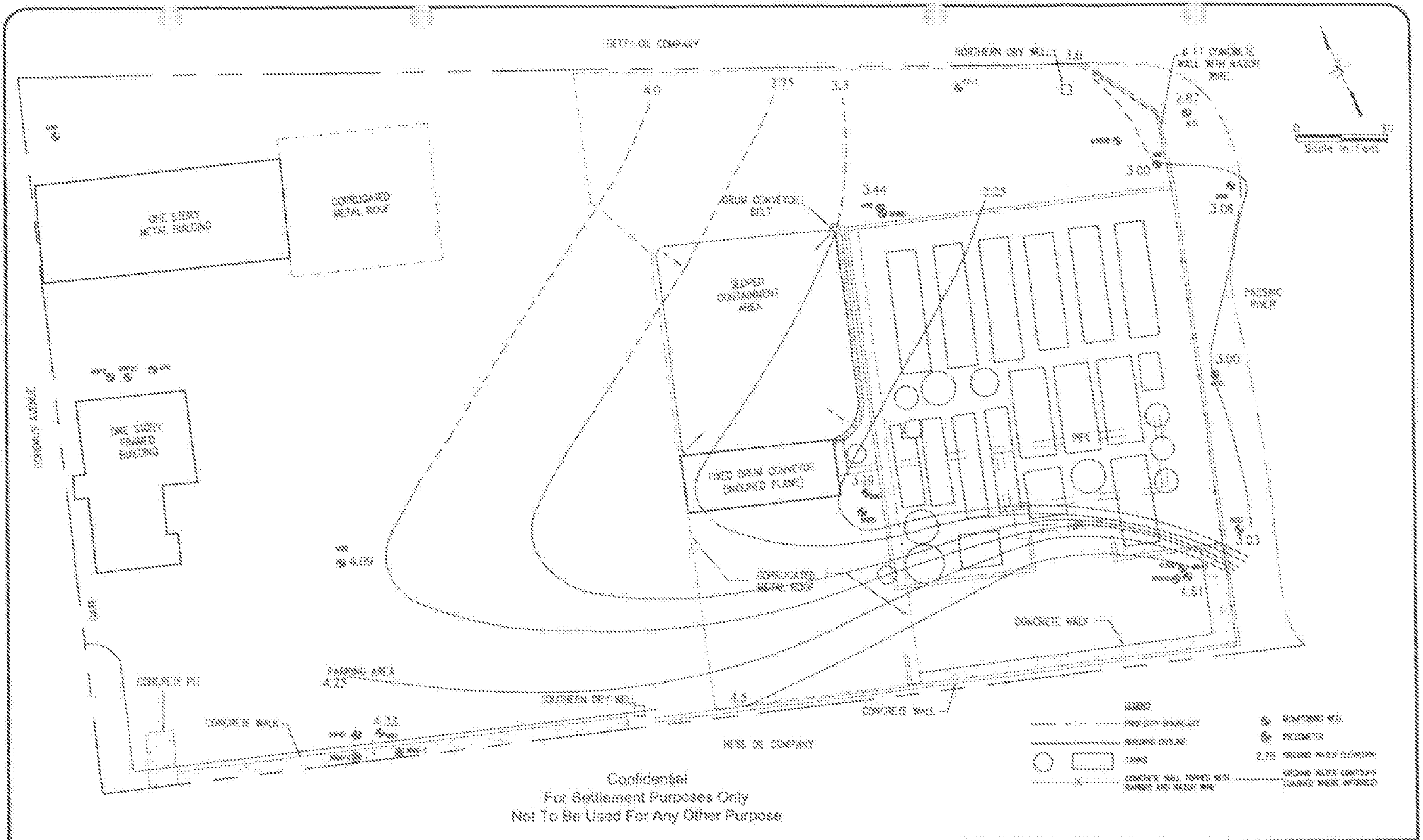
INTERPRETED GEOLOGIC CROSS-SECTION B-B'

INDUSTRIAL PETROCHEMICALS, INC.
128 DOREMUS AVENUE, NEWARK, NEW JERSEY

FIGURE
2B



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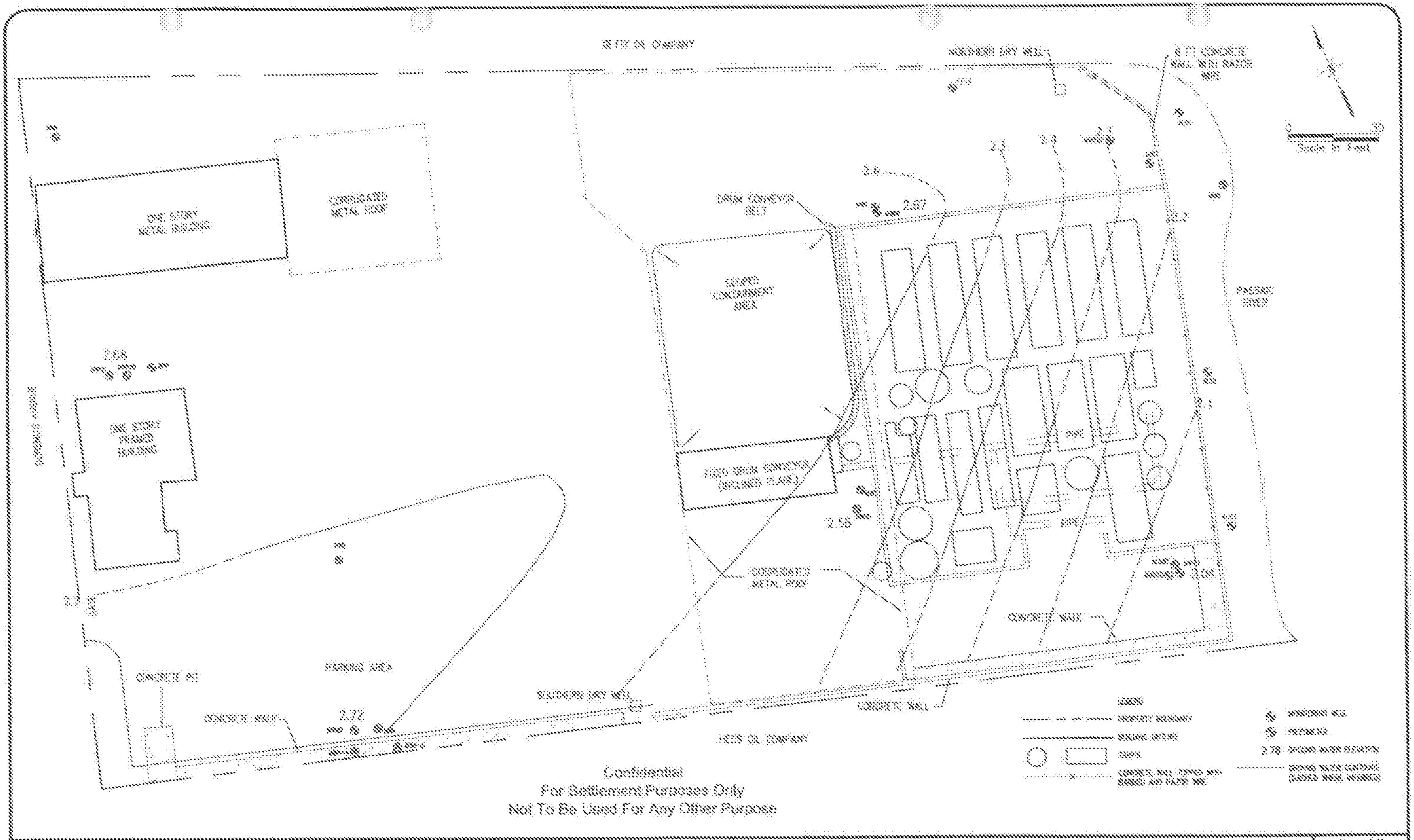
GROUND WATER ELEVATIONS FOR SHALLOW SATURATED ZONE (2-15 FT. BGS)-GROUND WATER ELEVATION CONTOURS (0.5 FT.)
INDUSTRIAL PETROCHEMICALS
128 DOREMUS AVENUE, NEWARK, NEW JERSEY

FIGURE
3



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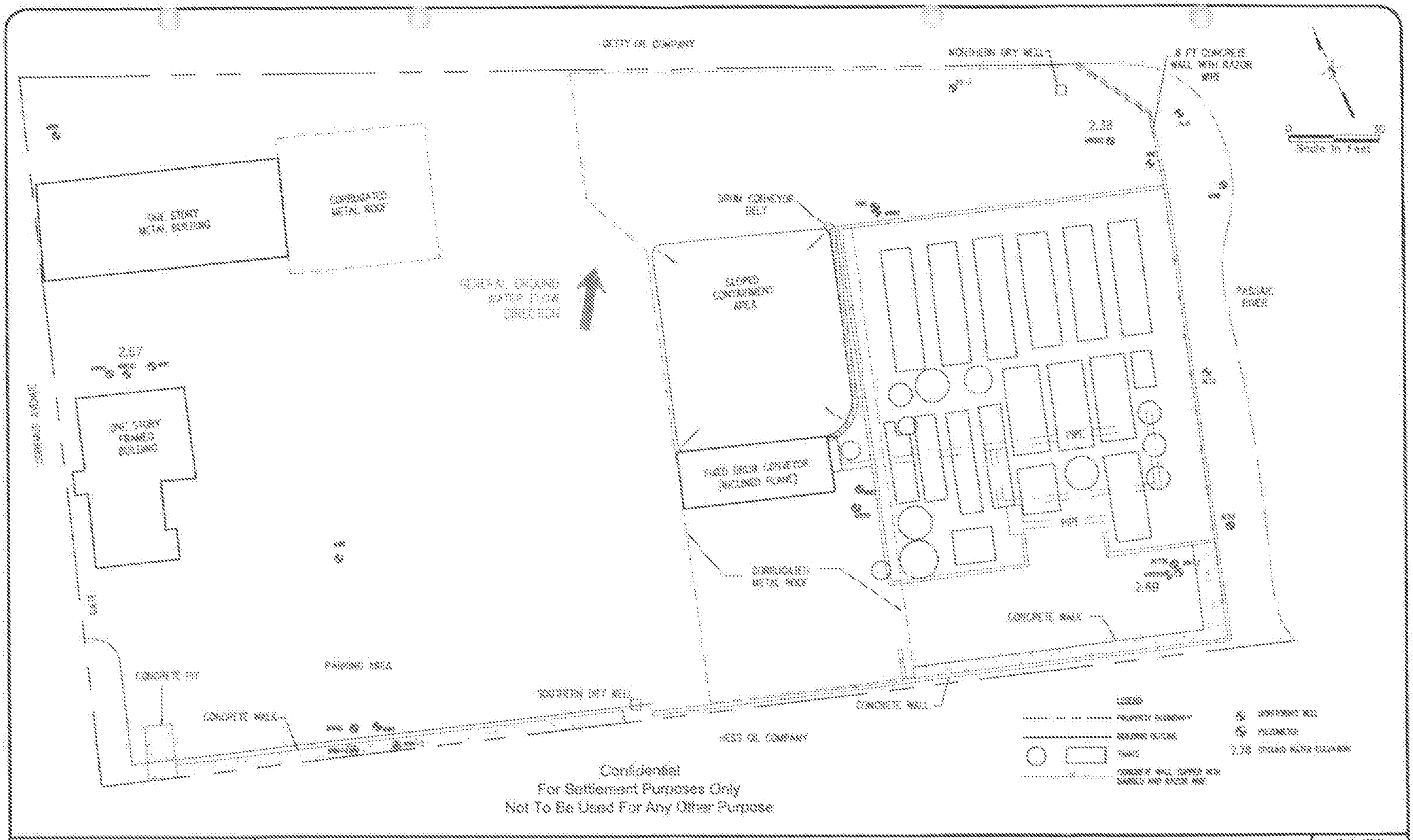
GROUND WATER ELEVATIONS FOR INTERMEDIATE SATURATED ZONE (20-40 FT. BGS)
INDUSTRIAL PETROCHEMICALS
128 DOREMUS AVENUE, NEWARK, NEW JERSEY

FIGURE
4



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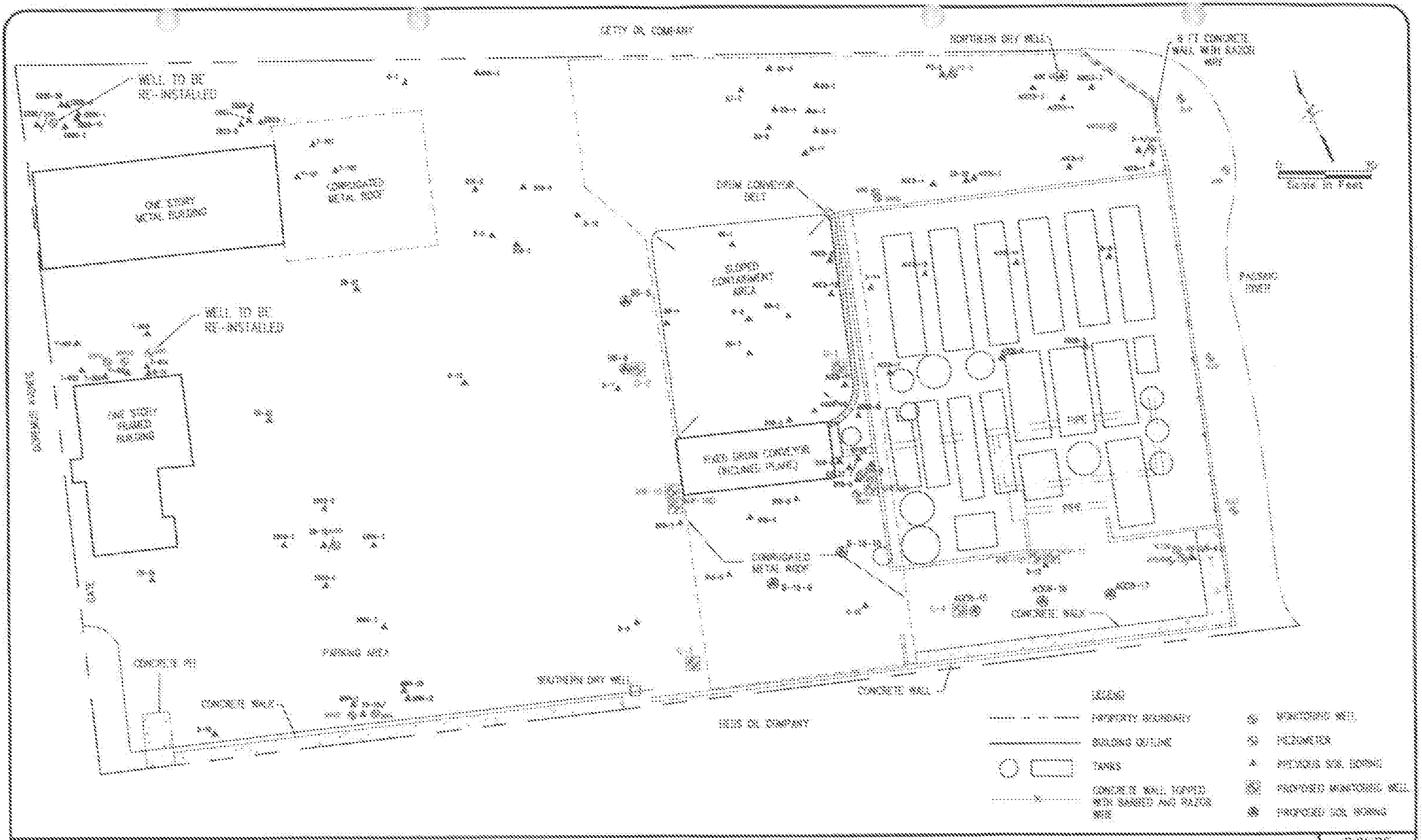
GROUND WATER ELEVATIONS FOR DEEP SATURATED ZONE (47–62 FT. BGS)

INDUSTRIAL PETROCHEMICALS
128 DOREMUS AVENUE, NEWARK, NEW JERSEY

FIGURE
5

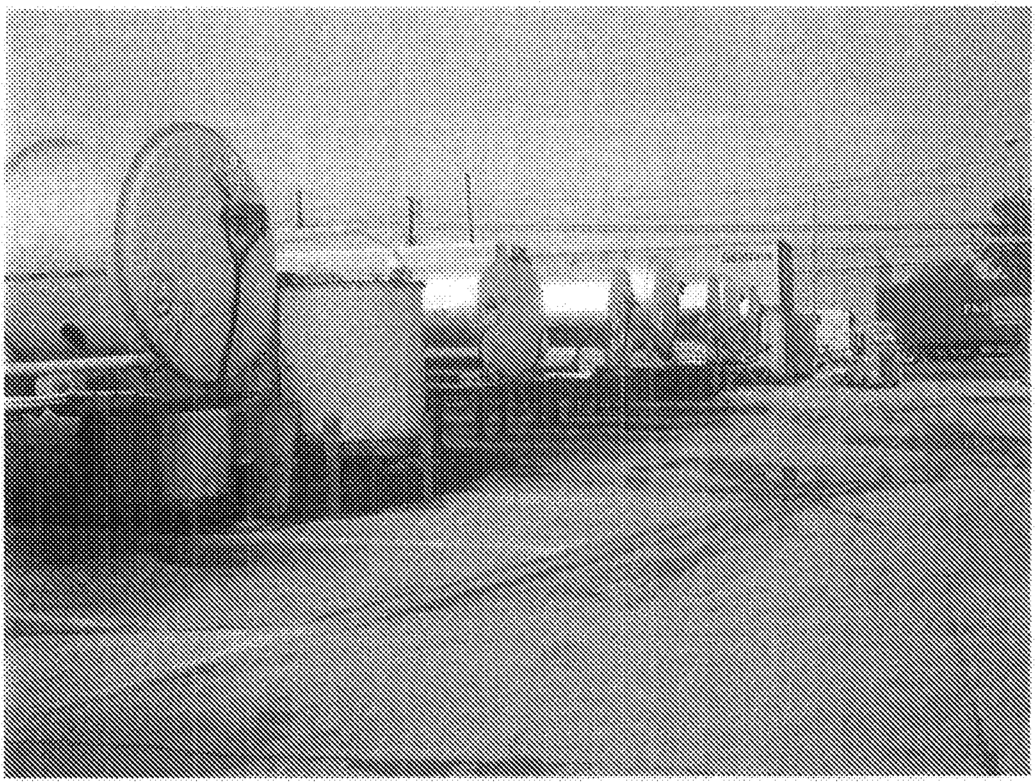


ENVIRON

DRAFTED BY: [illegible] DATE: [illegible]

SITE LAYOUT WITH PREVIOUS AND PROPOSED SAMPLING LOCATIONS
INDUSTRIAL PETROCHEMICALS, INC.
128 DOREMUS AVENUE, NEWARK, NEW JERSEY

FIGURE
6



PHOTOGRAPH 1: SOUTHERN TANKER PARKING AREA LOOKING WEST

PHOTOGRAPH 2: OFFICE BUILDING (DOREMUS AVENUE IS BEHIND BUILDING)

ENVIRON

DRAFTED BY: TSP

DATE: 6/27/2008

SITE PHOTOGRAPHS
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

FIGURE

E-1

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APPENDIX A

Soil Boring and Monitoring Well Logs

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BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

BORING #:	AOC8-10
DATE:	2/6/05
START TIME:	1140
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER :	R. Logel
RIG:	GEFCO Skid Rig
SAMPLING METHOD:	2-foot continuous split spoons
BORING DIA:	7 5/8 inches
BORING DEPTH	9.5 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

COMMENTS:

AOC 8

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 1.5 Concrete.
1.5-3.5	5-3-2-6	0.33	814	-AOC8-10-SS01 (3.0-3.5') for VOC+10 and TPHCs	1.5 – 3.5 Gray fine sand with PHC-like odor; wet at 3.25 feet bgs.
3.5-5.5	1-1-1-1	1.00	223, 276, 296		3.5 – 5.5 Dark gray clay with stiff consistency and a zone of fine wet sand at 4.0 feet bgs.
5.5-7.5	1-1-1-1	1.67	632, 99, 41, 29	-AOC8-10-SS02 (5.5-6.0') for VOC+10 and TPHCs	5.5 – 7.5 Gray fine to medium sand with zones of gray clay and organics from 6.8-7.0' and 7.25'-7.5'; wet.
7.5-9.5	1-1-1-1	1.00	33.1, 22.7, 40.9	-AOC8-10-SS03 (7.0-7.5') for VOC+10 and TPHCs	7.5 – 9.5 Light brown-gray clay with some organics and a medium soft consistency.

COMMENTS:

2-12799A:PRIN_WP\21320v1.DOC

BORING #: AOC8-11
DATE: 2/6/05
START TIME: 1058
LOGGED BY: Trevor Tompkins
DRILLING CO: Advanced Drilling, Inc.
DRILLER : R. Logel
RIG: GEFCO Skid Rig
SAMPLING METHOD: 2-foot continuous split spoons
BORING DIA: 7 5/8-inches
BORING DEPTH 8.5-feet
ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:

AOC 8

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.5 Concrete.
2.5-4.5	6-6-5-5	0.75	763, 599	-AOC8-11-SS01 (3.0-3.5') for VOC+10 and TPHCs	2.5 – 4.5 Black cinders with solvent odor and some clay from 2.5-2.75 feet bgs; wet at 3.75 feet bgs.
4.5-6.5	1-1-1-1	1.67	219, 68, 40, 28		4.5 – 6.5 Gray clay with stiff consistency and zone of fine sand at 5.0 feet bgs that is wet.
6.5-8.5	1-1-1-1	1.83	203, 78, 24, 12	-AOC8-11-SS02 (6.75-7.25') for VOC+10 and TPHCs	6.5 – 7.0 Light gray ash; wet. 7.0 – 7.25 Gray coarse sand; wet. 7.25 – 8.5 Brown-gray clay with some organics.

COMMENTS:

BORING #:	AOC8-12	**ENVIRON** BORING LOG PROJECT: Industrial Petrochemicals, Inc. 128 Doremus Ave, Newark CASE # 02-12799A	
DATE:	2/6/05		
START TIME:	1017		
LOGGED BY:	Trevor Tompkins		
DRILLING CO:	Advanced Drilling, Inc.		
DRILLER:	R. Logel		
RIG:	GEFCO Skid Rig	COMMENTS: AOC 10	
SAMPLING METHOD:	2-foot continuous split spoons		
BORING DIA:	7 5/8 inches		
BORING DEPTH	8.0 feet		
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)		

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.0 Concrete.
2.0-4.0	9-8-6-5	1.25	842, 394, 104	-AOC8-12-SS01 (2.0-2.5') for VOC+10 and TPHCs	2.0 – 3.5 Gray fine sand with little silt and gravel and trace brick fragments; moist. 3.5 – 4.0 Black cinders; wet.
4.0-6.0	1-1-1-1	0.83	256, 316	-AOC8-12-SS02 (3.0-3.5') for VOC+10 and TPHCs	4.0 – 6.0 Gray clay with a soft consistency.
6.0-8.0	1-1-1-1	1.50	606, 58, 308	-AOC8-12-SS03 (7.0-7.5') for VOC+10 and TPHCs	6.0 – 8.0 Light brown-gray clay with medium soft consistency.

COMMENTS:

BORING #:	AOC8-13
DATE:	1/21/05
START TIME:	0904
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER:	C. Conner
RIG:	Jack-Hammer
SAMPLING METHOD:	Jack-Hammer & Four-foot Macrocore
BORING DIA:	2 inches
BORING DEPTH	8.5 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:

AOC 10

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 0.5 Concrete.
0.5-4.5	NA	2.00	1.4, 2.7, 124.9, 175.5	-AOC8-13-SS01 (0.5-1.0') for VOC+10 and TPHCs	0.5 – 1.0 Brown fine sand; moist.
4.5-8.5	NA	2.67	ND		1.0 – 2.5 Brown fine sand and clay with zone of organics at 2.0 feet; wet at 1.75'.
				-AOC8-13-SS02 (4.0-4.5') for VOC+10 and TPHCs	2.5 – 4.5 Dark gray clay with strong PHC-like odor.
					4.5 – 6.5 Gray clay with soft consistency and band of fine sand at 5.5'.
				-AOC8-13-SS03 (7.5-8.0') for VOC+10 and TPHCs	6.5 – 8.5 Brown clay with soft consistency and organics throughout.

COMMENTS:

)2-12799A:PRIN_WP\21320v1.DOC

BORING #:	AOC8-14
DATE:	1/21/05
START TIME:	1014
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER:	C. Conner
RIG:	Jack-Hammer
SAMPLING METHOD:	Jack-Hammer & Four-foot Macrocore
BORING DIA:	2 inches
BORING DEPTH	8.5 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:

AOC 10

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 0.5 Concrete.
0.5-4.5	NA	2.00	1.0, 1.4, 80.3, 29.4	-AOC8-14-SS01 (0.5-1.0') for VOC+10 and TPHCs	0.5 – 0.75 Brown fine sand and clay; moist. 0.75 – 4.5 Gray to dark gray clay with a soft consistency and PHC-like odor.
4.5-8.5	NA	1.00	ND	-AOC8-14-SS02 (3.5-4.0') for VOC+10 and TPHCs -AOC8-14-SS03 (7.5-8.0') for VOC+10 and TPHCs	4.0 – 8.0 Dark gray clay with a soft consistency and PHC-like odor.

COMMENTS:

)2-12799A:PRIN_WP\21320v1.DOC

BORING #: AOC13-2
DATE: 1/25/05
START TIME: 1511
LOGGED BY: Trevor Tompkins
DRILLING CO: Advanced Drilling, Inc.
DRILLER : R. Logel
RIG: GEFCO Skid Rig
SAMPLING METHOD: 2-foot continuous split spoons
BORING DIA: 7 5/8 inches
BORING DEPTH 5.0 feet
ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON
BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:
AOC 13

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 1.0 Concrete.
1.0-3.0	NT	0.75	34.8, 59.5	-AOC13-2-SS01 (2.5-3.0') for VOC+10 and TPHCs	1.0 – 1.5 Concrete sub-base.
3.0-5.0	NT	0.83	347, 513		1.5 – 3.0 Gray-green silt and fine sand with gravel throughout; moist; some areas of rust coloration
				-AOC13-2-SS02 (4.0-4.5') for VOC+10 and TPHCs	3.0 – 5.0 Black cinders; wet at 4.5 feet bgs.

COMMENTS:

BORING #:	AOC13-3
DATE:	1/25/05
START TIME:	1337
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER :	R. Logel
RIG:	GEFCO Skid Rig
SAMPLING METHOD:	2-foot continuous split spoons
BORING DIA:	7 5/8 inches
BORING DEPTH	5.0 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:

AOC 13

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 1.0 Concrete.
1-3	NT	0.50	23.2	-AOC13-3-SS01 (1.5-2.0') for VOC+10 and TPHCs	1.0 – 2.0 Dark gray fine sand with some gravel and a PHC odor; moist. *Split Spoon refusal at 2.0 feet bgs.
					2.0 – 5.0 Concrete

COMMENTS:

BORING #:	AOC13-4
DATE:	1/25/05
START TIME:	1318
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER :	R. Logel
RIG:	GEFCO Skid Rig
SAMPLING METHOD:	2-foot continuous split spoons
BORING DIA:	7 5/8 inches
BORING DEPTH	5.5 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799B

COMMENTS:

AOC 13

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 1.5 Concrete.
1.5-3.5	NT	1.25	319, 289, 249	-AOC13-4-SS01 (2.5-3.0') for VOC+10 and TPHCs	1.5 – 2.0 Dark brown gravel and fine sand; moist. 2.0 – 3.0 Green silt and rock fragments with strong PHC odor; moist.
3.5-5.5	NT	0.83	470, 410	-AOC13-4-SS02 (4.0-4.5') for VOC+10 and TPHCs	3.0 – 5.5 Black cinders with PHC odor; wet.

COMMENTS:

2-12799A:PRIN_WP\21320v1.DOC

BORING #: B3-5

DATE: 1/25/05

START TIME: 1544

LOGGED BY: Trevor Tompkins

DRILLING CO: Advanced Drilling, Inc.

DRILLER : R. Logel

RIG: GEFCO Skid Rig

SAMPLING METHOD: 2-foot continuous split spoons

BORING DIA: 7 5/8 inches

BORING DEPTH 6.0 feet

ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:

AOC 11

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.0 Concrete and tight fill.
2.0-4.0	NT	1.50	6.5, 7.0, 46.5	-B3-5-SS01 (2.5-3.0') for TPHCs	2.0 – 4.0 Cinders, brick and mica with PHC odor: wet.
4.0-6.0	NT	1.17	9.0, 14.6, 7.5		4.0 – 5.5 Dark gray cinders: wet. 5.5 – 6.0 Gray clay with soft consistency.

COMMENTS:

BORING #: B3-6
DATE: 1/26/05
START TIME: 0823
LOGGED BY: Trevor Tompkins
DRILLING CO: Advanced Drilling, Inc.
DRILLER : R. Logel
RIG: GEFCO Skid Rig
SAMPLING METHOD: 2-foot continuous split spoons
BORING DIA: 7 5/8 inches
BORING DEPTH 6.0 feet
ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:

AOC 11

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.0 Concrete and tight fill.
2.0-4.0	NT	1.33	6.2, 42.1, 57.8	-B3-6-SS01 (2.5-3.0') for TPHCs	2.0 – 4.0 Dark gray cinders, gravel and mica fragments with strong PHC odor; moist.
4.0-6.0	NT	1.00	20.7, 30.3, 30.1		4.0 – 6.0 Fragments of mica schist with a strong PHC odor; wet at 4.0 feet bgs.

COMMENTS:

BORING #: B6-1
DATE: 2/6/05
START TIME: 1450
LOGGED BY: Trevor Tompkins
DRILLING CO: Advanced Drilling, Inc.
DRILLER : R. Logel
RIG: GEFCO Skid Rig
SAMPLING METHOD: 2-foot continuous split spoons
BORING DIA: 7 5/8 inches
BORING DEPTH 9.0 feet
ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799B

COMMENTS:

AOC 8

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 1.0 Concrete.
1.0-3.0	2-2-2-1	0.25	158.2	-B6-1-SS01 (2.5-3.0') for VOC+10 and TPHCs	1.0 – 3.5 Orange silt; moist.
3.0-5.0	6-8-8-9	1.00	267, 387, 332		3.5 – 5.2 Dark gray medium to coarse sand with some fine gravel; wet at 4.0 feet bgs.
5.0-7.0	NT	1.17	132, 29.1, 3.0	-B6-1-SS02 and B6-1-SS22 (4.5-5.0') for VOC+10 and TPHCs	5.2 – 7.0 Gray clay with a stiff consistency.
7.0-9.0	NT	2.00	25.9, 23.2, 6.3, 8.2		7.0 – 9.0 Brown-gray clay with medium soft consistency.

COMMENTS:

BORING #: B6-2
DATE: 2/6/05
START TIME: 0945
LOGGED BY: Trevor Tompkins
DRILLING CO: Advanced Drilling, Inc.
DRILLER : R. Logel
RIG: GEFCO Skid Rig
SAMPLING METHOD: 2-foot continuous split spoons
BORING DIA: 7 5/8 inches
BORING DEPTH 9.5 feet
ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799B

COMMENTS:

AOC 8

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 1.5 Concrete.
1.5-3.5	6-3-1-2	0.83	1101, 156	-B6-2-SS01 (1.5-2.0') for VOC+10 and TPHCs	1.5 – 3.5 Gray fine sand with zones of clay with a strong solvent odor and few fine gravel; wet at 2.5 feet bgs.
3.5-5.5	2-2-1-1	1.25	369, 116, 118	-B6-2-SS02 (4.5-5.0') for VOC+10 and TPHCs	3.5 – 4.25 Gray clay with a medium soft consistency. 4.25 – 5.25 Alternating bands of gray clay and fine sand (the sand is wet). 5.25 – 5.5 Gray medium to coarse sand; wet.
5.5-7.5	1-1-1-1	2.00	137, 123, 141, 24		5.5 – 7.5 Gray clay with a soft consistency and a zone of fine sand at 7.0 feet bgs.
7.5-9.5	1-1-1-1	1.17	56.1, 30.4, 168		7.5 – 9.5 Light brown-gray clay with some organics and a medium soft consistency.

COMMENTS:

02-12799A:PRIN_WP\21320v1.DOC

BORING #: B6-3
DATE: 2/6/05
START TIME: 1352
LOGGED BY: Trevor Tompkins
DRILLING CO: Advanced Drilling, Inc.
DRILLER : R. Logel
RIG: GEFCO Skid Rig
SAMPLING METHOD: 2-foot continuous split spoons
BORING DIA: 7 5/8 inches
BORING DEPTH 9.0 feet
ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799B

COMMENTS:

AOC 8

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 3.0 Concrete.
3.0-5.0	3-3-12-3	1.00	>2000	-<u>B6-3-SS01</u> (3.0-3.5') for VOC+10 and TPHCs -<u>B6-3-SS02</u> (4.5-5.0') for VOC+10 and TPHCs.	3.0 – 3.75 Brown to red-brown silt and fine sand with strong solvent odor; moist. 3.75 – 3.9 Wood fragments. 3.9 – 5.75 Gray fine sand; wet.
5.0-7.0	NT	1.50	>2000		5.75 – 7.0 Gray clay with a stiff consistency and a band (2") of fine at 6.4 feet bgs.
7.0-9.0	NT	1.67	>2000		7.0 – 9.0 Brown-gray clay with a stiff consistency and a band (2") of fine sand at 8.0 feet bgs.

COMMENTS:

BORING #: B6-4
DATE: 2/6/05
START TIME: 0902
LOGGED BY: Trevor Tompkins
DRILLING CO: Advanced Drilling, Inc.
DRILLER : R. Logel
RIG: GEFCO Skid Rig
SAMPLING METHOD: 2-foot continuous split spoons
BORING DIA: 7 5/8-inches
BORING DEPTH 9.0-feet
ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799B

COMMENTS:

AOC 8

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
1.0-3.0	70-100/4"	0.83	11.5, 28.1	-B6-4-SS01 (3.0-3.5') for VOC+10 and TPHCs	0.0 – 1.0 Concrete. 1.0 – 2.0 Gray to dark gray fine sand and gravel; moist. *Refusal at 2.0 feet bgs. 3.0 – 3.75 Black tar-like substance, with fragment of concrete at 3.5 feet. 3.75 – 5.0 Gray fine sand with thin bands (1-2") of clay throughout; wet. 5.0 – 7.0 Dark gray clay with some organics and a medium soft consistency. 7.0 – 7.75 Brown-gray fine sand with little fine gravel, clay and organics; wet. 7.75 – 9.0 Light brown-gray clay and organics with medium soft consistency.
3.0-5.0	119-12-6-4	1.17	219, 130, 152		
5.0-7.0	NT	1.17	25.1, 11.9, 12.4	-B6-4-SS02 (4.5-5.0') for VOC+10 and TPHCs	
7.0-9.0	NT	1.67	135.5, 8.6, 9.7, 12.4		

COMMENTS:

BORING #:	B18-4
DATE:	2/6/05
START TIME:	1523
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER :	R. Logel
RIG:	GEFCO Skid Rig
SAMPLING METHOD:	2-foot continuous split spoons
BORING DIA:	7 5/8 inches
BORING DEPTH	9.0 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:

AOC 3

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 3.0 Concrete.
3.0-5.0	22-2-4-4	1.17	2300	-B18-4-SS01 (3.5-4.0') for VOC+10	3.0 – 3.25 Orange-brown fine sand; wet. 3.25 – 5.0 Alternating bands of gray fine sand that is wet and gray clay with a medium soft consistency. Bands are three to four inches thick.
5.0-7.0	1-1-1-2	1.67	245, 347, 123, 62		5.0 – 6.0 Gray fine sand with some clay; wet. 6.0 – 6.8 Gray clay with a stiff consistency.
7.0-9.0	1-1-1-1	1.25	134, 50, 42	-B18-4-SS02 (7.0-7.5') for VOC+10	6.8 – 8.0 Gray medium sand; wet. 8.0 – 9.0 Brown-gray clay with some organics and a stiff consistency.

COMMENTS:

02-12799A:PRIN_WP\21320v1.DOC

BORING #:	B18-5
DATE:	1/26/05
START TIME:	1108
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER:	R. Logel
RIG:	GEFCO Skid Rig
SAMPLING METHOD:	2-foot continuous split spoons
BORING DIA:	7 5/8 inches
BORING DEPTH	8.0 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:

AOC 3

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 3.0 Concrete.
3.0-5.0	NT	1.00	149, 287, 391	-B18-5-SS01 (3.75-4.25') for VOC+10	3.0 – 4.5 Yellow-orange fine to medium sand; wet at 4.25 feet bgs. *Refusal at 4.5 feet bgs.
6.0-8.0	NT	0.67	118.1, 40.4	-B18-5-SS02 (7.3-7.8') for VOC+10	4.5 – 6.0 Concrete. 6.0 – 7.8 Gray fine to medium sand with wood fragments in the upper 0.2 feet and a PHC odor; wet.

COMMENTS:

2-12799A:PRIN_WP\21320v1.DOC

BORING #: B18-6
DATE: 1/26/05
START TIME: 1335
LOGGED BY: Trevor Tompkins
DRILLING CO: Advanced Drilling, Inc.
DRILLER: R. Logel
RIG: GEFCO Skid Rig
SAMPLING METHOD: 2-foot continuous split spoons
BORING DIA: 7 5/8 inches
BORING DEPTH 8.0 feet
ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799B

COMMENTS:

AOC 4

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.5 Concrete and steel plating
2.5-4.5	NT	1.17	885, 834, 978	-B18-6-SS01 and –B18-6-SS11 (4.0-4.5') for VOC+10 and TPHCs	2.5 – 3.0 Light brown fine to medium sand with a solvent odor; moist. 3.0 – 4.6 Yellow-orange fine to medium sand with a solvent odor; moist.
4.5-6.5	NT	0.25	779	-B18-6-SS02 (4.5-5.0') for VOC+10 and TPHCs	4.6 – 5.0 Black medium sand with a PHC-like odor; wet. *Refusal at 5.0 feet bgs.
6.0-8.0	NT	0.42	280	-B18-6-SS03 (7.0-7.5') for VOC+10 and TPHCs	5.0 – 6.0 Concrete. 6.0 – 8.0 Gray fine sand with some coarse sand in the upper 0.2 feet; wet.

COMMENTS:

2-12799A:PRIN_WP\21320v1.DOC

BORING #: B18-7
DATE: 1/26/05
START TIME: 0958
LOGGED BY: Trevor Tompkins
DRILLING CO: Advanced Drilling, Inc.
DRILLER: R. Logel
RIG: GEFCO Skid Rig
SAMPLING METHOD: 2-foot split spoons
BORING DIA: 7 5/8 inches
BORING DEPTH 8.0-feet
ORGANIC VAPOR EQUIPMENT PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799B

COMMENTS:

AOC 4

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.0 Concrete.
2.0-4.0	NT	0.83	215, 104.3, 67.3	-B18-7-SS01 and -B18-7-SS11 (3.5-4.0') for VOC+10 and TPHCs	2.0 – 6.0 Brown and gray silt and fine sand with some medium gravel and chunks of wood and concrete from 3.8 to 4.0 feet bgs; moist with solvent-like odor to 4 feet.
4.0-6.0	NS				
6.0-8.0	NT	1.67	8.7, 4.3, 12.4, 2.1	-B18-7-SS02 (7.0-7.5') for VOC+10 and TPHCs	6.0 – 6.25 Gray fine sand; wet. 6.25 – 7.0 Gray clay with stiff consistency. 7.0 – 8.0 Gray fine to medium sand with little silt; wet.

COMMENTS:

BORING #:	B18-8
DATE:	1/26/05
START TIME:	1447
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER:	R. Logel
RIG:	GEFCO Skid Rig
SAMPLING METHOD:	2-foot continuous split spoons
BORING DIA:	7 5/8-inches
BORING DEPTH	8.0-feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799B

COMMENTS:

AOC 4

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.0 Concrete.
2.0-4.0	NT	0.25	3.2, 3.8	-B18-8-SS01 (3.5-4.0') for VOC+10 and TPHCs	2.0 – 4.0 Red silt with some gravel and woodchips changing to dark brown with depth; moist.
4.0-6.0	NT	1.33	7.6, 4.3, 3.8	-B18-8-SS02 (4.5-5.0') for VOC+10 and TPHCs	4.0 – 5.0 Gray-brown fine sand; wet. 5.0 – 6.0 Dark gray clay with a stiff consistency and some fine sand.
6.0-8.0	NT	1.25	3.8, 39.8, 45.9	-B18-8-SS03 (7.0-7.5') for VOC+10 and TPHCs	6.0 – 6.5 Dark gray clay with a soft consistency. 6.5 – 8.0 Dark gray medium sand with a PHC odor; wet.

COMMENTS:

BORING #:	EB19-1
DATE:	1/24/05
START TIME:	1419
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER :	C. Conner
RIG:	GEFCO Truck-Mounted Rig
SAMPLING METHOD:	2-foot continuous split spoons
BORING DIA:	5 ½ inches
BORING DEPTH	6.0 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

COMMENTS:

AOC 2

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.0 Concrete.
2.0-4.0	39-32-41-33	1.17	1.5, 0.6, ND	-EB19-1-SS01 (2.0-2.5') for VOC+10	2.0 – 2.5 Orange silt and clay; moist. 2.5 – 3.5 Gray-green sand, gravel and rock fragments.
4.0-6.0	18-21-19-14	0.50	1.5, 1.1	-EB19-1-SS02 (3.5-4.0') for VOC+10	3.5 – 6.0 Dark gray to black cinders with a PHC-like odor; wet at 4.0 feet bgs.

COMMENTS:

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799A

BORING #: EB19-2

DATE: 1/24/05

START TIME: 1342

LOGGED BY: Trevor Tompkins

DRILLING CO: Advanced Drilling, Inc.

DRILLER: C. Conner

RIG: Gefco Truck-Mounted Rig

SAMPLING METHOD: 2-foot continuous split spoons

BORING DIA: 5 ½ inches

BORING DEPTH 6.0 feet

ORGANIC VAPOR EQUIPMENT: PID (10.6 eV)

COMMENTS:

AOC 2

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.0 Concrete.
2.0-4.0	12-80-29-22	1.33	0.6, 21.3, 24.5	-EB19-2-SS01 (2.0-2.5') for VOC+10	2.0 – 2.5 Orange silt and clay; moist. 2.5 – 2.75 Gray-green sand, gravel and rock fragments; moist.
4.0-6.0	15-15-22-14	1.00	3.7, 5.5, 8.5	-EB19-2-SS02 (3.5-4.0') for VOC+10	2.75 – 5.0 Dark gray to black cinders; wet at 4.0'. 5.0 – 6.0 Red rock fragments; wet.

COMMENTS:

02-12799A:PRIN_WP\21320v1.DOC

BORING #:	EB19-3
DATE:	1/24/05
START TIME:	1042
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER :	C. Conner
RIG:	Gefco Truck-Mounted Rig
SAMPLING METHOD:	2-foot continuous split spoons
BORING DIA:	5 ½ inches
BORING DEPTH	6.0 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799a

COMMENTS:

AOC 2

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 2.0 Concrete and sub-base.
2.0-4.0	16-83-40-31	1.25	0.2, 0.7, 0.7	-EB19-3-SS01 (2.0-2.5) for VOC+10	2.0 – 2.5 Orange silt and clay; moist. 2.5 – 3.0 Gray green gravel, sand and rock fragments.
4.0-6.0	15-18-13-12	1.17	ND	-EB19-3-SS02 (4.0-4.5) for VOC+10	3.0 – 6.0 Dark gray cinders with PHC-like odor, brick fragments from 3.5 to 4.0'; wet at 4.0'.

COMMENTS:

BORING #:	EB19-4
DATE:	1/24/05
START TIME:	0939
LOGGED BY:	Trevor Tompkins
DRILLING CO:	Advanced Drilling, Inc.
DRILLER:	C. Conner
RIG:	Gefco Truck-Mounted Rig
SAMPLING METHOD:	2-foot continuous split spoons
BORING DIA:	5 ½ inches
BORING DEPTH	5.5 feet
ORGANIC VAPOR EQUIPMENT	PID (10.6 eV)

ENVIRON

BORING LOG

PROJECT: Industrial Petrochemicals, Inc.
128 Doremus Ave, Newark

CASE # 02-12799B

COMMENTS:

AOC 2

DEPTH (feet)	BLOW COUNTS	RECOVERY (feet)	ORGANIC VAPORS (ppm)	SAMPLE(S) DESIGNATION	DESCRIPTION
					0.0 – 1.5 Concrete.
1.5-3.5	20-19-52-15	1.00	ND	-EB19-4-SS01 (1.5-2.0') for VOC+10	1.5 – 2.0 Dark gray cinders and gravel; moist. 2.0 – 2.5 Gray-green rock fragments.
3.5-5.5	12-14-17-14	1.17	ND	-EB19-4-SS02 (3.5-4.0') for VOC+10	2.5 – 5.5 Dark gray cinders with PHC-like odor; wet at 5.5'.

COMMENTS:

ENVIRON
WELL LOG

WELL# MW-1D
PERMIT# 2600073378
DATE: 1/19/05-1/20/05
LOGGED BY: T.TOMPKINS
DRILLING CO.: ADVANCED DRILLING, INC.
DRILLER: R.LOGEL & C.CONNER
RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG
METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY
BORING DIA.: 12-INCH & 6-INCH
BORING DEPTH: 40 FEET
DEPTH TO WATER: 5.42 FEET
SURFACE ELEV.: 8.24 FEET AMSL

WELL CASING
INTERVAL: 0-30 FEET
DIA.: 2-INCH
TYPE: SCHEDULE 40 PVC
T.O.C. ELEV.: 8.02 FEET AMSL

WELL SCREEN
INTERVAL: 30-40 FEET
DIA.: 2-INCH
SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT
TIME: 20 MINUTES
METHOD: WHALE PUMP
EST. YIELD: 1.25 GPM

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ
CASE # 02-12799A

COMMENTS:

▨ CEMENT
▩ #00 SAND
⋯ #1 SAND
☰ WELL SCREEN

Page 1 of 2

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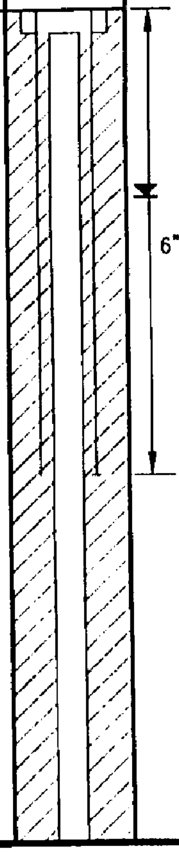
DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
0				SEE WELL LOG MW-1XD			
5							6" STEEL CASING
10							
15							
20							

WELL# MW-1D

PERMIT# 2600073378

DATE: 1/19/05-1/20/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 40 FEET

DEPTH TO WATER: 5.42 FEET

SURFACE ELEV.: 8.24 FEET AMSL

WELL CASING

INTERVAL: 0-30 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 8.02 FEET AMSL

WELL SCREEN

INTERVAL: 30-40 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 20 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 1.25 GPM

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE # 02-12799A

COMMENTS:

- ▨ CEMENT
- ▩ #00 SAND
- ░ #1 SAND
- ▤ WELL SCREEN

Page 2 of 2

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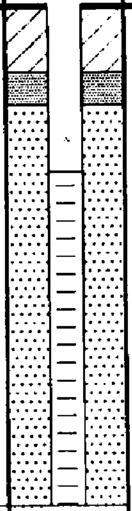
\12799A_MW1D

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
				SEE WELL LOG MW-1XD			
30							
35							
40							
45							
50							

WELL# MW-1XD

PERMIT# 2600073376

DATE: 1/18/05-1/20/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 60 FEET

DEPTH TO WATER: 5.09 FEET

SURFACE ELEV.: 8.18 FEET AMSL

WELL CASING

INTERVAL: 0-50 FEET

DIA.: 2-INCH

TYPE: PVC

T.O.C. ELEV.: 7.87 FEET AMSL

WELL SCREEN

INTERVAL: 50-60 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 50 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 0.55 GPM

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE # 02-12799A

COMMENTS:

- ▨ CEMENT
- ▩ #00 SAND
- ░ #1 SAND
- ▯ WELL SCREEN

Page 1 of 3

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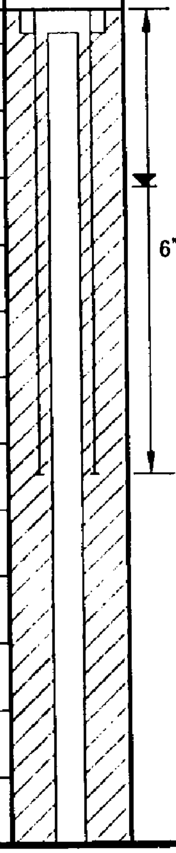
\12799A_MW-1XD

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
0				CONCRETE			
	SS-1	3-4-8-4	8	BROWN SILT AND FINE SAND WITH BRICK, WOOD AND GLASS FRAGMENTS AND LITTLE GRAVEL; MOIST.	ND		
	SS-2	5-7-4-3	5		ND		
5	SS-3	2-2-3-3	10	YELLOW FINE SAND WITH LITTLE FINE GRAVEL AND TWO THIN BANDS OF CLAY BETWEEN 7 AND 8.9 FEET; WET.	ND		
	SS-4	2-2-2-2	12		ND		6" STEEL CASING
10	SS-5	2-2-1-2	16	GRAY CLAY AND ORGANICS WITH STIFF CONSISTENCY. ORGANICS DECREASE IN CONCENTRATION WITH DEPTH AND ARE ABSENT BY 15 FEET. ZONE OF FINE GRAVEL AND ORGANICS AT 9.75 FEET WITH PETROLEUM HYDROCARBON STAINING AND ODOR BANDS OF FINE SAND (~1 INCH) AT 15.8, 16.75, 18.0, AND 18.9 FEET.	ND, 4.4, ND		
	SS-6	1-1-1-1	18		ND		
	SS-7	NT	22		ND		
15	SS-8	WOH/ 12"-1-1	24		ND		
	SS-9	1-1-1-1	24		ND		
20	SS-10	WOH/ 12"-1-1	24	GRAY FINE SAND WITH LITTLE CLAY AND TRACE ORGANICS; WET.	ND		
	SS-11	1-1-1-1	17	GRAY CLAY WITH MEDIUM SOFT TO STIFF CONSISTENCY AND FEW ORGANICS AND FINE SAND.	ND		
	SS-12	WOH/ 12"-1-1	12		ND		



WELL#: MW-1XD
PERMIT#: 2600073376
DATE: 1/18/05-1/20/05
LOGGED BY: T.TOMPKINS
DRILLING CO.: ADVANCED DRILLING, INC.
DRILLER: R.LOGEL & C.CONNER
RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG
METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY
BORING DIA.: 12-INCH & 6-INCH
BORING DEPTH: 60 FEET
DEPTH TO WATER: 5.09 FEET
SURFACE ELEV.: 8.18 FEET AMSL

WELL CASING

INTERVAL: 0-50 FEET
DIA.: 2-INCH
TYPE: PVC
T.O.C. ELEV.: 7.87 FEET AMSL

WELL SCREEN

INTERVAL: 50-60 FEET
DIA.: 2-INCH
SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 50 MINUTES
METHOD: WHALE PUMP
EST. YIELD: 0.55 GPM

ENVIRON
WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ
CASE #: 02-12799A

COMMENTS:
▨ CEMENT
▩ #00 SAND
░ #1 SAND
☰ WELL SCREEN

Page 2 of 3

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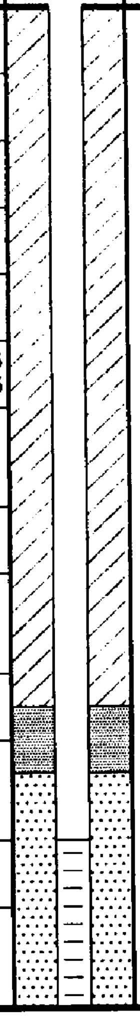
\12799A_MW-1XD

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
	SS-13	WOH/6"-1-1-1	19		ND		
	SS-14	1-1-1-1	22	LIGHT BROWN-GRAY CLAY & ORGANICS WITH A STIFF CONSISTENCY. DARK BROWN PEAT WITH SOME CLAY.	ND		
30	SS-15	1-1-1-1	11	LIGHT BROWN CLAY WITH TRACE FINE SAND AND A SOFT CONSISTENCY.	ND		
	SS-16	3-6-8-11	14	GRAY FINE TO MEDIUM SAND; WET. GRAIN SIZE INCREASES WITH DEPTH TO A FINE TO MEDIUM GRAVEL FROM 45-46 FEET.	ND		
35	SS-17	5-8-7-8	18		ND,0.6 ND,0.3		
40	SS-18	12-18-18-20	20		ND		
45	SS-19	5-5-7-7	20	ALTERNATING LAYERS OF RED CLAY WITH SOME SILT AND A STIFF CONSISTENCY AND RED FINE SAND THAT IS WET. LAYERS ARE 1-5 FEET THICK.	ND		
50	SS-20	27-28-41-27	17		ND		



ENVIRON
WELL LOG

WELL# MW-1XD
PERMIT# 2600073376
DATE: 1/18/05-1/20/05
LOGGED BY: T.TOMPKINS
DRILLING CO.: ADVANCED DRILLING, INC.
DRILLER: R.LOGEL & C.CONNER
RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG
METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY
BORING DIA.: 12-INCH & 6-INCH
BORING DEPTH: 60 FEET
DEPTH TO WATER: 5.09 FEET
SURFACE ELEV.: 8.18 FEET AMSL

WELL CASING

INTERVAL: 0-50 FEET
DIA.: 2-INCH
TYPE: PVC
T.O.C. ELEV.: 7.87 FEET AMSL

WELL SCREEN

INTERVAL: 50-60 FEET
DIA.: 2-INCH
SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 50 MINUTES
METHOD: WHALE PUMP
EST. YIELD: 0.55 GPM

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ
CASE # 02-12799A

COMMENTS:

- ▨ CEMENT
- ▩ #00 SAND
- ░ #1 SAND
- ☰ WELL SCREEN

Page 3 of 3

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DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
	SS-21	14-10-8-11	20		ND	░ ☰ ░	
60							
65							
70							
75							
80							

WELL# MW-2XD

PERMIT# 2600073379

DATE: 1/6/05-1/13/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 62 FEET

DEPTH TO WATER: 3.15 FEET

SURFACE ELEV.: 7.28 FEET AMSL

WELL CASING

INTERVAL: 0-52 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 6.19 FEET AMSL

WELL SCREEN

INTERVAL: 52-62 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 120 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 0.25 GPM

ENVIRON
WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE # 02-12799A

COMMENTS:

▨ CEMENT
▩ #00 SAND
⬚ #1 SAND
▯ WELL SCREEN

Page 1 of 3

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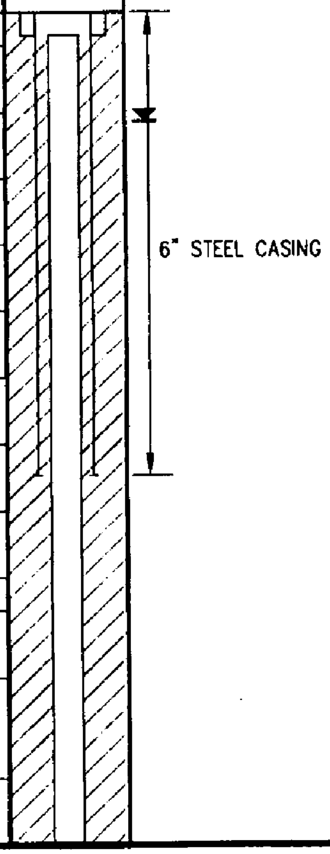
\12799A_MW-2XD

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
0							
	SS-1	37-100/5"	16	BROWN TO RED C-SAND AND GRAVEL WITH DARK GREEN ROCK FRAGMENTS FROM 1.5 TO 1.6 FEET; MOIST	ND		
	SS-2	4-7-8-6	18	LIGHT GRAY CINDERS WITH SOME GRAVEL, MOIST. DARK BROWN FINE SAND; MOIST.	ND		
5	SS-3	4-3-1-1	18	GRAY CLAY WITH SOME ORGANICS AND A SOFT CONSISTENCY. ORGANICS DECREASE IN CONCENTRATION WITH DEPTH AND ARE FOUND ONLY IN TRACE AMOUNTS BEYOND 17 FEET.	ND		
	SS-4	1/12"-1/12"	12		ND		
10	SS-5	1-1-1/12"	12		ND		
	SS-6	1/12"-1/12"	16		ND		
	SS-7	1/18"-1	15		ND		
15	SS-8	1/12"-1-1	10		ND		
	SS-9	7-22-NT-NT	18		ND		
20							
	SS-10	6-6-7-6	17		ND		



WELL# MW-2XD
PERMIT# 2600073379
DATE: 1/6/05-1/13/05
LOGGED BY: T.TOMPKINS
DRILLING CO.: ADVANCED DRILLING, INC.
DRILLER: R.LOGEL & C.CONNER
RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG
METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY
BORING DIA.: 12-INCH & 6-INCH
BORING DEPTH: 62 FEET
DEPTH TO WATER: 3.15 FEET
SURFACE ELEV.: 7.28 FEET AMSL

WELL CASING

INTERVAL: 0-52 FEET
DIA.: 2-INCH
TYPE: SCHEDULE 40 PVC
T.O.C. ELEV.: 6.19 FEET AMSL

WELL SCREEN

INTERVAL: 52-62 FEET
DIA.: 2-INCH
SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 120 MINUTES
METHOD: WHALE PUMP
EST. YIELD: 0.25 GPM

ENVIRON
WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ
CASE # 02-12799A

COMMENTS:

▨ CEMENT
▦ #00 SAND
⛆ #1 SAND
▯ WELL SCREEN

Page 2 of 3

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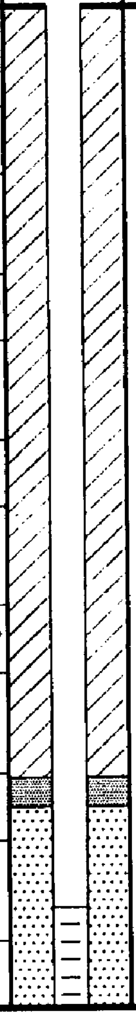
\12799A_MW-2XD

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
	SS-11	2-2-2-1	10	LIGHT BROWN FINE SAND; WET.	ND		
30				GRAY FINE TO MEDIUM SAND; WET. GRAIN SIZE INCREASES WITH DEPTH TO A COARSE SAND TO FINE GRAVEL FROM 43-44 FEET.			
	SS-12	6-5-5-7	12		ND,3.8, 2.1		
35							
	SS-13	5-6-6-5	12		ND		
40							
	SS-14	5-7-5-6	15	ALTERNATING LAYERS OF RED FINE SAND THAT IS WET AND RED CLAY WITH A STIFF CONSISTENCY. LAYERS ARE 1-5 FEET THICK.	ND,ND, 3.8		
45							
	SS-15	5-4-18-21	16		ND		
50							
	SS-16	1-12-33-24	15		ND		



WELL# MW-2XD

PERMIT# 2600073379

DATE: 1/6/05-1/13/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 62 FEET

DEPTH TO WATER: 3.15 FEET

SURFACE ELEV.: 7.28 FEET AMSL

WELL CASING

INTERVAL: 0-52 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 6.19 FEET AMSL

WELL SCREEN

INTERVAL: 52-62 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 120 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 0.25 GPM

ENVIRON
WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE # 02-12799A

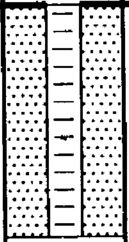
COMMENTS:

- ▨ CEMENT
- ▒ #00 SAND
- ░ #1 SAND
- ▯ WELL SCREEN

Page 3 of 3

F:\0212799A\LOGS
\12799A_MW-2XD

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
60							
65							
70							
75							
80							



ENVIRON

WELL LOG

WELL# MW-3XD

PERMIT# 2600073377

DATE: 1/5/05-1/11/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 57 FEET

DEPTH TO WATER: 3.32 FEET

SURFACE ELEV.: 6.85 FEET AMSL

WELL CASING

INTERVAL: 0-47 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 5.80 FEET AMSL

WELL SCREEN

INTERVAL: 47-57 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 100 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 0.55 GPM

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE # 02-12799A

COMMENTS:

▨ CEMENT

▩ #00 SAND

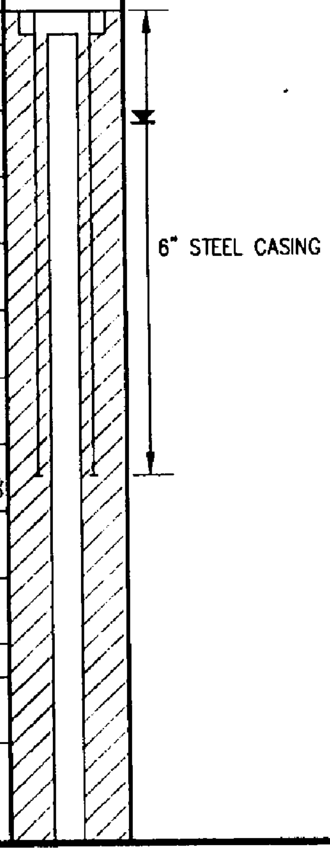
░ #1 SAND

▯ WELL SCREEN

Page 1 of 3

F:\0212799A\LOGS
\12799A_MW-3XD

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
0				CONCRETE			
	SS-1	2-18-20-20	12	BROWN TO OLIVE SILT AND GRAVEL WITH STRONG PETROLEUM HYDROCARBON ODOR.	409, 193, 6.3		
	SS-2	12-10-10-11	8	GRAY TO BLACK CINDERS; WET AT 4.9 FEET BGS. SHEEN ON WATER AND STRONG PETROLEUM HYDROCARBON ODOR.	17.6, 32.1		
5	SS-3	7-8-7-4	6	BLACK GRAVEL AND ORGANICS; WET WITH SHEEN AND STRONG PETROLEUM HYDROCARBON ODOR.	63, 17.8		
	SS-4	4-5-4-4	8		266, 231		
10	SS-5	4-4-4-3	10	LIGHT GRAY CLAY WITH SOME ORGANICS AND A SOFT CONSISTENCY. PRESENCE OF ORGANICS DECREASES WITH DEPTH.	102.6, 62.3		
	SS-6	3-4-3-3	20		98, 79.3, 92.4		
	SS-7	2-2-2-2	24		43.4, 102.8, 64, 153.8, 18.5		
15	SS-8	2-2-1-1	18		54.7, 138.4, 8.1		
	SS-9	1-2-2-2	3		67.9		
20	SS-10	3-4-4-4	11	ALTERNATING BANDS OF GRAY FINE SAND THAT IS WET AND GRAY CLAY WITH SOFT CONSISTENCY. WIDTH OF BANDS RANGES FROM 3 TO 4 INCHES TO 1 FOOT.	ND		



WELL#: MW-3XD
PERMIT#: 2600073377
DATE: 1/5/05-1/11/05
LOGGED BY: T.TOMPKINS
DRILLING CO.: ADVANCED DRILLING, INC.
DRILLER: R.LOGEL & C.CONNER
RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG
METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY
BORING DIA.: 12-INCH & 6-INCH
BORING DEPTH: 57 FEET
DEPTH TO WATER: 3.32 FEET
SURFACE ELEV.: 6.85 FEET AMSL

WELL CASING

INTERVAL: 0-47 FEET
DIA.: 2-INCH
TYPE: SCHEDULE 40 PVC
T.O.C. ELEV.: 5.80 FEET AMSL

WELL SCREEN

INTERVAL: 47-57 FEET
DIA.: 2-INCH
SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 100 MINUTES
METHOD: WHALE PUMP
EST. YIELD: 0.55 GPM

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ
CASE #: 02-12799A

COMMENTS:

- ▨ CEMENT
- ▩ #00 SAND
- ░ #1 SAND
- ▯ WELL SCREEN

Page 2 of 3

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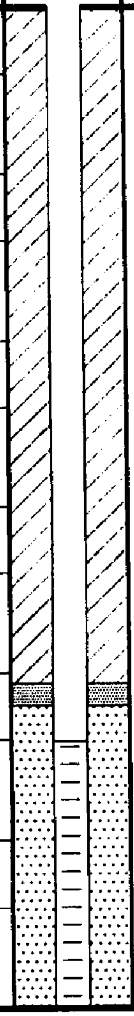
\12799A_MW-3XD

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
	SS-11	2-2-1-2	20	BROWN CLAY WITH SOME ORGANICS AND A MEDIUM SOFT CONSISTENCY.	ND		
				LIGHT BROWN FINE SAND; WET.			
30	SS-12	3-3-3-4	17	GRAY FINE TO MEDIUM SAND; WET. GRAIN SIZE INCREASES WITH DEPTH TO A COARSE SAND TO FINE GRAVEL FROM 40-43 FEET.	ND		
35	SS-13	2-3-3-4	15		ND		
40	SS-14	3-5-7-7	16		ND		
				ALTERNATING LAYERS OF RED FINE SAND THAT IS WET AND RED CLAY WITH A STIFF CONSISTENCY. LAYERS ARE 1-5 FEET THICK.			
45	SS-15	2-2-3-3	20		ND		
50	SS-16	6-7-8-8	14		ND		

ENVIRON
WELL LOG

WELL# MW-3XD
PERMIT# 2600073377
DATE: 1/5/05-1/11/05
LOGGED BY: T.TOMPKINS
DRILLING CO.: ADVANCED DRILLING, INC.
DRILLER: R.LOGEL & C.CONNER
RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG
METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY
BORING DIA.: 12-INCH & 6-INCH
BORING DEPTH: 57 FEET
DEPTH TO WATER: 3.32 FEET
SURFACE ELEV.: 6.85 FEET AMSL

WELL CASING

INTERVAL: 0-47 FEET
DIA.: 2-INCH
TYPE: SCHEDULE 40 PVC
T.O.C. ELEV.: 5.80 FEET AMSL

WELL SCREEN

INTERVAL: 47-57 FEET
DIA.: 2-INCH
SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 100 MINUTES
METHOD: WHALE PUMP
EST. YIELD: 0.55 GPM

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ
CASE # 02-12799A

COMMENTS:

▨ CEMENT
▩ #00 SAND
⠿ #1 SAND
▯ WELL SCREEN

Page 3 of 3

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\12799A_MW-3XD

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
	SS-17	4-5-7-8	24	RED CLAY WITH SOME SILT AND A STIFF CONSISTENCY.	NT	⠿ ▯ ⠿	
	SS-18	6-8-15-21	10		NT		
60							
65							
70							
75							
80							

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE #: 02-12799A

WELL#: MW-4D

PERMIT#: 2600073380

DATE: 1/14/05-1/18/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 40 FEET

DEPTH TO WATER: 4.83 FEET

SURFACE ELEV.: 8.12 FEET AMSL

WELL CASING

INTERVAL: 0-30 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 7.48 FEET AMSL

WELL SCREEN

INTERVAL: 30-40 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 55 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 1.0 GPM

COMMENTS:

▨ CEMENT

▩ #00 SAND

░ #1 SAND

▯ WELL SCREEN

Page 1 of 2

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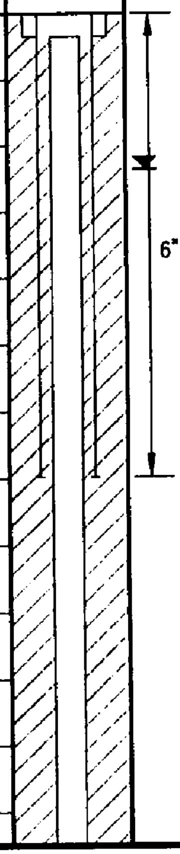
\12799A_MW4D

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
0				CONCRETE			
	SS-1	5-7-18-22	24	RED SILT WITH SOLVENT ODOR, MOIST. DARK GRAY CINDERS WITH PETROLEUM HYDROCARBON ODOR; WET AT 3.9 FEET BGS.	83.6, 235.8, 542, 159		
5	SS-2	6-6-6-5	5	BROWN FINE SAND AND GRAY CINDERS WITH BRICK FRAGMENTS FROM 6.0 TO 6.25 FEET; WET AT 6.0 FEET BGS.	4.1		
	SS-3	7-6-2-1	8	BLACK CLAY AND ORGANICS	1.0, 1.0		6" STEEL CASING
	SS-4	2-2-1-2	11	GRAY CLAY WITH THIN DARK GRAY LAMINATIONS AND INTERMITTENT LAYERS OF ORGANICS.	ND		
10	SS-5	WOH/18"-1	20	GRAY CLAY AND ORGANICS WITH MEDIUM SOFT CONSISTENCY. ORGANICS DECREASE WITH DEPTH AND ARE ABSENT AT 18 FEET.	ND		
	SS-6	1-1-1-1	24		ND		
15	SS-7	1-1-2-2	24		ND		
	SS-8	2-2-1-2	NR		NT		
	SS-9	2-1-1-2	24	GRAY FINE SAND WITH SOME CLAY AND LITTLE MEDIUM SAND; WET.	ND		
20	SS-10	1-1-1/12"	12		ND		
	SS-11	1/12"-1-1	18	GRAY CLAY WITH STIFF CONSISTENCY.	ND		
	SS-12	1/18"-1	24	ALTERNATING BANDS OF GRAY CLAY WITH STIFF CONSISTENCY & GRAY FINE SAND WITH LAYER OF ORGANICS AT 27 FEET.	ND		



WELL# MW-4D

PERMIT# 2600073380

DATE: 1/14/05-1/18/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 40 FEET

DEPTH TO WATER: 4.83 FEET

SURFACE ELEV.: 8.12 FEET AMSL

WELL CASING

INTERVAL: 0-30 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 7.48 FEET AMSL

WELL SCREEN

INTERVAL: 30-40 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 55 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 1.0 GPM

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE # 02-12799A

COMMENTS:

▨ CEMENT

▩ #00 SAND

⬚ #1 SAND

☰ WELL SCREEN

Page 2 of 2

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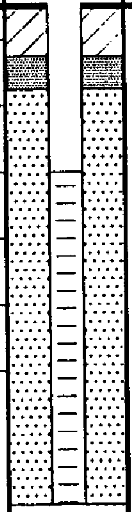
\12799A_MW4D

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
	SS-13	1/12"-1-1	24	ALTERNATING BANDS OF GRAY CLAY WITH STIFF CONSISTENCY & GRAY FINE SAND WITH LAYER OF ORGANICS AT 27 FEET.	ND		
	SS-14	2-3-3-3	24	GRAY-BROWN CLAY WITH SOME SILT AND FEW ORGANICS. CLAY HAS A STIFF CONSISTENCY.	ND		
30	SS-15	3-3-4-5	12		ND		
	SS-16	3-3-4-4	15	GRAY FINE SAND GRADING TO GRAY FINE TO MEDIUM SAND; WET.	ND		
35	SS-17	3-4-4-4	14		ND		
40							
45							
50							

WELL# MW-6D

PERMIT# 2600073381

DATE: 1/6/05-1/8/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 38.5 FEET

DEPTH TO WATER: 2.68 FEET

SURFACE ELEV.: 6.43 FEET AMSL

WELL CASING

INTERVAL: 0-28.5 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 5.46 FEET AMSL

WELL SCREEN

INTERVAL: 28.5-38.5 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 60 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 0.92 GPM

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE # 02-12799A

COMMENTS:

▨ CEMENT

▩ #00 SAND

⬚ #1 SAND

▯ WELL SCREEN

Page 1 of 2

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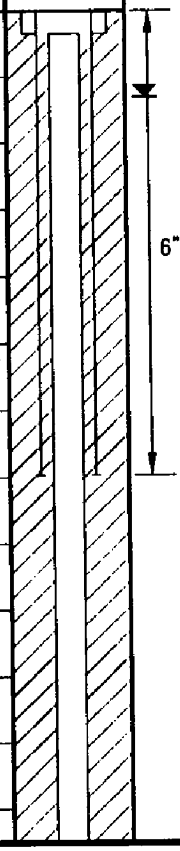
DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
0				CONCRETE			
	SS-1	5-4-4-4	14	GRAY TO DARK GRAY CLAY WITH SOFT CONSISTENCY. ORGANICS THROUGHOUT DECREASING IN CONCENTRATION WITH DEPTH.	568, 818, 140.7		
5	SS-2	2-2-2-1	6		94.1		
	SS-3	2-1-2-2	21		97.8, 5.9, 2.2		6" STEEL CASING
	SS-4	2-1/12"-1	22		12.2, 9.6, 4.3		
10	SS-5	1/12"-1/12"	24		34.8, 38.1, 28.2		
	SS-6	NT	6		33		
15	SS-7	2-3-2-3	20		ND		
	SS-8	1/12"-1/12"	24		ND		
	SS-9	3-4-4-4	24	ALTERNATING BANDS OF GRAY CLAY WITH SOFT CONSISTENCY AND GRAY FINE SAND THAT IS WET. WIDTH OF BANDS RANGES FROM 3 TO 4 INCHES TO 1 FOOT.	ND		
20	SS-10	2-2-1-1	24		ND		
	SS-11	1-1-1-1	15	GRAY-BROWN CLAY WITH FEW ORGANICS AND A MEDIUM SOFT CONSISTENCY.	ND		
	SS-12	1-1-1-2	20		ND		



WELL# MW-6D

PERMIT# 2600073381

DATE: 1/6/05-1/8/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 38.5 FEET

DEPTH TO WATER: 2.68 FEET

SURFACE ELEV.: 6.43 FEET AMSL

WELL CASING

INTERVAL: 0-28.5 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 5.46 FEET AMSL

WELL SCREEN

INTERVAL: 28.5-38.5 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 60 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 0.92 GPM

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE # 02-12799A

COMMENTS:

▨ CEMENT

▩ #00 SAND

░ #1 SAND

▯ WELL SCREEN

Page 2 of 2

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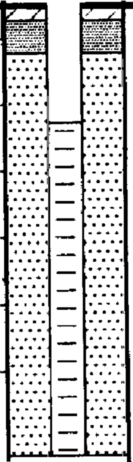
DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
	SS-13	1-1-2-2	20	GRAY-BROWN CLAY WITH FEW ORGANICS AND A MEDIUM SOFT CONSISTENCY.	ND		
	SS-14	1-1-1-2	21	BROWN FINE SAND WITH LITTLE CLAY; WET.	ND		
30	SS-15	1-2-1-2	18		ND		
	SS-16	3-4-4-7	10	GRAY FINE TO MEDIUM SAND; WET.	4.4, 5.2		
35	SS-17	5-5-7-8	12		ND		
40							
45							
50							

WELL# MW-7D

PERMIT# 2600073382

DATE: 1/11/05-1/12/05 & 1/17/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG

METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY

BORING DIA.: 12-INCH & 6-INCH

BORING DEPTH: 40 FEET

DEPTH TO WATER: 5.7 FEET

SURFACE ELEV.: 8.94 FEET AMSL

WELL CASING

INTERVAL: 0-30 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 8.24 FEET AMSL

WELL SCREEN

INTERVAL: 30-40 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 35 MINUTES

METHOD: WHALE PUMP

EST. YIELD: 1.1 GPM

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

CASE # 02-12799A

COMMENTS:

- ▨ CEMENT
- ▩ #00 SAND
- ░ #1 SAND
- ▯ WELL SCREEN

Page 1 of 2

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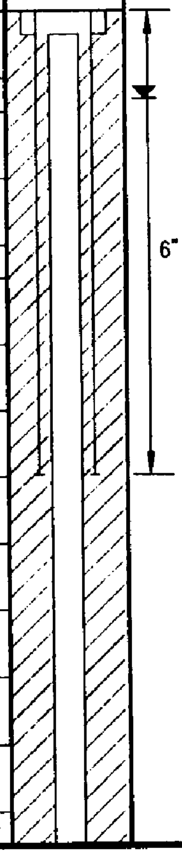
DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
0				CONCRETE			
	SS-1	50/0"	0		NT		
	SS-2	50/1"	1	GRAY-BROWN CINDERS WITH SOME METAL FRAGMENTS - REFUSAL AT 3.1 FEET.	NT		
5	SS-3	100/3"	2	5.0-5.1 DARK-GRAY BROWN CINDERS & ORANGE MEDIUM SAND TO COARSE GRAVEL; WET REFUSAL AT 5.1 FEET.	NT		
							6" STEEL CASING
	SS-4	1/24"	4	GRAY FINE SAND; WET WITH DIESEL FUEL ODOR.	2.5		
10	SS-5	1/12"-1/12"	15	BROWN-GRAY CLAY WITH LITTLE ORGANICS AND SOFT CONSISTENCY.	7.7, 29.5, 21.0		
	SS-6	1/24"	12		10.2, 2.5, 2.5		
15	SS-7	1/24"	14	GRAY CLAY WITH SOFT CONSISTENCY. TRACE ORGANICS FROM 14 TO 16 FEET.	16.7, 12.8, 6.4		
	SS-8	NT	15		2.5, 1.2, 5.2		
	SS-9	1-2-2-2	18	GRAY FINE TO MEDIUM SAND; WET.	1.5, 9.5, 29.7, 31.1		
20	SS-10	2-2-3-4	15		2.2, 1.0, 14.4		
	SS-11	4-4-5-5	12		13.2, 3.8, 1.0		
	SS-12	4-4-5-4	11		1.9, 2.4		

WELL# MW-7D
PERMIT# 2600073382
DATE: 1/11/05-1/12/05 & 1/17/05
LOGGED BY: T.TOMPKINS
DRILLING CO.: ADVANCED DRILLING, INC.
DRILLER: R.LOGEL & C.CONNER
RIG: GEFCO TRUCK-MOUNTED RIG & GEFCO SKID RIG
METHOD: 8 1/4"-INCH HOLLOW-STEM AUGER & 6-INCH MUD-ROTARY
BORING DIA.: 12-INCH & 6-INCH
BORING DEPTH: 40 FEET
DEPTH TO WATER: 5.7 FEET
SURFACE ELEV.: 8.94 FEET AMSL

WELL CASING

INTERVAL: 0-30 FEET
DIA.: 2-INCH
TYPE: SCHEDULE 40 PVC
T.O.C. ELEV.: 8.24 FEET AMSL

WELL SCREEN

INTERVAL: 30-40 FEET
DIA.: 2-INCH
SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 35 MINUTES
METHOD: WHALE PUMP
EST. YIELD: 1.1 GPM

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ
CASE # 02-12799A

COMMENTS:

- ▨ CEMENT
- ▩ #00 SAND
- ⛆ #1 SAND
- ▤ WELL SCREEN

Page 2 of 2

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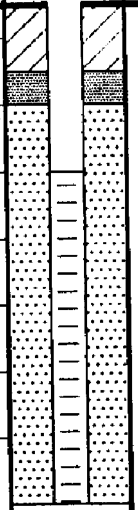
DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
	SS-13	3-2-2-3	20	BROWN CLAY AND WOODY ORGANICS WITH LITTLE SILT AND STIFF CONSISTENCY.	30.9, 26.4, 6.4, 24.3		
	SS-14	3-3-3-2	24	LIGHT BROWN TO GRAY BROWN CLAY WITH FEW ORGANICS AND STILL CONSISTENCY.	29.1,1.7, 7.9,5.7, 1.9		
30	SS-15	4-5-7-7	12	LIGHT BROWN FINE SAND WITH LITTLE CLAY FROM 30-32 FEET; WET.	8.3, 5.9, 3.4		
	SS-16	7-9-10-10	20		5.0, 6.4, 1.2, ND		
35	SS-17	6-6-7-8	12	GRAY FINE TO MEDIUM SAND WITH FEW COARSE SAND FROM 36-38 FEET; WET.	8.1, 2.1, 13.0		
	SS-18	8-8-8-10	10		5.6, 20.4		
40							
45							
50							



WELL# MW-9

PERMIT# 2600073383

DATE: 1/14/05

LOGGED BY: T.TOMPKINS

DRILLING CO.: ADVANCED DRILLING, INC.

DRILLER: R.LOGEL & C.CONNER

RIG: GEFCO TRUCK-MOUNTED RIG

METHOD: 4 1/4"-INCH HOLLOW-STEM AUGERS

BORING DIA.: 7 5/8-INCH

BORING DEPTH: 7 FEET

DEPTH TO WATER: 3.72 FEET

SURFACE ELEV.: 8.94 FEET AMSL

WELL CASING

INTERVAL: 0-2 FEET

DIA.: 2-INCH

TYPE: SCHEDULE 40 PVC

T.O.C. ELEV.: 8.24 FEET AMSL

WELL SCREEN

INTERVAL: 2-7 FEET

DIA.: 2-INCH

SLOT SIZE: 0.010-INCH

WELL DEVELOPMENT

TIME: 35 MINUTES

METHOD: WHALE PUMP

EST. YIELD: ~1.1 GPM

ENVIRON

WELL LOG

PROJECT: INDUSTRIAL PETROCHEMICAL
128 DOREMUS AVE., NEWARK, NJ

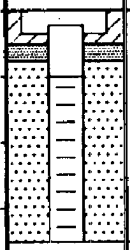
CASE # 02-12799A

COMMENTS:

- ▨ CEMENT
- ▩ #00 SAND
- ░ #1 SAND
- ☰ WELL SCREEN

Page 1 of 1

F:\0212799A\LOGS
\12799A_MW9

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN.)	DESCRIPTION	PID (ppm)	WELL CONSTRUCTION	REMARKS
0				CONCRETE			
				FILL MATERIAL: GRAY-GREEN SILT TO FINE SAND, BLACK CINDERS, BLACK COARSE SAND AND FINE GRAVEL. WET AT 4.0 FEET BGS.			
	SS-1	50/5"	3		NT		▼
5	SS-2	6-5-3-2	4		NT		
	SS-3	1-1-1-1	20	GRAY TO DARK GRAY CLAY WITH SOFT CONSISTENCY. THIN LAMINATIONS IN LOWER 3 INCHES.	NT		BORING TERMINATED AT 7 FEET BGS
10							
15							
20							

Confidential
For Settlement Purposes Only
Not To Be Used For Any Other Purpose

APPENDIX B

Monitoring Well Permits and Form B Certifications

WR-133M
11/01

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON, NJ

26000 12816
26000 12817

MONITORING WELL PERMIT

Mail To:
IJDEP
BUREAU OF WATER ALLOCATION
PO BOX 426
RENTON, NJ 08625-0426

VALID ONLY AFTER APPROVAL BY THE D.E.P.

Permit No. ______________

COORD #: 26.26.124

Owner GJ Chemical
dress 128 Doremus Ave
Newark, NJ 07105

Driller Advanced Drilling Inc
Address 3 Colt Rd
Pittstown, NJ 08867

me of Facility Same
Address ______________

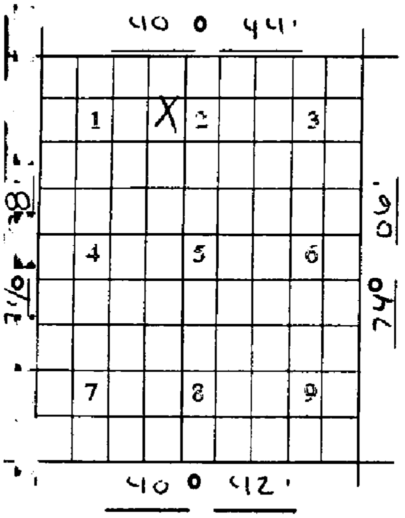
Diameter of Well(s)	2 Inches	Proposed Depth of Well(s)	50 Feet
# of Wells Applied for (max. 10)	2	Will pumping equipment be utilized?	YES ☐ NO ☑
Type of Well (see reverse)	Monitoring	If Yes, give pump capacity	cumulative GPM

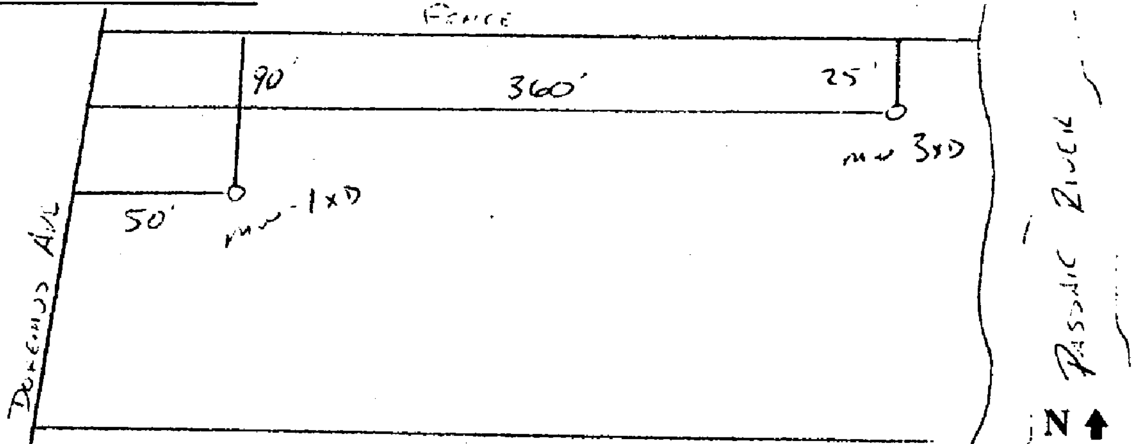
LOCATION OF WELL(S)

ot #	Block #	Municipality	County
10	5011	Newark	Essex

State Atlas Map No. 26

Draw sketch of well(s) nearest roads,buildings, etc. with marked distances in feet. Each well MUST be labeled with a name and/or number on the sketch.





PROPOSED WELL LOCATION (NAD 83 HORIZONTAL DATUM)
NJ STATE PLANE COORDINATE IN US SURVEY FEET

NORTHING: ________ EASTING: ________
OR
LATITUDE: __° __' __" LONGITUDE: __° __' __"

OR MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE FOLLOWING MUST BE COMPLETED BY THE APPLICANT. PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

☐ RCRA Site
☐ Underground Storage Tank Site
☐ Operational Ground Water Permit Site
☐ Pretreatment and Residuals Site
☐ Water and Hazardous Waste Enforcement Case
☐ Water Supply Aquifer Test Observation Well
☐ Other (explain) ______________

☐ Spill Site
☒ ISRA Site
☐ CERCLA (Superfund) Site

CASE I.D. Number E86317

This Space for Approval Stamp

WELL PERMIT APPROVED
N.J. D.E.P.
DEC 28 2004
BUREAU OF WATER ALLOCATION

OR D.E.P. USE
☐ Issuance of this permit is subject to the conditions attached. (see next page)
☒ For monitoring purposes only
☐ ______________

EE REVERSE SIDE FOR IMPORTANT PROVISIONS PERTAINING TO THIS PERMIT.
pliance with N.J.S.A.58:4A-14, application is made for a permit to drill a well as described above.

Date 12 21 04
Signature of Driller
Registration No. M1578
Signature of Property Owner

DWR-133M
11/01

2600010378
to
2600010383

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON, NJ

MONITORING WELL PERMIT

Permit No.

VALID ONLY AFTER APPROVAL BY THE D.E.P.

Mail To:
IJDEP
BUREAU OF WATER ALLOCATION
PO BOX 426
RENTON, NJ 08625-0426

COORD #: 26.23.124

wner ESTATE OF HENRY BUROH

dress 820 MORRIS TURNPIKE
SHORT HILLS, NJ 07078

Driller ADVANCED DRILLING INC
Address 3 COLT RD
PITTSTOWN, NJ 08867

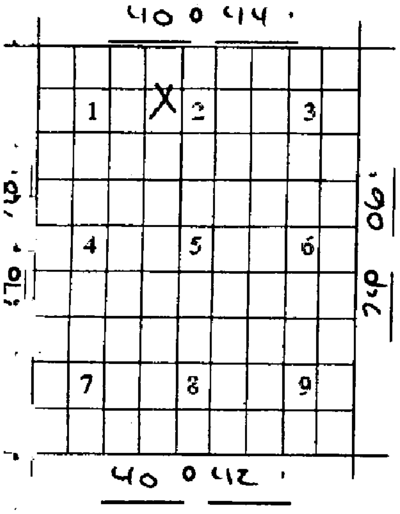
me of Facility GJ CHEMICAL CO
Address 128 DOREMUS AVE
NEWARK, NJ 07105

Diameter of Well(s) 2 Inches	Proposed Depth of Well(s) 50 Feet
# of Wells Applied for (max. 10) 6	Will pumping equipment be utilized? YES ☐ NO ☒
Type of Well (see reverse) MONITORING	If Yes, give pump capacity cumulative GPM

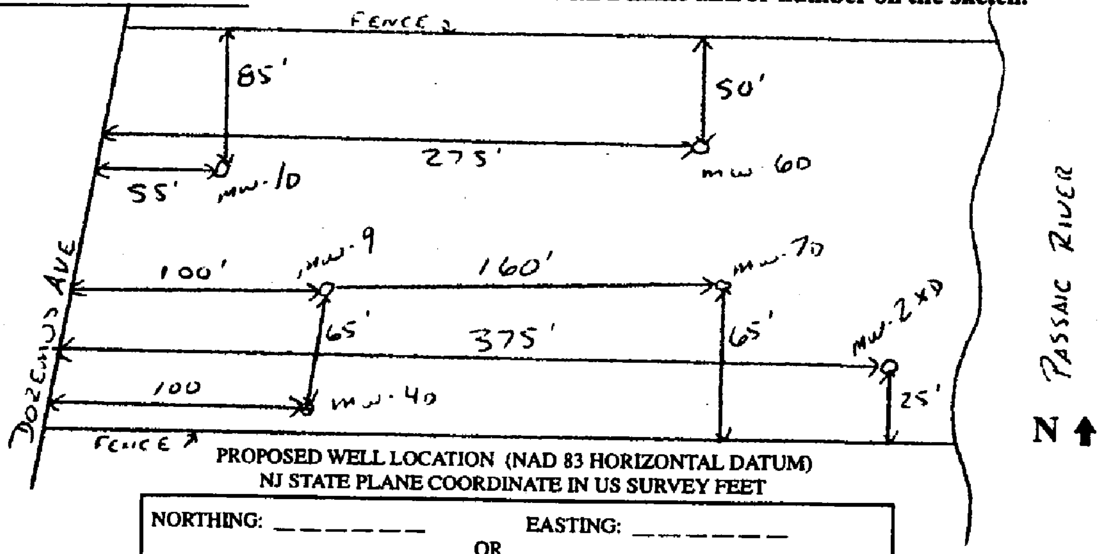
LOCATION OF WELL(S)

t #	Block #	Municipality	County
10	5011	NEWARK	ESSEX

State Atlas Map No. 26



Draw sketch of well(s) nearest roads,buildings, etc. with marked distances in feet. Each well MUST be labeled with a name and/or number on the sketch.



PROPOSED WELL LOCATION (NAD 83 HORIZONTAL DATUM)
NJ STATE PLANE COORDINATE IN US SURVEY FEET

NORTHING: _______ OR EASTING: _______
LATITUDE: __° __' __" LONGITUDE: __° __' __"

R MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE FOLLOWING MUST BE COMPLETED BY PPLICANT. PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

- RCRA Site
- Underground Storage Tank Site
- Operational Ground Water Permit Site
- Pretreatment and Residuals Site
- Water and Hazardous Waste Enforcement Case
- Water Supply Aquifer Test Observation Well
- Other (explain)

- ☐ Spill Site
- ☒ ISRA Site
- ☐ CERCLA (Superfund) Site

CASE I.D. Number E86317

This Space for Approval Stamp

WELL PERMIT APPROVED
N.J. D.E.P.
DEC 28 2004
BUREAU OF WATER ALLOCATION

R D.E.P. USE ☐ ☐ Issuance of this permit is subject to the conditions attached. (see next page) ☒ For monitoring purposes only

VERSE SIDE FOR IMPORTANT PROVISIONS PERTAINING TO THIS PERMIT.
liance with N.J.S.A.58:4A-14, application is made for a permit to drill a well as described above.

ate 12-21-04 Signature of Driller Registration No. 1141-40

MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner:	Industrial Petrochemicals
Name of Facility:	GJ Chemicals
Location:	128 Doremus Avenue - Newark - New Jersey
Case Number(s):	ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-16038-2

Owner Well Number (As shown on application or plans): MW-1

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ` 18.034 " Latitude: North 40 ° 43 ` 43.034 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690558 East 596972

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 10.40

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)

Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
Project # 3707

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of these individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

PROFESSIONAL LAND SURVEYOR'S SIGNATURE

March 3, 2005
DATE

James M. Stewart - License # GS26108
PROFESSIONAL LAND SURVEYOR'S NAME AND LICENSE NUMBER

9622 Evans Street, Philadelphia, Pa., 19115, 215-969-1577
PROFESSIONAL LAND SURVEYOR'S ADDRESS AND PHONE NUMBER

MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner: Industrial Petrochemicals
Name of Facility: GJ Chemicals
Location: 128 Doremus Avenue - Newark - New Jersey
Case Number(s): ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-0007337-8

Owner Well Number (As shown on application or plans): MW-1D

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ' 18.215 " Latitude: North 40 ° 43 ' 43.067 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690561 East 596958

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 8.02

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)
Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
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MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner: Industrial Petrochemicals
Name of Facility: GJ Chemicals
Location: 128 Doremus Avenue - Newark - New Jersey
Case Number(s): ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-0007337-6

Owner Well Number (As shown on application or plans): MW-1XD

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ' 18.147 " Latitude: North 40 ° 43 ' 43.044 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690559 East 596963

Elevation of Top of Inner Casing (cap off) at Reference mark Nearest 0.01'): Site Datum 7.87

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)

Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
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MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner: Industrial Petrochemicals
Name of Facility: GJ Chemicals
Location: 128 Doremus Avenue - Newark - New Jersey
Case Number(s): ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-16039-1

Owner Well Number (As shown on application or plans): MW-2

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ` 14.377 " Latitude: North 40 ° 43 ` 41.052 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690358 East 597254

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 9.80

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)

Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
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MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner: Industrial Petrochemicals
Name of Facility: GJ Chemicals
Location: 128 Doremus Avenue - Newark - New Jersey
Case Number(s): ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-0007337-9

Owner Well Number (As shown on application or plans): MW-2XD

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ` 14.427 " Latitude: North 40 ° 43 ` 41.059 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690359 East 597250

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 6.19

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)

Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
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9622 Evans Street, Philadelphia, Pa., 19115, 215-969-1577
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MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner:	Industrial Petrochemicals
Name of Facility:	GJ Chemicals
Location:	128 Doremus Avenue - Newark - New Jersey
Case Number(s):	ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-0007337-7

Owner Well Number (As shown on application or plans): MW-3XD

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ` 13.879 " Latitude: North 40 ° 43 ` 42.436 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690498 East 597292

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 5.80

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)
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Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
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MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner:	Industrial Petrochemicals
Name of Facility:	GJ Chemicals
Location:	128 Doremus Avenue - Newark - New Jersey
Case Number(s):	ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-0007338-0

Owner Well Number (As shown on application or plans): MW-4D

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ' 17.882 " Latitude: North 40 ° 43 ' 41.680 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690421 East 596984

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 7.48

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)

Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
Project # 3707

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March 3, 2005
DATE

James M. Stewart - License # GS26108
PROFESSIONAL LAND SURVEYOR'S NAME AND LICENSE NUMBER

9622 Evans Street, Philadelphia, Pa., 19115, 215-969-1577
PROFESSIONAL LAND SURVEYOR'S ADDRESS AND PHONE NUMBER

MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner:	Industrial Petrochemicals
Name of Facility:	GJ Chemicals
Location:	128 Doremus Avenue - Newark - New Jersey
Case Number(s):	ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-25356-9

Owner Well Number (As shown on application or plans): MW-6

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ' 14.920 " Latitude: North 40 ° 43 ' 42.554 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690510 East 597212

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 6.20

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)

Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
Project # 3707

AUTHENTICATION

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PROFESSIONAL LAND SURVEYOR'S SIGNATURE

March 3, 2005
DATE

James M. Stewart - License # GS26108
PROFESSIONAL LAND SURVEYOR'S NAME AND LICENSE NUMBER

9622 Evans Street, Philadelphia, Pa., 19115, 215-969-1577
PROFESSIONAL LAND SURVEYOR'S ADDRESS AND PHONE NUMBER

MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner:	Industrial Petrochemicals
Name of Facility:	GJ Chemicals
Location:	128 Doremus Avenue - Newark - New Jersey
Case Number(s):	ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-0007338-1

Owner Well Number (As shown on application or plans): MW-6D

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ` 14.921 " Latitude: North 40 ° 43 ` 42.535 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690508 East 597212

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 5.46

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)
Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
Project # 3707

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PROFESSIONAL LAND SURVEYOR'S SIGNATURE

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9622 Evans Street, Philadelphia, Pa., 19115, 215-969-1577
PROFESSIONAL LAND SURVEYOR'S ADDRESS AND PHONE NUMBER

MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner:	Industrial Petrochemicals
Name of Facility:	GJ Chemicals
Location:	128 Doremus Avenue - Newark - New Jersey
Case Number(s):	ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-25357

Owner Well Number (As shown on application or plans): MW-7

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ` 15.480 " Latitude: North 40 ° 43 ` 41.728 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690426 East 597169

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 10.77

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)

Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
Project # 3707

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of these individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

PROFESSIONAL LAND SURVEYOR'S SIGNATURE

March 3, 2005
DATE

James M. Stewart - License # GS26108
PROFESSIONAL LAND SURVEYOR'S NAME AND LICENSE NUMBER

9622 Evans Street, Philadelphia, Pa., 19115, 215-969-1577
PROFESSIONAL LAND SURVEYOR'S ADDRESS AND PHONE NUMBER

MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner:	Industrial Petrochemicals
Name of Facility:	GJ Chemicals
Location:	128 Doremus Avenue - Newark - New Jersey
Case Number(s):	ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-0007338-2

Owner Well Number (As shown on application or plans): MW-7D

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ' 15.528 " Latitude: North 40 ° 43 ' 41.677 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690421 East 597165

Elevation of Top of Inner Casing (cap off) at Reference mark Nearest 0.01'): Site Datum 8.24

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)

Form B Certification: Inner Casing of MW-7 Elevation= 10.77'

Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:

Project # 3707

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of these individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

PROFESSIONAL LAND SURVEYOR'S SIGNATURE

March 3, 2005
DATE

James M. Stewart - License # GS26108
PROFESSIONAL LAND SURVEYOR'S NAME AND LICENSE NUMBER

9622 Evans Street, Philadelphia, Pa., 19115, 215-969-1577
PROFESSIONAL LAND SURVEYOR'S ADDRESS AND PHONE NUMBER

MONITORING WELL CERTIFICATION FORM B LOCATION CERTIFICATION

Name of Owner:	Industrial Petrochemicals
Name of Facility:	GJ Chemicals
Location:	128 Doremus Avenue - Newark - New Jersey
Case Number(s):	ISRA # E86317

LAND SURVEYOR'S CERTIFICATION

Well Permit Number
(this number must be permanently affixed to- the well casing.) 26-0007338-3

Owner Well Number (As shown on application or plans): MW-9

Geographic Coordinates NAD 83 (to nearest 1/10 of a second):

Longitude: West 74 ° 7 ` 17.642 " Latitude: North 40 ° 43 ` 42.211 "

New Jersey State Plane Coordinates NAD 83 to nearest 10 feet:

North 690474 East 597002

Elevation of Top of Inner Casing (cap off) at
Reference mark Nearest 0.01'): Site Datum 7.37

Sources of elevation datum (benchmark, number/description and elevation/datum. If an on-site datum is used, identify, here, assumed datum of 100', and give approximated actual elevation.)

Form B Certification: Inner Casing of MW-7 Elevation= 10.77'
Reported as NGVD 1929 based on Newark City Benchmark 89-10 (Elevation= 9.67')

Significant observations and notes:
Project # 3707

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of these individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

PROFESSIONAL LAND SURVEYOR'S SIGNATURE

March 3, 2005
DATE

James M. Stewart - License # GS26108
PROFESSIONAL LAND SURVEYOR'S NAME AND LICENSE NUMBER

9622 Evans Street, Philadelphia, Pa., 19115, 215-969-1577
PROFESSIONAL LAND SURVEYOR'S ADDRESS AND PHONE NUMBER

APPENDIX C

Electronic Data Deliverables

Confidential
For Settlement Purposes Only
Not To Be Used For Any Other Purpose

APPENDIX D

Summary Soil and Ground Water Data Tables

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	AOC13-2	AOC13-2	AOC13-3
ENVIRON Sample ID				AOC13-2-SS01	AOC13-2-SS02	AOC13-3-SS01
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				1/25/2005	1/25/2005	1/25/2005
Collection Depth (ft)				2.5-3	4-4.5	1-1.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (10)	U (26)	U (4.3)
1,1-Dichloroethane	570	1000	10	U (10)	U (26)	U (4.3)
1,1-Dichloroethene	8	150	10	U (4)	U (10)	U (1.7)
1,2-Dichloroethane	6	24	1	U (4)	U (10)	U (1.7)
Benzene	3	13	1	*1.8 J (2)*	U (5.2)	U (0.86)
Chlorobenzene	37	680	1	U (10)	U (26)	U (4.3)
Chloroethane				U (10)	U (26)	U (4.3)
Chloroform	19	28	1	U (10)	U (26)	U (4.3)
cis-1,2-Dichloroethene	79	1000	1	U (10)	U (26)	U (4.3)
Ethylbenzene	1000	1000	100	3.4 J (8)	20 J (21)	0.57 J (3.4)
Methylene Chloride	49	210	1	U (6)	U (16)	U (2.6)
Tetrachloroethene	4	6	1	U (2)	U (5.2)	U (0.86)
Toluene	1000	1000	500	3.6 J (10)	3.2 J (26)	U (4.3)
Trichloroethene	23	54	1	U (2)	U (5.2)	U (0.86)
Vinyl Chloride	2	7	10	U (10)	U (26)	U (4.3)
Xylenes (total)	410	1000	67	10 (10)	*230 (26)*	3.5 J (4.3)
PDIST						
Petroleum Hydrocarbons		10000		**14900 (25)**	4640 (25)	4140 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	AOC13-4	AOC13-4	AOC8-10
ENVIRON Sample ID				AOC13-4-SS01	AOC13-4-SS02	AOC8-10-SS01
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				1/25/2005	1/25/2005	2/6/2005
Collection Depth (ft)				2.5-3	4-4.5	3-3.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (4.5)	U (5.1)	U (280)
1,1-Dichloroethane	570	1000	10	U (4.5)	U (5.1)	U (280)
1,1-Dichloroethene	8	150	10	U (1.8)	U (2)	U (110)
1,2-Dichloroethane	6	24	1	U (1.8)	U (2)	U (110)
Benzene	3	13	1	U (0.89)	U (1)	U (57)
Chlorobenzene	37	680	1	U (4.5)	U (5.1)	U (280)
Chloroethane				U (4.5)	U (5.1)	U (280)
Chloroform	19	28	1	U (4.5)	U (5.1)	U (280)
cis-1,2-Dichloroethene	79	1000	1	U (4.5)	U (5.1)	U (280)
Ethylbenzene	1000	1000	100	0.86 J (3.6)	18 (4.1)	U (230)
Methylene Chloride	49	210	1	U (2.7)	U (3.1)	U (170)
Tetrachloroethene	4	6	1	U (0.89)	U (1)	U (57)
Toluene	1000	1000	500	0.59 J (4.5)	1.7 J (5.1)	***9400 (280)***
Trichloroethene	23	54	1	U (0.89)	U (1)	U (57)
Vinyl Chloride	2	7	10	U (4.5)	U (5.1)	U (280)
Xylenes (total)	410	1000	67	4.4 J (4.5)	*110 (5.1)*	*73 J (280)*
PDIST						
Petroleum Hydrocarbons		10000		5790 (25)	5730 (25)	**10600 (25)**

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	AOC8-10	AOC8-10	AOC8-11
ENVIRON Sample ID				AOC8-10-SS02	AOC8-10-SS03	AOC8-11-SS01
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				2/6/2005	2/6/2005	2/6/2005
Collection Depth (ft)				5.5-6	7-7.5	3-3.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (0.64)	U (0.64)	U (29)
1,1-Dichloroethane	570	1000	10	0.077 J (0.64)	U (0.64)	U (29)
1,1-Dichloroethene	8	150	10	U (0.25)	U (0.25)	U (11)
1,2-Dichloroethane	6	24	1	U (0.25)	U (0.25)	U (11)
Benzene	3	13	1	0.31 (0.13)	0.56 (0.13)	*3.6 J (5.7)*
Chlorobenzene	37	680	1	U (0.64)	U (0.64)	U (29)
Chloroethane				U (0.64)	U (0.64)	U (29)
Chloroform	19	28	1	U (0.64)	U (0.64)	U (29)
cis-1,2-Dichloroethene	79	1000	1	0.85 (0.64)	0.09 J (0.64)	U (29)
Ethylbenzene	1000	1000	100	0.98 (0.51)	0.79 (0.51)	4.4 J (23)
Methylene Chloride	49	210	1	0.39 (0.38)	U (0.38)	U (17)
Tetrachloroethene	4	6	1	U (0.13)	U (0.13)	U (5.7)
Toluene	1000	1000	500	3.4 (0.64)	3.3 (0.64)	450 (29)
Trichloroethene	23	54	1	U (0.13)	U (0.13)	U (5.7)
Vinyl Chloride	2	7	10	0.63 J (0.64)	U (0.64)	U (29)
Xylenes (total)	410	1000	67	1.6 (0.64)	0.58 J (0.64)	20 J (29)
PDIST						
Petroleum Hydrocarbons		10000		155 (25)	179 (25)	1950 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	AOC8-11	AOC8-12	AOC8-12
ENVIRON Sample ID				AOC8-11-SS02	AOC8-12-SS01	AOC8-12-SS02
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				2/6/2005	2/6/2005	2/6/2005
Collection Depth (ft)				6.75-7.25	2-2.5	3-3.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (1.2)	U (98)	U (1.7)
1,1-Dichloroethane	570	1000	10	U (1.2)	U (98)	U (1.7)
1,1-Dichloroethene	8	150	10	U (0.46)	U (39)	U (0.67)
1,2-Dichloroethane	6	24	1	U (0.46)	U (39)	U (0.67)
Benzene	3	13	1	*2 (0.23)*	U (20)	0.23 J (0.34)
Chlorobenzene	37	680	1	U (1.2)	U (98)	U (1.7)
Chloroethane				U (1.2)	U (98)	U (1.7)
Chloroform	19	28	1	U (1.2)	U (98)	U (1.7)
cis-1,2-Dichloroethene	79	1000	1	0.96 J (1.2)	U (98)	0.23 J (1.7)
Ethylbenzene	1000	1000	100	2.3 (0.92)	89 (78)	11 (1.3)
Methylene Chloride	49	210	1	U (0.69)	U (59)	0.29 J (1)
Tetrachloroethene	4	6	1	U (0.23)	U (20)	U (0.34)
Toluene	1000	1000	500	26 (1.2)	***3600 (98)***	41 (1.7)
Trichloroethene	23	54	1	U (0.23)	U (20)	U (0.34)
Vinyl Chloride	2	7	10	U (1.2)	U (98)	0.34 J (1.7)
Xylenes (total)	410	1000	67	11 (1.2)	***1100 (98)***	54 (1.7)
PDIST						
Petroleum Hydrocarbons		10000		1220 (25)	3710 (25)	670 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	AOC8-12	AOC8-13	AOC8-13
ENVIRON Sample ID				AOC8-12-SS03	AOC8-13-SS01	AOC8-13-SS02
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Direct Push	Direct Push
Collection Date				2/6/2005	1/21/2005	1/21/2005
Collection Depth (ft)				7-7.5	0.5-1	4-4.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (2.3)	U (1.2)	U (2.7)
1,1-Dichloroethane	570	1000	10	U (2.3)	U (1.2)	U (2.7)
1,1-Dichloroethene	8	150	10	U (0.92)	U (0.46)	U (1.1)
1,2-Dichloroethane	6	24	1	U (0.92)	U (0.46)	U (1.1)
Benzene	3	13	1	U (0.46)	U (0.23)	*1.1 (0.54)*
Chlorobenzene	37	680	1	U (2.3)	U (1.2)	U (2.7)
Chloroethane				U (2.3)	U (1.2)	U (2.7)
Chloroform	19	28	1	U (2.3)	U (1.2)	U (2.7)
cis-1,2-Dichloroethene	79	1000	1	U (2.3)	U (1.2)	U (2.7)
Ethylbenzene	1000	1000	100	U (1.8)	U (0.92)	0.86 J (2.1)
Methylene Chloride	49	210	1	U (1.4)	U (0.69)	U (1.6)
Tetrachloroethene	4	6	1	U (0.46)	U (0.23)	U (0.54)
Toluene	1000	1000	500	2.8 (2.3)	U (1.2)	1.1 J (2.7)
Trichloroethene	23	54	1	U (0.46)	U (0.23)	U (0.54)
Vinyl Chloride	2	7	10	U (2.3)	U (1.2)	U (2.7)
Xylenes (total)	410	1000	67	0.65 J (2.3)	0.32 J (1.2)	1.9 J (2.7)
PDIST						
Petroleum Hydrocarbons		10000		55.8 (25)	2080 (25)	5980 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	AOC8-13	AOC8-14	AOC8-14
ENVIRON Sample ID				AOC8-13-SS03	AOC8-14-SS01	AOC8-14-SS02
Matrix				Soil	Soil	Soil
Collection Method				Direct Push	Direct Push	Direct Push
Collection Date				1/21/2005	1/21/2005	1/21/2005
Collection Depth (ft)				7.5-8	0.5-1	3.5-4
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (0.019)	U (0.0093)	U (0.93)
1,1-Dichloroethane	570	1000	10	U (0.019)	U (0.0093)	U (0.93)
1,1-Dichloroethene	8	150	10	U (0.0076)	U (0.0037)	U (0.37)
1,2-Dichloroethane	6	24	1	U (0.0076)	U (0.0037)	U (0.37)
Benzene	3	13	1	U (0.0038)	0.034 (0.0018)	0.59 (0.18)
Chlorobenzene	37	680	1	U (0.019)	U (0.0093)	U (0.93)
Chloroethane				U (0.019)	U (0.0093)	U (0.93)
Chloroform	19	28	1	U (0.019)	U (0.0093)	U (0.93)
cis-1,2-Dichloroethene	79	1000	1	U (0.019)	U (0.0093)	U (0.93)
Ethylbenzene	1000	1000	100	U (0.015)	U (0.0074)	0.54 J (0.74)
Methylene Chloride	49	210	1	U (0.011)	U (0.0056)	U (0.56)
Tetrachloroethene	4	6	1	U (0.0038)	U (0.0018)	U (0.18)
Toluene	1000	1000	500	U (0.019)	0.006 J (0.0093)	0.38 J (0.93)
Trichloroethene	23	54	1	U (0.0038)	U (0.0018)	U (0.18)
Vinyl Chloride	2	7	10	U (0.019)	U (0.0093)	U (0.93)
Xylenes (total)	410	1000	67	U (0.019)	U (0.0093)	0.77 J (0.93)
PDIST						
Petroleum Hydrocarbons		10000		27.4 (25)	590 (25)	127 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	AOC8-14	B18-4	B18-4
ENVIRON Sample ID				AOC8-14-SS03	B18-4-SS01	B18-4-SS02
Matrix				Soil	Soil	Soil
Collection Method				Direct Push	Split Spoon	Split Spoon
Collection Date				1/21/2005	2/6/2005	2/6/2005
Collection Depth (ft)				7.5-8	3.5-4	7-7.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (0.018)	U (28)	U (0.6)
1,1-Dichloroethane	570	1000	10	U (0.018)	U (28)	0.15 J (0.6)
1,1-Dichloroethene	8	150	10	U (0.0074)	U (11)	U (0.24)
1,2-Dichloroethane	6	24	1	U (0.0074)	U (11)	0.19 J (0.24)
Benzene	3	13	1	U (0.0037)	U (5.5)	0.33 (0.12)
Chlorobenzene	37	680	1	U (0.018)	U (28)	U (0.6)
Chloroethane				U (0.018)	U (28)	U (0.6)
Chloroform	19	28	1	U (0.018)	U (28)	U (0.6)
cis-1,2-Dichloroethene	79	1000	1	U (0.018)	U (28)	*5.6 (0.6)*
Ethylbenzene	1000	1000	100	U (0.015)	9.9 J (22)	1.3 (0.48)
Methylene Chloride	49	210	1	U (0.011)	U (17)	U (0.36)
Tetrachloroethene	4	6	1	U (0.0037)	U (5.5)	0.25 (0.12)
Toluene	1000	1000	500	0.0088 J (0.018)	*620 (28)*	8 (0.6)
Trichloroethene	23	54	1	U (0.0037)	U (5.5)	0.32 (0.12)
Vinyl Chloride	2	7	10	U (0.018)	U (28)	0.65 (0.6)
Xylenes (total)	410	1000	67	0.062 (0.018)	39 (28)	3.5 (0.6)
PDIST						
Petroleum Hydrocarbons		10000		309 (25)		

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	B18-5	B18-5	B18-6
ENVIRON Sample ID				B18-5-SS01	B18-5-SS02	B18-6-SS01
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				1/26/2005	1/26/2005	1/26/2005
Collection Depth (ft)				3.75-4.25	7.3-7.8	4-4.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	0.069 (0.0049)	5 (0.52)	*210 (51)*
1,1-Dichloroethane	570	1000	10	U (0.0049)	0.7 (0.52)	U (51)
1,1-Dichloroethene	8	150	10	0.0007 J (0.002)	U (0.21)	U (20)
1,2-Dichloroethane	6	24	1	0.035 (0.002)	0.17 J (0.21)	U (20)
Benzene	3	13	1	0.0004 J (0.001)	U (0.1)	U (10)
Chlorobenzene	37	680	1	U (0.0049)	U (0.52)	U (51)
Chloroethane				U (0.0049)	U (0.52)	U (51)
Chloroform	19	28	1	0.0037 J (0.0049)	0.16 J (0.52)	U (51)
cis-1,2-Dichloroethene	79	1000	1	0.008 (0.0049)	*5.5 (0.52)*	U (51)
Ethylbenzene	1000	1000	100	0.0072 (0.0039)	2.7 (0.42)	18 J (41)
Methylene Chloride	49	210	1	0.0014 JB (0.0029)	U (0.31)	U (31)
Tetrachloroethene	4	6	1	0.18 (0.001)	***11 (0.1)***	***1100 (10)***
Toluene	1000	1000	500	0.0088 (0.0049)	3 (0.52)	23 J (51)
Trichloroethene	23	54	1	0.14 (0.001)	*3.4 (0.1)*	***310 (10)***
Vinyl Chloride	2	7	10	U (0.0049)	0.64 (0.52)	U (51)
Xylenes (total)	410	1000	67	0.017 (0.0049)	10 (0.52)	44 J (51)
PDIST						
Petroleum Hydrocarbons		10000				4440 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	B18-6	B18-6	B18-6
ENVIRON Sample ID				B18-6-SS02	B18-6-SS03	B18-6-SS11
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				1/26/2005	1/26/2005	1/26/2005
Collection Depth (ft)				4.5-5	7-7.5	4-4.5
Comments						Field Duplicate
VOC						
1,1,1-Trichloroethane	210	1000	50	*390 (53)*	*320 (110)*	*370 (48)*
1,1-Dichloroethane	570	1000	10	U (53)	U (110)	U (48)
1,1-Dichloroethene	8	150	10	U (21)	U (43)	U (19)
1,2-Dichloroethane	6	24	1	U (21)	U (43)	U (19)
Benzene	3	13	1	U (11)	U (22)	U (9.6)
Chlorobenzene	37	680	1	U (53)	U (110)	U (48)
Chloroethane				U (53)	U (110)	U (48)
Chloroform	19	28	1	*5.5 J (53)*	U (110)	*5.2 J (48)*
cis-1,2-Dichloroethene	79	1000	1	*22 J (53)*	*79 J (110)*	*8.7 J (48)*
Ethylbenzene	1000	1000	100	26 J (43)	64 J (86)	21 J (38)
Methylene Chloride	49	210	1	U (32)	U (64)	U (29)
Tetrachloroethene	4	6	1	***1600 (11)***	***3200 (22)***	***1500 (9.6)***
Toluene	1000	1000	500	24 J (53)	32 J (110)	34 J (48)
Trichloroethene	23	54	1	***450 (11)***	***470 (22)***	***480 (9.6)***
Vinyl Chloride	2	7	10	U (53)	U (110)	U (48)
Xylenes (total)	410	1000	67	48 J (53)	*290 (110)*	37 J (48)
PDIST						
Petroleum Hydrocarbons		10000		3890 (25)	159 (25)	5420 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	B18-7	B18-7	B18-7
ENVIRON Sample ID				B18-7-SS01	B18-7-SS02	B18-7-SS11
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				1/26/2005	1/26/2005	1/26/2005
Collection Depth (ft)				3.5-4	7-7.5	3.5-4
Comments						Field Duplicate
VOC						
1,1,1-Trichloroethane	210	1000	50	U (1.1)	U (0.007)	U (0.56)
1,1-Dichloroethane	570	1000	10	U (1.1)	0.005 J (0.007)	U (0.56)
1,1-Dichloroethene	8	150	10	U (0.44)	U (0.0028)	U (0.22)
1,2-Dichloroethane	6	24	1	U (0.44)	U (0.0028)	U (0.22)
Benzene	3	13	1	U (0.22)	0.012 (0.0014)	U (0.11)
Chlorobenzene	37	680	1	U (1.1)	U (0.007)	U (0.56)
Chloroethane				U (1.1)	0.14 J (0.6)	U (0.56)
Chloroform	19	28	1	U (1.1)	U (0.007)	U (0.56)
cis-1,2-Dichloroethene	79	1000	1	U (1.1)	U (0.007)	U (0.56)
Ethylbenzene	1000	1000	100	1.1 (0.89)	0.027 (0.0056)	0.85 (0.45)
Methylene Chloride	49	210	1	U (0.67)	0.0032 JB (0.0042)	U (0.34)
Tetrachloroethene	4	6	1	U (0.22)	U (0.0014)	U (0.11)
Toluene	1000	1000	500	0.61 J (1.1)	0.072 (0.007)	0.58 (0.56)
Trichloroethene	23	54	1	U (0.22)	U (0.0014)	U (0.11)
Vinyl Chloride	2	7	10	U (1.1)	U (0.007)	U (0.56)
Xylenes (total)	410	1000	67	42 (1.1)	0.12 (0.007)	35 (0.56)
PDIST						
Petroleum Hydrocarbons		10000		2010 (25)	2450 (25)	3160 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	B18-8	B18-8	B18-8
ENVIRON Sample ID				B18-8-SS01	B18-8-SS02	B18-8-SS03
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				1/26/2005	1/26/2005	1/26/2005
Collection Depth (ft)				3.5-4	4.5-5	7-7.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (0.52)	U (0.56)	4.6 J (11)
1,1-Dichloroethane	570	1000	10	U (0.52)	U (0.56)	U (11)
1,1-Dichloroethene	8	150	10	U (0.21)	U (0.22)	U (4.4)
1,2-Dichloroethane	6	24	1	U (0.21)	U (0.22)	U (4.4)
Benzene	3	13	1	U (0.1)	U (0.11)	U (2.2)
Chlorobenzene	37	680	1	U (0.52)	U (0.56)	U (11)
Chloroethane				U (0.52)	U (0.56)	U (11)
Chloroform	19	28	1	U (0.52)	U (0.56)	U (11)
cis-1,2-Dichloroethene	79	1000	1	0.31 J (0.52)	U (0.56)	*8.1 J (11)*
Ethylbenzene	1000	1000	100	0.052 J (0.41)	U (0.44)	5.7 J (8.7)
Methylene Chloride	49	210	1	U (0.31)	U (0.33)	U (6.5)
Tetrachloroethene	4	6	1	0.44 (0.1)	0.26 (0.11)	U (2.2)
Toluene	1000	1000	500	0.4 J (0.52)	0.38 J (0.56)	6.9 J (11)
Trichloroethene	23	54	1	0.1 J (0.1)	U (0.11)	U (2.2)
Vinyl Chloride	2	7	10	U (0.52)	U (0.56)	2.7 J (11)
Xylenes (total)	410	1000	67	0.31 J (0.52)	U (0.56)	23 (11)
PDIST						
Petroleum Hydrocarbons		10000		1890 (25)	682 (25)	2980 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	B3-5	B3-6	B6-1
ENVIRON Sample ID				B3-5-SS01	B3-6-SS01	B6-1-SS01
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				1/25/2005	1/26/2005	2/6/2005
Collection Depth (ft)				2.5-3	2.5-3	2.5-3
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50			U (12)
1,1-Dichloroethane	570	1000	10			U (12)
1,1-Dichloroethene	8	150	10			U (4.9)
1,2-Dichloroethane	6	24	1			U (4.9)
Benzene	3	13	1			*3.4 (2.5)*
Chlorobenzene	37	680	1			U (12)
Chloroethane						U (12)
Chloroform	19	28	1			U (12)
cis-1,2-Dichloroethene	79	1000	1			U (12)
Ethylbenzene	1000	1000	100			67 (9.8)
Methylene Chloride	49	210	1			U (7.4)
Tetrachloroethene	4	6	1			*1.4 J (2.5)*
Toluene	1000	1000	500			420 (12)
Trichloroethene	23	54	1			U (2.5)
Vinyl Chloride	2	7	10			U (12)
Xylenes (total)	410	1000	67			*610 (12)*
PDIST						
Petroleum Hydrocarbons		10000		5080 (25)	9120 (25)	**12400 (25)**

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	B6-1	B6-1	B6-2
ENVIRON Sample ID				B6-1-SS02	B6-1-SS22	B6-2-SS01
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				2/6/2005	2/6/2005	2/6/2005
Collection Depth (ft)				4.5-5	4.5-5	1.5-2
Comments					Field Duplicate	
VOC						
1,1,1-Trichloroethane	210	1000	50	U (1.2)	U (5.9)	U (78)
1,1-Dichloroethane	570	1000	10	U (1.2)	U (5.9)	U (78)
1,1-Dichloroethene	8	150	10	U (0.46)	U (2.4)	U (31)
1,2-Dichloroethane	6	24	1	U (0.46)	U (2.4)	U (31)
Benzene	3	13	1	*3.8 (0.23)*	*1.5 (1.2)*	*7.8 J (16)*
Chlorobenzene	37	680	1	U (1.2)	U (5.9)	U (78)
Chloroethane				U (1.2)	U (5.9)	U (78)
Chloroform	19	28	1	U (1.2)	U (5.9)	U (78)
cis-1,2-Dichloroethene	79	1000	1	0.77 J (1.2)	U (5.9)	U (78)
Ethylbenzene	1000	1000	100	39 (0.93)	9.9 (4.8)	33 J (62)
Methylene Chloride	49	210	1	0.31 J (0.7)	U (3.6)	U (47)
Tetrachloroethene	4	6	1	U (0.23)	U (1.2)	U (16)
Toluene	1000	1000	500	32 (1.2)	3.7 J (5.9)	*840 (78)*
Trichloroethene	23	54	1	U (0.23)	U (1.2)	U (16)
Vinyl Chloride	2	7	10	U (1.2)	U (5.9)	U (78)
Xylenes (total)	410	1000	67	15 (1.2)	3.6 J (5.9)	*170 (78)*
PDIST						
Petroleum Hydrocarbons		10000		**14300 (25)**	**13200 (25)**	4060 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location ENVIRON Sample ID Matrix Collection Method Collection Date Collection Depth (ft) Comments	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	B6-2 B6-2-SS02 Soil Split Spoon 2/6/2005 4.5-5	B6-3 B6-3-SS01 Soil Split Spoon 2/6/2005 3-3.5	B6-3 B6-3-SS02 Soil Split Spoon 2/6/2005 4.5-5
VOC						
1,1,1-Trichloroethane	210	1000	50	U (0.84)	U (200)	U (40)
1,1-Dichloroethane	570	1000	10	U (0.84)	U (200)	U (40)
1,1-Dichloroethene	8	150	10	U (0.33)	U (79)	U (16)
1,2-Dichloroethane	6	24	1	U (0.33)	U (79)	U (16)
Benzene	3	13	1	0.33 (0.17)	U (40)	U (8.1)
Chlorobenzene	37	680	1	U (0.84)	U (200)	U (40)
Chloroethane				U (0.84)	U (200)	U (40)
Chloroform	19	28	1	U (0.84)	U (200)	U (40)
cis-1,2-Dichloroethene	79	1000	1	U (0.84)	*65 J (200)*	U (40)
Ethylbenzene	1000	1000	100	2.8 (0.67)	*160 (160)*	38 (32)
Methylene Chloride	49	210	1	U (0.5)	U (120)	U (24)
Tetrachloroethene	4	6	1	U (0.17)	U (40)	U (8.1)
Toluene	1000	1000	500	0.27 J (0.84)	***5900 (200)***	490 (40)
Trichloroethene	23	54	1	U (0.17)	U (40)	U (8.1)
Vinyl Chloride	2	7	10	U (0.84)	U (200)	U (40)
Xylenes (total)	410	1000	67	3.8 (0.84)	***760 (200)***	*180 (40)*
PDIST						
Petroleum Hydrocarbons		10000		3900 (25)	**15300 (25)**	971 (25)

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	B6-4	B6-4	EB19-1
ENVIRON Sample ID				B6-4-SS01	B6-4-SS02	EB19-1-SS01
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				2/6/2005	2/6/2005	1/24/2005
Collection Depth (ft)				3-3.5	4.5-5	2-2.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (170)	U (24)	U (0.0047)
1,1-Dichloroethane	570	1000	10	U (170)	U (24)	U (0.0047)
1,1-Dichloroethene	8	150	10	U (67)	U (9.5)	U (0.0019)
1,2-Dichloroethane	6	24	1	U (67)	U (9.5)	U (0.0019)
Benzene	3	13	1	***200 (34)***	***18 (4.8)***	U (0.0009)
Chlorobenzene	37	680	1	U (170)	U (24)	U (0.0047)
Chloroethane				U (170)	U (24)	U (0.0047)
Chloroform	19	28	1	U (170)	U (24)	U (0.0047)
cis-1,2-Dichloroethene	79	1000	1	U (170)	U (24)	U (0.0047)
Ethylbenzene	1000	1000	100	*900 (130)*	*250 (19)*	U (0.0038)
Methylene Chloride	49	210	1	U (100)	U (14)	0.0012 JB (0.0028)
Tetrachloroethene	4	6	1	U (34)	U (4.8)	U (0.0009)
Toluene	1000	1000	500	***3100 (170)***	U (24)	U (0.0047)
Trichloroethene	23	54	1	U (34)	U (4.8)	U (0.0009)
Vinyl Chloride	2	7	10	***40 J (170)***	U (24)	U (0.0047)
Xylenes (total)	410	1000	67	***3600 (170)***	***840 (24)***	U (0.0047)
PDIST						
Petroleum Hydrocarbons		10000		8250 (25)	245 (25)	

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	EB19-2	EB19-3	EB19-4
ENVIRON Sample ID				EB19-2-SS01	EB19-3-SS01	EB19-4-SS01
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				1/24/2005	1/24/2005	1/24/2005
Collection Depth (ft)				2-2.5	2-2.5	1.5-2
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (0.0046)	U (0.0045)	0.1 J (0.38)
1,1-Dichloroethane	570	1000	10	U (0.0046)	0.0036 J (0.0045)	0.11 J (0.38)
1,1-Dichloroethene	8	150	10	U (0.0018)	U (0.0018)	U (0.15)
1,2-Dichloroethane	6	24	1	U (0.0018)	U (0.0018)	U (0.15)
Benzene	3	13	1	0.012 (0.0009)	U (0.0009)	U (0.077)
Chlorobenzene	37	680	1	U (0.0046)	U (0.0045)	U (0.38)
Chloroethane				0.017 (0.0046)	U (0.0045)	U (0.38)
Chloroform	19	28	1	U (0.0046)	U (0.0045)	U (0.38)
cis-1,2-Dichloroethene	79	1000	1	0.01 (0.0046)	0.0014 J (0.0045)	U (0.38)
Ethylbenzene	1000	1000	100	0.0062 (0.0037)	U (0.0036)	5.5 (0.31)
Methylene Chloride	49	210	1	0.0017 JB (0.0028)	U (0.0027)	U (0.23)
Tetrachloroethene	4	6	1	U (0.0009)	U (0.0009)	0.049 J (0.077)
Toluene	1000	1000	500	0.014 (0.0046)	U (0.0045)	0.42 (0.38)
Trichloroethene	23	54	1	U (0.0009)	U (0.0009)	U (0.077)
Vinyl Chloride	2	7	10	0.012 (0.0046)	U (0.0045)	U (0.38)
Xylenes (total)	410	1000	67	0.004 J (0.0046)	U (0.0045)	0.4 (0.38)
PDIST						
Petroleum Hydrocarbons		10000				

TABLE 1
Analytical Results for SOIL
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg)	NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg)	MW3XD	MW3XD	MW6D
ENVIRON Sample ID				MW3XD-SS01	MW3XD-SS02	MW6D-SS01
Matrix				Soil	Soil	Soil
Collection Method				Split Spoon	Split Spoon	Split Spoon
Collection Date				1/5/2005	1/5/2005	1/6/2005
Collection Depth (ft)				4-4.5	8-8.5	3-3.5
Comments						
VOC						
1,1,1-Trichloroethane	210	1000	50	U (3)	U (0.99)	U (150)
1,1-Dichloroethane	570	1000	10	U (3)	U (0.99)	U (150)
1,1-Dichloroethene	8	150	10	U (1.2)	U (0.39)	U (62)
1,2-Dichloroethane	6	24	1	U (1.2)	U (0.39)	U (62)
Benzene	3	13	1	U (0.59)	U (0.2)	U (31)
Chlorobenzene	37	680	1	U (3)	U (0.99)	*24 J (150)*
Chloroethane				U (3)	U (0.99)	U (150)
Chloroform	19	28	1	U (3)	U (0.99)	U (150)
cis-1,2-Dichloroethene	79	1000	1	0.35 J (3)	U (0.99)	U (150)
Ethylbenzene	1000	1000	100	3.8 (2.4)	U (0.79)	*120 J (120)*
Methylene Chloride	49	210	1	U (1.8)	U (0.59)	U (93)
Tetrachloroethene	4	6	1	U (0.59)	U (0.2)	U (31)
Toluene	1000	1000	500	1.7 J (3)	U (0.99)	***1500 (150)***
Trichloroethene	23	54	1	U (0.59)	U (0.2)	U (31)
Vinyl Chloride	2	7	10	U (3)	U (0.99)	U (150)
Xylenes (total)	410	1000	67	48 (3)	0.3 J (0.99)	*570 (150)*
PDIST						
Petroleum Hydrocarbons		10000		3110 (25)	108 (25)	8170 (25)

TABLE 2

Analytical Results for Ground Water
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Class II-A Groundwater Criteria (ug/L)	ALS1	ALS2	ALS3	ALS3D	MW1D
ENVIRON Sample ID		ALS1-GW01	ALS2-GW01	ALS3-GW01	ALS3D-GW01	MW1D-GW01
Matrix		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Collection Method		Teflon Bailer	Teflon Bailer	Teflon Bailer	Teflon Bailer	Teflon Bailer
Collection Date		2/7/2005	2/7/2005	2/7/2005	2/8/2005	2/9/2005
Comments						
VOC						
1,1,1-Trichloroethane	30	1.5 (0.3)	2.5 (0.3)	4.4 (0.3)	18 (14)	1.1 (0.3)
1,1-Dichloroethane	50	5.1 (0.4)	5.9 (0.4)	4 (0.4)	**800 (18)**	0.7 (0.4)
1,1-Dichloroethene	2	U (0.3)	U (0.3)	U (0.3)	**120 (17)**	U (0.3)
1,2-Dichloroethane	2	1.6 (0.4)	1.8 (0.4)	U (0.4)	**180 (18)**	U (0.4)
Benzene	1	**1.8 (0.3)**	U (0.3)	U (0.3)	**87 (16)**	**64 (0.3)**
Bromodichloromethane	1	U (0.3)	U (0.3)	U (0.3)	U (14)	**2.2 (0.3)**
Carbon Tetrachloride	2	U (0.3)	U (0.3)	U (0.3)	U (15)	U (0.3)
Chlorobenzene	50	0.8 (0.3)	U (0.3)	U (0.3)	**58 (13)**	1.3 (0.3)
Chloroethane	100	30 (0.4)	U (0.4)	U (0.4)	U (18)	U (0.4)
Chloroform	6	U (0.3)	U (0.3)	1.1 (0.3)	**140 (17)**	**14 (0.3)**
cis-1,2-Dichloroethene	70	12 (0.4)	22 (0.4)	17 (0.4)	**1900 (18)**	1.3 (0.4)
Ethylbenzene	700	U (0.3)	U (0.3)	U (0.3)	91 (16)	14 (0.3)
Methylene Chloride	3	0.9 (0.9)	U (0.9)	U (0.9)	U (46)	U (0.9)
Tetrachloroethene	1	U (0.4)	U (0.4)	0.8 (0.4)	U (18)	**13 (0.4)**
Toluene	1000	0.3 (0.3)	1 (0.3)	U (0.3)	170 (14)	66 (0.3)
Trichloroethene	1	U (0.4)	0.6 (0.4)	U (0.4)	**33 (20)**	**2.3 (0.4)**
Vinyl Chloride	5	2.8 (0.4)	4 (0.4)	U (0.4)	**7000 (18)**	0.6 (0.4)
Xylenes (total)	1000	U (0.2)	U (0.2)	U (0.2)	320 (9)	46 (0.2)

TABLE 2
Analytical Results for Ground Water
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Class II-A Groundwater Criteria (ug/L)	MW1XD	MW2	MW2XD	MW3	MW3XD
ENVIRON Sample ID		MW1XD-GW01	MW2-GW01	MW2XD-GW01	MW3-GW01	MW3XD-GW01
Matrix		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Collection Method		Teflon Bailer	Teflon Bailer	Teflon Bailer	Teflon Bailer	Teflon Bailer
Collection Date		2/9/2005	2/8/2005	2/8/2005	2/8/2005	2/8/2005
Comments						
VOC						
1,1,1-Trichloroethane	30	2.5 (0.3)	U (0.3)	U (0.3)	11 (0.3)	U (0.3)
1,1-Dichloroethane	50	1.1 (0.4)	U (0.4)	U (0.4)	21 (0.4)	U (0.4)
1,1-Dichloroethene	2	U (0.3)	U (0.3)	U (0.3)	U (0.3)	U (0.3)
1,2-Dichloroethane	2	U (0.4)	U (0.4)	0.4 (0.4)	**7.1 (0.4)**	U (0.4)
Benzene	1	**6.4 (0.3)**	U (0.3)	U (0.3)	**3.5 (0.3)**	0.4 (0.3)
Bromodichloromethane	1	U (0.3)	U (0.3)	U (0.3)	U (0.3)	U (0.3)
Carbon Tetrachloride	2	0.6 (0.3)	U (0.3)	U (0.3)	U (0.3)	**5.9 (0.3)**
Chlorobenzene	50	U (0.3)	U (0.3)	U (0.3)	2.2 (0.3)	U (0.3)
Chloroethane	100	U (0.4)	U (0.4)	U (0.4)	76 (0.4)	U (0.4)
Chloroform	6	U (0.3)	U (0.3)	U (0.3)	**6.3 (0.3)**	**30 (0.3)**
cis-1,2-Dichloroethene	70	3.4 (0.4)	U (0.4)	2.4 (0.4)	69 (0.4)	U (0.4)
Ethylbenzene	700	0.8 (0.3)	U (0.3)	U (0.3)	4.9 (0.3)	U (0.3)
Methylene Chloride	3	1.1 (0.9)	U (0.9)	U (0.9)	**4.7 (0.9)**	1.7 (0.9)
Tetrachloroethene	1	**18 (0.4)**	U (0.4)	U (0.4)	U (0.4)	U (0.4)
Toluene	1000	2.6 (0.3)	0.3 (0.3)	1 (0.3)	3.2 (0.3)	1.4 (0.3)
Trichloroethene	1	**4.6 (0.4)**	U (0.4)	U (0.4)	**1.1 (0.4)**	U (0.4)
Vinyl Chloride	5	U (0.4)	U (0.4)	2.6 (0.4)	**5.7 (0.4)**	U (0.4)
Xylenes (total)	1000	1.5 (0.2)	U (0.2)	1.1 (0.2)	12 (0.2)	0.6 (0.2)

TABLE 2
Analytical Results for Ground Water
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Class II-A Groundwater Criteria (ug/L)	MW4	MW4D	MW4D	MW6	MW6D
ENVIRON Sample ID		MW4-GW01	MW4D-GW01	MW4D-GW11	MW6-GW01	MW6D-GW01
Matrix		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Collection Method		Teflon Bailer	Teflon Bailer	Teflon Bailer	Teflon Bailer	Teflon Bailer
Collection Date		2/9/2005	2/9/2005	2/9/2005	2/8/2005	2/8/2005
Comments				Field Duplicate		
VOC						
1,1,1-Trichloroethane	30	14 (2.9)	0.5 (0.3)	0.4 (0.3)	7.4 (0.6)	U (0.3)
1,1-Dichloroethane	50	**180 (3.6)**	0.6 (0.4)	0.6 (0.4)	**66 (0.7)**	U (0.4)
1,1-Dichloroethene	2	U (3.4)	U (0.3)	U (0.3)	U (0.7)	U (0.3)
1,2-Dichloroethane	2	U (3.6)	U (0.4)	U (0.4)	**66 (0.7)**	U (0.4)
Benzene	1	**700 (3.1)**	**76 (0.3)**	**74 (0.3)**	**270 (0.6)**	**41 (0.3)**
Bromodichloromethane	1	U (2.9)	U (0.3)	U (0.3)	U (0.6)	U (0.3)
Carbon Tetrachloride	2	U (3)	U (0.3)	U (0.3)	U (0.6)	1.6 (0.3)
Chlorobenzene	50	20 (2.6)	2.4 (0.3)	2.2 (0.3)	11 (0.5)	5.6 (0.3)
Chloroethane	100	**110 (3.7)**	U (0.4)	U (0.4)	42 (0.7)	U (0.4)
Chloroform	6	U (3.4)	U (0.3)	U (0.3)	**9.7 (0.7)**	**16 (0.3)**
cis-1,2-Dichloroethene	70	15 (3.5)	1.3 (0.4)	1.3 (0.4)	**330 (0.7)**	U (0.4)
Ethylbenzene	700	100 (3.3)	12 (0.3)	12 (0.3)	72 (0.7)	14 (0.3)
Methylene Chloride	3	**29 (9.1)**	U (0.9)	U (0.9)	**52 (1.8)**	1.2 (0.9)
Tetrachloroethene	1	U (3.6)	**16 (0.4)**	**16 (0.4)**	U (0.7)	U (0.4)
Toluene	1000	**1900 (2.7)**	91 (0.3)	92 (0.3)	56 (0.5)	80 (0.3)
Trichloroethene	1	**6.6 (4)**	**2.6 (0.4)**	**2.5 (0.4)**	U (0.8)	U (0.4)
Vinyl Chloride	5	**5.1 (3.5)**	U (0.4)	U (0.4)	**160 (0.7)**	U (0.4)
Xylenes (total)	1000	140 (1.8)	46 (0.2)	47 (0.2)	180 (0.4)	46 (0.2)

TABLE 2
Analytical Results for Ground Water
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	NJ Class II-A Groundwater Criteria (ug/L)	MW7	MW7D	MW8	MW9
ENVIRON Sample ID		MW7-GW01	MW7D-GW01	MW8-GW01	MW9-GW01
Matrix		Ground Water	Ground Water	Ground Water	Ground Water
Collection Method		Teflon Bailer	Teflon Bailer	Teflon Bailer	Teflon Bailer
Collection Date		2/8/2005	2/8/2005	2/7/2005	2/7/2005
Comments					
VOC					
1,1,1-Trichloroethane	30	**14000 (140)**	**200 (2.9)**	**210 (7.2)**	U (0.3)
1,1-Dichloroethane	50	**3700 (180)**	**84 (3.6)**	**370 (9)**	1.7 (0.4)
1,1-Dichloroethene	2	**520 (170)**	U (3.4)	U (8.5)	U (0.3)
1,2-Dichloroethane	2	**1900 (180)**	**44 (3.6)**	**170 (9)**	U (0.4)
Benzene	1	U (160)	**52 (3.1)**	U (7.8)	**170 (0.3)**
Bromodichloromethane	1	U (140)	U (2.9)	U (7.2)	U (0.3)
Carbon Tetrachloride	2	U (150)	U (3)	U (7.5)	U (0.3)
Chlorobenzene	50	U (130)	6.8 (2.6)	U (6.5)	U (0.3)
Chloroethane	100	U (180)	U (3.7)	U (9.2)	5.7 (0.4)
Chloroform	6	**890 (170)**	4.5 (3.4)	**63 (8.5)**	U (0.3)
cis-1,2-Dichloroethene	70	**43000 (180)**	**250 (3.5)**	**2300 (8.8)**	26 (0.4)
Ethylbenzene	700	610 (160)	22 (3.3)	20 (8.2)	10 (0.3)
Methylene Chloride	3	**1800 (460)**	**120 (9.1)**	**95 (23)**	U (0.9)
Tetrachloroethene	1	**2200 (180)**	**1200 (3.6)**	U (9)	U (0.4)
Toluene	1000	**2000 (140)**	43 (2.7)	120 (6.8)	21 (0.3)
Trichloroethene	1	**3500 (200)**	**230 (4)**	**30 (10)**	U (0.4)
Vinyl Chloride	5	**5400 (180)**	**21 (3.5)**	**500 (8.8)**	**60 (0.4)**
Xylenes (total)	1000	**2700 (90)**	89 (1.8)	120 (4.5)	27 (0.2)

TABLE 3
Analytical Results for QAQC
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	QAQC	QAQC	QAQC	QAQC	QAQC	QAQC
ENVIRON Sample ID	FB-050105	FB050207	FB050208	FB050209	TB-050105	TB050207
Matrix	Blank Water	Blank Water	Blank Water	Blank Water	Blank Water	Blank Water
Collection Method	NA	NA	NA	NA	NA	NA
Collection Date	1/5/2005	2/7/2005	2/8/2005	2/9/2005	1/5/2005	2/7/2005
Collection Depth (ft)	-	-	-	-	-	-
Comments	Field Blank	Field Blank	Field Blank	Field Blank	Trip Blank	Trip Blank
VOC						
Toluene	U (0.3)	U (0.3)	U (0.3)	U (0.3)	U (0.3)	U (0.3)
PDIST	U					

Notes:

1 All concentrations are presented in ug/L (ppb).

2 Only compounds with at least one detection are shown.

Abbreviations:

U -- Not Detected.
J -- Estimated Concentration.
( ) -- Detection Limit.

TABLE 3
Analytical Results for QAQC
Industrial Petrochemicals, Inc.
128 Doremus Avenue, Newark, New Jersey

Location	QAQC	QAQC
ENVIRON Sample ID	TB050208	TB050209
Matrix	Blank Water	Blank Water
Collection Method	NA	NA
Collection Date	2/8/2005	2/9/2005
Collection Depth (ft)	-	-
Comments	Trip Blank	Trip Blank
VOC		
Toluene	0.4 (0.3)	U (0.3)
PDIST		

Notes:

1 All concentrations are presented in ug/L (ppb).

2 Only compounds with at least one detection are shown.

Abbreviations:

U -- Not Detected.

J -- Estimated Concentration.

( ) -- Detection Limit.

Table 1 and Table 3 Notes:

Notes:	
1	All concentrations are presented in ug/L (ppb).
2	Only compounds with at least one detection are shown.
3	Concentrations that exceed the GWQS are **boldfaced.**
Abbreviations:	
	U -- Not Detected.
	J -- Estimated Concentration.
	( ) -- Detection Limit.

Table 2 Notes:

Notes:	
1	All concentrations are presented in mg/kg (ppm).
2	Only compounds with at least one detection are shown.
3	Concentrations that exceed the NJ Nonresidential Direct Contact Soil Cleanup Criteria (mg/kg) are **boldfaced.**
4	Concentrations that exceed the NJ Residential Direct Contact Soil Cleanup Criteria (mg/kg) are double underlined.
5	Concentrations that exceed the NJ Impact to Ground Water Soil Cleanup Criteria (mg/kg) are *italicized*.
Abbreviations:	
	U -- Not Detected.
	J -- Estimated Concentration.
	( ) -- Detection Limit.

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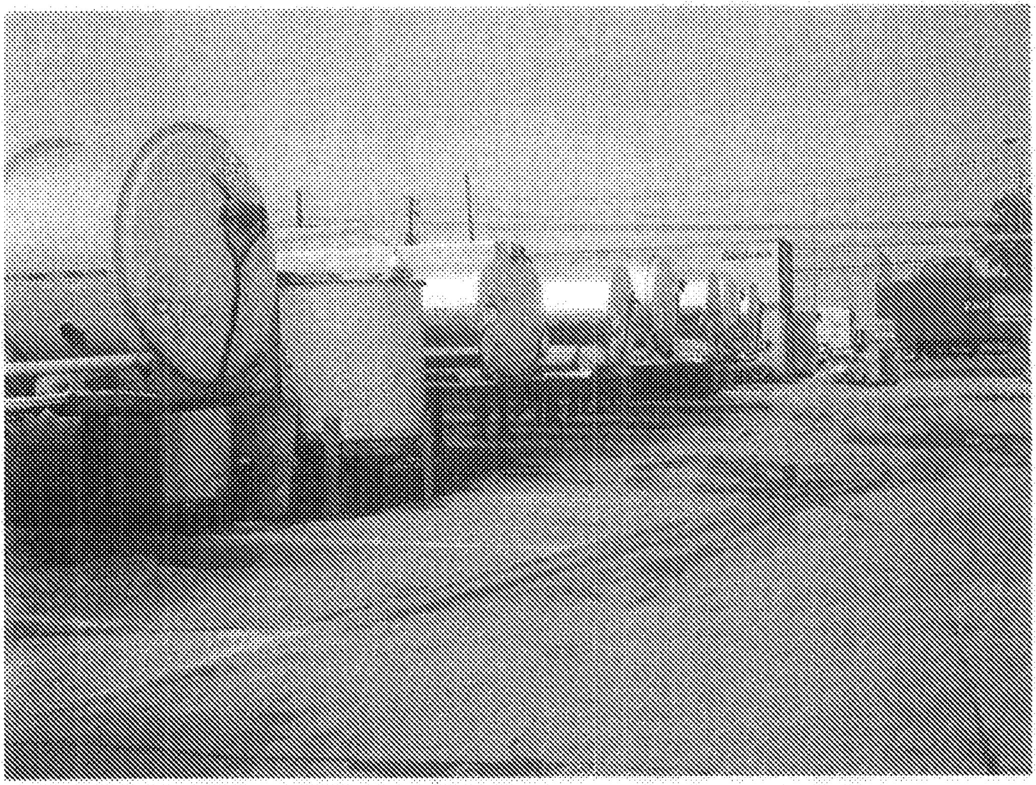
APPENDIX E

Site Photographs



PHOTOGRAPH 1: SOUTHERN TANKER PARKING AREA LOOKING WEST

PHOTOGRAPH 2: OFFICE BUILDING (DOREMUS AVENUE IS BEHIND BUILDING)

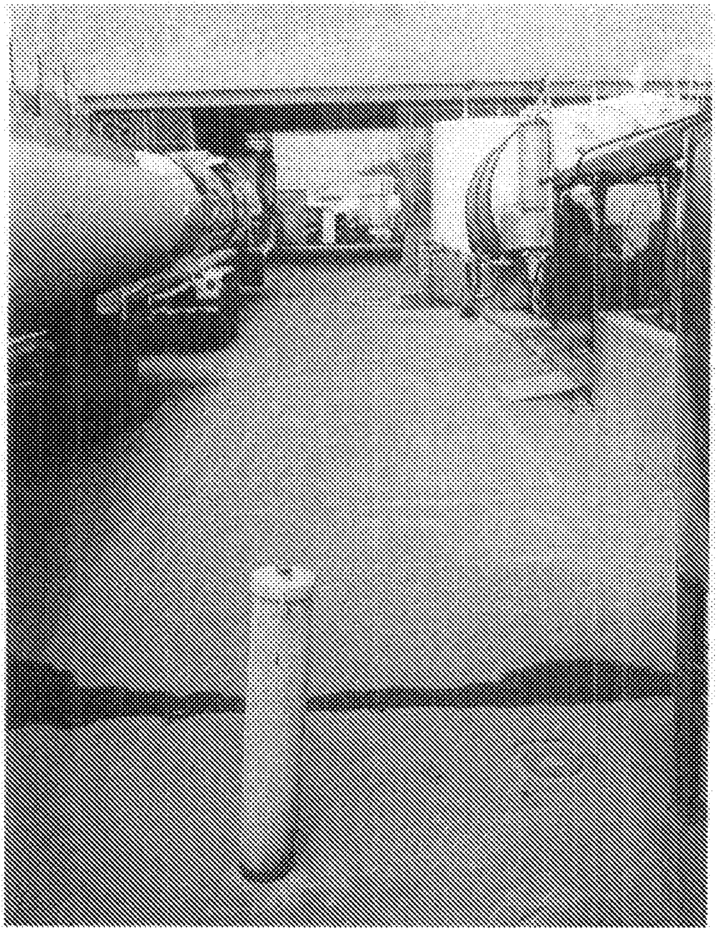
ENVIRON

DRAFTED BY: TSP | DATE: 5/27/2005

SITE PHOTOGRAPHS
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

FIGURE
E-1

PHOTOGRAPH 3: NORTHERN TRUCK WASHING AREA LOOKING NORTHWEST



PHOTOGRAPH 4: TANKER FILLING AREA VIEWED FROM SOUTHEAST CORNER OF THE SITE (WELLS MW2 AND ALS3D IN FOREGROUND)

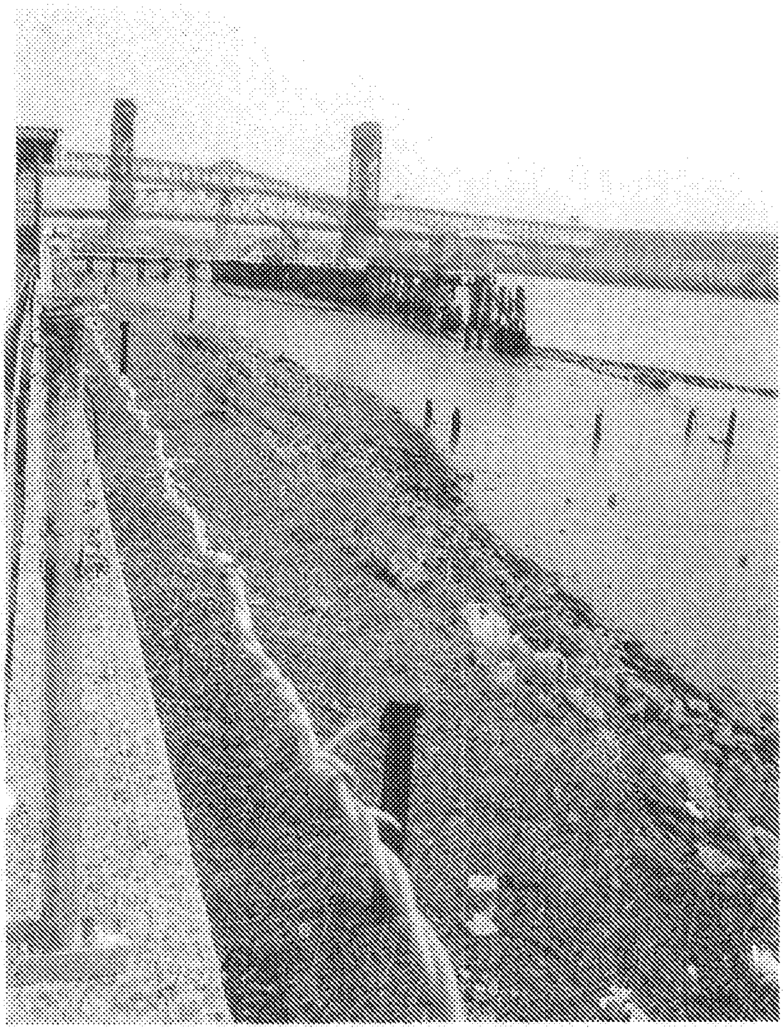
U:\02-1276A\1276GRAPH1.PPT

ENVIRON

DRAFTED BY: TSP | DATE: 5/27/2005

SITE PHOTOGRAPHS
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

FIGURE
E-2



PHOTOGRAPH 5: WELLS ALONG THE PASSAIC RIVER ALONG EASTERN BOUNDARY OF PROPERTY LOOKING NORTH (WELL ALS3 IN FOREGROUND AND MW8 CLOSEST TO RIVER NEAR UPPER LEFT)

ENVIRON

DRAFTED BY: TSP

DATE: 8/27/2005

SITE PHOTOGRAPHS
INDUSTRIAL PETROCHEMICALS, INC.
NEWARK, NEW JERSEY

FIGURE

E-3