

# **BROWNFIELDS TARGETED SITE ASSESSMENT**

**FORMER PORTLAND CHEMICAL WORKS SITE  
MIDDLETOWN, CONNECTICUT**

**RESPONSE ACTION CONTRACT (RAC), REGION I**

**For  
U.S. Environmental Protection Agency**

**By  
Tetra Tech NUS, Inc.**

**EPA Contract No. 68-W6-0045  
EPA Work Assignment No. 114-SISI-01ZZ  
TtNUS Project No. N4128**

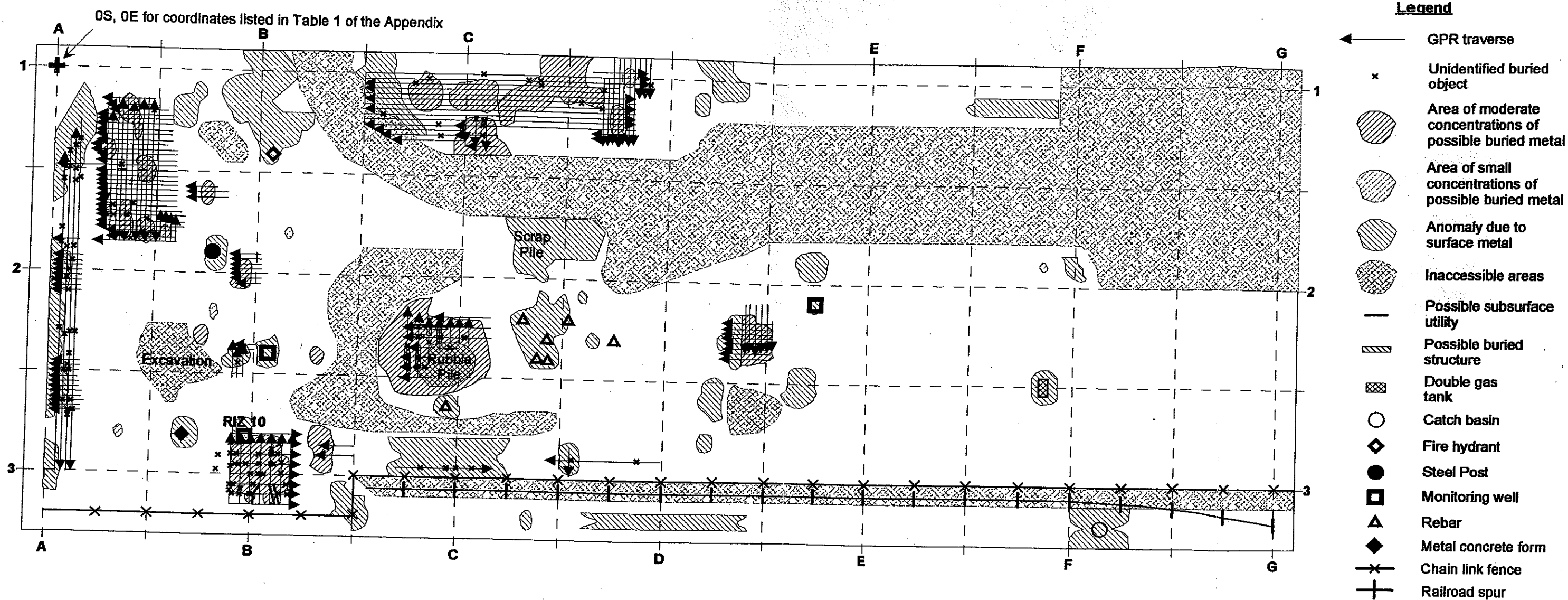
**December 2002**



**TETRA TECH NUS, INC.**

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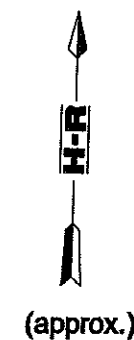


**Notes:**

1. Site sketch generated from field notes.
2. Geophysical survey locations tied to grid established and staked by TtNUS.
3. Locations are approximate due to local changes in topography and surface obstructions.
4. Surface objects are not drawn to scale and are located at the center of the symbol.

SCALE (feet)

0 50 100



(approx.)

**Figure 4**  
Integrated Interpretation  
Former Portland Chemical Works Site  
Middletown, Connecticut

FILE 02G12

MAY, 2002

HAGER-RICHTER GEOSCIENCE, INC.  
Salem, New Hampshire

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MIDDLETOWN, CONNECTICUT

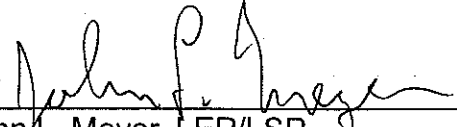
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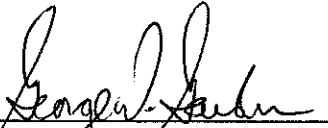
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December 2002

  
John L. Meyer, LEP/LSP  
Project Manager

  
George D. Gardner, P.E.  
Program Manager



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## 1.0 BACKGROUND

At the request of the U.S. Environmental Protection Agency (EPA) Region I, Tetra Tech NUS, Inc. (TtNUS) completed a Brownfields Targeted Site Assessment (BTSA) at the Former Portland Chemical Works Site (the Site). This BTSA Report presents a summary of the findings of the BTSA and recommendations for further action. This work is authorized under EPA Work Assignment No. 114-SISI-01ZZ, Contract No. 68-W6-0045.

### 1.1 Site Description

The Site is the former location of an industrial chemical distributor that operated from 1962 to 1991. The Site is located on the east-side of Newfield Street near Cromwell Meadows in Middletown, Connecticut (Figure 1-1), and was sub-divided into two parcels (Parcel A and Parcel B) in March 1998 (Figure 1-2). Access to both parcels is available from Newfield Street via an asphalt driveway located on the southwestern portion of the site. Both parcels are located in Middlesex County, Connecticut, and are within the United States Geological Survey 7.5-Minute topographic map of the Middletown, Connecticut Quadrangle (USGS, 1965). According to the Middletown Tax Assessor's records, Parcel A and Parcel B are approximately 2.9 acres and 3.1 acres in size, respectively. The subject of this BTSA is Parcel B (the Site).

Parcel A is located at 680 Newfield Street and contains two buildings (Building 1 and Building 2). An asphalt-paved parking area extends along the northern portion of Building 1 and in between Buildings 1 and 2. Building 1 is located in the western portion of the parcel. This building is a 14,560-square foot two-story brick structure with a steel-frame addition. The brick portion of the building was constructed circa 1920 as a schoolhouse (the Newfield School) and contains a partial concrete-floored basement. The addition was constructed circa 1960 on an at-grade concrete slab. According to municipal records this addition was demolished and rebuilt in 1968-69 and currently functions as a garage/warehouse for a Mitsubishi Fuso truck dealership. A waste oil burning furnace currently heats Building 1.

Building 2 is an 8,000-square foot steel-framed warehouse structure that was constructed in 1964 on an at-grade concrete slab. This building is currently used for storage. Two heating units, an overhead heating unit and an oil-burning furnace, are present in the building. Fuel for the heating units (No. 2 fuel oil) is contained in a 275-gallon above ground storage tank (AST).



NOTES:

1. PLAN NOT FOR DESIGN

2. ALL LOCATIONS CONSIDERED TO BE

APPROXIMATE

0.2 0 0.2 0.4 Miles

BASEMAP: PORTION OF THE FOLLOWING U.S.G.S QUADRANGLE MA - MAP 67 MIDDLETOWN

SITE LOCATION MAP

BROWNFIELDS TARGETED SITE ASSESSMENT - PORTLAND CHEMICAL WORKS

MIDDLETOWN, CONNECTICUT

|             |                 |            |                                           |
|-------------|-----------------|------------|-------------------------------------------|
| DRAWN BY:   | D.W. MACDOUGALL | REV.:      | 0                                         |
| CHECKED BY: | B. SMITH        | DATE:      | DECEMBER 2002                             |
| SCALE:      | AS SHOWN        | FILE NAME: | PROJECTS\BROWNFIELDS\41282630\APR2630.APR |

FIGURE 1-1



TETRA TECH NUS, INC.

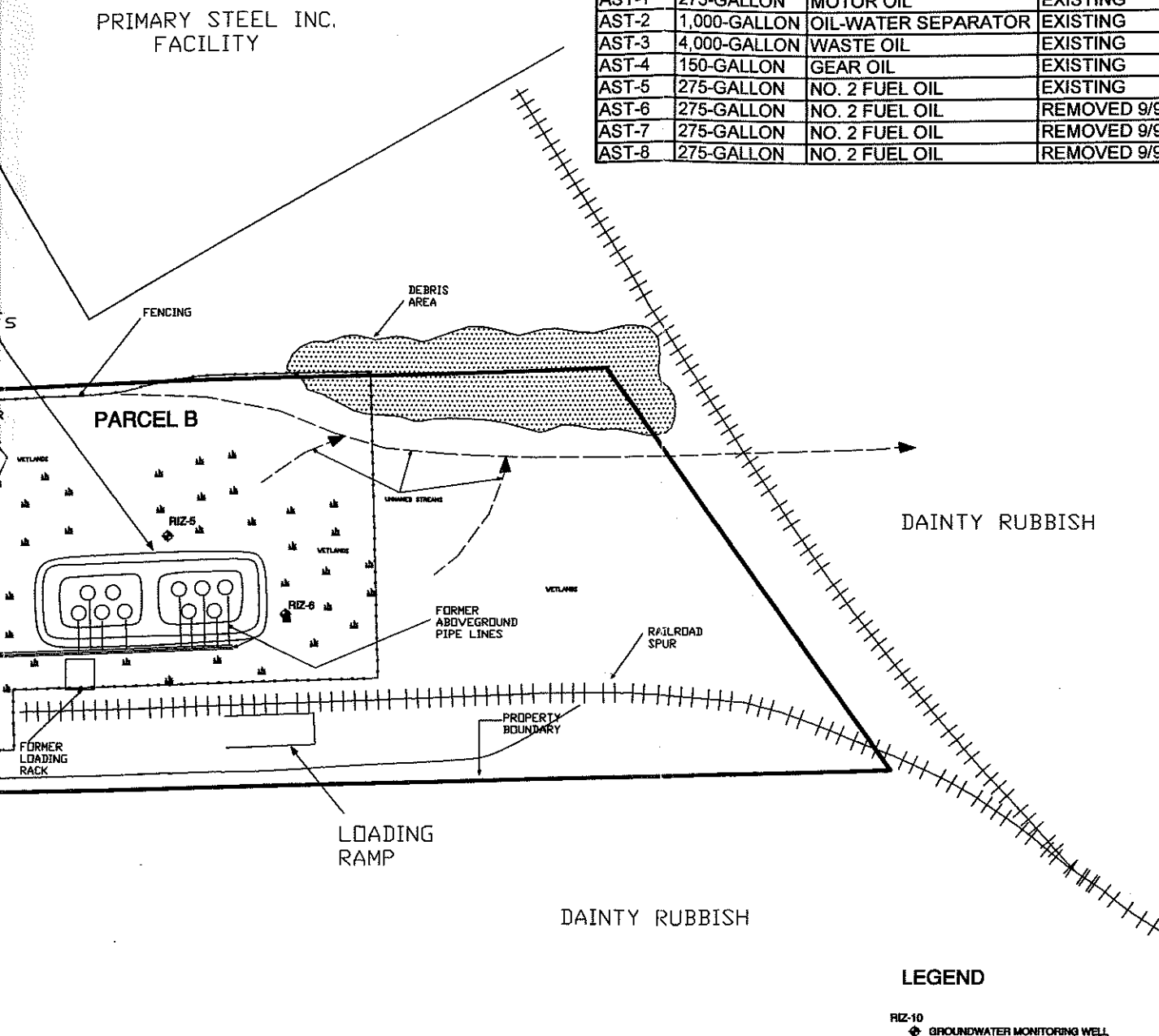
55 Jonspin Road

Wilmington, MA 01887

(978)658-7899

Tetra Tech NUS, Inc.

| TANK ID | CAPACITY     | MATERIAL STORED     | STATUS       |
|---------|--------------|---------------------|--------------|
| UST-1   | 1,000-GALLON | NO. 2 FUEL OIL      | REMOVED 9/99 |
| UST-2   | 3,000-GALLON | DIESEL FUEL         | REMOVED 9/99 |
| UST-3   | 1,000-GALLON | GASOLINE            | REMOVED 9/99 |
| UST-4   | 7,000-GALLON | NO. 2 FUEL OIL      | REMOVED 9/99 |
| AST-1   | 275-GALLON   | MOTOR OIL           | EXISTING     |
| AST-2   | 1,000-GALLON | OIL-WATER SEPARATOR | EXISTING     |
| AST-3   | 4,000-GALLON | WASTE OIL           | EXISTING     |
| AST-4   | 150-GALLON   | GEAR OIL            | EXISTING     |
| AST-5   | 275-GALLON   | NO. 2 FUEL OIL      | EXISTING     |
| AST-6   | 275-GALLON   | NO. 2 FUEL OIL      | REMOVED 9/99 |
| AST-7   | 275-GALLON   | NO. 2 FUEL OIL      | REMOVED 9/99 |
| AST-8   | 275-GALLON   | NO. 2 FUEL OIL      | REMOVED 9/99 |



## SITE PLAN

BROWNFIELDS TARGETED SITE ASSESSMENT - PORTLAND CHEMICAL WORKS

MIDDLETOWN, CONNECTICUT

DRAWN BY: D.W. MACDOUGALL

REV.: 0

CHECKED BY: B. SMITH

DATE: DECEMBER 2002

SCALE: AS SHOWN

FILE NO.: DWG\4128\2690\FIG\_1-2.DWG

## FIGURE 1-2



TETRA TECH NUS, INC.

55 Jonspin Road

Wilmington, MA 01887

(978)658-7899

Parcel B is currently undeveloped vegetated land that is surrounded by a chain link fence. The western portion of the parcel and the adjacent upland area is overgrown with Common Reed (*Phragmites australis*). Several excavated pits and soil stockpiles remain on the site from previous remedial activities. The eastern portion of the parcel contains a wetland area. A storm drain outfall discharges to a wetland near the northern boundary of the parcel. An intermittent stream flows from the culvert, through the wetland, and exits the eastern portion of the parcel via a culvert underneath an adjacent railroad grade. Access to the site is available from the west via a locked gate on Parcel A. A railroad spur is located adjacent to the parcel's southern boundary. A concrete loading ramp structure is located adjacent to the rail spur in the south-central portion of the parcel. A concrete slab that was the foundation of a former storage shed is located west of the ramp. No other structures are present on the Site.

Parcel B formerly contained a storage tank farm consisting of ten 10,000-gallon ASTs, a loading rack, a loading dock, and a drum filling building associated with the former chemical distribution facility. The loading rack was located adjacent to the loading dock and was used to transfer chemicals from railroad tank cars to the tank farm. The tank farm was located in the central portion of the site and was used for storing bulk chemicals. The tank farm was connected via piping to a single-story drum filling building that was formerly located west of the tank farm. Floor drains in the drum filling building were connected to an underground "chemical manhole" structure located adjacent to the north side of the drum filling building. According to previously completed environmental reports on the site, the chemical manhole was an underground storage tank (UST) that may have replaced, or possibly discharged to, a 20-foot by 20-foot leaching field. Several smaller shed-like structures were also located in the vicinity of the drum filling building. No information was available regarding the function of these former structures, although they were probably used for storage.

Parcel B is abutted by Parcel A to the west, by an auto dealership (Middletown Toyota) and a steel fabrication facility (Primary Steel) to the north, by an active railroad line and the Mattabassett River to the east, and by a bulk waste landfill (Dainty Rubbish) to the south.

## 1.2 Site Operational History

Parcels A and B were originally the location of the City of Middletown Newfield School. Later occupants of the parcels included Safeway Heat Elements (1950 to 1962), and chemical

distribution operations, including Phillips Brothers Chemicals (1962 to 1984), and Portland Chemical Works (1985 to 1992). The City of Middletown took possession of the Parcels in 1998. Parcel A is currently occupied by Jukonski Mitsubishi Fuso Truck Sales.

### **1.3            Oil and Hazardous Materials**

This section presents information relating to the use, storage, and disposal of oil and hazardous materials (OHM) at the Site.

#### **1.3.1            Storage Tanks**

This section presents information concerning current and former ASTs and USTs on the two parcels.

##### **1.3.1.1            Above Ground Storage Tanks (ASTs)**

The Phase I report prepared for the Site by HRP Associates, Inc. ([HRP], October 2001) identified five existing and three former ASTs on Parcel A (Figure 1-2). Existing ASTs include a 275-gallon AST containing motor oil (AST1), a 1,000-gallon oil water separator (AST2), a 4,000-gallon AST containing waste oil (AST3), a 150-gallon AST containing gear oil (AST4), and a 275-gallon AST containing No. 2 fuel oil (AST5). AST1 through AST4 are located in Building 1, whereas AST5 is located in Building 2. Three former 275-gallon ASTs (AST6 through AST8) which contained No. 2 fuel oil were located adjacent to the north side of Building 2. These ASTs were removed in September 1999. No ASTs are currently present on Parcel B. The former site occupant, Portland Chemical Works, maintained a tank farm on Parcel B that consisted of ten 10,000-gallon ASTs used to store chemicals off-loaded from railroad tank cars prior to repackaging and distribution. These ASTs were removed from the site in September 1999. The location of existing and former ASTs is depicted on Figure 1-2.

##### **1.3.1.2            Underground Storage Tanks (USTs)**

Parcel A of the Former Portland Chemical Works Property had four registered underground storage tanks. An unregistered 4,000-gallon waste chemical storage UST is reported to have been located at or near the Chemical Manhole Structure on Parcel B. Removal of this UST is



not well documented, and it may have been removed from the Site in September 2001. The former locations of USTs on both Parcels are depicted on Figure 1-2.

### **1.3.2 Oil and Hazardous Materials**

This section presents a summary of known or suspected use and disposal of OHM at the Site.

#### **1.3.2.1 Use and Releases of Oil**

The VISTA Report identified the Site as a Connecticut Department of Environmental Protection (CTDEP) Spill site. On September 15, 1999, a subsurface release of diesel fuel and gasoline was identified on Parcel A during UST removal. This release contaminated approximately 200 cubic yards of soil. Emergency measures were taken to remove 1,000 gallons of gasoline and 3,000 gallons of diesel fuel from the USTs and to remove the tanks and contaminated soil from Parcel A.

#### **1.3.2.2 Use, Storage Generation, and Releases of Hazardous Materials**

According to a regulatory agency database search report prepared for TtNUS by VISTA Information Solutions (VISTA), the Site is not currently listed as a generator of hazardous waste (VISTA, 2001). Information obtained during TtNUS's review of CTDEP records indicates that the Portland Chemical Works was used as a chemical storage and distribution facility from 1962 to 1992 and used, stored, generated, and released hazardous materials. CTDEP records also indicate that chemicals distributed from the site included plating solutions and aromatic and chlorinated hydrocarbon solvents. The site was listed as a Small Quantity Generator (EPA ID No. CTD069262186). Wastes shipped from the site in 1983 and 1985 included flammable liquid wastes, ketones, aromatic solvents, plasticizers, glycols, and glycol ethers. Portland Chemical Works received numerous violations from CTDEP for improper storage of hazardous waste, which Portland Chemical Works claimed was off-specification but usable virgin product material. CTDEP records indicate that leaks from the railroad car off-loading facility were released to the ground, and that spills inside the drum filling building were released to a subsurface leaching system via floor drains. The Site is considered to be an "Establishment" under the Connecticut Real Estate Transfer Act, although Portland Chemical Works disputed this designation. An "establishment" is any real property or business operation that generated (after November 16,

1980) more than 100 Kg/month of hazardous waste, recycled, reclaimed, stored, handled, treated, or disposed of hazardous waste generated at another location; operated as a dry cleaner, furniture stripper, or vehicle body repair facility on or after May 1, 1967.

Buried plastic-lined fiberboard drums were unexpectedly encountered on Parcel B during remediation activities that took place in January 2001 (see Section 1.4 of this report). Several of the drums ruptured and necessitated an emergency response action by CTDEP. Drums containing hydrochloric acid, phosphoric acid, chromic acid, sulfuric acid, perchloroethane (PCE), nickel sulfate, copper sulfate, toluene, trichloroethane (TCE), arsenic, and lead were encountered during the emergency response action. The buried drums and associated contaminated soil and groundwater were removed from the site for disposal, and the Site file was closed by CTDEP.

#### **1.4            Previous Investigations**

The section provides a summary of previous investigations of the Site reviewed by TtNUS as part of this BTSa.

##### **1.4.1            Rizzo Associates, Inc. Letter Report, January 14, 1992**

A letter report prepared by Rizzo Associates, Inc. (Rizzo) describes the investigation of half-buried discarded, rotted-out drums and tanks located near the boundary between the northeastern portion of Parcel B and Primary Steel property. The letter concluded that six to nine deteriorated drums containing an unidentified white powdery substance were discarded on the site via access through the adjacent (Primary Steel) property. Without accepting liability for these drums, the Hampden Mathieu Chemical Corporation (the Site owner/occupant at that time) agreed to sample and over-pack the drums, and cover the drum disposal area with polyethylene sheeting.

A follow-up letter (dated January 17, 1992) submitted to the CTDEP indicated that the drums referred to in the January 14, 1992 letter report were to be characterized prior to over-packing due to safety concerns. A letter dated March 13, 1992 from Rizzo to CTDEP indicates that Rizzo could not identify the material based on a full Toxic Characteristic Leaching Procedure (TCLP) scan. The primary constituents were later identified as hydroxide, sodium, carbonate,

and iron. Cyanide and pH analysis was also completed to determine if the material was characterized as hazardous. The substance within the drums was concluded to be non-hazardous and the drums were repackaged in DOT-approved drums for storage in the onsite buildings prior to disposal. A letter dated November 20, 1992 from Rizzo to CTDEP Waste Engineering and Enforcement Division (WEED) indicates that the material was finally identified as disodium phosphate. The drums were transported to an out-of-state disposal facility on July 30, 1992.

#### **1.4.2 Rizzo Letter Report, June 23, 1992**

A June 23, 1992 letter report prepared by Rizzo discusses the analysis of three soil samples collected from the stained area beneath the Site's former loading rack. Collection and analysis of these samples was performed in response to CTDEP Notice of Violation (NOV) No. 426. Soil samples were analyzed by EPA Methods 8010/8020, which detected trace concentrations of 1,1-dichloroethane (1,1-DCA), 1,1,1-trichloroethane (1,1,1-TCA), toluene, and ethylbenzene, and up to 2,600 parts per billion (ppb) of xylenes.

#### **1.4.3 Woodard & Curran, Inc. Phase I Environmental Site Assessment, June 1998**

This Phase I Environmental Site Assessment report identified nine (9) site features as Areas of Concern (AOCs):

| <b>Area of Concern</b>                    | <b>Description</b>                                                                                                                                                   |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AOC1. Above-Ground Tank Farm              | Chemical storage and pipe transfer, soil within the dike area, and dike breached to wetlands                                                                         |
| AOC2. Loading Rack                        | Chemical pipe transfer including hand hookups and inadequate spill containment                                                                                       |
| AOC3. Heating Oil UST                     | Potential release to subsurface                                                                                                                                      |
| AOC4. Gasoline and Diesel USTs            | Potential release to subsurface                                                                                                                                      |
| AOC5. Chemical Manhole                    | Designed to receive spilled chemicals from floor drains in the drum fill building, possible releases may have triggered the installation of nearby monitoring wells. |
| AOC6. Three (3) Fuel-Oil ASTs             | Visual evidence of releases to surface soil                                                                                                                          |
| AOC7. Debris Area on North Side of Stream | Presence of petroleum containers and general dump area                                                                                                               |

| Area of Concern                | Description                                                                          |
|--------------------------------|--------------------------------------------------------------------------------------|
| AOC8. Area east of Building 1  | Potential impacts associated with material handling in the vicinity of the warehouse |
| AOC9. Area south of Building 2 | Potential impacts associated with material handling in the vicinity of Building 2.   |

This Phase I Environmental Site Assessment also outlined a proposal for additional Phase II Subsurface Investigations at the Site. Woodard & Curran, Inc. (Woodard & Curran) recommended the collection of near-surface soil samples, sediment samples, and/or groundwater samples from existing monitoring wells in order to evaluate the identified AOCs.

#### **1.4.4 Woodard & Curran Phase II and III Environmental Site Assessment, August 1998**

Woodward and Curran prepared a combined Phase II/Phase III Environmental Site Assessment of the Former Portland Chemical Works Property in August 1998.

##### **1.4.4.1 Phase II Investigation**

Woodward and Curran's Phase II investigation of the Site consisted of collection and analysis of soil and groundwater samples from the nine AOCs identified in the 1998 Phase I report. Eighteen soil samples were collected from four soil borings. Fourteen additional shallow soil samples were collected from depth intervals ranging from 0.5 to 4.0 feet below ground surface (bgs). Soil samples were analyzed for Volatile Organic Compounds (VOCs) by EPA Method 8260, for Resource Conservation and Recovery Act (RCRA) 8 metals plus copper and nickel by mass analysis and the Synthetic Precipitation Leaching Procedure (SPLP), and for Total Petroleum Hydrocarbons (TPH) by EPA Method 418.1, and cyanide. Laboratory analysis results were compared to soil and groundwater remediation criteria contained in the CTDEP Remediation Standard Regulations (RSRs).

TPH was detected in shallow soil samples collected from AOCs 2, 5, 6, and 7. TPH concentrations detected in the sample collected from AOC2 exceeded applicable criteria. VOCs were detected in soil samples collected from AOCs 1, 2, 5, and 6. Perchloroethylene (PCE) concentrations detected in one sample (Sample 2A) collected from the loading rack area

(AOC2) exceeded the CTDEP RSRs GB Pollution Mobility Criteria (GB PMC) and industrial/commercial Direct Exposure Criteria (I/C DEC).

Hexavalent chromium concentrations detected in a shallow soil sample collected from the chemical manhole (AOC5) exceeded the I/C DEC. SPLP analysis of this sample indicated that leachable chromium concentrations exceeded the GB PMC.

Twelve groundwater samples were collected from the twelve groundwater monitoring wells at the Site (eight existing wells and four new wells installed by Woodward & Curran for the Phase II investigation). Groundwater samples were analyzed for VOCs by EPA Method 8260, dissolved RCRA 8 metals plus copper and nickel, TPH by EPA Method 418.1, and cyanide.

VOCs were detected in seven of the twelve groundwater samples. TPH, cyanide, and all analyzed metals, with the exception of barium, were below the respective laboratory detection limits. Detected barium concentrations were below applicable standards. Laboratory detection limits for dissolved arsenic, mercury, silver, copper, and cyanide were greater than the Surface Water Protection Criteria (SWPC).

Woodard & Curran concluded that groundwater did not require remediation, and that remedial efforts would focus on removing contaminated soil. Of the nine AOCs identified and evaluated during the Phase I and Phase II investigations concentrations of contamination detected at AOC2 (the Loading Rack), AOC5 (the Chemical Manhole), and AOC6, (the fuel oil ASTs) were sufficiently elevated to warrant performance of a Phase III investigation.

#### 1.4.4.2 Phase III Investigation

Woodward and Curran's Phase III investigation involved the advancement of fourteen direct-push soil borings at three of the nine AOCs where contamination warranting further investigation was detected. Borings were advanced to a depth of eight feet bgs. Twenty-eight soil samples were collected for analysis of TPH by EPA Method 418.1. One sample collected from the four to eight foot bgs depth interval in the Chemical Manhole area was analyzed for VOCs by EPA Method 8260. Soil samples collected from the loading rack area indicated that approximately 185 cubic yards of soil contained concentrations of TPH that exceeded regulatory criteria.

Concentrations of chlorinated hydrocarbons and solvents detected in groundwater samples collected from the Chemical Manhole Area (AOC 5) exceeded the I/C volatilization criteria (VC). Further investigation of this area also identified the presence of a leach field at a depth of approximately six to eight feet below the chemical manhole. Woodard & Curran determined that the leach field was the probable source of VOCs detected in groundwater samples collected during the Phase II investigation. Analysis of soil samples collected from the Chemical Manhole area indicated that approximately 120 cubic yards of soil was contaminated with concentrations of OHM that exceeded regulatory criteria.

Soil samples collected from the Fuel Oil AST Area (AOC 6) contained concentrations of TPH that exceeded the I/C DEC. Contamination exceeding regulatory criteria was detected in this area to a depth of 8 feet bgs. Woodward & Curran estimated that approximately 45 cubic yards of soil exceeding regulatory criteria was present in this area.

#### **1.4.5 Woodard & Curran Draft Remedial Action Plan (RAP), August 1998**

The RAP prepared for the City of Middletown outlined costs for remediating contamination detected at the following six AOCs: AOC1, (the Tank Farm); AOC2, (the Loading Dock); AOC3, (the Heating Oil UST); AOC4, (the Gasoline and Diesel USTs); AOC5, (the Chemical Manhole); and AOC6, (the three Fuel Oil ASTs). The estimated cost for the proposed remedial actions was \$102,900. Estimated costs for post-remedial groundwater monitoring ranged from \$20,000 to \$28,000.

#### **1.4.6 Environmental Condition Assessment Form (ECAF) prepared by Woodard & Curran, September 1999**

Woodard & Curran prepared an ECAF for the City of Middletown. The report identified the nine areas of concern as identified in the June 1998 Phase I investigation. No groundwater contamination is reported in the ECAF.

Site activities included the distribution, packaging and warehousing of chemicals, primarily those used in metal plating operations. Bulk chemicals were transported to the Site via rail car, stored in ASTs, and then transferred to smaller containers, (typically 55-gallon drums), for distribution.

The ECAF indicates that a wide range of chemicals were distributed from the site including chromic acid, sulfuric acid, sulfamic acid, sodium nitrate, copper sulfate, nickel carbonate, and ammonium chloride. Other chemicals stored on site included heating oil, diesel fuel, and gasoline.

#### **1.4.7            Emergency Response, January 2001**

On January 12, 2001 several buried plastic-lined fiber board drums were unearthed during remedial excavation activities that were being undertaken to remove contaminated soil from the Chemical Manhole Area (AOC5) on Parcel B. The contents of several drums were released when they were ruptured by the excavator. Emergency response actions were conducted by HRP from January 18, 2001 to January 31, 2001 to remove the drums and the associated OHM release.

#### **1.4.8            HRP Associates, Inc *Phase I Environmental Site Assessment Report at the Former Portland Chemical Site, October 2001***

HRP conducted a Phase I Environmental Site Assessment (ESA) in October 2001 to evaluate the potential for contamination of the Site's soil, groundwater and surface water resulting from site operations, use, and conditions. The ESA was designed to evaluate site contamination potential for the purposes of real property management in consideration of the Connecticut "Super Lien" and the Connecticut "Real Estate Transfer Act"

HRP proposed a number of recommendations for further action at the Site:

- Retain appropriate environmental legal counsel to review the status of the Site in regards to any applicable Federal, State, and municipal regulations, including, but not limited to, the following: the RCRA Corrective Action program, the CERCLIS program, the Connecticut Real Estate Transfer Act, the Site's September 9, 1999 ECAF filing under the voluntary remediation program, and the CTDEP delegation of the Site to an LEP.
- Identify and contact knowledgeable person or persons who are familiar with the Site's historical processes, raw material storage, and waste management practices, including solid waste management practices, associated with the former chemical distribution

operations for information regarding historical industrial practices and potential sources of environmental contamination.

- Review any additional CTDEP or Woodard & Curran documentation pertaining to the on-site investigative or remedial activities.
- Perform a dye-test to determine if on-site catch basins and the oil/water separator are connected to the culvert that discharges to the wetland located in the eastern portion of Parcel B.
- Perform a geophysical survey on the Site to identify buried subsurface structures, including abandoned USTs, debris, or drums.
- Subsequent to the geophysical survey, HRP recommended that Phase II and Phase III subsurface investigations be performed on the subject property. HRP recommended that the investigations include a soil-gas survey, soil borings, installation of monitoring wells, and sampling of soil, groundwater, surface water, and sediment to determine if residual waste material remains on-site from the January 2001 emergency response activities.

## 1.5 Report Objectives

The purpose of this BTSA was to investigate for the presence of OHM in soil, groundwater, and sediment on Parcel B. This information is used in this report to determine the potential risks posed by detected contamination, and, if necessary, to develop recommendations and order-of-magnitude cost estimates for further investigations and remedial actions. This BTSA report presents the results of the field investigation and provides the recommendations and order-of-magnitude cost estimates for future actions that will facilitate redevelopment of the Site.



## 2.0 FIELD INVESTIGATIONS

The following sections describe the field investigations performed by TtNUS at the Site in March 2002.

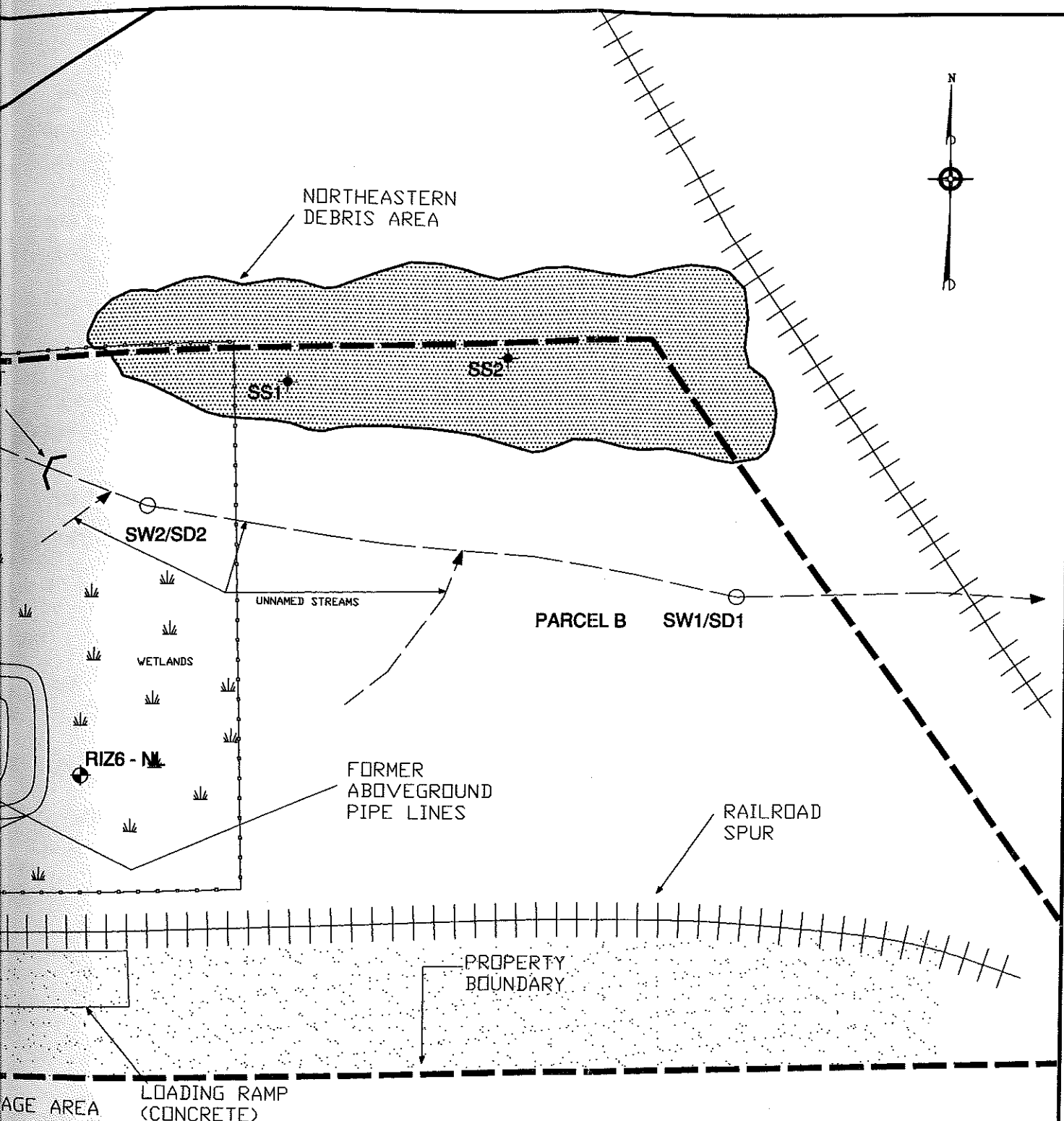
### 2.1 Geophysical Surveys

Prior to beginning the BTSA field investigation, Hager-Richter, Inc. (Hager-Richter) was subcontracted by TtNUS to perform a geophysical survey of the Site. The geophysical survey was conducted from March 19 to 20, 2002 using two complementary geophysical methods: a time domain electromagnetic induction (EM) metal detector and ground penetrating radar (GPR). The EM data was collected at approximately 8-inch intervals along lines spaced 10 feet apart across a survey grid staked in the field by TtNUS. The EM survey detected and outlined areas containing buried metal. However, this survey method cannot provide information on the type of objects causing EM anomalies. In order to aid in the identification of the objects, a GPR survey was conducted in areas of EM anomalies attributed to buried metal. In such areas, GPR traverses were spaced no greater than 5 feet apart, oriented parallel and perpendicular to the survey grid. Details of the geophysical survey are presented in the geophysical survey report contained in Appendix A. Locations of soil borings and monitoring wells installed during the BTSA investigation were based in part on the information from the geophysical survey.

EM anomalies detected in the vicinity of the chain-link fence separating Parcels A and B were initially attributed to surface metal (the chain link fence separating the two parcels). GPR investigation of these anomalies was performed on April 24, 2002 after drilling encountered a possible fiberboard drum near this fence (see Sections 4.1 and 4.4).

### 2.2 Surficial Soil Sampling

Two composite surficial soil samples (SS1 and SS2) were collected at a depth of 0 to 1 feet bgs from the northeast debris area (Figure 2-1). The composite samples consisted of two grab samples each, which were collected with a stainless steel trowel and composited in a stainless steel bowl. The two surficial samples collected at the Site were submitted for laboratory analysis of extractable total petroleum hydrocarbons (ETPH), semivolatile organic compounds



## SAMPLING LOCATIONS, PARCEL B

FIGURE 2-1

BROWNFIELDS TARGETED SITE ASSESSMENT - PORTLAND CHEMICAL WORKS

MIDDLETOWN, CONNECTICUT

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CHECKED BY: B. SMITH

DATE: DECEMBER 2002

SCALE: AS SHOWN

FILE NO.: DWG\4128\2690\FIG\_2-1.DWG



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(SVOCs), pesticides/polychlorinated biphenyls (PCBs), and metals. One grab sample was collected from each area for analysis of VOCs.

## **2.3            Hollow-Stem Auger (HSA) Drilling**

In April 2002, TtNUS advanced three HSA soil borings at the Site to a depth of 16 feet bgs. The three soil borings were completed as 2-inch interior diameter (I.D.) monitoring wells. A suspected buried drum was encountered while drilling Boring SB1. This boring was abandoned and relocated approximately 10 feet to the south of where the drum was encountered. The locations of soil borings and monitoring wells are depicted on Figure 2-1.

### **2.3.1            Subsurface Soil Sampling**

Soil borings were located in close proximity to EM Anomalies and buried objects detected during the geophysical investigation. Soil samples were collected at continuous 2-foot intervals from the ground surface to the water table (approximately 7 to 8 feet bgs) using a 2-foot long, 2.0-inch I.D. split-spoon sampler. Below the water table, one two-foot interval was sampled only for soil classification by the universal Soil Classification System (USCS). Each soil sample was field screened for organic vapors immediately upon collection, using the Massachusetts Department of Environmental Protection (MADEP) Jar Headspace Technique (MADEP Policy WSC-97). Physical characteristics of soil samples collected from each depth interval were described and recorded on soil boring log sheets. Soil boring and jar headspace log sheets are contained in Appendix B.

One soil sample was collected from each boring for laboratory analysis. The sample was selected from the depth interval above the water table that indicated the highest concentration of organic vapors, as determined by the MADEP Jar Headspace Technique. If organic vapors were not detected in soil samples collected from a soil boring, the sample that exhibited visual or olfactory signs of contamination was collected for analysis. If no visual or olfactory evidence of contamination was detected, the sample collected from the depth interval that intersected the water table was submitted for laboratory analysis. Samples collected from soil borings were analyzed for VOCs, SVOCs, pesticides/PCBs, ETPH, and metals. Sample collection summary sheets, sample log sheets, and chain-of-custody forms are contained in Appendix B.

### **2.3.2 Monitoring Well Construction and Development**

Soil borings SB1, SB3, and SB5 were completed as monitoring wells MW1, MW3, and MW5, respectively. Monitoring wells were constructed of 2-inch I.D. Schedule 40 polyvinyl chloride (PVC). Well screens were ten feet in length with a 0.010-inch slot size. All well screens were fitted with a PVC end plug. Initial determination of the depth to water table was made by visual observation of soil moisture content in split spoon samples recovered from soil borings. All monitoring wells were screened to intersect the groundwater table, with two feet screened above the water table.

A sand filter pack was placed in the borehole to a depth of approximately 2 feet above the top of the well screen. A two-foot thick bentonite seal was placed above the filter pack. Native material was allowed to collapse around the well riser above the filter pack seal. Monitoring wells were completed with lockable above ground steel protective covers, surrounded by a one-foot radius concrete surface seal. Well risers were sealed with a lockable expandable cap. All protective covers were locked. Details pertaining to individual well construction are documented on the monitoring well construction log sheets contained in Appendix B.

Following completion, each monitoring well was developed by pumping with a Waterra inertial pump. Turbidity was monitored during the development of each well. The turbidity, flow rate, and total volume of water purged was recorded on well development data sheets, which are contained in Appendix B.

### **2.4 Groundwater Sampling**

A period of at least 24 hours was maintained between well development and sampling events. The EPA "low flow" purging and sampling procedure (EPA SOP No. GW-001) was used to collect groundwater samples from monitoring wells MW1 and MW3. No groundwater was present in monitoring well MW2 at the time of sampling. Therefore, no groundwater sample was collected from this well. Groundwater samples collected from the Site were submitted for laboratory analysis of VOCs, SVOCs, ETPH, and metals. Groundwater sample log sheets, sample collection summary sheets, and chain-of-custody forms are contained in Appendix B.

## 2.5 Sediment Sampling

Two sediment samples were collected from the unnamed stream at a depth of 0- to 6-inches below the streambed (Figure 2-1). The samples were collected using a decontaminated stainless steel trowel and stainless steel bowl and analyzed for VOCs, SVOCs, pesticides/PCBs, ETPH, and metals. Samples for VOC analysis were collected directly from the streambed. The sediment sample log sheet is contained in Appendix B.

## 2.6 Surface Water Sampling

Two surface water samples were collected from the unnamed stream (Figure 2-1). The samples were collected by direct filling of the sampling containers. The two surface water samples were analyzed for VOCs, SVOCs, pesticides/PCBs, ETPH, and metals. The surface water sample log sheet is contained in Appendix B.

flowing tributary to the Mattabassett River located on the eastern portion of Parcel B is unclassified, and as such, is presumed by CTDEP to be of Class "A" quality (CTDEP, 1993). Groundwater contaminant concentrations were compared to SWPC to evaluate potential ecological risk associated with groundwater contamination. VC have been developed for migration of VOC vapors from contaminated groundwater into indoor air of overlying buildings. CTDEP has developed VC for residential (R VC) and industrial/commercial (I/C VC) site activities.

### 3.3 Regulatory Standards Applicable to the Site

The Site has historically been used for industrial activity, and the Town of Middletown intends that future Site use remain industrial or commercial. Therefore, I/C DEC are applicable to soil samples collected from the ground surface to a depth of 4 feet bgs. Since groundwater on the Site is rated use class GB, and is not used as a source of private or public water supply, GB PMC apply. CTDEP I/C VC would apply to groundwater under any building constructed on the Site as part of future redevelopment.

SWPC would apply to the site if a contaminant plume from the Site was discharging to, or had the potential to discharge to, the on-site tributary to the Mattabassett River or the on-site wetland.

## 4.0 ANALYSIS OF FIELD INVESTIGATION RESULTS

This section presents the results of the field investigation described in Section 2.0, and provides a comparison of laboratory analytical results from soil, groundwater, sediment, and surface water samples to the site-applicable regulatory standards established in Section 3.0.

### 4.1 Geophysical Survey Results

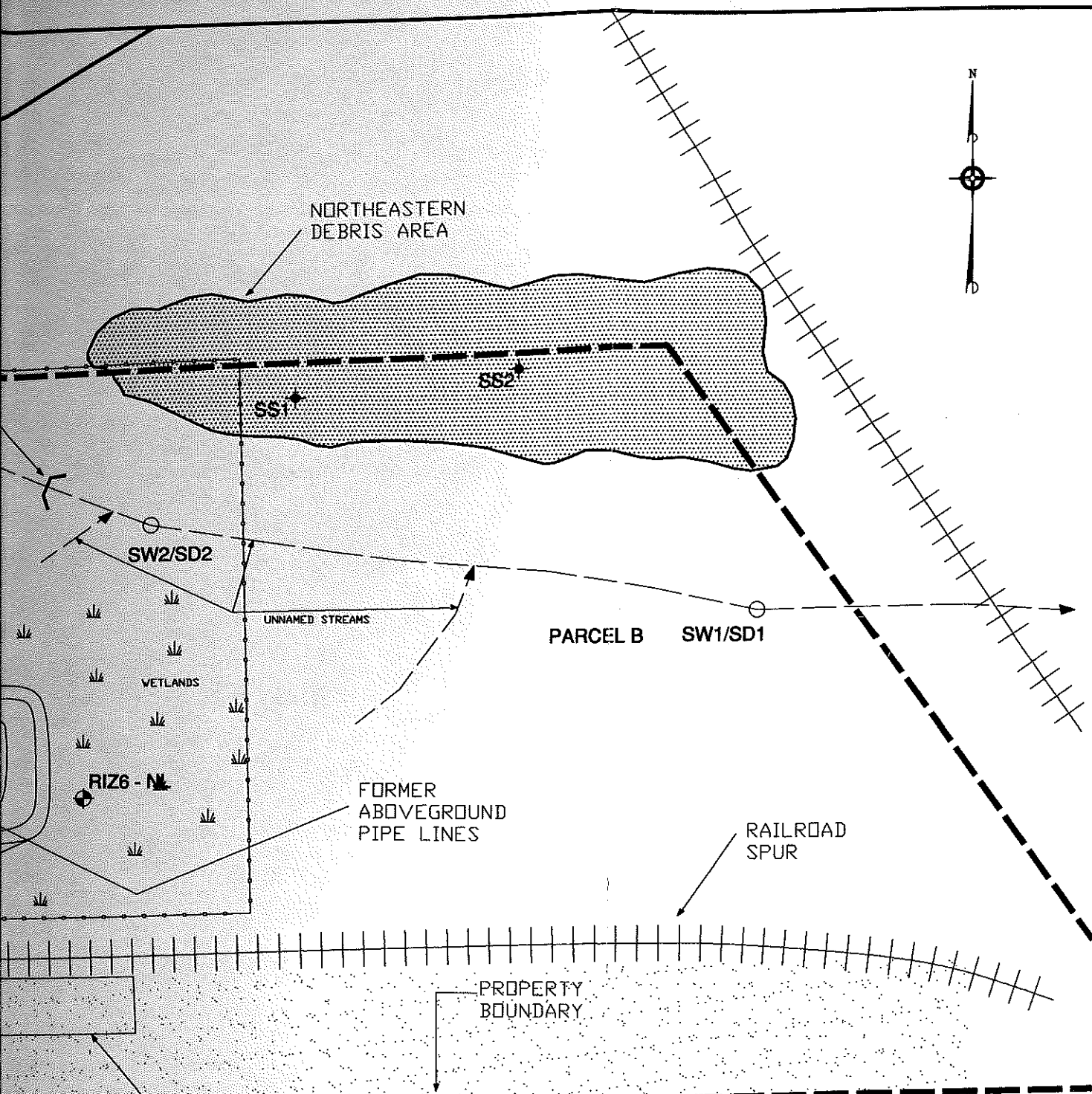
The results of Hager-Richter's geophysical surveys of the Site indicate that:

- Between 30 and 40 objects (likely to be drums) may be located along (east of) the fence near MW1 at depths ranging from 1-foot bgs to 4 feet bgs (Figure 4-1).
- Several areas containing small to moderate amount of buried metal and other unidentified buried objects were detected.
- A few possible buried structures such as a concrete pad or a foundation were detected.
- Three segments of possible buried subsurface utilities were detected.
- Several subsurface utility lines were detected.

The Hager-Richter geophysical survey report is contained in Appendix A.

### 4.2 Site Geology and Hydrogeology

Inspection of samples collected from soil borings advanced during TtNUS's BTSA investigation indicate that surficial deposits underlying the Site consist of alluvium underlain by lacustrine deposits. The alluvial deposits are composed of fine to coarse sand with varying amounts of gravel and extend from approximately 0 to 1 feet bgs. The lacustrine deposits consist of medium-red clay with a trace of gravel. The lacustrine deposits extend from approximately 1-foot bgs to greater than 16 feet bgs. Bedrock was not encountered during the BTSA investigation. No petroleum odor was noted in the soil samples collected from the Site. No sheen was observed on groundwater samples collected from the Site.



AGE AREA

LOADING RAMP  
(CONCRETE)

BURIED DRUM LOCATIONS

FIGURE 4-1

BROWNFIELDS TARGETED SITE ASSESSMENT - PORTLAND CHEMICAL WORKS

MIDDLETOWN, CONNECTICUT

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Field screening of soil samples detected 52.2 parts per million by volume (ppm/v) of organic vapors in a soil sample collected from the 0 to 2-foot bgs depth interval at boring SB3 (located near the former storage shed area).

However, due to high moisture conditions caused by heavy rain, the photoionization detector (PID) did not function properly during most of the drilling and sample collection effort. Table 4-1 summarizes field screening results for the BTSA investigation.

During advancement of a soil boring located near the fence separating Parcels A and B, the drilling subcontractor struck an obstruction at the 2- to 4-foot bgs depth interval. Upon removal of the split-barrel sampler, TtNUS observed a gray liquid in the boring that exhibited a strong petroleum odor. Based on the previous removal of OHM-containing steel and fiberboard drums from the Site, TtNUS believed the obstruction to be a buried drum of chemical waste. The drill rig was moved 10 feet south of this location and the boring was completed as SB1. After discussion between the TtNUS Field Engineer, the TtNUS project manager, and EPA, it was decided that the drilling program should be stopped, and an additional geophysical survey conducted in the vicinity of boring SB1 to determine if buried drums were present (see Section 4.1).

Groundwater depth measurements made at the Site during the BTSA investigation indicate that the water table ranges in depth from approximately 3 to 10 feet bgs. The inferred groundwater flow direction is to the south-southeast. Table 4-2 contains a summary of groundwater depths and associated elevations measured during the investigation. Figure 4-2 depicts groundwater contours and flow direction. Groundwater level measurement logs and well construction diagrams for wells installed by TtNUS are contained in Appendix B.

#### **4.3      Analytical Data Validation and Verification Methods**

A modified Tier II-like data validation was performed on the soil and groundwater analytical data obtained during the BTSA. The data validation procedures included checking chain-of-custody records for sampling, shipping, analysis, and reporting for accuracy and completeness. The results of the data validation indicated that analytical results met validation criteria and are useable for the purposes of this BTSA. The chain of custody forms and analytical data summaries are contained in Appendix C.

TABLE 4-1  
SUMMARY OF SOIL ORGANIC VAPOR CONCENTRATIONS DETECTED  
BY JAR HEADSPACE SCREENING  
BROWNFIELDS TARGETED SITE ASSESSMENT  
FORMER PORTLAND CHEMICAL WORKS SITE  
MIDDLETOWN, CONNECTICUT

| Depth (bgs) | Organic Vapor Concentration (ppmv) |            |            |
|-------------|------------------------------------|------------|------------|
|             | Boring SB1                         | Boring SB3 | Boring SB5 |
| 0-2         | NA                                 | 52.2       | NA         |
| 2-4         | NA                                 | NA         | NA         |
| 4-6         | NA                                 | NA         | NA         |
| 6-8         | NA                                 | NA         | NA         |
| 8-10        | NA                                 | NA         | NA         |
| 10-12       | NA                                 | NA         | NA         |
| 12-14       | NA                                 | NA         | NA         |
| 14-16       | NA                                 | NA         | NA         |

Notes:

bgs – Below ground surface

ppm/v – Parts per million by volume

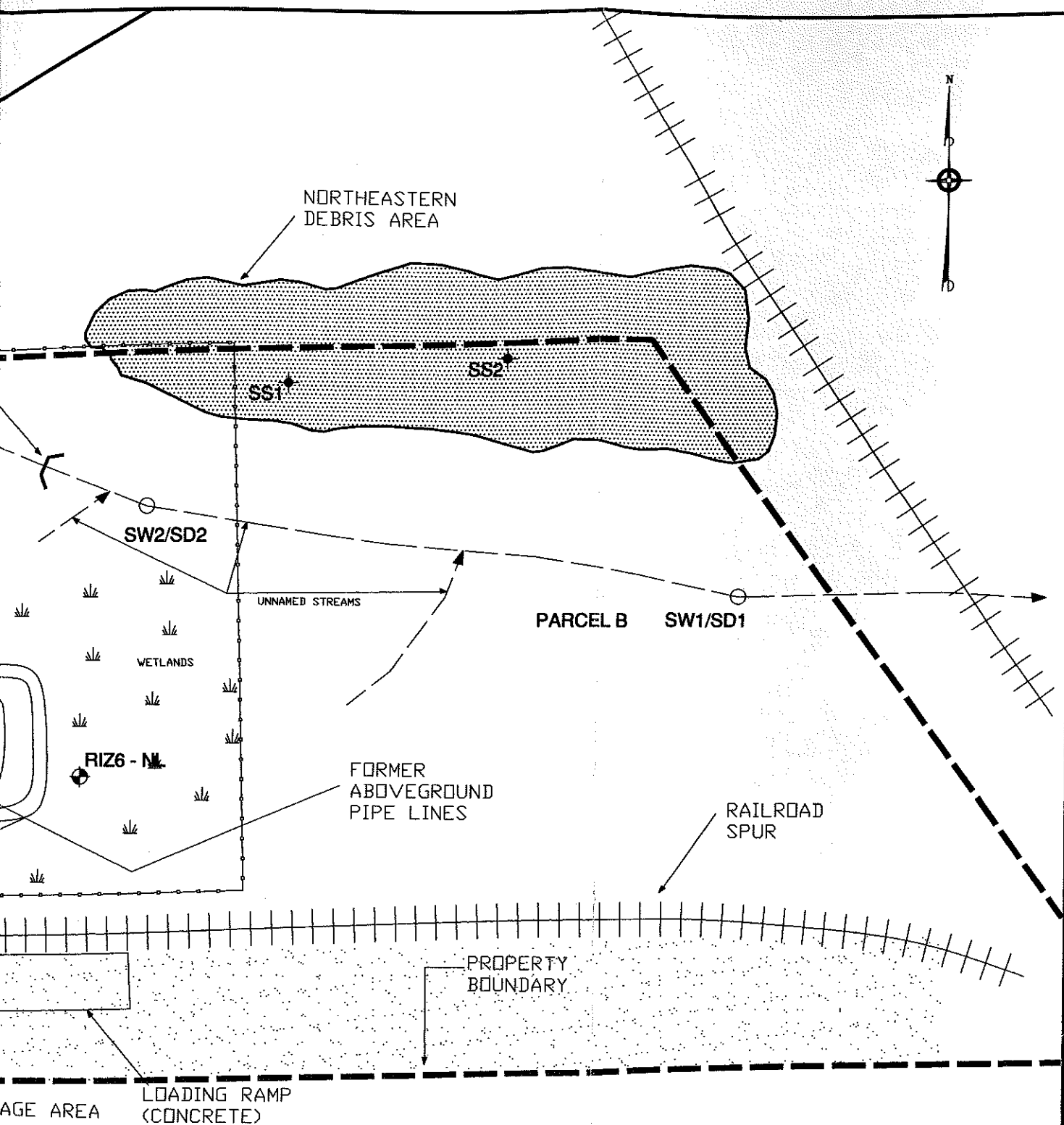
NA – Not available - Jar headspace screening was not performed because the PID was not functioning due to excessive atmospheric moisture.

TABLE 4-2  
GROUNDWATER ELEVATION SUMMARY  
BROWNFIELDS TARGETED SITE ASSESSMENT  
FORMER PORTLAND CHEMICAL WORKS SITE  
MIDDLETOWN, CONNECTICUT

| Monitoring Well Identifier | Depth to Groundwater (feet bgs) | Elevation of PVC Casing (feet) | Elevation of Water Table (feet) | Total Depth of Monitoring Well (feet bgs) | Screened Interval of Monitoring Well (feet bgs) |
|----------------------------|---------------------------------|--------------------------------|---------------------------------|-------------------------------------------|-------------------------------------------------|
| MW1                        | 3.10                            | 100.00                         | 96.90                           | 15                                        | 5-15                                            |
| MW3                        | 10.34                           | 99.90                          | 89.56                           | 16                                        | 6-16                                            |
| MW5                        | 4.15                            | 96.84                          | 92.69                           | 15                                        | 5-15                                            |

NOTES:

1. Groundwater elevations measured from top of PVC casing
2. Elevations referenced to arbitrary benchmark



## GROUNDWATER CONTOUR

FIGURE 4-2

BROWNFIELDS TARGETED SITE ASSESSMENT - PORTLAND CHEMICAL WORKS

MIDDLETOWN, CONNECTICUT

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#### **4.4            Soil Analytical Results**

This section summarizes OHM detected in soil samples collected from the Site during the BTSA. Elevated concentrations of PAHs and metals were detected in soil samples collected from soil borings and in surficial soil samples collected from the northeast debris area. A summary of OHM detected in soil samples is contained in Table 4-3. OHM detected at concentrations greater than CTDEP RSR soil standards are highlighted in black.

##### **4.4.1            Subsurface Soil Samples with OHM Concentrations Exceeding Applicable CTDEP RSR Standards**

This section summarizes subsurface soil samples collected from soil borings in which OHM was detected at concentrations exceeding applicable CTDEP soil standards. The potential exceedance of the PMC by metals was based on estimated leachable concentrations calculated by multiplying the PMC by a factor of 20.

No OHM detected in the soil samples exceeded the CTDEP I/C DEC.

Metals detected in soil samples at concentrations estimated to exceed the CTDEP GB PMC included:

- Total barium in a sample collected from the 6 to 8 foot bgs depth interval at boring SB1 and from the 8 to 10 foot bgs depth interval at boring SB3.
- Total beryllium in the sample collected from the 8 to 10 foot bgs depth interval at boring SB3.
- Total chromium, lead, nickel, and vanadium in the samples collected from 6 to 8 foot bgs depth interval at boring SB1, from the 8 to 10 foot bgs depth interval at boring SB3, and from the 6 to 8 foot bgs depth interval at boring SB5.

No other OHM detected in subsurface soil samples collected from borings SB1, SB3, or SB5 exceeded CTDEP I/C DEC or GB PMC.

**TABLE 4-3**  
**OHM DETECTED IN SOIL SAMPLES**  
**BROWNFIELDS TARGETED SITE ASSESSMENT**  
**FORMER PORTLAND CHEMICAL WORKS SITE**  
**MIDDLETOWN, CONNECTICUT**

| Sample Number                                | PC-SO-SB1-0608    | PC-SO-SB3-0810                | PC-SO-DUP-01                  | PC-SO-SB5-0608 | PC-SO-SB1-0001 | PC-SO-SB2-0001 |
|----------------------------------------------|-------------------|-------------------------------|-------------------------------|----------------|----------------|----------------|
| Sample Location                              | SB1               | SB3                           | SB3                           | SB5            | SB1            | SB2            |
| Date Sampled                                 | 4/22/2002         | 4/22/2002                     | 4/22/2002                     | 4/22/2002      | 4/23/2002      | 4/23/2002      |
| Depth Interval                               | 6.0-8.0           | 8.0-10.0                      | 8.0-10.0                      | 6.0-8.0        | 0.0-1.0        | 0.0-1.0        |
| QC Identifier                                | CTDEP<br>GB PMC 1 | Field Dup. PC-SO-<br>SB3-0810 | Field Dup. PC-SO-<br>SB3-0810 | None           | None           | None           |
| <b>Volatile Organic Analysis (UG/KG)</b>     |                   |                               |                               |                |                |                |
| 2-Butanone                                   | 1000000           | 1900                          | J                             | 1400           | J              | 1100           |
| Acetone                                      | 1000000           | 190                           | JEB                           | 180            | JEB            | 140            |
| Methyl Acetate                               |                   | 200                           | U                             | 220            | U              | 170            |
| <b>Semivolatile Organic Analysis (UG/KG)</b> |                   |                               |                               |                |                |                |
| Acenaphthylene                               | 2500000           | 84000                         | U                             | 450            | U              | 440            |
| Benzaldehyde                                 |                   | 430                           | U                             | 450            | U              | 440            |
| Benzo(a)anthracene                           | 7800              | 1000                          | U                             | 450            | U              | 440            |
| Benzo(a)pyrene                               | 1000              | 1000                          | U                             | 450            | U              | 440            |
| Benzo(b)fluoranthene                         | 7800              | 1000                          | U                             | 450            | U              | 440            |
| Benzo(g,h,i)perylene                         | 2500000           | 40000                         | U                             | 450            | U              | 440            |
| Benzo(k)fluoranthene                         | 78000             | 1000                          | U                             | 450            | U              | 440            |
| bis(2-Ethylhexyl)phthalate                   | 410000            | 11000                         | EB                            | 140            | JEB            | 2400           |
| Caprolactam                                  |                   |                               | 61                            | J              | 450            | U              |
| Chrysene                                     | 780000            | 960                           | U                             | 450            | U              | 440            |
| Di-n-octylphthalate                          | 2500000           | 20000                         | U                             | 450            | U              | 440            |
| Fluoranthene                                 | 2500000           | 56000                         | U                             | 450            | U              | 440            |
| Indeno(1,2,3-cd)pyrene                       | 7800              | 9.6                           | U                             | 450            | U              | 440            |
| Phenanthrene                                 | 2500000           | 40000                         | U                             | 450            | U              | 440            |
| Pyrene                                       | 2500000           | 40000                         | U                             | 450            | U              | 440            |
| <b>Pesticide/PCB Analysis (UG/KG)</b>        |                   |                               |                               |                |                |                |
| 4,4'-DDD                                     | 24000             | 29                            | U                             | 4.5            | U              | 4.3            |
| 4,4'-DDT                                     | 17000             | 21                            | U                             | 4.5            | U              | 4.3            |
| alpha-Chlordane                              | 2200              | 66                            | U                             | 2.3            | U              | 2.2            |
| gamma-Chlordane                              | 2200              | 66                            | U                             | 2.3            | U              | 2.2            |

Black Background - Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;  
 \* - From dilution analysis; R - Rejected; NA - Not Analyzed; 1. PMC for metals multiplied by 20 because SPLP was not performed

TABLE 4-3 (cont.)

OHM DETECTED IN SOIL SAMPLES  
BROWNFIELDS TARGETED SITE ASSESSMENT  
FORMER PORTLAND CHEMICAL WORKS SITE  
MIDDLETOWN, CONNECTICUT  
PAGE 2 OF 2

| Sample Number                                | Sample Location  | PC-SO-SB1-0608    | PC-SO-SB3-0810                | PC-SO-DUP-01                  | PC-SO-SB5-0608 | PC-SS-SS1-0001 | PC-SS-SS2-0001 |
|----------------------------------------------|------------------|-------------------|-------------------------------|-------------------------------|----------------|----------------|----------------|
|                                              |                  | SB1               | SB3                           | SB3                           | SB5            | SS1            | SS2            |
| Date Sampled                                 |                  | 4/22/2002         | 4/22/2002                     | 4/22/2002                     | 4/22/2002      | 4/23/2002      | 4/23/2002      |
| Depth Interval                               |                  | 6.0-8.0           | 8.0-10.0                      | 8.0-10.0                      | 6.0-8.0        | 0.0-1.0        | 0.0-1.0        |
| QC Identifier                                | CTDEP<br>I/C DEC | CTDEP<br>GB PMC 1 | Field Dup. PC-SO-<br>SB3-0810 | Field Dup. PC-SO-<br>SB3-0810 | None           | None           | None           |
| TAL Metal Analysis (MG/KG)                   |                  |                   |                               |                               |                |                |                |
| Aluminum                                     |                  |                   | 15400                         |                               |                |                |                |
| Arsenic                                      | 10               | 10                | 3.4                           | 14700                         | 12800          | 5960           | 7760           |
| Barium                                       | 140000           | 200               | 282                           | 3.3                           | 3.2            | 1.9            | 2.8            |
| Beryllium                                    | 2                | 0.8               | 1.1                           | 162                           | 145            | 58.6           | 124            |
| Calcium                                      |                  |                   | 1.4                           | 1.0                           | 1.1            | 0.42           | 0.48           |
| Chromium                                     | 100              | 10                | 5800                          | 15800                         | 2360           | 6380           | 4920           |
| Cobalt                                       | 2500             |                   | 32.7                          | 29.0                          | 25.5           | 12.3           | 12.0           |
| Copper                                       | 76000            | 260               | 15.8                          | 13.6                          | 13.2           | 7.2            | 7.4            |
| Iron                                         |                  |                   | 29.1                          | 23.8                          | 20.4           | 25.0           | 32.6           |
| Lead                                         | 1000             | 3                 | 29500                         | 26700                         | 28900          | 15000          | 17500          |
| Magnesium                                    |                  |                   | 12.9                          | 11.2                          | 11.7           | 32.7           | 236            |
| Manganese                                    | 47000            |                   | 9190                          | 9650                          | 6940           | 4420           | 3980           |
| Mercury                                      | 610              | 0.4               | 1700                          | 616                           | 1260           | 450            | 386            |
| Nickel                                       | 7500             | 20                | 0.076                         | 0.050                         | 0.061          | 0.038          | 0.28           |
| Potassium                                    |                  |                   | 31.6                          | 29.6                          | 23.7           | 13.3           | 12.9           |
| Sodium                                       |                  |                   | 2530                          | 3180                          | 2240           | 655            | 878            |
| Vanadium                                     | 14000            | 10                | 377                           | 326                           | 268            | 223            | 301            |
| Zinc                                         | 610000           | 1000              | 46.4                          | 43.3                          | 45.1           | 25.5           | 28.1           |
|                                              |                  |                   | 79.6                          | 71.3                          | 59.3           | 53.6           | 148            |
| Total Petroleum Hydrocarbon Analysis (MG/KG) |                  |                   |                               |                               |                |                |                |
| Extractable TPH                              | 2500             | 2500              | 20                            | 15                            | 15             | 410            | 190            |

Black Background - Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;  
\* - From dilution analysis; R - Rejected; NA - Not Analyzed; 1. PMC for metals multiplied by 20 because SPLP was not performed

#### **4.4.2            Surfacial Soil Samples with OHM Concentrations Exceeding Applicable CTDEP RSR Standards**

This section summarizes surficial soil samples collected from the northeast debris area in which OHM was detected at concentrations exceeding applicable CTDEP soil standards.

Benzo(a)pyrene was detected at concentrations exceeding the CTDEP I/C DEC in surficial soil samples SS1 and SS2.

OHM detected at concentrations exceeding the CTDEP GB PMC included:

- Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene in samples SS1 and SS2.
- 4,4'-DDT in sample SS2.
- Chromium, lead, and vanadium in samples SS1 and SS2 are estimated to exceed the GB PMC.

No other OHM detected in the two surficial soil samples exceeded CTDEP I/C DEC or GB PM soil standards.

#### **4.5                Groundwater Analytical Results**

Analysis of groundwater samples collected during the BTSA investigation of the Site detected several VOCs, metals, and ETPH. Human and environmental risk associated with the presence of the elevated concentrations of these OHM were evaluated by comparing them to CTDEP I/C VC, and SWPC. OHM detected in groundwater samples collected during the BTSA are summarized in Table 4-4. OHM detected at concentrations greater than CTDEP standards are highlighted in black.



**TABLE 4-4**  
**OHM DETECTED IN GROUNDWATER SAMPLES**  
**BROWNFIELDS TARGETED SITE ASSESSMENT**  
**FORMER PORTLAND CHEMICAL WORKS SITE**  
**MIDDLETOWN, CONNECTICUT**

| Sample Number                                      |                  |              | PC-GW-MW1-01                | PC-GW-DUP-01                | PC-GW-MW3-01 | PC-GW-MW5-01 |
|----------------------------------------------------|------------------|--------------|-----------------------------|-----------------------------|--------------|--------------|
| Sample Location                                    |                  |              | MW1                         | MW1                         | MW3          | MW5          |
| Date Sampled                                       |                  |              | 4/24/2002                   | 4/24/2002                   | 4/24/2002    | 4/24/2002    |
| QC Identifier                                      | CTDEP<br>I/C VOL | CTDEP<br>SWP | Field Dup. PC-GW-<br>MW1-01 | Field Dup. PC-GW-<br>MW1-01 | None         | None         |
| <b>Volatile Organic Analysis (UG/L)</b>            |                  |              |                             |                             |              |              |
| 1,1-Dichloroethane                                 | 50000            |              | 80                          | 80                          | 10 U         | 10 U         |
| 1,1-Dichloroethene                                 | 6                | 96           | 2 J                         | 2 J                         | 10 U         | 10 U         |
| 1,2-Dichloroethane                                 | 90               | 2970         | 1 J                         | 1 J                         | 2 J          | 10 U         |
| Chloroethane                                       |                  |              | 15 J                        | 15 J                        | 10 UJ        | 10 UJ        |
| Chloromethane                                      |                  |              | 10 U                        | 10 U                        | 1 J          | 10 U         |
| cis-1,2-Dichloroethene                             |                  |              | 62                          | 62                          | 2 J          | 6 J          |
| trans-1,2-Dichloroethene                           |                  |              | 10 U                        | 2 J                         | 10 U         | 10 U         |
| Trichloroethene                                    | 540              | 2340         | 2 J                         | 2 J                         | 10 U         | 10 U         |
| Vinyl Chloride                                     | 2                | 15750        | 59 J                        | 58 J                        | 10 UJ        | 3 J          |
| <b>TAL Metal Analysis (UG/L)</b>                   |                  |              |                             |                             |              |              |
| Aluminum                                           |                  |              | 208 U                       | 264 U                       | 775          | 115 U        |
| Antimony                                           |                  | 86000        | 1.9 J                       | 1.6 U                       | 1.6 U        | 1.6 U        |
| Barium                                             |                  |              | 744                         | 720                         | 129          | 220          |
| Calcium                                            |                  |              | 134000                      | 135000                      | 77800        | 92300        |
| Chromium                                           |                  |              | 0.50 U                      | 0.50 U                      | 1.7          | 0.50 U       |
| Cobalt                                             |                  |              | 13.4                        | 13.2                        | 0.60 UJ      | 6.7 J        |
| Copper                                             |                  | 48           | 2.7 J                       | 3.0 J                       | 0.70 UJ      | 0.70 UJ      |
| Iron                                               |                  |              | 3640                        | 3180                        | 1460         | 13400        |
| Magnesium                                          |                  |              | 41300                       | 41700                       | 23400        | 35400        |
| Manganese                                          |                  |              | 13400                       | 13500                       | 331          | 13200        |
| Nickel                                             |                  | 880          | 12.1                        | 12.0                        | 2.0 U        | 2.5 U        |
| Potassium                                          |                  |              | 2880 J                      | 2950 J                      | 3020 J       | 3840 J       |
| Sodium                                             |                  |              | 48300                       | 48300                       | 25300        | 28400        |
| Thallium                                           |                  | 63           | 17.2                        | 15.1                        | 3.3 U        | 16.0         |
| Zinc                                               |                  | 123          | 1.7 J                       | 2.0 J                       | 1.4 UJ       | 1.4 UJ       |
| <b>Total Petroleum Hydrocarbon Analysis (MG/L)</b> |                  |              |                             |                             |              |              |
| Extractable TPH                                    |                  |              | 0.65                        | 0.80                        | 0.11         | 0.33         |

Black Background - Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;  
 \* - From dilution analysis; R - Rejected; NA - Not Analyzed

#### 4.5.1 Compounds Exceeding CTDEP I/C Volatilization Standard

Vinyl chloride was detected at concentrations exceeding the I/C VC in groundwater samples collected from monitoring wells MW1 (located near the area where suspected buried drums were identified) and MW5.

No other OHM compounds detected in groundwater samples exceeded the CTDEP I/C VC.

#### 4.5.2 Compounds Exceeding CTDEP SWPC

No OHM compounds detected in groundwater samples exceeded the CTDEP SWPC.

#### 4.6 Sediment Analytical Results

This section summarizes OHM detected in sediment samples. Elevated concentrations of PAHs, pesticides/PCBs, metals, and ETPH were detected in sediment samples collected from the unnamed stream at the Site. A summary of OHM detected in sediment samples collected during the BTSA is contained in Table 4-5. OHM detected at concentrations greater than CTDEP RSR soil standards are highlighted in black.

Benzo(a)anthracene and benzo(a)pyrene concentrations detected in sediment sample SD-02 exceeded the CTDEP I/C DEC.

OHM compounds detected at concentrations exceeding the CTDEP GB PMC included:

- Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene in sample SD-02.
- Bis(2-ethylhexyl)phthalate and indeno(1,2,3-cd)pyrene in sample SD-01.
- 4,4'-DDE in sample SD-01.

No other OHM compounds detected in the two sediment samples exceeded CTDEP I/C DEC or GB PMC.

TABLE 4-5  
OHM DETECTED IN SEDIMENT SAMPLES  
BROWNFIELDS TARGETED SITE ASSESSMENT  
FORMER PORTLAND CHEMICAL WORKS SITE  
MIDDLETOWN, CONNECTICUT

| Sample Number                                |                  |                 | PC-SD-01  | PC-SD-02            | PC-SD-DUP-01        |
|----------------------------------------------|------------------|-----------------|-----------|---------------------|---------------------|
| Sample Location                              |                  |                 | SD-01     | SD-02               | SD-02               |
| Date Sampled                                 |                  |                 | 4/19/2002 | 4/19/2002           | 4/19/2002           |
| QC Identifier                                | CTDEP<br>I/C DEC | CTDEP<br>GB PMC | None      | Field Dup. PC-SD-02 | Field Dup. PC-SD-02 |
| <b>Volatile Organic Analysis (UG/KG)</b>     |                  |                 |           |                     |                     |
| Methyl Acetate                               |                  |                 | 130 UJ    | 250 J               | 91 UJ               |
| <b>Semivolatile Organic Analysis (UG/KG)</b> |                  |                 |           |                     |                     |
| 2-Methylnaphthalene                          | 2500000          | 56000           | 320 U     | 46 J                | 310 UJ              |
| Acenaphthene                                 | 2500000          | 84000           | 320 U     | 160 J               | 310 UJ              |
| Acenaphthylene                               | 2500000          | 84000           | 320 U     | 940 J               | 220 J               |
| Anthracene                                   | 2500000          | 400000          | 320 U     | 1800 J              | 190 J               |
| Benzo(a)anthracene                           | 7800             | 1000            | 270 J     | 8000 J*             | 3200 J*             |
| Benzo(a)pyrene                               | 1000             | 1000            | 270 J     | 5600 J*             | 2700 J*             |
| Benzo(b)fluoranthene                         | 7800             | 1000            | 510 J     | 7000 J*             | 4000 J*             |
| Benzo(g,h,i)perylene                         | 2500000          | 40000           | 130 J     | 1900 J              | 1100 J              |
| Benzo(k)fluoranthene                         | 78000            | 1000            | 200 J     | 2400 J*             | 1800 J              |
| bis(2-Ethylhexyl)phthalate                   | 410000           | 11000           | 88000 J*  | 3800 J*             | 1800 J              |
| Carbazole                                    | 290000           | 360             | 320 U     | 160 J               | 49 J                |
| Chrysene                                     | 780000           | 960             | 140 J     | 8400 J*             | 3500 J*             |
| Di-n-octylphthalate                          | 2500000          | 20000           | 2200 J    | 1200 J              | 250 J               |
| Dibenzo(a,h)anthracene                       | 780              | 0.96            | 320 UJ    | 630 J               | 350 J               |
| Dibenzofuran                                 | 2500000          | 5600            | 320 U     | 100 J               | 310 UJ              |
| Fluoranthene                                 | 2500000          | 56000           | 440       | 16000 J*            | 5600 J*             |
| Fluorene                                     | 2500000          | 56000           | 320 U     | 920 J               | 51 J                |
| Indeno(1,2,3-cd)pyrene                       | 7800             | 9.6             | 140 J     | 2100 J              | 1300 J              |
| Naphthalene                                  | 2500000          | 56000           | 320 U     | 45 J                | 310 UJ              |
| Phenanthrene                                 | 2500000          | 40000           | 190 J     | 13000 J*            | 1000 J              |
| Pyrene                                       | 2500000          | 40000           | 1700 J    | 20000 J*            | 6200 J*             |
| <b>Pesticide/PCB Analysis (UG/KG)</b>        |                  |                 |           |                     |                     |
| 4,4'-DDD                                     | 24000            | 29              | 11        | 3.2 U               | 3.1 U               |
| 4,4'-DDE                                     | 17000            | 21              | 23        | 3.2 U               | 3.1 U               |
| 4,4'-DDT                                     | 17000            | 21              | 6.1       | 4.1 J               | 11 J                |
| alpha-Chlordane                              | 2200             | 66              | 2.0       | 1.7 U               | 1.6 U               |
| Aroclor-1254                                 | 10000            |                 | 1100      | 32 U                | 31 U                |
| Endosulfan Sulfate                           | 1200000          | 8400            | 11        | 3.2 U               | 3.1 U               |
| Endrin Aldehyde                              | 610000           |                 | 18        | 3.2 U               | 3.1 U               |
| Endrin Ketone                                | 610000           |                 | 3.2 U     | 3.2 UJ              | 12 J                |
| gamma-Chlordane                              | 2200             | 66              | 10        | 1.7 U               | 1.6 U               |
| Methoxychlor                                 | 10000000         | 8000            | 17 U      | 17 U                | 20                  |

Black Background - Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;  
\* - From dilution analysis; R - Rejected; NA - Not Analyzed

TABLE 4-5 (cont.)  
OHM DETECTED IN SEDIMENT SAMPLES  
BROWNFIELDS TARGETED SITE ASSESSMENT  
FORMER PORTLAND CHEMICAL WORKS SITE  
MIDDLETOWN, CONNECTICUT  
PAGE 2 OF 2

| Sample Number                                       |                  |                 | PC-SD-01  | PC-SD-02            | PC-SD-DUP-01        |
|-----------------------------------------------------|------------------|-----------------|-----------|---------------------|---------------------|
| Sample Location                                     |                  |                 | SD-01     | SD-02               | SD-02               |
| Date Sampled                                        |                  |                 | 4/19/2002 | 4/19/2002           | 4/19/2002           |
| QC Identifier                                       | CTDEP<br>I/C DEC | CTDEP<br>GB PMC | None      | Field Dup. PC-SD-02 | Field Dup. PC-SD-02 |
| <b>TAL Metal Analysis (MG/KG)</b>                   |                  |                 |           |                     |                     |
| Aluminum                                            |                  |                 | 4830      | 7530                | 6440                |
| Arsenic                                             | 10               |                 | 3.4       | 3.7                 | 6.8                 |
| Barium                                              | 140000           |                 | 60.9      | 81.8                | 102                 |
| Beryllium                                           | 2                |                 | 0.30      | 0.41                | 0.40                |
| Cadmium                                             | 1000             |                 | 1.3       | J                   | 0.14                |
| Calcium                                             |                  |                 | 1170      | 3150                | 4570                |
| Chromium                                            | 100              |                 | 47.3      | J                   | 56.2                |
| Cobalt                                              | 2500             |                 | 5.6       | J                   | 8.5                 |
| Copper                                              | 76000            |                 | 39.1      | J                   | 32.9                |
| Iron                                                |                  |                 | 15200     | 17900               | 21500               |
| Lead                                                | 1000             |                 | 23.9      | 12.6                | 20.4                |
| Magnesium                                           |                  |                 | 2360      | 3660                | 3760                |
| Manganese                                           | 47000            |                 | 589       | J                   | 2430                |
| Mercury                                             | 610              |                 | 0.26      | 0.059               | 0.060               |
| Nickel                                              | 7500             |                 | 24.8      | 18.5                | 26.0                |
| Potassium                                           |                  |                 | 432       | 821                 | 744                 |
| Selenium                                            | 10000            |                 | 1.6       | J                   | 2.3                 |
| Vanadium                                            | 14000            |                 | 22.6      | 31.1                | 34.6                |
| Zinc                                                | 610000           |                 | 109       | 61.7                | 96.3                |
| <b>Total Petroleum Hydrocarbon Analysis (MG/KG)</b> |                  |                 |           |                     |                     |
| Extractable TPH                                     | 2500             | 2500            | 580       | 90                  | 170                 |

Black Background - Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;  
\* - From dilution analysis; R - Rejected; NA - Not Analyzed

#### 4.7 Surface Water Analytical Results

This section summarizes OHM compounds detected in surface water samples. Elevated concentrations of VOCs, bis(2-ethylhexyl)phthalate, metals, and ETPH were detected in surface water samples collected from the unnamed stream at the Site. A summary of OHM compounds detected in surface water samples collected during the BTSA investigation is contained in Table 4-6. No OHM compounds detected in the two surface water samples exceeded CTDEP SWPC.

**TABLE 4-6**  
**OHM DETECTED IN SURFACE WATER SAMPLES**  
**BROWNFIELDS TARGETED SITE ASSESSMENT**  
**FORMER PORTLAND CHEMICAL WORKS SITE**  
**MIDDLETOWN, CONNECTICUT**

| Sample Number                                      |           | PC-SW-01  | PC-SW-02            | PC-SW-DUP-01        |
|----------------------------------------------------|-----------|-----------|---------------------|---------------------|
| Sample Location                                    |           | SW-01     | SW-02               | SW-02               |
| Date Sampled                                       |           | 4/19/2002 | 4/19/2002           | 4/19/2002           |
| QC Identifier                                      | CTDEP SWP | None      | Field Dup. PC-SW-02 | Field Dup. PC-SW-02 |
| <b>Volatile Organic Analysis (UG/L)</b>            |           |           |                     |                     |
| 1,1,1-Trichloroethane                              | 62000     | 10 U      | 2 J                 | 2 J                 |
| 1,1-Dichloroethane                                 |           | 10 U      | 2 J                 | 2 J                 |
| Carbon Tetrachloride                               | 132       | 10 U      | 0.7 J               | 0.7 J               |
| cis-1,2-Dichloroethene                             |           | 4 J       | 35                  | 35                  |
| Methyl tert-Butyl Ether                            |           | 10 U      | 1 J                 | 1 J                 |
| Tetrachloroethene                                  | 88        | 0.8 J     | 7 J                 | 7 J                 |
| Trichloroethene                                    | 2340      | 0.5 J     | 3 J                 | 3 J                 |
| Vinyl Chloride                                     | 15750     | 10 U      | 2 J                 | 2 J                 |
| <b>Semivolatile Organic Analysis (UG/L)</b>        |           |           |                     |                     |
| bis(2-Ethylhexyl)phthalate                         | 59        | 17        | 10 U                | 10 U                |
| <b>TAL Metal Analysis (UG/L)</b>                   |           |           |                     |                     |
| Barium                                             |           | 120       | 102                 | 107                 |
| Calcium                                            |           | 71100     | 64200               | 64400               |
| Copper                                             | 48        | 4.1 U     | 7.4 J               | 19.7                |
| Iron                                               |           | 2530      | 4640                | 5290                |
| Lead                                               | 13        | 4.3       | 6.8                 | 8.7                 |
| Magnesium                                          |           | 15700     | 15800               | 15800               |
| Manganese                                          |           | 4440      | 2080                | 2120                |
| Potassium                                          |           | 2560      | 2730                | 2770                |
| Sodium                                             |           | 28800     | 37600               | 37500               |
| <b>Total Petroleum Hydrocarbon Analysis (MG/L)</b> |           |           |                     |                     |
| Extractable TPH                                    |           | 0.27      | 0.50                | 0.45                |

Black Background - Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;  
 \* - From dilution analysis; R - Rejected; NA - Not Analyzed

This section summarizes the conclusions reached during evaluation of field and laboratory analytical data obtained during the BTSA investigation.

Recommendations for further action to address the OHM contamination detected at the Site are presented in Section 6.0. Estimated order-of-magnitude costs associated with implementing these recommendations are presented in Section 7.0.

### 5.1 Site Geology and Hydrogeology

Inspection of soil samples collected from soil borings advanced during TtNUS's BTSA investigation indicate that surficial deposits underlying the Site consist of alluvium underlain by lacustrine deposits. The alluvial deposits are composed of fine to coarse sand with varying amounts of gravel and extend from approximately 0 to 1 feet bgs. The lacustrine deposits consist of medium-red clay with a trace of gravel and extend from approximately 1-foot bgs to greater than 16 feet bgs. Bedrock was not encountered during the BTSA investigation.

Groundwater depth measured at the Site during the BTSA investigation indicates that the water table ranges from approximately 3 to 10 feet bgs. Inferred groundwater flow is to the south-southeast.

### 5.2 Soil and Groundwater Contamination

This section discusses OHM compounds detected in the Site's soil and groundwater.

#### 5.2.1 Soil

Concentrations of barium, beryllium, chromium, lead, nickel, and vanadium detected in subsurface soil samples indicate that concentrations of leachable metals may exceed the CTDEP GB PMC. PMC for metals is based on SPLP. Because SPLP was not performed as part of this BTSA, the PMC for metals were multiplied by 20, and the subsurface soil sample results were compared to the modified standard as a screening of OHM compounds that may exceed the PMC.

Benzo(a)pyrene was detected in surficial soil samples SS1 and SS2 at concentrations exceeding the CTDEP I/C DEC.

The PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were detected in surficial soil samples SS1 and SS2 at concentrations exceeding the CTDEP GB PMC. Concentrations of total lead and vanadium detected in these samples indicate that leachable forms of these metals may exceed the CTDEP PMC.

The pesticide 4,4'-DDT was detected in surficial sample SS2 at a concentration exceeding the CTDEP GB PMC.

#### **5.2.2 Groundwater**

Vinyl chloride was detected in samples collected from monitoring wells MW1 and MW5 at concentrations exceeding the CTDEP I/C VC.

### **5.3 Sediment and Surface Water Contamination**

This section discusses contaminants detected in the Site's sediment and surface water.

#### **5.3.1 Sediment**

Benzo(a)anthracene and benzo(a)pyrene were detected in sediment sample SD02 at concentrations exceeding the CTDEP I/C DEC.

The SVOC compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, bis(2-ethylhexyl)phthalate and indeno(1,2,3-cd)pyrene and the pesticide 4,4'-DDE were detected in sediment samples SD01 and SD02 at concentrations exceeding the CTDEP GB PMC.



### 5.3.2 Surface Water

OHM detected in the two surface water samples SW01 and SW02 did not exceed the CTDEP SWPC.

## 5.4 Evaluation of Exposure Risks

The risk to human and environmental receptors resulting from exposure to soil, groundwater, sediment, and surface water contamination detected at the Site was based on comparison of detected contaminant concentrations to applicable RSR criteria promulgated by CTDEP and evaluation of existing site characteristics.

Thirty to forty buried objects suspected to be drums of unknown type, content, and capacity are estimated to be present in the northwestern portion of the Site near the chainlink fence that separates Parcels A and B. These suspected drums are buried at depths between one and four feet bgs. These drums may contain hazardous waste and represent a potential threat to human health and the environment and will require removal before any further action is taken at the Site.

Measures should be taken during drum removal to limit worker exposure to contaminated accessible soil. These measures could include, but are not limited to, minimizing soil disturbance, requiring 40-hour hazardous waste site worker training (under 29 CFR 1910.120), and use of personal protective equipment for all site workers exposed to contaminated soil.

SVOC concentrations detected in sediment samples and surficial soil samples collected from the stockpiles on the site exceeded CTDEP I/C DEC and may pose a threat to human receptors.

SVOC concentrations detected in sediment samples and pesticides detected in sediment and surficial soil samples collected from the northeastern debris area and metal concentrations detected in subsurface soil samples exceeded CTDEP PMC and may pose a threat to groundwater and environmental receptors.

Vinyl chloride was detected in groundwater samples at concentrations exceeding I/C VC, therefore indoor air impacts to future buildings at the site may be an issue.



## 6.0 RECOMMENDATIONS

This BTSA should be considered a site screening investigation, as the limited scope of the subsurface investigation does not allow a complete determination of the horizontal and vertical extent of contamination at the Site. Changes to the recommendations presented in this section may be required if additional information on the nature and extent of contamination on the Site becomes available. Estimated costs associated with implementing these recommendations are presented in Table 7-1.

### 6.1 Buried Drum Removal

Before any further investigation is conducted on the Site, the buried drums identified near the western fence line must be removed and disposed of properly. This will require removal of the fence, and then excavation, removal, overpacking, transportation, and disposal of the drums by an environmental remediation contractor. Plastic-lined fiberboard drums may be present, therefore extra care should be taken not to puncture the drums during removal. Each drum must be sampled prior to transportation from the site to identify and characterize the contents for transportation and disposal purposes. The appropriate means of drum content disposal will be based on the waste characterization analysis.

Subsequent to drum removal, confirmatory soil samples should be collected to determine whether residual soil contamination is present in the drum disposal area. Contaminated soil generated during the removal of buried drums should be excavated and transported from the Site for disposal. TtNUS estimates approximately 150 yd<sup>3</sup> (225 tons) of contaminated soil will be generated from excavation activities associated with drum removal.

### 6.2 Additional Investigations

Additional soil, groundwater, and sediment investigations are recommended at the Site to further evaluate the source and extent of OHM detected during the BTSA investigation.

Recommended soil, groundwater, and sediment investigations include:

- Advance at least 4 soil borings in the vicinity of monitoring well MW1 (one upgradient, one downgradient, and two cross gradient);
- At each boring, collect soil samples at two-foot intervals from the ground surface to the water table and submit the samples for analysis of VOCs, SVOCs and SPLP and total metals;
- Install groundwater monitoring wells in each of the four borings. Collect groundwater samples from the four monitoring wells and MW1 once per quarter for a period of one year. Analyze samples for VOCs;
- Collect two additional sediment samples from the unnamed stream, one near the storm drain system outfall pipe and one near the railroad track to further characterize SVOC and pesticide contamination in sediment. Analyze all sediment samples for SVOCs, pesticides/PCBs, and metals.

### **6.3            Debris Stockpile Removal**

In addition to removal of contaminated soil generated during the excavation of the buried drums, TtNUS recommends removal of the debris stockpiles located on the northeast portion of the Site.

Collect soil samples from the soil stockpile waste characterization analysis at the rate of one sample every 500 cubic yards. These samples should be submitted for laboratory analysis for VOCs, SVOCs, metals, corrosivity, and pH.

Contaminated soil should be excavated and transported from the Site for disposal. TtNUS estimates the existing soil stockpiles contain approximately 2,000 cubic yards (3,000 tons) of soil. Subsequent to soil removal, confirmatory soil samples should be collected to determine whether residual soil contamination remains in the stockpile area.

## 7.0

### PRELIMINARY COST ESTIMATES

Preliminary order-of-magnitude cost estimates have been developed to implement the recommended remedial measures. These estimates are intended for use in making decisions regarding additional actions to take at the Site to evaluate and remediate environmental contamination. Both the recommendations and associated cost estimates may change if additional information on the nature and extent of contamination at the Site becomes available. In addition, these estimates should not be interpreted as accurate costs for procuring consulting or remedial services.

Approximate costs for implementation of recommended remedial measures are as follows:

- |                                                   |           |
|---------------------------------------------------|-----------|
| • Drum Removal Action                             | \$191,100 |
| • Additional Investigation                        | \$45,200  |
| • Soil Stockpile Removal (3,000 tons at \$65/ton) | \$311,600 |

|             |           |
|-------------|-----------|
| Total Cost: | \$547,900 |
|-------------|-----------|

Table 7-1 contains a preliminary cost breakdown for implementation of the recommended measures.

**TABLE 7-1**  
**PRELIMINARY COST ESTIMATES FOR RECOMMENDED MEASURES**  
**BROWNFIELDS TARGETED SITE ASSESSMENT**  
**FORMER PORTLAND CHEMICAL WORKS SITE**  
**MIDDLETOWN, CONNECTICUT**

**Drum Removal Action:**

| ITEM                           | QTY | UNIT | UNIT COST | TOTAL COST |
|--------------------------------|-----|------|-----------|------------|
| 1. Mobilization/Demobilization | 16  | HR   | \$85      | \$1,360    |
| 2. Field Labor                 |     |      |           |            |
| a. Operator and Excavator      | 30  | DAY  | \$840     | \$25,200   |
| b. Foreman                     | 30  | DAY  | \$336     | \$10,080   |
| c. Technician (3)              | 30  | DAY  | \$320     | \$28,800   |
| d. Engineer/Geologist oversite | 30  | DAY  | \$600     | \$54,000   |
| 3. Sampling Equipment Rental   |     |      |           |            |
| a. Photoionization Detector    | 30  | DAY  | \$100     | \$3,000    |
| 4. Analytical Cost             |     |      |           |            |
| a. Drum Liquid/VOC             | 40  | EA   | \$200     | \$8,000    |
| b. Drum Liquid/SVOC            | 40  | EA   | \$200     | \$8,000    |
| c. Drum Liquid/Metals          | 40  | EA   | \$150     | \$6,000    |
| d. Drum Liquid/Corrosivity     | 40  | EA   | \$50      | \$2,000    |
| e. Drum Liquid/pH              | 40  | EA   | \$30      | \$1,200    |
| 5. Overpacking                 |     |      |           |            |
| a. Overpacks                   | 40  | EA   | \$185     | \$7,400    |
| b. Level B PPE                 | 30  | DAY  | \$200     | \$6,000    |
| 6. Transportation and Disposal |     |      |           |            |
| a. Chlorinated liquid drum     | 20  | EA   | \$395     | \$7,900    |
| b. Corrosive liquid drum       | 20  | EA   | \$225     | \$4,500    |
| 7. Soil Removal                |     |      |           |            |
| a. Removal of 150 CY           | 225 | TON  | \$65      | \$14,625   |
| 8. Report Sampling Results     | 40  | HR   | \$75      | \$3,000    |

**TOTAL ESTIMATED COST**

**\$191,065**

**Soil Stockpile Removal Action:**

| ITEM                           | QTY  | UNIT | UNIT COST | TOTAL COST |
|--------------------------------|------|------|-----------|------------|
| 1. Mobilization/Demobilization | 16   | HR   | \$85      | \$1,360    |
| 2. Field Labor                 |      |      |           |            |
| a. Operator and Excavator      | 25   | DAY  | \$840     | \$21,000   |
| b. Foreman                     | 25   | DAY  | \$336     | \$8,400    |
| c. Technician (3)              | 25   | DAY  | \$320     | \$24,000   |
| d. Engineer/Geologist oversite | 25   | DAY  | \$600     | \$45,000   |
| b. Level B PPE                 | 25   | DAY  | \$200     | \$5,000    |
| 3. Sampling Equipment Rental   |      |      |           |            |
| a. Photoionization Detector    | 25   | DAY  | \$100     | \$2,500    |
| 4. Analytical Cost             |      |      |           |            |
| a. Soil/VOC                    | 10   | EA   | \$200     | \$2,000    |
| b. Soil/SVOC                   | 10   | EA   | \$200     | \$2,000    |
| c. Soil/Metals                 | 10   | EA   | \$150     | \$1,500    |
| d. Soil/Corrosivity            | 10   | EA   | \$50      | \$500      |
| e. Soil/pH                     | 10   | EA   | \$30      | \$300      |
| 5. Transportation and Disposal |      |      |           |            |
| a. Removal of 150 CY           | 3000 | TON  | \$65      | \$195,000  |
| 8. Report Sampling Results     | 40   | HR   | \$75      | \$3,000    |

**TOTAL ESTIMATED COST**

**\$311,560**

TABLE 7-1 (cont.)  
 PRELIMINARY COST ESTIMATES FOR RECOMMENDED MEASURES  
 BROWNFIELDS TARGETED SITE ASSESSMENT  
 FORMER PORTLAND CHEMICAL WORKS SITE  
 MIDDLETOWN, CONNECTICUT  
 PAGE 2 OF 2

Additional Soil and Groundwater Sample Collection/Method 3 Risk Assessment

| ITEM                          | QTY | UNIT | UNIT COST | TOTAL COST |
|-------------------------------|-----|------|-----------|------------|
| 1. Prepare Sample Plan        | 60  | HR   | \$75      | \$4,500    |
| 2. Field Labor                | 120 | HR   | \$75      | \$9,000    |
| 3. Hollow Stem Auger Drilling |     |      |           |            |
| a. Mob/Demob                  | 1   | LS   | \$2,000   | \$2,000    |
| b. HSA Drilling               | 50  | LF   | \$20      | \$1,000    |
| c. Sample Collection          | 16  | EA   | \$40      | \$640      |
| d. Well Construction          | 30  | LF   | \$10      | \$300      |
| e. Well Caps                  | 2   | EA   | \$75      | \$150      |
| f. Well Development           | 2   | EA   | \$25      | \$50       |
| g. Boring Abandonment         | 20  | LF   | \$5       | \$100      |
| 4. Sampling Equipment Rental  |     |      |           |            |
| a. Photoionization Detector   | 1   | WK   | \$400     | \$400      |
| b. Scale Balance              | 1   | WK   | \$100     | \$100      |
| c. Peristaltic Pump           | 1   | WK   | \$60      | \$60       |
| d. YSI 6820 Multimeter        | 1   | WK   | \$400     | \$400      |
| e. Turbidity Meter            | 1   | WK   | \$50      | \$50       |
| f. Water Level Indicator      | 1   | WK   | \$50      | \$50       |
| g. GPS Unit                   | 1   | WK   | \$600     | \$600      |
| 5. Analytical Cost            |     |      |           |            |
| a. Soil/VOC                   | 16  | EA   | \$200     | \$3,200    |
| b. Soil/SVOC                  | 15  | EA   | \$200     | \$3,000    |
| c. Soil/Metals                | 15  | EA   | \$150     | \$2,250    |
| b. Groundwater/VOC            | 4   | EA   | \$200     | \$800      |
| c. Sediment/SVOC              | 3   | EA   | \$200     | \$600      |
| d. Sediment/Pesticides/PCBs   | 3   | EA   | \$150     | \$450      |
| e. Sediment/Metals            | 3   | EA   | \$150     | \$450      |
| 6. Report Sampling Results    | 80  | HR   | \$75      | \$6,000    |
| 7. Method 3 Risk Assessment   | 120 | HR   | \$75      | \$9,000    |

TOTAL ESTIMATED COST:

\$45,150





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**APPENDIX A**  
**GEOPHYSICAL SURVEY REPORT**



**GEOPHYSICAL SURVEY  
BROWNFIELDS TARGETED  
SITE ASSESSMENT  
FORMER PORTLAND CHEMICAL WORKS  
MIDDLETOWN, CONNECTICUT**

*Prepared for:*

Tetra Tech NUS, Inc.  
55 Jonspin Road  
Wilmington, MA 01887-1062

*Prepared by:*

Hager-Richter Geoscience, Inc.  
8 Industrial Way - D10  
Salem, New Hampshire 03079

File 02G12  
May, 2002

# HAGER-RICHTER GEOSCIENCE, INC.

CONSULTANTS IN GEOLOGY & GEOPHYSICS  
8 INDUSTRIAL WAY-D10  
SALEM, NEW HAMPSHIRE 03079-5820  
TELEPHONE (603) 893-9944  
FAX (603) 893-8313

May 6, 2002  
File 02G12

Mr. John Meyer  
Tetra Tech NUS, Inc.  
55 Jonspin Road  
Wilmington, MA 01887-1062

RE: Geophysical Survey  
Former Portland Chemical Works  
Middletown, Connecticut  
TtNUS Project No. N4128

Dear Mr. Meyer:

In this letter, we report the results of a geophysical survey conducted by Hager-Richter Geoscience, Inc. at a site designated as the Former Portland Chemical Works Site in Middletown, Connecticut for Tetra Tech NUS, Inc. (TtNUS). The scope of the project and area of interest were specified by TtNUS. The geophysical survey is part of a Brownsfield Targeted Site Assessment by TtNUS for the USEPA Region I under EPA Contract No. 68-W6-0045. This report is a revision of a report<sup>1</sup> dated April 10, 2002, and incorporates the results of additional data acquired on April 24, 2002 at the request of TtNUS.

## INTRODUCTION

The Site consists of two separate parcels (Parcel A and Parcel B). The Site was formerly occupied by both Phillips Brothers Chemicals (1962 - 1984) and Portland Chemical Works (1985 - 1992) before being taken by the town of Middletown in 1998. Parcel A is currently occupied by Jukonski Mitsubishi Fuso Truck Sales, and Parcel B is currently undeveloped vegetated land surrounded by a chain link fence. The general location of the Site is shown in Figure 1, and Figure 2 is a "not-to-scale" site sketch that has been modified from a site sketch provided by TtNUS. TtNUS specified the area of interest for the geophysical survey at the Site as the accessible portions of Parcel B. According to information provided by TtNUS, buried metal may be present in the area of interest.

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<sup>1</sup> Hager-Richter Geoscience, Inc. report to TtNUS entitled "Geophysical Survey, Brownsfield Targeted Site Assessment, Former Portland Chemical Works, Middletown, Connecticut", dated April 10, 2002.

Geophysical Survey  
Former Portland Chemical Works  
Middletown, Connecticut  
File 02G12 May, 2002

## OBJECTIVE

The objective of the geophysical survey was to search for areas of possible buried metal in the accessible portions of the specified area of interest, and if detected, to locate each.

## THE SURVEY

James Coffman and Steven Grant of Hager-Richter conducted the field operations on March 19, 2002 and James Coffman conducted the field operations on March 20, and April 24, 2002. The project was coordinated with Mr. John Meyer of TtNUS. Ms. Christine Mackey and Mr. Brandon Smith of TtNUS were present during the field operations and specified the area of interest. TtNUS established a local survey grid in the field prior to the geophysical survey.

The geophysical survey was conducted using two complementary geophysical methods: a time domain electromagnetic induction metal detector (EM61) and ground penetrating radar (GPR). The EM61 data were collected at approximately 8-inch intervals along lines spaced 10 feet apart across the accessible portion of the area of interest. The EM61 line spacing of 10 feet was specified by TtNUS. The EM61 survey detects and outlines areas containing buried metal. However, the EM method cannot provide information on the type of objects causing EM anomalies. In order to aid in the identification of the objects, a GPR survey was also conducted in the accessible areas of *selected* EM anomalies attributed to buried metal, as time permitted. GPR investigation of additional EM anomalies was performed on April 24, 2002 after drilling encountered a possible fiber board drum near the edge of an EM anomaly attributed to surface metal in the original report. GPR traverses were spaced no greater than 5 feet apart, and were oriented parallel and perpendicular to the survey grid.

Portions of the Site could not be surveyed due to obstructions such as piles of rubble, standing water, etc. The geophysical locations are approximate due to severe local changes in topography and surface obstacles that led to inaccuracies with the distance recorded by the EM61 and GPR survey wheels.

## EQUIPMENT

*EM61.* The EM survey was conducted using a Geonics EM61 time domain electromagnetic induction metal detector. The EM61 was designed specifically for detecting buried metal objects such as USTs, drums, and utilities. An air-cored 1-meter square transmitter coil generates a pulsed primary magnetic field in the earth, thereby inducing eddy currents in nearby metal objects. The decay of the eddy current produces a secondary magnetic field that is sensed by two receiver coils,

Geophysical Survey  
Former Portland Chemical Works  
Middletown, Connecticut  
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one coincident with the transmitter and one positioned 40 cm above the main coil. By measuring the secondary magnetic field after the current in the ground has dissipated but before the current in metal objects has dissipated, the instrument responds only to the secondary magnetic field produced by metal objects. Two channels of secondary response are measured in mV and are recorded on a digital data logger. The system is generally operated by pulling the coils as a trailer with an odometer mounted on the axle to trigger the data logger automatically at approximately 8-inch intervals.

*GPR.* The GPR survey was conducted using a Sensors & Software Smart Cart Noggin Plus digital subsurface imaging radar system. The system includes a survey wheel that triggers the recording of the data at fixed intervals, thereby increasing the accuracy of the locations of features detected along the survey lines. The GPR system was used with a 250 MHz antenna and a 60 nsec time window. The GPR traverses were located over anomalies detected with the EM61 that could not be attributed to a surface objects.

## LIMITATIONS OF THE METHODS

*EM61.* The data from an EM61 survey are affected by surface metal debris, and its depth sensitivity is limited to about 15 feet. The instrument is relatively cumbersome, and works best where the 1-meter square transmit and receive coils can be hand pulled in a small trailer.

Detection and identification should be clearly differentiated. Detection is the recognition of the presence of a metal object, and the electromagnetic method is excellent for such purposes. Identification, on the other hand, is determination of the nature of the causative body (i.e., what is the body -- a cache of drums, UST, automobile, white goods, etc.?). Although the EM61 data cannot be used to *identify* all buried metal objects, they provide excellent guides to the identification of some objects. For example, buried metal utilities produce anomalies with lengths many times their widths.

*GPR.* There are limitations of the GPR technique as used to detect and/or locate targets such as those of the objectives of this survey: (1) surface conditions, (2) electrical conductivity of the ground, (3) contrast of the electrical properties of the target and the surrounding soil, and (4) spacing of the traverses. Of these restrictions, only the last is controllable by us.

The condition of the ground surface can affect the quality of the GPR data and the depth of penetration of the GPR signal. Sites covered with snow piles, high grass, bushes, landscape structures, debris, obstacles, soil mounds, etc. limit the survey access and the coupling of the GPR antenna with the ground. In many cases, the GPR signal will not penetrate below concrete pavement,



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especially inside buildings, and a target may not be detectable. The GPR method also commonly does not provide useful data under canopies found at some facilities.

The electrical conductivity of the ground determines the attenuation of the GPR signals, and thereby limits the maximum depth of exploration. For example, the GPR signal does not penetrate clay-rich soils, and targets buried in clay might not be detected.

A definite contrast in the electrical conductivities of the surrounding ground and the target material is required to obtain a reflection of the GPR signal. If the contrast is too small then the reflection may be too weak to recognize, possibly due to deeply corroded metal in the target, the target can be missed.

Spacing of the traverses is limited by access at many sites, but where flexibility of traverse spacing is possible, the spacing is adjusted to the size of the target.

## RESULTS

*General.* The geophysical survey consisted of a time domain electromagnetic induction metal detector (EM61) survey and a GPR survey. Figure 3 is a color contour plot of the EM61 data. Figure 4 shows the locations of the GPR traverses and the integrated interpretation of the EM61 and GPR data for the Site.

*EM61.* Interpretation of EM61 data is based on the *relative* response of the instrument in millivolts to local conditions. The instrument is not calibrated to provide an absolute measure of a particular property, such as the conductivity of the soil or the strength of the earth's magnetic field. Subsurface metal objects produce sharply defined positive anomalies when the EM61 is positioned directly over them. Such anomalies are colored green, yellow and orange on the color plot presented herein. Collecting data at short intervals along closely spaced lines, as was done at the subject site, provides high spatial resolution of the location and footprint of the targets. Thus, buried metal is recognized in contour plots of EM61 data by positive anomalies roughly corresponding to the dimensions of the buried metal.

There are several locations throughout the Site where surface metal, such as scrap piles; fire hydrants, etc. affects the EM response. The presence or absence of subsurface metal objects in such areas cannot be determined on the basis of the EM61 data alone due to anomalies caused by the surface metal objects. The locations of surface metal at the Site and the locations of the associated anomalies attributed to the surface metal are shown on Figure 4.

Geophysical Survey  
Former Portland Chemical Works  
Middletown, Connecticut  
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Several medium amplitude EM anomalies are present in the data for the survey area. Based on the size and amplitude of these anomalies, they are likely due to moderate amounts of scattered metal debris. The locations of such anomalies are shown as blue hatched areas on Figure 4. There are also many areas in which low amplitude EM anomalies are present. Such areas likely contain small amounts of scattered metal debris and are shown on Figure 4 with orange hatching.

*GPR.* GPR was used to investigate further the locations of selected EM61 anomalies detected at the Site. The GPR survey areas were selected on the basis of the EM data, access, and time limitations. The locations of the GPR traverses and our interpretation of the data are shown on Figure 4. Apparent GPR signal penetration was good, with reflections received through about 50 nsec. Based on handbook time-to-depth conversions for the GPR signal in average soils, the GPR signal penetration is estimated to have been about 5 to 7 feet.

GPR reflections typical of large metal objects, such as USTs, were not detected in the GPR records for the areas surveyed at the Site. Numerous scattered unidentified buried objects were detected in the GPR survey areas, and their locations are shown on Figure 4. Approximate depths and positions of the larger objects are provided, at the request of Tetra Tech NUS, in the appendix. Whether any objects occur at depths greater than the effective GPR signal penetration cannot be determined on the basis of the geophysical data.

The GPR survey detected three segments of possible utilities at the Site, all located in the southwestern GPR survey area. The locations of these features are shown in Figure 4. A few flat reflecting surfaces were also identified. Flat reflecting surfaces are typical of subsurface former structures such as a concrete slab or foundation. Such structures are shown as hatched rectangles on Figure 4. No other sizeable objects or utilities were detected in the GPR survey areas.

## CONCLUSIONS

Based on the geophysical survey conducted at the Former Portland Chemical Works Site in Middletown, Connecticut for Tetra Tech NUS, Inc. on March 19-20 and April 24, 2002, we conclude:

- Several areas containing small to moderate amounts of buried metal and other unidentified buried objects were detected.
- A few possible buried structures such as a concrete pad or foundation were detected.
- Three segments of possible subsurface utilities were detected.

Geophysical Survey  
Former Portland Chemical Works  
Middletown, Connecticut  
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## **LIMITATIONS**

This letter report was prepared for the exclusive use of Tetra Tech NUS, Inc. and the USEPA (Client). No other party shall be entitled to rely on this Report or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience, Inc. (H-R) in the performance of its work. The Report relates solely to the specific project for which H-R has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of H-R. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to H-R.

H-R has used reasonable care, skill, competence and judgment in the performance of its services for this project consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by H-R should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, H-R makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.

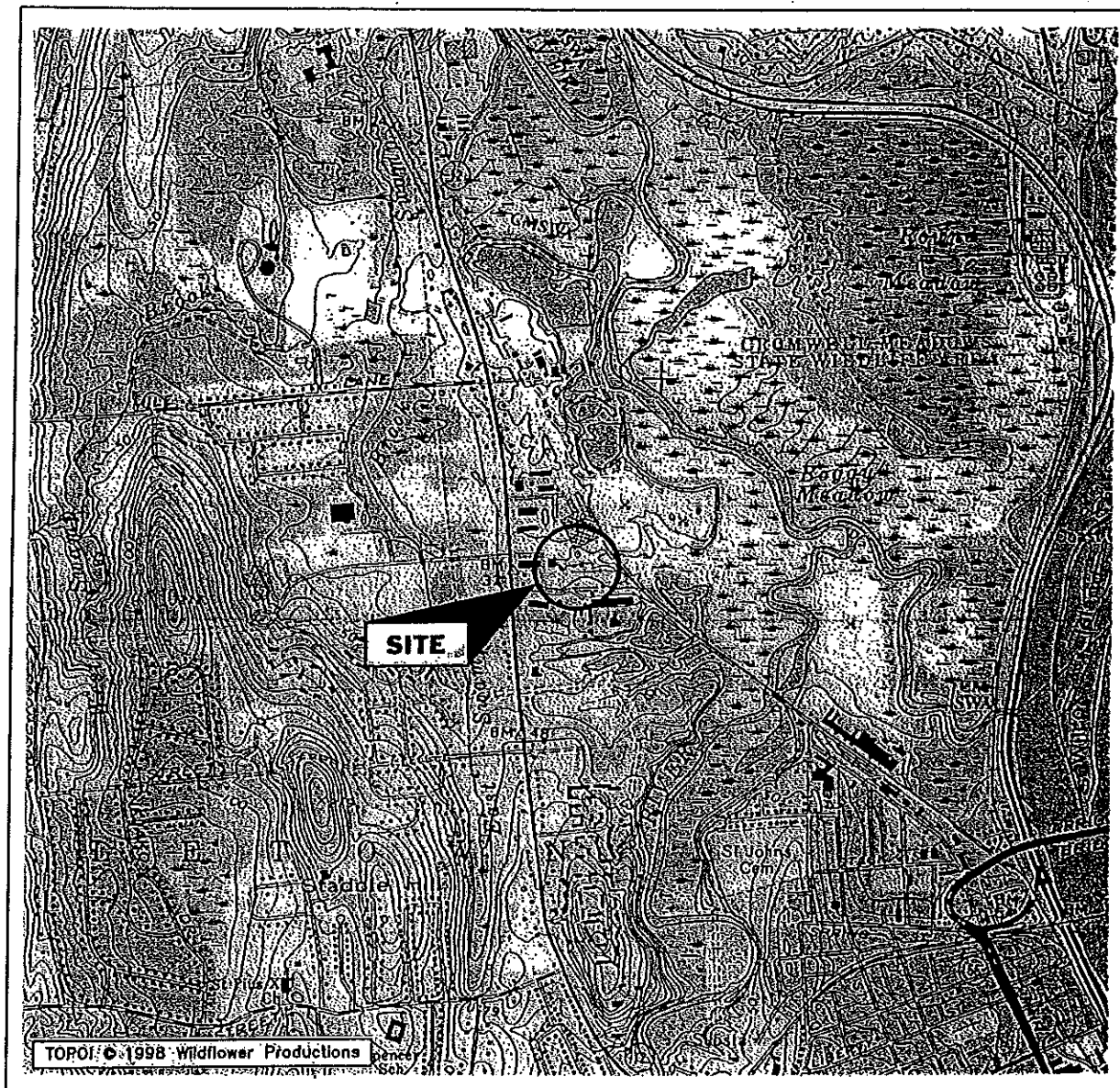
If you have any questions or comments on this letter report, please contact us at your convenience. It has been a pleasure to work with TtNUS on this project. We look forward to working with you again in the future.

Sincerely yours,  
HAGER-RICHTER GEOSCIENCE, INC.



Dorothy Richter  
President

Attachments: Figures 1-4



LOCATION

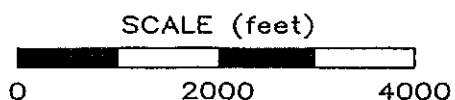
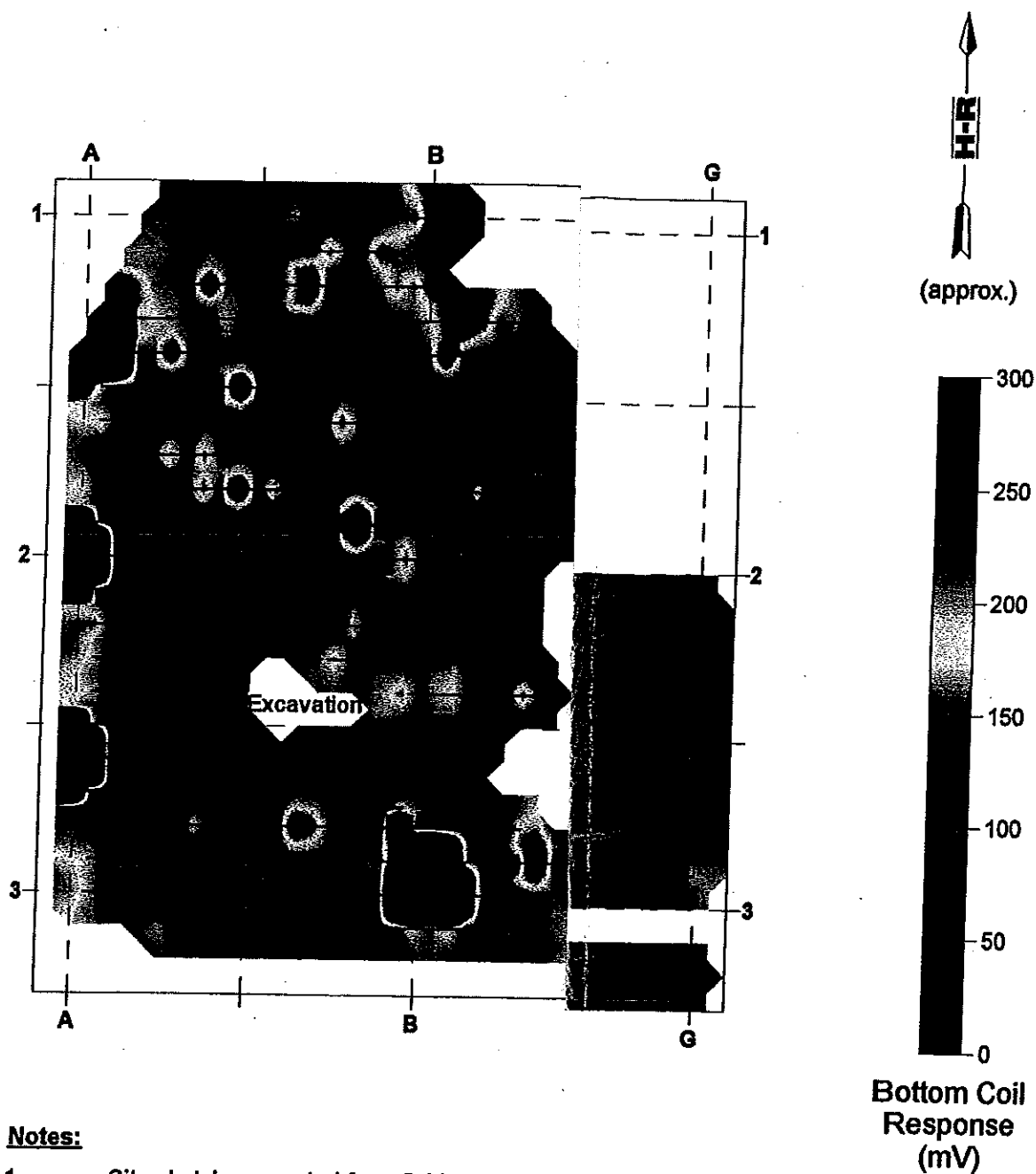


Figure 1  
General Site Location  
Former Portland Chemical Works Site  
Middletown, Connecticut

File 02G12

May, 2002

HAGER-RICHTER GEOSCIENCE, INC.  
Salem, New Hampshire



**Notes:**

1. Site sketch generated from field notes.
2. Data were acquired using Geonics EM61. Bottom coil response shown.
3. Geophysical survey locations tied to grid established and staked by TINUS.
4. Locations are approximate due to local changes in topography and surface obstructions.
5. Surface objects are not drawn to scale and located at the center of the symbol.

**Figure 3**  
**EM61 Survey**  
**Former Portland Chemical Works**  
**Middletown, Connecticut**

**FILE 02G12**

**MAY, 2002**

**HAGER-RICHTER GEOSCIENCE, INC.**  
**Salem, New Hampshire**

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**APPENDIX B**  
**FIELD FORMS**





Geophysical Survey  
Former Portland Chemical Works  
Middletown, Connecticut  
File 02G12 May, 2002

**APPENDIX  
LOCATIONS AND DEPTHS  
OF MODERATE-SIZE UNIDENTIFIED  
BURIED OBJECTS**

| Object<br>Coordinate<br>(ft) | Estimated<br>Depth<br>(ft) | Object<br>Coordinate<br>(ft) | Estimated<br>Depth<br>(ft) | Object<br>Coordinate<br>(ft) | Estimated<br>Depth<br>(ft) |
|------------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
| 130S, 180E                   | 2.0                        | 195S, 97.5E                  | 1.5                        | 200S, 115E                   | 1.0                        |
| 205S, 105E                   | 1.5                        | 205S, 110E                   | 1.5                        | 205S, 112E                   | 1.5                        |
| 210S, 94E                    | 1.5                        | 210S, 100E                   | 1.0                        | 210S, 111E                   | 1.0                        |
| 210S, 115E                   | 1.5                        | 207.5S, 105E                 | 3.0                        | 215S, 113E                   | 1.0                        |
| 215S, 114E                   | 1.75                       | 30S, 215E                    | 4.0                        | 173S, 10E                    | 1.5                        |
| 170S, 10E                    | 2.0                        | 170S, 12.5E                  | 2.0                        | 169S, 5E                     | 0.5                        |
| 165S, 7.5E                   | 2.0                        | 165S, 11E                    | 2.0                        | 150S, 7.5E                   | 2.0                        |
| 150S, 10E                    | 2.0                        | 147.5S, 9E                   | 3.0                        | 143S, 10E                    | 2.0                        |
| 132S, 7.5E                   | 3.0                        | 131S, 10E                    | 2.0                        | 131S, 12.5E                  | 2.0                        |
| 128S, 5E                     | 3.5                        | 110S, 9E                     | 2.0                        | 105S, 3E                     | 1.0                        |
| 105S, 5E                     | 3.0                        | 103S, 7.5E                   | 2.0                        | 100S, 8E                     | 2.0                        |
| 95S, 10E                     | 1.0                        | 88S, 7.5E                    | 1.0                        | 88S, 10E                     | 2.0                        |
| 86S, 5E                      | 2.0                        | 79S, 5E                      | 2.0                        | 56S, 10E                     | 2.0                        |
| 55S, 5E                      | 2.0                        | 55S, 12.5E                   | 2.0                        | 50S, 10E                     | 2.0                        |
| 49S, 7.5E                    | 2.0                        | 48S, 5E                      | 2.0                        | 41S, 7.5E                    | 2.0                        |
| 39S, 10E                     | 1.5                        | 35S, 12.5E                   | 1.0                        | 83S, 37.5E                   | 3.0                        |
| 80S, 43E                     | 2.0                        | 73S, 45E                     | 4.0                        | 72.5S, 36E                   | 2.0                        |
| 72.5S, 28E                   | 2.0                        | 72.5S, 26E                   | 2.0                        | 67.5S, 28E                   | 3.0                        |
| 67S, 37.5E                   | 2.0                        | 47.5S, 32.5E                 | 2.0                        | 20S, 47.5E                   | 1.0                        |
| 145S, 92.5E                  | 1.0                        | 30S, 187E                    | 1.0                        | 25S, 186E                    | 2.0                        |
| 22.5S, 208E                  | 1.0                        | 20S, 158E                    | 1.0                        | 5S, 175E                     | 1.0                        |

Note: The origin for coordinates identified in the appendix is shown in Figure 4.

Geophysical Survey  
Former Portland Chemical Works  
Middletown, Connecticut  
File 02G12 May, 2002

| Object<br>Coordinate<br>(ft) | Estimated<br>Depth<br>(ft) | Object<br>Coordinate<br>(ft) | Estimated<br>Depth<br>(ft) | Object<br>Coordinate<br>(ft) | Estimated<br>Depth<br>(ft) |
|------------------------------|----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
| 2.5S, 182.5E                 | 1.0                        | 0S, 208E                     | 2.0                        | 2.5S, 230E                   | 3.0                        |
| 2.5S, 236E                   | 2.0                        | 5S, 236E                     | 1.0                        | 6.5S, 267.5                  | 1.5                        |
| 12.5S, 255E                  | 1.0                        | 15S, 266E                    | 3.0                        | 28S, 282.5E                  | 3.0                        |
| 22.5S, 280E                  | 3.0                        | 3.5S, 290E                   | 2.0                        |                              |                            |

Note: The origin for coordinates identified in the appendix is shown in Figure 4.



TETRA TECH NUS INC.

## FIELD MODIFICATION RECORD

Site Name: Portland Chemical Works

Location: Middletown, CT

Project Number: 4128-2640

Task Assignment: \_\_\_\_\_

To: \_\_\_\_\_

Location: \_\_\_\_\_

Date: 4/19/02

Description: No rinsate blank was taken for surface water samples from the unharmed stream

Reason for Change: No equipment was used to sample surface water, the bottles were directly filled, therefore no rinsate blank was necessary

Recommended Action: None

Field Operations Leader (Signature): Bruce Smith

Date: 4/19/02

Disposition/Action: \_\_\_\_\_

Project Manager (Signature): John H. Meyer

Date: 4/26/02

Distribution: Program Manager: \_\_\_\_\_

Project Manager: \_\_\_\_\_

Quality Assurance Officer: \_\_\_\_\_

Field Operations Leader: \_\_\_\_\_

Project File: \_\_\_\_\_

Others as Required: \_\_\_\_\_



TETRA TECH NUS INC.

## FIELD MODIFICATION RECORD

Site Name: Portland Chemical Works Location: Middletown, CT  
Project Number: 4128-2640 Task Assignment: \_\_\_\_\_  
To: \_\_\_\_\_ Location: \_\_\_\_\_ Date: 4/22/02

Description: Only 3 borings were advanced instead of the 5  
proposed at the site.

Reason for Change: It was believed that a drum was hit while advancing  
SB1, therefore J. Meyer advised to end drilling program because  
of the potential of encountering additional buried drums.

Recommended Action: Huger - Richter was contacted to complete a more  
comprehensive GPR survey than previously done. Drilling  
activities may continue at a later time.

Field Operations Leader (Signature): [Signature] Date: 4/22/02

Disposition/Action:

Project Manager (Signature): [Signature] Date: 4/26/02

|               |                            |       |                     |       |
|---------------|----------------------------|-------|---------------------|-------|
| Distribution: | Program Manager:           | _____ | Others as Required: | _____ |
|               | Project Manager:           | _____ |                     | _____ |
|               | Quality Assurance Officer: | _____ |                     | _____ |
|               | Field Operations Leader:   | _____ |                     | _____ |
|               | Project File:              | _____ |                     | _____ |



TETRA TECH NUS INC.

## FIELD MODIFICATION RECORD

Site Name: Portland Chemical Works Location: Middletown, CT  
Project Number: 4128-2640 Task Assignment: \_\_\_\_\_  
To: \_\_\_\_\_ Location: \_\_\_\_\_ Date: 4/24/02

Description: R128 was not sampled for groundwater, and no existing monitoring wells were sampled. 3 groundwater samples were collected instead of 4.

Reason for Change: R128 was missing, all existing monitoring wells were inaccessible or destroyed with the exception of R1210, which is in very close proximity to MW3 and MW5.

Recommended Action: J. Meyer advised to only sample new T+NUS monitoring wells.

Field Operations Leader (Signature): [Signature] Date: 4/24/02

Disposition/Action:

Project Manager (Signature): [Signature] Date: 4/26/02

|               |                            |       |                     |       |
|---------------|----------------------------|-------|---------------------|-------|
| Distribution: | Program Manager:           | _____ | Others as Required: | _____ |
|               | Project Manager:           | _____ |                     | _____ |
|               | Quality Assurance Officer: | _____ |                     | _____ |
|               | Field Operations Leader:   | _____ |                     | _____ |
|               | Project File:              | _____ |                     | _____ |

Parkland (Lin. rec)

# Drilling Services Pay Sheet

Date: 4/22/08

| Item No. | Description                                                                             | Quantity<br>Borehole # |    |    |  | Units       | Total Amount           |
|----------|-----------------------------------------------------------------------------------------|------------------------|----|----|--|-------------|------------------------|
|          |                                                                                         | 16                     | 15 | 19 |  |             |                        |
| 1.       | Mobilization/Demobilization<br>(Includes Site Orientation Mtg.,<br>decontamination pad) | 1                      |    |    |  | (1 only)    | 1                      |
| 2.       | 55 gallon, DOT 17, steel drums                                                          | 7                      |    |    |  | each        | 7                      |
| 3.       | HSA                                                                                     |                        |    |    |  |             |                        |
| 3a       | DPT drilling                                                                            | 16                     | 15 | 19 |  | linear feet | 50                     |
| 3b       | DPT soil samples                                                                        |                        |    |    |  | each        |                        |
| 3c       | DPT groundwater samples                                                                 |                        |    |    |  | each        |                        |
| 4.       | MW                                                                                      |                        |    |    |  |             |                        |
| 4a       | SDD well and riser installation                                                         | 16                     | 15 | 19 |  | linear feet | 50 + 6 hand setup = 56 |
| 4b       | SDD well screen and<br>sediment trap                                                    | 1                      | 1  | 1  |  | each        | 3                      |
| 4c       | SDD expandable well caps                                                                | 1                      | 1  | 1  |  | each        | 3                      |
| 4d       | SDD well points (expendable)                                                            | 1                      | 1  | 1  |  | each        | 3                      |
| 5.       | Flush mount for SDD wells<br>sl. pump                                                   | 1                      | 1  | 1  |  | each        | 3                      |
| 6.       | Boring abandonment                                                                      |                        |    |    |  | linear feet |                        |
| 7.       | IDW drum handling and<br>transport to on-site storage                                   |                        |    |    |  | linear feet |                        |
| 8.       | Utility/"Dig Safe" Clearances,<br>Permits, and bonds                                    |                        |    | 1  |  | lump sum    | 1                      |
| 9.       | OTHER -<br>Steam Cleaner and Decon<br>Generator<br>Jackhammer                           |                        | 2  |    |  | per day     | 2 day<br>1             |
|          |                                                                                         |                        | 1  |    |  | per week    |                        |
|          |                                                                                         |                        | 8  |    |  | per week    |                        |

Tetra Tech NUS representative:

Signature [Signature]

Date 4/22/08

Drilling representative:

Signature \_\_\_\_\_

Date \_\_\_\_\_



TETRA TECH NUS, INC.

## SAMPLE LOG SHEET - SOLID PHASE

Site Name: Portland Cement WorksSample ID: PC-SO-SB1-0058Tetra Tech, NUS Job No./PMS 4128-2640QC Information: NA (if applicable)Sample Method: HSADepth Sampled: 6-8 feetSample Date & Time: 4/22/02 1533 hours Dup NA hoursSampler(s): P. Smith, C. M. SmithData Recorded By: B. Smith SignaturePID/OVA Monitor Reading: NA ppmTYPE OF SAMPLE: (Check all that apply)  
☒ Soil ☐ Trip Blank\*  
☐ Sediment ☐ Rinsate Blank\*  
☐ Lagoon/Pond ☐ Field Duplicate collected  
☒ Grab ☐ Other (Specify):Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) Clay - Spc. bearingSAMPLE DATA/REMARKS: PID malfunctioning due to water

| ANALYSIS       | BOTTLE LOT NO. |
|----------------|----------------|
| <u>vd</u>      |                |
| <u>qlsd-8</u>  |                |
| <u>lepy</u>    |                |
| <u>swp/ptd</u> |                |
| <u>mg h-14</u> |                |
|                |                |
|                |                |
|                |                |
|                |                |

NOTES/SKETCH:

# SAMPLE LOG SHEET - SOLID PHASE

Site Name: PC - Portland Cement works  
Sample ID: PC-SO-SBZ - 0810

Tetra Tech, NUS Job No./PMS 4128-2640  
QC Information: DUP (if applicable)

Sample Method: WST  
Depth Sampled: 8-10 feet  
Sample Date & Time: 9/22/02 0947 hours  
Sampler(s): B. S. m. C. m. L. 4 Dup 22 hours

Data Recorded By: B. S. Signature \_\_\_\_\_

PID/OVA Monitor Reading: 6.12 ppm

|                                          |                                                               |
|------------------------------------------|---------------------------------------------------------------|
| TYPE OF SAMPLE:                          | (Check all that apply)                                        |
| <input checked="" type="checkbox"/> Soil | <input type="checkbox"/> Trip Blank *                         |
| <input type="checkbox"/> Sediment        | <input type="checkbox"/> Rinsate Blank *                      |
| <input type="checkbox"/> Lagoon/Pond     | <input checked="" type="checkbox"/> Field Duplicate collected |
| <input checked="" type="checkbox"/> Grab | <input type="checkbox"/> Other (Specify):                     |

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet,  
Etc.) Clay - soft boggy

SAMPLE DATA/REMARKS: PID misfiring due to rain

[illegible]





TETRA TECH NUS, INC.

## SAMPLE LOG SHEET - SOLID PHASE

Site Name:

Powdered Aluminum Oxide

Sample ID:

PL-50-DUP-01

Tetra Tech, NUS Job No./PMS

4/28-2640

QC Information:

DUP (if applicable)

Sample Method:

USA

Depth Sampled:

8-10

feet

Sample Date &amp; Time:

4/22/03

hours

Dup 950 hours

Sampler(s):

B. Swiney, C. McChery

Data Recorded By:

B. Swiney

Signature

PID/OVA Monitor Reading:

6.0

ppm

TYPE OF SAMPLE: (Check all that apply)

☒ Soil☐ Sediment☐ Lagoon/Pond☒ Grab☐ Trip Blank\*☐ Rinsate Blank\*☒ Field Duplicate collected☐ Other (Specify):Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) Clay - See bag log.

SAMPLE DATA/REMARKS:

PID malfunctioning at low conc.

ANALYSIS

BOTTLE LOT NO.

NOTES/SKETCH:

VIAold solidEPDSWR (P/PD)ANALYSIS

Tt NUS Form 0005A

| TETRA TECH NUS, INC.                                                                                                                                                                                                                                                                            |                | SAMPLE LOG SHEET - SOLID PHASE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <div style="display: flex; justify-content: space-between;"> <div> <p>Site Name: <u>Parkland Chemical works</u></p> <p>Sample ID: <u>PC-SO-SBS-0608</u></p> </div> <div> <p>Tetra Tech, NUS Job No./PMS <u>4188-2640</u></p> <p>QC Information: <u>AS/ASD</u> (if applicable)</p> </div> </div> |                | <p>TYPE OF SAMPLE: (Check all that apply)</p> <div style="display: flex; justify-content: space-between;"> <div> <p><input checked="" type="checkbox"/> Soil</p> <p><input type="checkbox"/> Sediment</p> <p><input type="checkbox"/> Lagoon/Pond</p> <p><input checked="" type="checkbox"/> Grab</p> </div> <div> <p><input type="checkbox"/> Trip Blank*</p> <p><input type="checkbox"/> Rinsate Blank*</p> <p><input type="checkbox"/> Field Duplicate collected</p> <p><input type="checkbox"/> Other (Specify):</p> </div> </div> <p>Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) <u>Clay - see boring log</u></p> |  |
| <p>Sample Method: <u>N/A</u></p> <p>Depth Sampled: <u>6-8</u> feet</p> <p>Sample Date &amp; Time: <u>4/22/03</u> <u>1310</u> hours Dup <u>N/A</u> hours</p> <p>Sampler(s): <u>C. Acetone, B. Sample</u></p>                                                                                     |                | <p>Data Recorded By: <u>[Signature]</u> Signature</p> <p>PID/OVA Monitor Reading: <u>N/A</u> ppm</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <p>SAMPLE DATA/REMARKS: <u>PID malfunctioning due to rain.</u></p>                                                                                                                                                                                                                              |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| ANALYSIS                                                                                                                                                                                                                                                                                        | BOTTLE LOT NO. | NOTES/SKETCH:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| <u>NAC</u>                                                                                                                                                                                                                                                                                      |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <u>To sed-1</u>                                                                                                                                                                                                                                                                                 |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <u>GRPH</u>                                                                                                                                                                                                                                                                                     |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <u>SWR 10/1/13</u>                                                                                                                                                                                                                                                                              |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <u>Me 1/13</u>                                                                                                                                                                                                                                                                                  |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|                                                                                                                                                                                                                                                                                                 |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| Tt NUS Form 0005A                                                                                                                                                                                                                                                                               |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |



TETRA TECH NUS, INC.

## SAMPLE LOG SHEET - SOLID PHASE

Site Name: Portland ChemicalSample ID: PC-SD-01Tetra Tech, NUS Job No./PMS 4138-2640QC Information: N/A (if applicable)

Sample Method: Tower lead bowl / springs  
Depth Sampled: 0-1 feet  
Sample Date & Time: 4/15/02 0915 hours Dup NA hours  
Sampler(s): Ben Smith, C. Mearns

Data Recorded By: Ben Smith SignaturePID/OVA Monitor Reading: 0.0 ppm

## TYPE OF SAMPLE: (Check all that apply)

Soil \_\_\_\_\_ Trip Blank\* \_\_\_\_\_  
☒ Sediment \_\_\_\_\_ Rinsate Blank\* \_\_\_\_\_  
Lagoon/Pond \_\_\_\_\_ Field Duplicate collected \_\_\_\_\_  
Grab ☒ Other (Specify): \_\_\_\_\_

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) Wet clay

## SAMPLE DATA/REMARKS:

| ANALYSIS   | BOTTLE LOT NO. |
|------------|----------------|
| VIA        |                |
| SVOC/P/P/B |                |
| pesticides |                |
| ETPH       |                |
| metals     |                |
|            |                |
|            |                |
|            |                |
|            |                |

## NOTES/SKETCH:



TETRA TECH NUS, INC.

## SAMPLE LOG SHEET - SOLID PHASE

Site Name: Portland CementSample ID: PC-SD-02Tetra Tech, NUS Job No./PMS 4128-2640QC Information: PCR (if applicable)

Sample Method: Trowl and bail/syringe  
Depth Sampled: 0-1 feet  
Sample Date & Time: 4/14/02 0530 hours Dup 0 hours  
Sampler(s): B. Smith, C. Buckley

Data Recorded By: [Signature] SignaturePID/OVA Monitor Reading: 0.0 ppm

## TYPE OF SAMPLE: (Check all that apply)

Soil ☐ Trip Blank\* ☐  
☒ Sediment ☐ Rinsate Blank\* ☐  
Lagoon/Pond ☐ Field Duplicate collected ☒  
Grab ☒ Other (Specify): ☐

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) Wet clay

## SAMPLE DATA/REMARKS:

| ANALYSIS   | BOTTLE LOT NO. | NOTES/SKETCH: |
|------------|----------------|---------------|
| UGA        |                |               |
| SOC (P/PC) |                |               |
| % Solids   |                |               |
| ETPH       |                |               |
| Metals     |                |               |
|            |                |               |
|            |                |               |
|            |                |               |
|            |                |               |
|            |                |               |



TETRA TECH NUS, INC.

## SAMPLE LOG SHEET - SOLID PHASE

Site Name: Paradise AmusementSample ID: PC-SD-DUP-01Tetra Tech, NUS Job No./PMS 4128-2640QC Information: 707 (if applicable)

Sample Method: From seal bag / syringe  
Depth Sampled: 0-1 feet  
Sample Date & Time: 4/19/02 0940 hours Dup 0932 hours  
Sampler(s): B. Smith, C. Madley

Data Recorded By: [Signature] SignaturePID/OVA Monitor Reading: 0.0 ppm

TYPE OF SAMPLE: (Check all that apply)

Soil ☐ Trip Blank\* ☐  
Sediment ☒ Rinsate Blank\* ☐  
Lagoon/Pond ☐ Field Duplicate collected ☐  
Grab ☒ Other (Specify): ☐

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) wet clay

SAMPLE DATA/REMARKS:

| ANALYSIS         | BOTTLE LOT NO. |
|------------------|----------------|
| <u>VDA</u>       |                |
| <u>Sex PCBs</u>  |                |
| <u>ole sol-d</u> |                |
| <u>ETPH</u>      |                |
| <u>metals</u>    |                |
|                  |                |
|                  |                |
|                  |                |
|                  |                |

NOTES/SKETCH:

Tt NUS Form 0005A



TETRA TECH NUS, INC.

## SAMPLE LOG SHEET - LIQUID PHASE

Site Name: Powdered Ammonium  
Sample ID: PC-SW-01  
Tetra Tech NUS Job No./PMS 4128-2640  
QC Information: NA (if applicable)

Sample Method/Device: Direct fill of bottles  
Depth Sampled: 0.5 feet Total Depth 1 feet (SW Only)  
Sample Date & Time: 4/19/02 0830 hours  
Sampler(s): R. Smith, C. Mackey  
Date Recorded By: R. Smith Signature

TYPE OF SAMPLE: (Check all that apply)  
☒ Groundwater  
☐ Surface Water  
☐ Residential Supply  
☐ Grab  
☐ Composite  
☐ Trip Blank\*  
☐ Rinsate Blank\*  
☐ Field Duplicate Collected  
☐ Other (Specify):

\*Include sample source &amp; lot No.

| WELL PURGE DATA: <u>NA</u> |        | Micro Tip/OVA Monitor Reading: <u>0.0</u> |     | ppm                  |  |
|----------------------------|--------|-------------------------------------------|-----|----------------------|--|
| Well Depth                 | feet   | Purge Start                               | hrs | Sampling/Purge Data: |  |
| Inside Diameter            | Inches | Purge Stop Time                           | hrs | Vol. #               |  |
| Water Level                | feet   | Total Gallons Purged                      |     | 0                    |  |
| Well Volume                | gal.   | Purge Method                              |     | 1                    |  |
| Color:                     |        | Turbidity: CLR/SL CLDY/CLDY/OPAQ          |     | 3                    |  |
|                            |        |                                           |     | 4                    |  |

Temp °C NA pH NA Spec. Cond. NA DO NA

| ANALYSIS            | BOTTLE LOT NO. | TRAFFIC REPORT NO. | COMMENTS  |
|---------------------|----------------|--------------------|-----------|
| <u>VOA</u>          |                |                    |           |
| <u>Suac (P/BTS)</u> |                | ORGANIC            | INORGANIC |
| <u>ETPH</u>         |                |                    |           |
| <u>Metals</u>       |                |                    |           |
|                     |                |                    |           |
|                     |                |                    |           |
|                     |                |                    |           |
|                     |                |                    |           |
|                     |                |                    |           |
|                     |                |                    |           |

Tt NUS Form 0004





# SAMPLE LOG SHEET - LIQUID PHASE

Site Name: Portland Avenue 1.  
Sample ID: PC-Sw-DUP-61

Tetra Tech-NUS Job No./PMS 4128-2640  
QC Information: DS7 (if applicable)

Sample Method/Device: Diver to 6-11 cat bottles  
 Depth Sampled:        feet      Total Depth 7 feet (SW Only)  
 Sample Date & Time: 4/14/02  
 Sampler(s): B-Swath, C-Mark II  
 Date Recorded By: [Signature]      Signature

**TYPE OF SAMPLE: (Check all that apply)**

| Sample Type        | Trip Blank* | Rinsate Blank* | Field Duplicate | Collected Other (Specify): |
|--------------------|-------------|----------------|-----------------|----------------------------|
| Groundwater        |             |                |                 |                            |
| Surface Water      |             |                |                 |                            |
| Residential Supply |             |                |                 |                            |
| Grab               |             |                |                 |                            |
| Composite          |             |                |                 |                            |

\*include sample source & lot No.

WELL PURGE DATA: N/A

| Well Depth       | feet | Purge Start | hrs | Micro Tip/OVA Monitor Reading: | ppm |
|------------------|------|-------------|-----|--------------------------------|-----|
| WELL PURGE DATA: | NA   |             |     |                                |     |
|                  |      |             |     | Sampling/Purge Data:           |     |
|                  |      |             |     |                                |     |

| Inside Diameter | Inches | Purge Stop Time | hrs | Vol. # | Temp °C   | pH | Spec. Cond. | DO |
|-----------------|--------|-----------------|-----|--------|-----------|----|-------------|----|
|                 |        |                 |     | 0      |           |    |             |    |
|                 |        |                 |     | 1      | <u>NA</u> |    |             |    |
|                 |        |                 |     | 3      |           |    |             |    |
|                 |        |                 |     | 4      |           |    |             |    |
| Water Level     |        |                 |     |        |           |    |             |    |

Color: \_\_\_\_\_ Turbidity: CLR/SL CLDY/CLDY/OPA0

| ANALYSIS | BOTTLE LOT NO. | TRAFFIC REPORT NO. | COMMENTS |
|----------|----------------|--------------------|----------|
|----------|----------------|--------------------|----------|

| ORGANIC | INORGANIC |
|---------|-----------|
|---------|-----------|

一、

357-4  
H4T3  
22/20ms

Tt NUS Form 0004



BORING NO.: SB1  
 START DATE: 9/22/00  
 COMPLETION DATE: 9/22/00  
 MON. WELL NO.: 101  
 CHECKED BY: ML

TRANSCRIBED BY: \_\_\_\_\_  
 ELEVATION FROM: \_\_\_\_\_

BORING LOG FOR: SB1  
 PROJECT NO.: 9128-2640  
 LOGGED BY: D. Smith  
 DRILLED BY (Company/Driller): Geobond  
 GRD. SURFACE ELEVATION: \_\_\_\_\_

| DEPTH (FEET) | BLOWS PER 6" | SAMP REC. / SAMP LENG. | SAMPLING TIME & SAMPLE NO. (QA/QC STATUS) | DEPTH MAT'L CHG. / WELL PROF'L | SOIL DENSITY/ CONSIS. or ROCK HARD. | CLR | MATERIAL CLASSIFICATION  | USCS or ROCK BRKN | REMARKS (moisture condition, odor; geological classification; rock weathering, etc.) | FIELD SCREENING DATA METHOD - (FID, (PPM)) |
|--------------|--------------|------------------------|-------------------------------------------|--------------------------------|-------------------------------------|-----|--------------------------|-------------------|--------------------------------------------------------------------------------------|--------------------------------------------|
| 0            | 15           | 1.4                    | 51                                        |                                | Loose                               | GRY | Gravel w/ sand 0.6-0.5   |                   | DRY                                                                                  | DRY                                        |
| 2            | 24           | 1.20                   | 1515                                      |                                | Loose                               | Red | med. clay w/ sand 0.5-20 |                   |                                                                                      | DRY                                        |
| 2            | 43           |                        |                                           |                                | Dense                               | Red | med. clay                |                   | DRY                                                                                  |                                            |
| 4            | 8            | 1.0                    | 1517                                      |                                |                                     |     |                          |                   |                                                                                      |                                            |
| 4            | 16           |                        |                                           |                                |                                     |     |                          |                   |                                                                                      |                                            |
| 4            | 2            | 1.5                    | 53                                        |                                | Dense                               | Red | med. clay w/ fine gravel |                   | DRY                                                                                  |                                            |
| 6            | 3            | 6.0                    | 1527                                      |                                |                                     |     |                          |                   |                                                                                      |                                            |
| 6            | 5            |                        |                                           |                                | Dense                               | Red | med. clay w/ fine gravel |                   | WET                                                                                  |                                            |
| 6            | 8            | 1.7                    | 54                                        |                                |                                     |     |                          |                   |                                                                                      |                                            |
| 8            | 8            | 2.0                    | 1533                                      |                                | Dense                               | Red | med. clay w/ fine gravel |                   | WET                                                                                  |                                            |
| 8            | 11           |                        |                                           |                                |                                     |     |                          |                   |                                                                                      |                                            |
| 8            | 3            | 2.0                    | 55                                        |                                | Dense                               | Red | med. clay                |                   | WET                                                                                  |                                            |
| 10           | 5            |                        | 1542                                      |                                |                                     |     |                          |                   |                                                                                      |                                            |
| 10           | 3            | 2.0                    | 56                                        |                                | Dense                               | Red | med. clay                |                   | WET                                                                                  |                                            |
| 12           | 3            | 2.0                    | 1540                                      |                                |                                     |     |                          |                   |                                                                                      |                                            |
| 12           | 3            |                        |                                           |                                | Dense                               | Red | med. clay                |                   | WET                                                                                  |                                            |
| 14           | 3            | 2.0                    | 57                                        |                                |                                     |     |                          |                   |                                                                                      |                                            |
| 14           | 3            | 2.0                    | 1555                                      |                                | Dense                               | Red | med. clay                |                   | WET                                                                                  |                                            |
| 14           | 1            |                        |                                           |                                |                                     |     |                          |                   |                                                                                      |                                            |
| 14           | 3            | 2.0                    | 58                                        |                                | Dense                               | Red | med. clay                |                   | WET                                                                                  |                                            |
| 16           | 3            |                        | 1558                                      |                                |                                     |     |                          |                   |                                                                                      |                                            |

TYPE OF DRILLING RIG: \_\_\_\_\_

METHOD OF ADVANCING BORING: \_\_\_\_\_

METHOD OF SOIL SAMPLING: \_\_\_\_\_

METHOD OF ROCK CORING: \_\_\_\_\_

GROUNDWATER LEVELS: \_\_\_\_\_

OTHER OBSERVATIONS: \_\_\_\_\_

Tetra Tech NUS, Inc. 

BORING NO.: \_\_\_\_\_ PAGE: \_\_\_\_\_ OF \_\_\_\_\_

Tetra Form 0018

## BORING LOG FOR:

PROJECT NO.:

LOGGED BY:

DRILLED BY (Company/Driller):

GRD. SURFACE ELEVATION:

TRANSCRIBED BY:

ELEVATION FROM:

BORING NO.:

START DATE:

COMPLETION DATE:

MON. WELL NO.:

CHECKED BY:

| DEPTH<br>(FEET) | BLOWS<br>PER<br>6" | SAMP<br>REC.<br>/ SAMP<br>LENG. | SAMPLING<br>TIME<br>&<br>SAMPLE NO.<br>(QA/QC STATUS) | DEPTH<br>MATH<br>CHG./<br>WELL<br>PROFL | SOIL<br>DENSITY/<br>CONSIS.<br>or ROCK<br>HARD. | CLR | MATERIAL<br>CLASSIFICATION | USCS<br>or<br>ROCK<br>BRKN | REMARKS<br>(moisture condition; color;<br>geological classification;<br>rock weathering; etc.) | FIELD<br>SCREENING<br>DATA<br>METHOD =<br>[FID. (PPM)] |
|-----------------|--------------------|---------------------------------|-------------------------------------------------------|-----------------------------------------|-------------------------------------------------|-----|----------------------------|----------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 0               | 2                  | 0.2/1.0                         | 51                                                    |                                         | Dry                                             | Red | 0.0-0.1 Topsoil            |                            | DRY                                                                                            | 52.2                                                   |
| 2               | 3                  | 0.2/1.0                         | 52                                                    |                                         | Dry                                             | Red | 0.1-2.0 med. clay, brown   |                            | N/A                                                                                            | N/A                                                    |
| 4               | 11                 | 0.2/1.0                         | 53                                                    |                                         |                                                 |     | Noncrumbly                 |                            | WET                                                                                            | Not L. v. g.                                           |
| 6               | 12                 | 0.6/1.0                         | 54                                                    |                                         |                                                 |     | Noncrumbly                 |                            | N/A                                                                                            |                                                        |
| 8               | 12                 | 0.6/1.0                         | 54                                                    |                                         |                                                 |     | Med. clay                  |                            | WET                                                                                            |                                                        |
| 10              | 12                 | 1.9/1.0                         | 53                                                    |                                         |                                                 |     | Med. clay                  |                            | WET                                                                                            |                                                        |
| 12              | 12                 | 2.0/1.0                         | 56                                                    |                                         |                                                 |     | Med. clay                  |                            | WET                                                                                            |                                                        |
| 14              | 12                 | 2.0/1.0                         | 57                                                    |                                         |                                                 |     | Grainy to SC               |                            | WET                                                                                            |                                                        |
| 16              | 12                 | 2.0/1.0                         | 58                                                    |                                         |                                                 |     | Grainy to SC               |                            | WET                                                                                            |                                                        |

TYPE OF DRILLING RIG:

METHOD OF ADVANCING BORING:

METHOD OF SOIL SAMPLING:

METHOD OF ROCK CORING:

GROUNDWATER LEVELS:

OTHER OBSERVATIONS:

Tetra Tech NUS, Inc.



PAGE OF

BORING NO.:

Tetra Form 0018

BORING LOG FOR:

PROJECT NO.:

LOGGED BY:

DRILLED BY (Company/Driller):

GRD. SURFACE ELEVATION:

SPS

9188-26410

B. Smith

Stalwood Drilling

TRANSCRIBED BY:

ELEVATION FROM:

BORING NO.:

START DATE:

COMPLETION DATE:

MON. WELL NO.:

CHECKED BY:

SPS

9/27/02

AMS

| DEPTH<br>(FEET) | BLOWS<br>PER<br>6" | SAMP<br>REC.<br>/<br>SAMP<br>LENG. | SAMPLING<br>TIME<br>&<br>SAMPLE NO.<br>(QA/QC STATUS) | DEPTH<br>MFTL<br>CHG/<br>WELL<br>PROFL | SOIL<br>DENSITY/<br>CONSIS.<br>or ROCK<br>HARD. | CLR | MATERIAL<br>CLASSIFICATION | USCS<br>or<br>ROCK<br>BRKN | REMARKS<br>(moisture condition; odors;<br>geological classification;<br>rock weathering, etc.) | FIELD<br>SCREENING<br>DATA<br>METHOD =<br>[FID. (PPM)] |
|-----------------|--------------------|------------------------------------|-------------------------------------------------------|----------------------------------------|-------------------------------------------------|-----|----------------------------|----------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 0               | 17                 | 0.24                               | 51                                                    |                                        | Loose Silty                                     |     | Gravel w/ sand             |                            | DRY                                                                                            | Not                                                    |
| 2               | 33                 | 0.20                               | 49                                                    |                                        |                                                 |     |                            |                            |                                                                                                | functioning                                            |
| 2               | 30                 |                                    |                                                       |                                        |                                                 |     |                            |                            |                                                                                                |                                                        |
| 4               | 3                  | 0.33                               | 27                                                    |                                        | Dense                                           | Red | Med. Clay                  |                            | DRY                                                                                            |                                                        |
| 4               | 3                  | 1.7                                | 17                                                    |                                        | Dense                                           | Red | Med. Clay w/ fine sand     |                            | DRY                                                                                            |                                                        |
| 6               | 3                  | 1.9                                | 54                                                    |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | WET                                                                                            |                                                        |
| 6               | 3                  | 1.4                                | 20                                                    |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | WET                                                                                            |                                                        |
| 8               | 3                  | 1.4                                | 55                                                    |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | WET                                                                                            |                                                        |
| 8               | 3                  | 2.0                                | 1300                                                  |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | WET                                                                                            |                                                        |
| 10              | 4                  | 1.4                                | 56                                                    |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | WET                                                                                            |                                                        |
| 10              | 3                  | 1.20                               | 1308                                                  |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | WET                                                                                            |                                                        |
| 12              | 7                  | 1.9                                | 57                                                    |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | Wet                                                                                            |                                                        |
| 12              | 9                  | 1.9                                | 13.20                                                 |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | Wet                                                                                            |                                                        |
| 14              | 10                 | 1.9                                | 13.20                                                 |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | Wet                                                                                            |                                                        |
| 14              | 11                 | 1.9                                | 58                                                    |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | Wet                                                                                            |                                                        |
| 14              | 3                  | 1.4                                | 20                                                    |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | Wet                                                                                            |                                                        |
| 16              | 3                  | 1.4                                | 20                                                    |                                        | Dense                                           | Red | Med. Clay w/ trace silt    |                            | Wet                                                                                            |                                                        |

TYPE OF DRILLING RIG:

METHOD OF ADVANCING BORING:

METHOD OF SOIL SAMPLING:

METHOD OF ROCK CORING:

GROUNDWATER LEVELS:

OTHER OBSERVATIONS:

Tetra Tech NUS, Inc.



PAGE: OF

BORING NO.:

Thus Form 0018

## OVERBURDEN MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS, INC.

PROJECT NAME: Portland ChemicalPROJECT NO: N4128-2640PROJECT LOCATION: Middletown, CTWELL NO: MW-1CLIENT: US EPABORING NO: SB-1CONTRACTOR: Seaboard

DRILLER:

BORING LOCATION:

LOGGED BY: C. MackeyDATE: 4/22/02

CHECKED BY:

DATE:

PAGE: 1 OF 1

ELEVATION TOP OF PROTECTIVE CASING

ELEVATION TOP OF RISER PIPE

GROUND ELEVATION

SAND DRAIN LAYER

LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE (Ft.)

3.81'

LENGTH OF RISER PIPE ABOVE GROUND SURFACE (Ft.)

3.50'

TYPE OF SURFACE SEAL

Cement

DIA. SURFACE SEAL BGS (In.)

12"

DEPTH TO BOTTOM OF SURFACE SEAL (Ft.)

1'

I.D. OF PROTECTIVE CASING (In.)

5"

TYPE OF PROTECTIVE CASING

Steel

DEPTH BOTTOM OF PROTECTIVE CASING (Ft.)

1.2'

DEPTH BOTTOM OF DRAIN LAYER (Ft.)

2'

RISER PIPE (In.) I.D.: 2"

O.D.: 2.25"

TYPE OF RISER PIPE

PVC

TYPE OF BACKFILL AROUND RISER PIPE

Native Material

DEPTH TOP OF SEAL (Ft.)

3.0'

TYPE OF SEAL

Bentonite Chips

DEPTH BOTTOM OF SEAL (Ft.)

4.0'

DEPTH TOP OF PERVIOUS SECTION (Ft.)

15'

DIAMETER OF BOREHOLE (In.)

9"

TYPE OF PERVIOUS SECTION

PVC

TYPE OF OPENINGS

0.010

PERVIOUS SECTION (In.) I.D.: 2"

O.D.: 2.25"

TYPE OF FILTER PACK AROUND PERVIOUS SECTION

No. 2 Medium Sand

DEPTH BOTTOM OF PERVIOUS SECTION (Ft.)

15'

DEPTH BOTTOM OF FILTER PACK (Ft.)

15'

TYPE OF BACKFILL BELOW FILTER PACK

NA

END OF BORING (Ft.)

15'

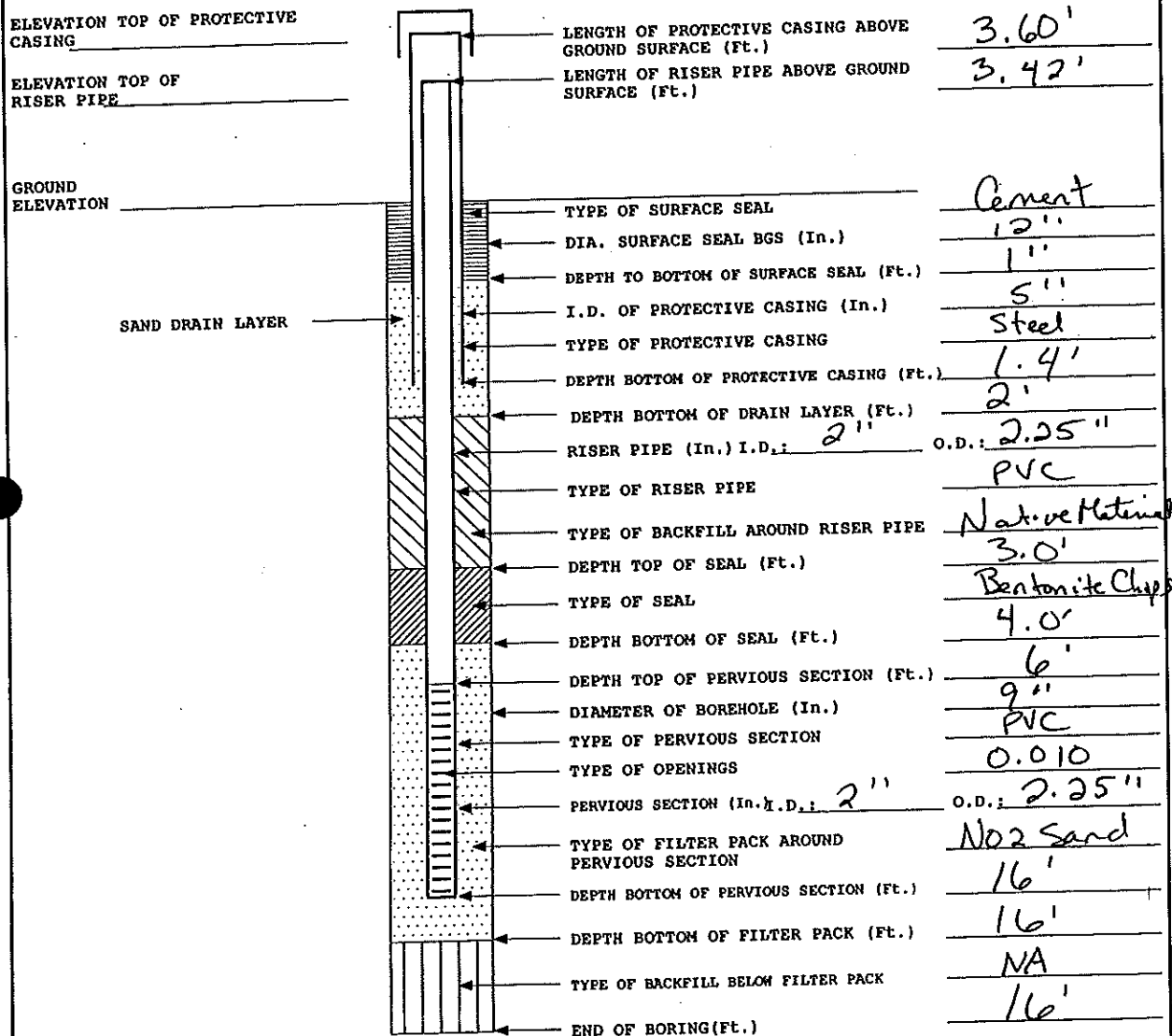
## GENERAL NOTE:

1. Entry of 0.00 for Ground Elevation, Elev. Top of Riser Pipe & Elev. Top of Protective Casing Indicates that Surveyed Ground Elevation Not Available.

## OVERBURDEN MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS, INC.

PROJECT NAME: Portland Chemical PROJECT NO: N4128-2640  
 PROJECT LOCATION: Middletown, CT WELL NO: MW-3  
 CLIENT: USEPA BORING NO: SB-3  
 CONTRACTOR: Seaboard DRILLER: \_\_\_\_\_ BORING LOCATION: \_\_\_\_\_  
 LOGGED BY: C. Mackey DATE: 4/22/02  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ PAGE: 1 OF 1



## GENERAL NOTE:

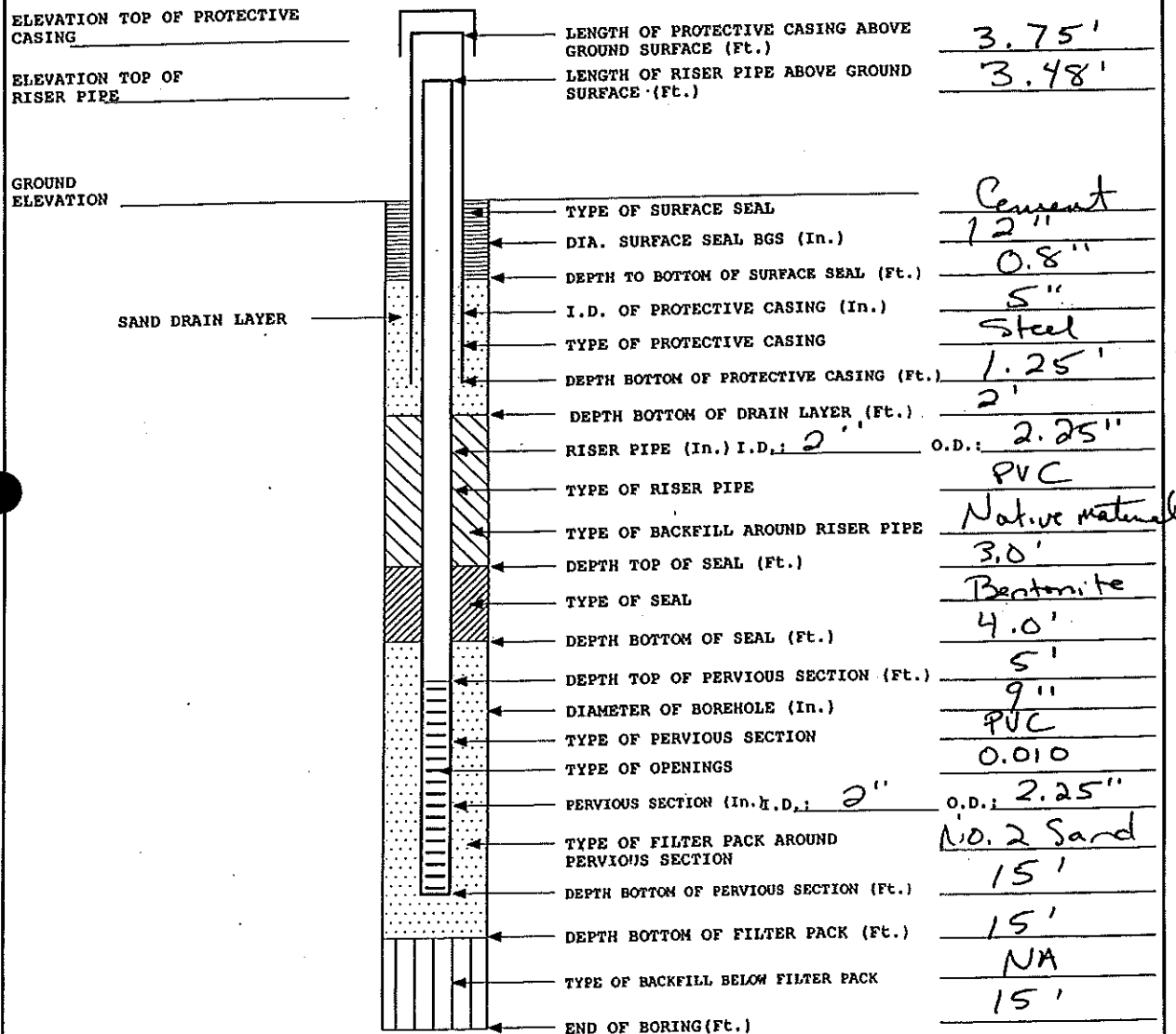
1. Entry of 0.00 for Ground Elevation, Elev. Top of Riser Pipe & Elev. Top of Protective Casing Indicates that Surveyed Ground Elevation Not Available.

## OVERBURDEN MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS, INC.

PROJECT NAME: Portland Chemical PROJECT NO: N4128-2640  
 PROJECT LOCATION: Middletown, CT WELL NO: MW-5  
 CLIENT: USEPA BORING NO: SB-5  
 CONTRACTOR: Seaboard DRILLER: \_\_\_\_\_ BORING LOCATION: \_\_\_\_\_  
 LOGGED BY: C. Mackey DATE: 4/22/02  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

PAGE: 1 OF 1



## GENERAL NOTE:

1. Entry of 0.00 for Ground Elevation, Elev. Top of Riser Pipe & Elev. Top of Protective Casing Indicates that Surveyed Ground Elevation Not Available.



# WELL DEVELOPMENT DATA SHEET

Well No.: MW-01

PROJECT: 4128-2640 PORTLAND CHEM. WORKS

DATE: 4-23-02

WEATHER: ~45°F.

PROJECT NO.: 7  
PERSONNEL: B. SMITH; C. MACEY; T. DORSTON

Well Screen Depth: 5 1 15 ft. bgs

Pump Type/Material: WATER PUMP - VALVE

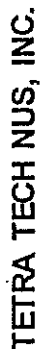
H&S Monitoring Instrument Reading 0.0

**Pump Intake Depth:** 12/1

Total Purge Volume =  $\sim 20$  (gal)

**Data Recorded By:** CM

[illegible]



# WELL DEVELOPMENT DATA SHEET

Well No.: MW-03

PROJECT: PORTLAND CHEMICAL WORKS

PROJECT: PORTLAND CHEMICAL WORKS

PROJECT: PORTLAND CHEMICAL WORKS

Total Depth = 17.78' Below Top PVC

DATE: 4-23-02

WEATHER: Cloudy, T. wind, 45°F  
STAPPED RAINING - 800 TO 900.

PERSONNEL: C. MACKAY, B. SMITH, T. DALGAN

Well Screen Depth: 61 16 ft. bgs

H&S Monitoring Instrument Reading 0-0

Pump Type/Material: WATTERA FOOT-VALE

Pump Type/Material: Concrete w/ 1" ARCADE DOWELS  
Pump Intake Depth: 15'

Total Purge Volume = ~6 (gal)

**Data Recorded By:** T.D.

[illegible]



**TETRA TECH NUS, INC.**

# WELL DEVELOPMENT DATA SHEET

Well No.: MW-05

PROJECT: PORTLAND CHEMICAL WORKS

PROJECT NO.: 4128-2640

PERSONNEL: T. J. DALLAN, C. M. HENRY, B. SMITH

Total depth = 16.82

J  
A  
'6  
A  
F  
B  
B

NO UNAPL, PASS-DUNAPL! - HGH<sup>STERN</sup>

DATE:

WEATHER: CLIMY STOPPED RAINING

$N = 0.00$ .  $\text{log } 0.00 \approx -4.5$

2501-101/101 101

Well Screen Depth: 5 1 5 ft. bgs

H&S Monitoring Instrument Reading 7.4 p.p.m.

Pump Type/Material: BLUE WATER FOOT-VALVE

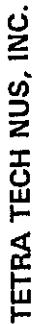
Pump Intake Depth: ~1' from Bottom -

$$\text{Total Purge Volume} \approx 25 \text{ (gal)}$$

Data Recorded By: T.D./CM.

[illegible]





**SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER**

**Site Name:**

**Sample ID:**

Portland Chemical

PC-6W-MW03-01

**Sample Method:**

**Depth Sampled:**

Sample Date & Time

Sampler(s): U.

**Data Recorded By**

NOTES.

11

100

| Clock time | 24hr | be | wa |
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|------------|------|----|----|

[illegible]

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| 11 | 580 |
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| 11 | 206 |
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|      |  |
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| 0905 |  |
|------|--|

|   |   |
|---|---|
| 4 | 1 |
| 2 | 3 |
| 3 | 2 |
| 1 | 4 |

|     |      |
|-----|------|
| 500 | 5160 |
|-----|------|

[illegible]

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|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|

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|--|--|

15. Pump dial setting

2. Siemens per cm

### 3. Oxidation reduction

Tt NUS Form 0005

.....

11. Pump dial setting (for example: hertz, cycle/min, etc.)

2. Siemens per cm (same as umhos/cm) at 25°C.

3. Oxidation reduction potential (stand in for Eh).

\*\*\*\*\* CONT \*\*





TETRA TECH NUS, INC.

# VOC SOIL SAMPLE COLLECTION/PRESERVATION LOG SHEET

Sample Container Lot # \_\_\_\_\_

Preserved in the field

Date: 4/22/02

| Sample #     | Bottle Letter | Vial ID Number | LOW CONCENTRATION VOC                       |                              |                                        |                        | HIGH CONCENTRATION |                              |                  |                        | LAB |
|--------------|---------------|----------------|---------------------------------------------|------------------------------|----------------------------------------|------------------------|--------------------|------------------------------|------------------|------------------------|-----|
|              |               |                | Sodium Bisulfate (NAHSO <sub>4</sub> ) (mL) | Tare Weight Vial + Pres. (g) | Final Weight Vial + Pres. + Sample (g) | Soil Sample Weight (g) | Methanol (mL)      | Tare Weight Vial + Pres. (g) | Final Weight (g) | Soil Sample Weight (g) |     |
| PC-SD-01     |               |                |                                             |                              |                                        |                        | 5                  | 31.36                        | 44.12            | 12.76                  |     |
| PC-SD-01     |               |                |                                             |                              |                                        |                        |                    | 31.44                        | 44.48            | 13.04                  |     |
| PC-SD-02     |               |                |                                             |                              |                                        |                        |                    | 31.80                        | 44.23            | 12.43                  |     |
| PC-SD-02     |               |                |                                             |                              |                                        |                        |                    | 31.94                        | 47.03            | 15.09                  |     |
| PC-SD-DUP-01 |               |                |                                             |                              |                                        |                        |                    | 32.18                        | 45.87            | 13.69                  |     |
| PC-SD-DUP-01 |               |                |                                             |                              |                                        |                        |                    | 31.87                        | 49.16            | 17.29                  |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 30.62                        | 38.18            | 7.56                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 30.93                        | 38.02            | 7.09                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 30.91                        | 40.67            | 9.76                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 30.65                        | 36.82            | 6.17                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 31.28                        | 41.67            | 10.39                  |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 30.65                        | 39.66            | 9.01                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 30.77                        | 38.28            | 7.51                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 31.22                        | 39.49            | 8.27                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 31.46                        | 35.94            | 4.46                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 31.51                        | 37.61            | 6.10                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 31.79                        | 38.31            | 6.52                   |     |
| PC-SD-SS-01  |               |                |                                             |                              |                                        |                        |                    | 31.56                        | 38.65            | 7.09                   |     |

Note: Tare weight = vial, preservative, cap and magnetic stirrer, if applicable  
Severe effervescence: Yes ☐ No ☐

Laboratory Analysts initials: \_\_\_\_\_

Date: \_\_\_\_\_

Tt NUS Form 0040



TETRA TECH NUS, INC.

## SAMPLE COLLECTION SUMMARY RECORD

PROJECT NAME: Portland Chemical TETRA TECH NUS JOB NO./PMS: N4128-2640

SAMPLING EVENT: Spring 2002 CASE NO.: 25 ALLIED to DAS DAS NO.:           

| DATE    | TIME  | SAMPLE LOCATION | FIELD OC   | Vol | Size/Type | Temp | DAS    | COMMENTS     |
|---------|-------|-----------------|------------|-----|-----------|------|--------|--------------|
| 4/19/02 | 0830  | PC-SW-01        | MS/MSD     | 1   | 1         | 1    | DAS    | CLP-inorg    |
|         | 0845  | PC-SW-02        |            | 1   | 1         | 1    | D05194 | A0HK5 MA0GT8 |
|         | 0850  | PC-SW-DUP-1     | dup.       | 1   | 1         | 1    | D05195 | A0HK6 MA0GT9 |
|         | 0900  | PC-SW-TB-01     | Trip blank | 1   | 1         | 1    | D05196 | A0HK7 MA0GWD |
|         | 0915  | PC-SO-01        | MS/MSD     | 1   | 1         | 1    | D05197 | A0HK8        |
|         | 0930  | PC-SO-02        |            | 1   | 1         | 1    | D05198 |              |
|         | 0940  | PC-SO-DUP-01    | dup.       | 1   | 1         | 1    | D05199 |              |
|         | 0955  | PC-AQ-TB-01     | Rinsate    |     |           |      |        |              |
|         | 10:00 | PC-AQ-RD-01     | Rinsate    | 1   | 1         | 1    | D05200 |              |
| 4/19/02 | 09:55 | PC-SO-TB-01     | Trip blank | 1   |           |      | D05201 |              |
|         |       |                 |            |     |           |      |        |              |
|         |       |                 |            |     |           |      |        |              |
|         |       |                 |            |     |           |      |        |              |
|         |       |                 |            |     |           |      |        |              |
|         |       |                 |            |     |           |      |        |              |
|         |       |                 |            |     |           |      |        |              |



TETRA TECH NUS, INC.

## SAMPLE COLLECTION SUMMARY RECORD

PROJECT NAME: Portland Channel WorksTETRA TECH NUS JOB NO./PMS: 4188-2640SAMPLING EVENT: Spring 2002CASE NO.: 553

DAS NO.: \_\_\_\_\_

| DATE    | TIME | SAMPLE LOCATION  | FIELD QC | LOG | PTS | ANAL | FIELD | DAS #        | COMMENTS  |
|---------|------|------------------|----------|-----|-----|------|-------|--------------|-----------|
| 4/22/02 | 0947 | PC-SO-SB3-0810   | DUP      | 1   | 1   | 1    | 1     | D05202 A0HK9 | CLP INREG |
| 4/22/02 | 0950 | PC-SO-SB3-DUP-01 | DUP      | 1   | 1   | 1    | 1     | D05203 A0HLD | MA06W1    |
| 4/22/02 | 1210 | PC-SO-SB5-0608   | AS/ASD   | 1   | 1   | 1    | 1     | D05204 A0HLD | MA06W2    |
| 4/22/02 | 1533 | PC-SO-SB1-0608   |          | 1   | 1   | 1    | 1     | D05205 A0HLD | MA06W3    |
| 4/23/02 | 1070 | PC-SO-TB-01      | TB       | 1   |     |      |       | D05206 —     | MA06W4    |
| 4/23/02 | 1035 | PC-AQ-RB-02      | RB       | 1   | 1   | 1    | 1     | D05207 A0HLD | MA06W5    |
| 4/23/02 | 1100 | PC-SS-SS1-0001   |          | 1   | 1   | 1    | 1     | D05208 A0HLD | MA06W6    |
| 4/23/02 | 1115 | PC-SS-SS2-0001   |          | 1   | 1   | 1    | 1     | D05209 A0HLD | MA06W7    |
| 4/24/02 | 0935 | PC-GW-MW3-M      |          | 1   | 1   | 1    | 1     | D05210 A0HLD | MA06W8    |
| 4/24/02 | 1020 | PC-GW-MW5-01     | AS/ASD   | 1   | 1   | 1    | 1     | D05211 A0HLD | MA06W9    |
| 4/24/02 | 1147 | PC-GW-MW1-01     | DUP      | 1   | 1   | 1    | 1     | D05212 A0HLD | MA06X0    |
| 4/24/02 | 1150 | PC-GW-DUP-01     | DUP      | 1   | 1   | 1    | 1     | D05213 A0HLD | MA06X1    |
| 4/24/02 | 1130 | PC-AQ-RB-03      | RB       | 1   | 1   | 1    | 1     | D05214 A0HMD | MA06X2    |
| 4/24/02 | 1140 | PC-GW-TB-01      | TB       | 1   |     |      |       | — A0HMD      | —         |



# USEPA Contract Laboratory Program Generic Chain of Custody

Reference Case: 0290

Client No: S02-RAC-1-209

● R

|                                             |  |                                |  |                                    |  |
|---------------------------------------------|--|--------------------------------|--|------------------------------------|--|
| Region: 1                                   |  | Date Shipped: 4/19/02          |  | Chain of Custody Record            |  |
| Project Code: N4128-2640                    |  | Carrier Name: FedEx            |  | Relinquished By (Date / Time)      |  |
| Account Code: N4128-2640                    |  | Airbill: 83173585750           |  | Sampler Signature: <i>B. S. S.</i> |  |
| CERCLIS ID:                                 |  | Shipped to: Milkem Corporation |  | Received By (Date / Time)          |  |
| Spill ID:                                   |  | 175 Metro Center Blvd.         |  | 2                                  |  |
| Site Name/State: Portland Chemical (DAS)/CT |  | Warwick RI 02886               |  | 3                                  |  |
| Project Leader: John Meyer                  |  | (401) 732-3400                 |  | 4                                  |  |
| Action:                                     |  |                                |  |                                    |  |
| Sampling Co:                                |  |                                |  |                                    |  |

| SAMPLE No. | MATRIX/<br>SAMPLER                 | CONC/<br>TYPE | ANALYSIS/<br>TURNAROUND                                               | TAG No/<br>PRESERVATIVE | STATION<br>LOCATION | SAMPLE COLLECT<br>DATE/TIME | SAMPLE No. | QC<br>Type      |
|------------|------------------------------------|---------------|-----------------------------------------------------------------------|-------------------------|---------------------|-----------------------------|------------|-----------------|
| D05194     | Surface Water/<br>Christine Mackey | L/G           | ETPH (21)                                                             | (HCL) (2)               | PC-SW-01            | S: 4/19/02 8:30             |            | -               |
| D05195     | Surface Water/<br>Brandon Smith    | L/G           | ETPH (21)                                                             | (HCL) (2)               | PC-SW-02            | S: 4/19/02 8:45             |            | Field Duplicate |
| D05196     | Surface Water/<br>Christine Mackey | L/G           | ETPH (21)                                                             | (HCL) (2)               | PC-SW-DUP-01        | S: 4/19/02 8:50             |            | Field Duplicate |
| D05197     | Sediment/<br>Brandon Smith         | L/G           | BNAPest/P (21),<br>ETPH (21),<br>PER_SOL (21), T_M<br>(21), VOA_ (21) | (Ice Only) (4)          | PC-SD-01            | S: 4/19/02 9:15             |            | -               |
| D05198     | Sediment/<br>Christine Mackey      | L/G           | BNAPest/P (21),<br>ETPH (21),<br>PER_SOL (21), T_M<br>(21), VOA_ (21) | (Ice Only) (6)          | PC-SD-02            | S: 4/19/02 9:30             |            | Field Duplicate |
| D05199     | Sediment/<br>Christine Mackey      | L/G           | BNAPest/P (21),<br>ETPH (21),<br>PER_SOL (21), T_M<br>(21), VOA_ (21) | (Ice Only) (5)          | PC-SD-DUP-01        | S: 4/19/02 9:40             |            | Field Duplicate |
| D05200     | Aqueous/<br>Christine Mackey       | L/G           | BNAPest/P (21),<br>ETPH (21),<br>PER_SOL (21), T_M<br>(21), VOA_ (21) | (Ice Only) (7)          | PC-AQ-RB-01         | S: 4/19/02 10:00            |            | Rinsate         |
| D05201     | Sediment/<br>Christine Mackey      | L/G           | VOA_ (21)                                                             | (MEOH) (2)              | PC-SD-TB-01         | S: 4/19/02 9:55             |            | Trip Blank      |

|                                                                                                                                                                                                 |                                                           |                                          |                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------|-------------------------------|
| Shipment for Case Complete? N                                                                                                                                                                   | Sample(s) to be used for laboratory QC:<br>D05194, D05197 | Additional Sampler Signature(s):         | Chain of Custody Seal Number: |
| Analysts Key:<br>BNAPest/P = Semivolatiles and Pesticides/PCBs, ETPH = Extractable Total Petroleum Hydrocarbons, PER_SOL = Percent Solids, T_M = Total Metals, VOA_ = Volatile Organic Analysis | Concentration: L = Low, M = Low/Medium, H = High          | Type/Designator: Composite = C, Grab = G | Shipment Iced? _____          |

TR Number: 1-303437800-041902-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA 20191-3436 Phone 703/264-9348 Fax 703/264-9222

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F2V6.0.66 Page 1 of 1





# USEPA Contract Laboratory Program Organic Traffic Report & Chain of Custody Record

Case No: 30378  
DAS No:

30378

● R

|                                             |  |                                                |  |                                 |  |
|---------------------------------------------|--|------------------------------------------------|--|---------------------------------|--|
| Region: 1                                   |  | Date Shipped: 4/19/02                          |  | Chain of Custody Record         |  |
| Project Code: N4128-2640                    |  | Carrier Name: FedEx                            |  | Sampler Signature: <i>R. S.</i> |  |
| CERCLIS ID:                                 |  | Airbill: 8317-3588-5738                        |  | Relinquished By (Date / Time)   |  |
| Spill ID:                                   |  | Shipped to: Accura Analytical Laboratory, Inc. |  | Received By (Date / Time)       |  |
| Site Name/State: Portland Chemical (CLP)/CT |  | 8017 Financial Drive                           |  |                                 |  |
| Project Leader: John Meyer                  |  | Norcross GA 30071                              |  |                                 |  |
| Action:                                     |  | (770) 449-8800                                 |  |                                 |  |
| Sampling Co:                                |  |                                                |  |                                 |  |

| ORGANIC SAMPLE NO. | MATRIX/ SAMPLER                 | CONC/ TYPE | ANALYSIS/ TURNAROUND    | TAG No./ PRESERVATIVE                                                                                                                                                                                                                                                                                                       | STATION LOCATION | SAMPLE COLLECT DATE/TIME | INORGANIC SAMPLE No. | QC Type         |
|--------------------|---------------------------------|------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------|----------------------|-----------------|
| A0HK5              | Surface Water/ Christine Mackey | L/G        | BNAP/EST (21), VOA (21) | 183101 (HCL), 183102 (HCL), 183103 (HCL), 183104 (HCL), 183105 (HCL), 183106 (HCL), 183113 (Ice Only), 183114 (Ice Only), 183115 (Ice Only), 183116 (Ice Only), 183117 (Ice Only), 183118 (Ice Only), 183119 (Ice Only), 183120 (Ice Only), 183121 (Ice Only), 183122 (Ice Only), 183123 (Ice Only), 183124 (Ice Only) (18) | PC-SW-01         | S: 4/19/02 8:30          | MAOGT8               | -               |
| A0HK6              | Surface Water/ Brandon Smith    | L/G        | BNAP/EST (21), VOA (21) | 183107 (HCL), 183108 (HCL), 183125 (Ice Only), 183126 (Ice Only), 183127 (Ice Only), 183128 (Ice Only) (6)                                                                                                                                                                                                                  | PC-SW-02         | S: 4/19/02 8:45          | MAOGT9               | Field Duplicate |
| A0HK7              | Surface Water/ Brandon Smith    | L/G        | BNAP/EST (21), VOA (21) | 183109 (HCL), 183110 (HCL), 183129 (Ice Only), 183130 (Ice Only), 183131 (Ice Only), 183132 (Ice Only) (6)                                                                                                                                                                                                                  | PC-SW-DUP-01     | S: 4/19/02 8:50          | MAOGW0               | Field Duplicate |
| A0HK8              | Surface Water/ Christine Mackey | L/G        | VOA (21)                | 183111 (HCL), 183112 (HCL) (2)                                                                                                                                                                                                                                                                                              | PC-SW-TB-01      | S: 4/19/02 9:00          |                      | Trip Blank      |

|                                                                             |                                                  |                                          |                               |
|-----------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------|-------------------------------|
| Shipment for Case Complete? Y                                               | Sample(s) to be used for laboratory QC: A0HK5    | Additional Sampler Signature(s):         | Chain of Custody Seal Number: |
| Analysis Key:                                                               | Concentration: L = Low, M = Low/Medium, H = High | Type/Designator: Composite = C, Grab = G | Shipment Iced? _____          |
| BNA/PEST = CLP TCL Semivolatiles and Pesticides/PC, VOA = CLP TCL Volatiles |                                                  |                                          |                               |

TR Number: 1-303437800-041902-0002

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PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA. 20191-3436 Phone 703/264-9348 Fax 703/264-9722

F2V5.0.66 Page 1 of 1



**USEPA Contract Laboratory Program**  
**Inorganic Traffic Report & Chain of Custody Record**

Case No: 30378  
DAS No:

30378  
R

|                          |  |                                             |  |                                        |  |                               |  |                                 |  |
|--------------------------|--|---------------------------------------------|--|----------------------------------------|--|-------------------------------|--|---------------------------------|--|
| Region: 1                |  | Date Shipped: 4/19/02                       |  | Carrier Name: FedEx                    |  | Chain of Custody Record       |  | Sampler Signature: <i>B. S.</i> |  |
| Project Code: N4128-2640 |  | Airbill: 8317-3588-5749                     |  | Shipped to: Datchen Laboratories, Inc. |  | Relinquished By: <i>B. S.</i> |  | Received By: <i>B. S.</i>       |  |
| CERCLIS ID:              |  | Site Name/State: Portland Chemical (CLP)/CT |  | 960 West LeVoy Drive                   |  | 2                             |  | (Date / Time)                   |  |
| Spill ID:                |  | Project Leader: John Meyer                  |  | Salt Lake City UT 84123                |  | 3                             |  |                                 |  |
| Action:                  |  | Sampling Co:                                |  | (801) 266-7700                         |  | 4                             |  |                                 |  |

| INORGANIC SAMPLE No. | MATRIX/ SAMPLER                 | CONC/ TYPE | ANALYSIS/ TURNAROUND | TAG NO./ PRESERVATIVE            | STATION LOCATION | SAMPLE COLLECT DATE/TIME | ORGANIC SAMPLE No. | QC Type         |
|----------------------|---------------------------------|------------|----------------------|----------------------------------|------------------|--------------------------|--------------------|-----------------|
| MA0GT8               | Surface Water/ Christine Mackey | L/G        | TM (21)              | 183133 (HNO3), 183134 (HNO3) (2) | PC-SW-01         | S: 4/19/02 8:30          | A0HK5              | -               |
| MA0GT9               | Surface Water/ Brandon Smith    | L/G        | TM (21)              | 183135 (HNO3) (1)                | PC-SW-02         | S: 4/19/02 8:45          | A0HK6              | Field Duplicate |
| MA0GW0               | Surface Water/ Brandon Smith    | L/G        | TM (21)              | 183136 (HNO3) (1)                | PC-SW-DUP-01     | S: 4/19/02 8:50          | A0HK7              | Field Duplicate |

|                                         |                                                  |                                          |                               |
|-----------------------------------------|--------------------------------------------------|------------------------------------------|-------------------------------|
| Shipment for Case Complete? Y           | Sample(s) to be used for laboratory QC: MA0GT8   | Additional Sampler Signature(s):         | Chain of Custody Seal Number: |
| Analysis Key: TM = CLP TAL Total Metals | Concentration: L = Low, M = Low/Medium, H = High | Type/Designator: Composite = C, Grab = G | Shipment Iced? _____          |

TR Number: 1-303437800-041902-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA, 20191-3436 Phone 703/264-9348 Fax 703/264-9222

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**USEPA Contract Laboratory Program  
Generic Chain of Custody**

Reference Case: 0290  
Client No: S02-RAC1-209

**R**

|                                             |  |                               |  |                               |  |
|---------------------------------------------|--|-------------------------------|--|-------------------------------|--|
| Region: 1                                   |  | Date Shipped: 4/24/02         |  | Chain of Custody Record       |  |
| Project Code: N4128-2840                    |  | Carrier Name: FedEx           |  | Relinquished By (Date / Time) |  |
| Account Code:                               |  | Airbill: 8317-3588-5688       |  | Received By (Date / Time)     |  |
| CERCLIS ID:                                 |  | Shipped to: Mitem Corporation |  | 1 <i>B. S.</i> 4/24/02        |  |
| Spill ID:                                   |  | 175 Metro Center Blvd.        |  | 2                             |  |
| Site Name/State: Portland Chemical (DAS)/CT |  | Warwick RI 02886              |  | 3                             |  |
| Project Leader: John Meyer                  |  | (401) 732-3400                |  | 4                             |  |
| Action:                                     |  |                               |  |                               |  |
| Sampling Co:                                |  |                               |  |                               |  |

| SAMPLE No. | MATRIX/<br>SAMPLER                | CONC/<br>TYPE | ANALYSIS/<br>TURNAROUND | TAG No/<br>PRESERVATIVE | STATION<br>LOCATION | SAMPLE COLLECT<br>DATE/TIME | SAMPLE No. | QC<br>Type      |
|------------|-----------------------------------|---------------|-------------------------|-------------------------|---------------------|-----------------------------|------------|-----------------|
| D05210     | Ground Water/<br>Christine Mackey | L/G           | ETPH (21)               | (HCL) (2)               | PC-GW-MW3-01        | S: 4/24/02 9:35             |            |                 |
| D05211     | Ground Water/<br>Brandon Smith    | L/G           | ETPH (21)               | (HCL) (6)               | PC-GW-MW5-01        | S: 4/24/02 10:20            |            |                 |
| D05212     | Ground Water/<br>Christine Mackey | L/G           | ETPH (21)               | (HCL) (2)               | PC-GW-MW1-01        | S: 4/24/02 11:45            |            | Field Duplicate |
| D05213     | Ground Water/<br>Christine Mackey | L/G           | ETPH (21)               | (HCL) (2)               | PC-GW-DUP-01        | S: 4/24/02 11:50            |            | Field Duplicate |
| D05214     | Aqueous/<br>Christine Mackey      | L/G           | ETPH (21)               | (HCL) (2)               | PC-AQ-RB-03         | S: 4/24/02 11:30            |            | Rinse           |

|                                                 |                                                   |                                         |                               |
|-------------------------------------------------|---------------------------------------------------|-----------------------------------------|-------------------------------|
| Shipment for Case Complete? Y                   | Sample(s) to be used for laboratory QC:<br>D05211 | Additional Sampler Signature(s):        | Chain of Custody Seal Number: |
| Analysis Key:                                   | Concentration: L = Low, M = Low/Medium, H = High  | Type/Designate: Composite = C, Grab = G | Shipment load? _____          |
| ETPH = Extractable Total Petroleum Hydrocarbons |                                                   |                                         |                               |

**TR Number: 1-303437800-042402-0003**

PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA. 20191-3436 Phone 703/264-3348 Fax 703/264-9222

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# USEPA Contract Laboratory Program Organic Traffic Report & Chain of Custody Record

Case No: 30410  
DAS No:

● R

|                                             |  |                                                                                                   |  |                                                            |  |
|---------------------------------------------|--|---------------------------------------------------------------------------------------------------|--|------------------------------------------------------------|--|
| Region: 1                                   |  | Date Shipped: 4/24/02                                                                             |  | Chain of Custody Record                                    |  |
| Project Code: N4128-2840                    |  | Carrier Name: FedEx                                                                               |  | Relinquished By: <i>B. Sam</i> (Date / Time) 4/24/02 13:00 |  |
| Account Code:                               |  | Airbill: 8317-3588-5846                                                                           |  | Sampler Signature: <i>B. Sam</i>                           |  |
| CERCLUS ID:                                 |  | Shipped to: Celmic Corporation<br>10 Dean Krauss Drive<br>Narragansett RI 02882<br>(401) 782-9900 |  | Received By: (Date / Time)                                 |  |
| Spill ID:                                   |  |                                                                                                   |  | 2                                                          |  |
| Site Name/State: Portland Chemical (CLP)/CT |  |                                                                                                   |  | 3                                                          |  |
| Project Leader: John Meyer                  |  |                                                                                                   |  | 4                                                          |  |
| Action:                                     |  |                                                                                                   |  |                                                            |  |
| Sampling Co:                                |  |                                                                                                   |  |                                                            |  |

| ORGANIC SAMPLE No. | MATRIX/ SAMPLER                   | CONC/ TYPE | ANALYSIS/ TURNAROUND       | TAG No./ PRESERVATIVE                                                                                                                                                                                                                                                                                                       | STATION LOCATION | SAMPLE COLLECT DATETIME | INORGANIC SAMPLE No. | QC Type         |
|--------------------|-----------------------------------|------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------|----------------------|-----------------|
| A0HL6              | Ground Water/<br>Christine Mackey | L/G        | BNA/PEST (21),<br>VOA (21) | 183155 (HCL), 183156 (HCL), 183171 (Ice Only), 183172 (Ice Only), 183173 (Ice Only), 183174 (Ice Only) (6)                                                                                                                                                                                                                  | PC-GW-MW3-01     | S: 4/24/02 9:35         | MAOGW8               | -               |
| A0HL7              | Ground Water/<br>Brandon Smith    | L/G        | BNA/PEST (21),<br>VOA (21) | 183157 (HCL), 183158 (HCL), 183159 (HCL), 183160 (HCL), 183161 (HCL), 183162 (HCL), 183175 (Ice Only), 183176 (Ice Only), 183177 (Ice Only), 183178 (Ice Only), 183179 (Ice Only), 183180 (Ice Only), 183181 (Ice Only), 183182 (Ice Only), 183183 (Ice Only), 183184 (Ice Only), 183185 (Ice Only), 183186 (Ice Only) (18) | PC-GW-MW5-01     | S: 4/24/02 10:20        | MAOGW9               | -               |
| A0HL8              | Ground Water/<br>Christine Mackey | L/G        | BNA/PEST (21),<br>VOA (21) | 183153 (HCL), 183164 (HCL), 183187 (Ice Only), 183188 (Ice Only), 183189 (Ice Only), 183190 (Ice Only) (6)                                                                                                                                                                                                                  | PC-GW-MW1-01     | S: 4/24/02 11:45        | MAOGX0               | Field Duplicate |
| A0HL9              | Ground Water/<br>Christine Mackey | L/G        | BNA/PEST (21),<br>VOA (21) | 183195 (HCL), 183196 (HCL), 183197 (Ice Only), 183198 (Ice Only), 183199 (Ice Only), 183200 (Ice Only) (6)                                                                                                                                                                                                                  | PC-GW-DUP-01     | S: 4/24/02 11:50        | MAOGX1               | Field Duplicate |

|                                                                             |                                                  |                                          |                               |
|-----------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------|-------------------------------|
| Shipment for Case Complete? Y                                               | Sample(s) to be used for laboratory QC:          | Additional Sampler Signature(s):         | Chain of Custody Seal Number: |
|                                                                             | A0HL7                                            |                                          |                               |
| Analysis Key:                                                               | Concentration: L = Low, M = Low/Medium, H = High | Type/Designator: Composite = C, Grab = G | Shipment Iced? _____          |
| BNA/PEST = CLP TCL Semivolatiles and Pesticides/PC, VOA = CLP TCL Volatiles |                                                  |                                          |                               |

TR Number: 1-303437800-042402-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA. 20191-3436 Phone 703/264-8348 Fax 703/264-9722

REGION COPY



# USEPA Contract Laboratory Program Organic Traffic Report & Chain of Custody Record

Case No:

DAS No:

K

|                  |                              |                     |                       |
|------------------|------------------------------|---------------------|-----------------------|
| Region:          | Date Shipped: 4/24/02        | Carrier Name: FedEx | Shipped to:           |
| Project Code:    | Carrier Name: 8317-3888-5646 | Shipped to:         | Celtic Corporation    |
| Account Code:    | Carrier Name: 8317-3888-5646 | Shipped to:         | 10 Dean Krauss Drive  |
| CERCLIS ID:      | Carrier Name: 8317-3888-5646 | Shipped to:         | Narragansett RI 02882 |
| Spill ID:        | Carrier Name: 8317-3888-5646 | Shipped to:         | (401) 782-8900        |
| Site Name/State: | Carrier Name: 8317-3888-5646 | Shipped to:         |                       |
| Project Leader:  | Carrier Name: 8317-3888-5646 | Shipped to:         |                       |
| Action:          | Carrier Name: 8317-3888-5646 | Shipped to:         |                       |
| Sampling Co:     | Carrier Name: 8317-3888-5646 | Shipped to:         |                       |

| ORGANIC SAMPLE No. | MATRIX SAMPLER            | CONC/ TYPE | ANALYST/ TURBIDITY    | TAG No/ PREPARATIVE                                                                                        | STATION LOCATION | SAMPLE COLLECT DATE/TIME | INORGANIC SAMPLE No. | QC Type    |
|--------------------|---------------------------|------------|-----------------------|------------------------------------------------------------------------------------------------------------|------------------|--------------------------|----------------------|------------|
| AUH-M0             | Aqueous/ Christine Mackey | L/S        | ENAP/ES (21) VOA (21) | 183167 (HCL), 183165 (HCL), 183195 (Ice Only), 183197 (Ice Only), 183198 (Ice Only), 183199 (Ice Only) (6) | PC-AQ-RB-03      | S: 4/24/02 11:30         | MA0GX2               | Rinsate    |
| AUH-M1             | Aqueous/ Brandon Smith    | L/S        | VOA (21)              | 183169 (HCL), 183170 (HCL) (2)                                                                             | PC-GW-TB-01      | S: 4/24/02 11:40         |                      | Trip Blank |

|                                                                                   |                                              |                                          |                               |
|-----------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------|-------------------------------|
| Shipment for Case Complete? Y                                                     | Samples to be used for laboratory analysis:  | Additional Sample Signature(s):          | Chain of Custody Seal Number: |
|                                                                                   | A0H13                                        |                                          |                               |
| Analysis Key:                                                                     | Concentration: L = Low, M = Medium, H = High | Type/Designator: Composite = C, Grab = G | Shipment Iced? _____          |
| BNA/EST = CLP TOL, Semivolatiles and Pesticides (P, D, V, S) & CEP TOL Volatiles. |                                              |                                          |                               |

TR Number: 1-303437800-042402-0001  
PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
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F206.0.68 Page 2 of 2



# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 30410  
DAS No:

R

|                                             |                         |                                |                                  |                                    |
|---------------------------------------------|-------------------------|--------------------------------|----------------------------------|------------------------------------|
| Region: 1                                   | Date Shipped: 4/24/02   | Carrier Name: FedEx            | Relinquished By: <i>B. S. S.</i> | Sampler Signature: <i>B. S. S.</i> |
| Project Code: N4128-2640                    | Airbill: 8317-3588-5657 | Shipped to: Liberty Analytical | Received By: <i>B. S. S.</i>     | (Date / Time)                      |
| CERCLIS ID:                                 |                         | 501 Madison Avenue             | 2                                |                                    |
| Site ID:                                    |                         | Cary NC 27513                  | 3                                |                                    |
| Site Name/State: Portland Chemical (CLP)/CT |                         | (919) 379-4080                 | 4                                |                                    |
| Project Leader: John Meyer                  |                         |                                |                                  |                                    |
| Action:                                     |                         |                                |                                  |                                    |
| Sampling Co:                                |                         |                                |                                  |                                    |

| INORGANIC SAMPLE No. | MATRIX/ SAMPLER                | CONC/ TYPE | ANALYSIS/ TURNAROUND | TAG No./ PRESERVATIVE            | STATION LOCATION | SAMPLE COLLECT DATE/TIME | ORGANIC SAMPLE No. | QC Type         |
|----------------------|--------------------------------|------------|----------------------|----------------------------------|------------------|--------------------------|--------------------|-----------------|
| MA0GW8               | Ground Water/ Christine Mackey | L/G        | TM (21)              | 183199 (HNO3) (1)                | PC-GW-MW3-01     | S: 4/24/02 9:35          | A0HL6              | -               |
| MA0GW9               | Ground Water/ Brandon Smith    | L/G        | TM (21)              | 183001 (HNO3), 183200 (HNO3) (2) | PC-GW-MW5-01     | S: 4/24/02 10:20         | A0HL7              | -               |
| MA0GX0               | Ground Water/ Christine Mackey | L/G        | TM (21)              | 183002 (HNO3) (1)                | PC-GW-MW1-01     | S: 4/24/02 11:45         | A0HL8              | Field Duplicate |
| MA0GX1               | Ground Water/ Christine Mackey | L/G        | TM (21)              | 183003 (HNO3) (1)                | PC-GW-DUP-01     | S: 4/24/02 11:50         | A0HL9              | Field Duplicate |
| MA0GX2               | Aqueous/ Christine Mackey      | L/G        | TM (21)              | 183004 (HNO3) (1)                | PC-AQ-RB-03      | S: 4/24/02 11:30         | A0H10              | Rinsate         |

|                               |                                                  |                                          |                               |
|-------------------------------|--------------------------------------------------|------------------------------------------|-------------------------------|
| Shipment for Case Complete? Y | Sample(s) to be used for laboratory QC: MA0GW9   | Additional Sampler Signature(s):         | Chain of Custody Seal Number: |
| Analysis Key:                 | Concentration: L = Low, M = Low/Medium, H = High | Type/Designator: Composite = C, Grab = G | Shipment lost? _____          |
| TM = CLP TAL Total Metals     |                                                  |                                          |                               |

TR Number: 1-303437800-042402-0002

PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Roston, VA. 20191-3438 Phone 703/264-9348 Fax 703/264-9222

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TETRA TECH NUS, INC.

DAS

## LABORATORY ASSIGNMENT

SITE: Portland Chemical  
works

CASE#:

0290

Week(s) of:

4/15/02 → 4/26/02

List of samples:

Soils 10 VOC ; 9 / TPHGW 8 TPHSW 4 TPHAll-Sed 5 VOC ; 4 / SVOC, Pest / PCBs, metals

Laboratory:

Witherum Corp

Attention:

Ed Lawler

Street:

175 Metro Center Blvd.

City:

Warwick

State:

RI

Zip:

02886

Phone:

(401) 732-3400

Notes:

502-RACI-209

CASE#:

Week(s) of:

List of samples:

Laboratory:

Attention:

Street:

City:

State:

Zip:

Phone: ( )

Notes:



TETRA TECH NUS, INC.

CLP

## LABORATORY ASSIGNMENT

SITE: FormerPortland chemicalwork

CASE#:

30378

Week(s) of:

4/15/02

List of samples:

4 waters VOC, SVOC, 7.PCBs1 water VOC only

Laboratory:

Accura Analytical Lab

Attention:

Anthony Gatch

Street:

6017 Financial Drive

City:

Norcross

State:

GA

Zip:

30071

Phone:

(770) 442-8800

Notes:

21-day TAT

CASE#:

30378

Week(s) of:

4/15/02

List of samples:

4 waters metals

Laboratory:

Datachem Laboratories

Attention:

Roxanne Olson

Street:

960 West LeVoy Drive

City:

Salt Lake City

State:

UT

Zip:

84123

Phone:

(801) 266-7700

Notes:

21-day TATSW only this week





TETRA TECH NUS, INC.

LABORATORY ASSIGNMENT

SITE: TRAILER ROAD CEMETERY  
WORKS

CASE#:

3040

Week(s) of:

4/22/02

List of samples:

8 SOILS BNA/PEST/PCB

8 AQ UOA/BNA/PEST/PCB

Laboratory:

CEMEX CORPORATION

Attention:

KAREN WILLIAMSON

Street:

10 DEAN STREET

City:

NARRAGANSETT

State:

RI

Zip:

02882

Phone:

(401) 782-8900

Notes:

21 DAY TAT

CASE#:

30410

Week(s) of:

4/22/02

List of samples:

8 SOILS METALS

9 WATER METALS

Laboratory:

LIBERTY ANALYTICAL

Attention:

ALICE EVANS

Street:

50 MADISON AVENUE

City:

CARY

State:

NC

Zip:

27513

Phone:

(919) 377-4100

Notes:

21 DAY TAT



TETRA TECH NUS, INC.

## YSI 6820 MULTIPARAMETER METER

Serial No.: 01F0657

Site Name: Portland Chemical

Model No.: 600XL-B-M

Job No.: N4128-2640

Decal No.: 02132

Instrument is calibrated in accordance with Manufacturer's Instructions

| DATE: 4/24/02      | Pre Calibration Readings | Post Calibration Readings | PM Check | Calibration STDs (lot #'s) | Signature | Remarks |
|--------------------|--------------------------|---------------------------|----------|----------------------------|-----------|---------|
| Cond. mS/cm        | 6.985                    | 0.1620                    |          |                            |           |         |
| pH=4.0             | 4.12                     | 3.70                      |          |                            |           |         |
| pH=7.0             | 7.06                     | 6.81                      |          |                            |           |         |
| pH=10.0            | 10.13                    | 9.93                      |          |                            |           |         |
| D.O. mg/l / DO10   | 14.11 / 10.61            | 19.01 / 150.4             |          |                            |           |         |
| REDOX mV           | 100.6                    | 100.1                     |          |                            |           |         |
| Turbidity 0 NTUs   | —                        | —                         |          |                            |           |         |
| Turbidity 100 NTUs | —                        | —                         |          |                            |           |         |
| Temp °C            | 4.12                     | 22.29                     |          |                            |           |         |
| Salinity ‰         | 100.0                    | —                         |          |                            |           |         |

P. 10-1

|                    |             |          |          |  |  |  |
|--------------------|-------------|----------|----------|--|--|--|
| DATE: 5-1-02       |             |          |          |  |  |  |
| Cond. mS/cm        | 1.0         | 1.0      | 0.95     |  |  |  |
| pH=4.0             | 4.13        | 3.9      | 3.87     |  |  |  |
| pH=7.0             | 7.07        | 7.2      | 7.27     |  |  |  |
| pH=10.0            | 10.17       | 10.1     | 10.4     |  |  |  |
| D.O. mg/l          | 12.3 / 10.1 | 14 / 103 | 14 / 105 |  |  |  |
| REDOX mV           | 100.        | 100      | 105      |  |  |  |
| Turbidity 0 NTUs   | —           | —        | —        |  |  |  |
| Turbidity 100 NTUs | —           | —        | —        |  |  |  |
| Temp °C            | 10.5        |          | 19.8     |  |  |  |
| Salinity ‰         |             |          |          |  |  |  |

Tt NUS Form 0024



TETRA TECH NUS, INC.

PHOTOIONIZATION DETECTOR FIELD CALIBRATION LOG

Serial No.: \_\_\_\_\_ Model No.: \_\_\_\_\_ Decal No.: \_\_\_\_\_  
Site Name/Location: Parish and Avenue Tetra Tech NUS Job No./PMS: 4128-2640

| CALIBRATION DATE | STANDARD GAS-ISOBUTYLENE<br>Lot # _____<br>Conc. = _____ ppm | CALIBRATION READING<br>Isobutylene Equiv. (ppm) | CALIBRATION CHECK<br>Isobutylene Equiv. (ppm) | SIGNATURE  | COMMENTS               |
|------------------|--------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------|------------|------------------------|
| 4/23/02          | Lot # _____<br>Conc. = _____ ppm                             | 100                                             | 12/k                                          | B-sin      | Range, PID not working |
| 4/23/02          | Lot # _____<br>Conc. = _____ ppm                             | 100                                             | 100                                           | B-sin      |                        |
| 4/24/02          | Lot # _____<br>Conc. = _____ ppm                             | 100                                             | 98                                            | Chrisplech |                        |
|                  | Lot # _____<br>Conc. = _____ ppm                             |                                                 |                                               |            |                        |
|                  | Lot # _____<br>Conc. = _____ ppm                             |                                                 |                                               |            |                        |
|                  | Lot # _____<br>Conc. = _____ ppm                             |                                                 |                                               |            |                        |
|                  | Lot # _____<br>Conc. = _____ ppm                             |                                                 |                                               |            |                        |
|                  | Lot # _____<br>Conc. = _____ ppm                             |                                                 |                                               |            |                        |
|                  | Lot # _____<br>Conc. = _____ ppm                             |                                                 |                                               |            |                        |



## **APPENDIX C**

### **ANALYTICAL DATA SUMMARIES AND CHAIN OF CUSTODY FORMS**



**ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
CONNECTICUT**

| Sample Number                         | PC-SO-    | PC-SO-SB3-                | PC-SO-DUP-                | PC-SO-    | PC-SS-    | PC-SS-  |
|---------------------------------------|-----------|---------------------------|---------------------------|-----------|-----------|---------|
| SB1-0608                              | 0810      | SB3                       | SB5                       | SB1       | SB2       |         |
| Date Sampled                          | 4/22/2002 | 4/22/2002                 | 4/22/2002                 | 4/23/2002 | 4/23/2002 |         |
| Interval                              | 8.0-8.0   | 8.0-10.0                  | 8.0-10.0                  | 8.0-8.0   | 0.0-1.0   | 0.0-1.0 |
| QC Identifier                         | None      | Field Dup: PC-SO-SB3-0810 | Field Dup: PC-SO-SB3-0810 | None      | None      | None    |
| Dibenzofuran                          | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Diethylphthalate                      | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Dimethylphthalate                     | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Fluoranthene                          | 430 U     | 450 U                     | 440 U                     | 420 U     | 6400 U    | 3000 J  |
| Fluorene                              | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Hexachlorobenzene                     | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Hexachlorobutadiene                   | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Hexachlorocyclopentadiene             | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Hexachloroethane                      | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Indeno(1,2,3-cd)pyrene                | 430 U     | 450 U                     | 440 U                     | 420 U     | 2600 J    | 1300 J  |
| Isophorone                            | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| N-Nitroso-di-n-propylamine            | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| N-Nitroso-diphenylamine               | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Naphthalene                           | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Nitrobenzene                          | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Pentachlorophenol                     | 1100 U    | 1100 U                    | 1100 U                    | 1100 U    | 9200 U    | 11000 U |
| Phenanthrene                          | 430 U     | 450 U                     | 440 U                     | 420 U     | 2200 J    | 1700 J  |
| Phenol                                | 430 U     | 450 U                     | 440 U                     | 420 U     | 3700 U    | 4300 U  |
| Pyrene                                | 430 U     | 450 U                     | 440 U                     | 420 U     | 7000 U    | 2800 J  |
| <b>Pesticide/PCB Analysis (ug/kg)</b> |           |                           |                           |           |           |         |
| 4,4'-DDD                              | 4.3 U     | 4.5 U                     | 4.3 U                     | 4.3 U     | 3.7 U     | 6.1     |
| 4,4'-DDE                              | 4.3 U     | 4.5 U                     | 4.3 U                     | 4.3 U     | 3.7 U     | 4.3 U   |
| 4,4'-DDT                              | 4.3 U     | 4.5 U                     | 4.3 U                     | 4.3 U     | 21        | 40      |
| Aldrin                                | 2.2 U     | 2.3 U                     | 2.2 U                     | 2.2 U     | 1.9 U     | 2.2 U   |
| alpha-BHC                             | 2.2 U     | 2.3 U                     | 2.2 U                     | 2.2 U     | 1.9 U     | 2.2 U   |
| alpha-Chlordane                       | 2.2 U     | 2.3 U                     | 2.2 U                     | 2.2 U     | 1.9 U     | 10      |
| Aroclor-1016                          | 43 U      | 45 U                      | 43 U                      | 43 U      | 37 U      | 43 U    |
| Aroclor-1221                          | 87 U      | 91 U                      | 88 U                      | 87 U      | 74 U      | 87 U    |
| Aroclor-1232                          | 43 U      | 45 U                      | 43 U                      | 43 U      | 37 U      | 43 U    |
| Aroclor-1242                          | 43 U      | 45 U                      | 43 U                      | 43 U      | 37 U      | 43 U    |
| Aroclor-1248                          | 43 U      | 45 U                      | 43 U                      | 43 U      | 37 U      | 43 U    |
| Aroclor-1254                          | 43 U      | 45 U                      | 43 U                      | 43 U      | 37 U      | 43 U    |

U - Not detected; UU - Detection limit approximate; J - Quantitation approximate;  
\* - From dilution analysis; R - Rejected; NA - Not Analyzed

**ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT**

| Sample Number              | PCSS-<br>SB1-0608 | PCSS-SB4-<br>0810             | PCSS-00P-<br>01               | PCSS-<br>SB6-0608 | PCSS-<br>SB1-0001 | PCSS-<br>SS2-0001 |
|----------------------------|-------------------|-------------------------------|-------------------------------|-------------------|-------------------|-------------------|
| Sample Location            | SB1               | SB3                           | SB3                           | SB5               | SB1               | SS2               |
| Date Sampled               | 4/22/2002         | 4/22/2002                     | 4/22/2002                     | 4/22/2002         | 4/23/2002         | 4/23/2002         |
| Interval                   | 6.0-8.0           | 8.0-10.0                      | 8.0-10.0                      | 6.0-8.0           | 0.0-1.0           | 0.0-1.0           |
| QC Identifier              | None              | Field Dup. PC-<br>SC-SB3-0810 | Field Dup. PC-<br>SC-SB3-0810 | None              | None              | None              |
| 2-Nitrophenol              | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| 3,3'-Dichlorobenzidine     | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| 3-Nitroaniline             | 1100 U            | 1100 U                        | 1100 U                        | 1100 U            | 9200 U            | 11000 U           |
| 4,6-Dinitro-2-methylphenol | 1100 U            | 1100 U                        | 1100 U                        | 1100 U            | 9200 U            | 11000 U           |
| 4-Bromophenyl-phenylether  | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| 4-Chloro-3-methylphenol    | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| 4-Chloroaniline            | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| 4-Chlorophenyl-phenylether | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| 4-Methylphenol             | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| 4-Nitroaniline             | 1100 U            | 1100 U                        | 1100 U                        | 1100 U            | 9200 U            | 11000 U           |
| 4-Nitrophenol              | 1100 U            | 1100 U                        | 1100 U                        | 1100 U            | 9200 U            | 11000 U           |
| Acenaphthene               | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Acenaphthylene             | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Acetophenone               | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Anthracene                 | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Atrazine                   | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Benzaldehyde               | 430 U             | 450 U                         | 440 U                         | 45 JEB            | 3700 U            | 4300 U            |
| Benz(a)anthracene          | 430 U             | 450 U                         | 440 U                         | 420 U             | 3800 U            | 1700 J            |
| Benz(a)pyrene              | 430 U             | 450 U                         | 440 U                         | 150 J             | 3900 U            | 1700 J            |
| Benz(b)fluoranthene        | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 1600 J            |
| Benz(g,h,i)perylene        | 430 U             | 450 U                         | 440 U                         | 420 U             | 2800 J            | 1600 J            |
| Benz(k)fluoranthene        | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 1500 J            |
| Bis(2-Chloroethoxy)methane | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Bis(2-Chloroethyl)ether    | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Bis(2-Ethylhexyl)phthalate | 1600 EB           | 140 JEB                       | 2400 JEB                      | 320 JEB           | 3700 U            | 4300 U            |
| Buthylbenzylphthalate      | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Caprolactam                | 61 J              | 450 U                         | 440 U                         | 43 J              | 3700 U            | 4300 U            |
| Carbazole                  | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Chrysene                   | 430 U             | 450 U                         | 440 U                         | 420 U             | 4800 U            | 1900 J            |
| Di-n-Butylphthalate        | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Di-n-octylphthalate        | 66 J              | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |
| Dibenz(a,h)anthracene      | 430 U             | 450 U                         | 440 U                         | 420 U             | 3700 U            | 4300 U            |

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;  
\* - From dilution analysis; R - Rejected; NA - Not Analyzed



**ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
CONNECTICUT**

| Sample Number                                | PC-SO-SB1-0608 | PC-SO-SB3-0810            | PC-SO-DUP-01              | PC-SO-SB5-0608 | PC-SS-SS1-0001 | PC-SS-SS2-0001 |
|----------------------------------------------|----------------|---------------------------|---------------------------|----------------|----------------|----------------|
| Sample Location                              | SB1            | SB3                       | SB3                       | SB5            | SS1            | SS2            |
| Date Sampled                                 | 4/22/2002      | 4/22/2002                 | 4/22/2002                 | 4/22/2002      | 4/23/2002      | 4/23/2002      |
| Interval                                     | 6.0-8.0        | 8.0-10.0                  | 8.0-10.0                  | 6.0-8.0        | 0.0-1.0        | 0.0-1.0        |
| QC Identifier                                | None           | Field Dup: PC-SO-SB3-0810 | Field Dup: PC-SO-SB3-0810 | None           | None           | None           |
| Dibromochloromethane                         | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Dichlorodifluoromethane                      | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Ethylbenzene                                 | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Isopropylbenzene                             | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Methyl Acetate                               | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 130 J          |
| Methyl tert-Butyl Ether                      | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Methylcyclohexane                            | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Methylene Chloride                           | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Styrene                                      | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Tetrachloroethene                            | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Toluene                                      | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Total Xylenes                                | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| trans-1,2-Dichloroethene                     | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| trans-1,3-Dichloropropene                    | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Trichloroethene                              | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Trichlorofluoromethane                       | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| Vinyl Chloride                               | 200 U          | 220 U                     | 170 U                     | 180 U          | 230 U          | 200 U          |
| <b>Semivolatile Organic Analysis (UGRKG)</b> |                |                           |                           |                |                |                |
| 1,1'-Biphenyl                                | 430 U          | 450 U                     | 440 U                     | 420 U          | 3700 U         | 4300 U         |
| 2,2'-oxybis(1-Chloropropane)                 | 430 U          | 450 U                     | 440 U                     | 420 U          | 3700 U         | 4300 U         |
| 2,4,5-Trichlorophenol                        | 1100 U         | 1100 U                    | 1100 U                    | 1100 U         | 9200 U         | 11000 U        |
| 2,4,6-Trichlorophenol                        | 430 U          | 450 U                     | 440 U                     | 420 U          | 3700 U         | 4300 U         |
| 2,4-Dichlorophenol                           | 430 U          | 450 U                     | 440 U                     | 420 U          | 3700 U         | 4300 U         |
| 2,4-Dimethylphenol                           | 430 U          | 450 U                     | 440 U                     | 420 U          | 3700 U         | 4300 U         |
| 2,4-Dinitrophenol                            | 1100 U         | 1100 U                    | 1100 U                    | 1100 U         | 9200 U         | 11000 U        |
| 2,6-Dinitrophenol                            | 430 U          | 450 U                     | 440 U                     | 420 U          | 3700 U         | 4300 U         |
| 2-Chloronaphthalene                          | 430 U          | 450 U                     | 440 U                     | 420 U          | 3700 U         | 4300 U         |
| 2-Chlorophenol                               | 430 U          | 450 U                     | 440 U                     | 420 U          | 3700 U         | 4300 U         |
| 2-Methylphenol                               | 430 U          | 450 U                     | 440 U                     | 420 U          | 3700 U         | 4300 U         |
| 2-Nitroaniline                               | 1100 U         | 1100 U                    | 1100 U                    | 1100 U         | 9200 U         | 11000 U        |

U - Not detected; UU - Detection limit approximate; J - Quantitation approximate;  
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**ANALYTICAL RESULTS  
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|                                          |           |                           |                           |           |           |           |           |
|------------------------------------------|-----------|---------------------------|---------------------------|-----------|-----------|-----------|-----------|
| Sample Number                            | PCSS-0810 | PCSS-0810                 | PCSS-0810                 | PCSS-0810 | PCSS-0810 | PCSS-0810 | PCSS-0810 |
| Sample Location                          | SB1       | SB3                       | SB5                       | SS1       | SS2       |           |           |
| Date Sampled                             | 4/22/2002 | 4/22/2002                 | 4/22/2002                 | 4/23/2002 | 4/23/2002 |           |           |
| Interval                                 | 6.0-8.0   | 6.0-10.0                  | 6.0-10.0                  | 0.0-1.0   | 0.0-1.0   |           |           |
| QC Identifier                            | None      | Field Dup: PC-SC-SS3-0810 | Field Dup: PC-SC-SS3-0810 | None      | None      |           |           |
| <b>Volatile Organic Analysis (UG/KG)</b> |           |                           |                           |           |           |           |           |
| 1,1,1-Trichloroethane                    | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,1,2,2-Tetrachloroethane                | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,1,2-Trichloro-1,2,2-fluoroethane       | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,1,2-Trichloroethane                    | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,1-Dichloroethane                       | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,1-Dichlorobenzene                      | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,2,4-Trichlorobenzene                   | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,2-Dibromo-3-chloropropane              | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,2-Dibromoethane                        | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,2-Dichlorobenzene                      | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,2-Dichloroethane                       | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,2-Dichloropropane                      | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,3-Dichlorobenzene                      | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 1,4-Dichlorobenzene                      | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| 2-Butanone                               | 1900 J    | 1400 J                    | 1100 J                    | 1200 J    | 230 UJ    | 200 UJ    |           |
| 2-Hexanone                               | 200 UJ    | 220 UJ                    | 170 UJ                    | 180 UJ    | 230 UJ    | 200 UJ    |           |
| 4-Methyl-2-Pentanone                     | 200 UJ    | 220 UJ                    | 170 UJ                    | 180 UJ    | 230 UJ    | 200 UJ    |           |
| Acetone                                  | 190 JEB   | 180 JEB                   | 140 JEB                   | 170 JEB   | 230 UJ    | 200 UJ    |           |
| Benzene                                  | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Bromochloroethane                        | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Bromoforn                                | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Bromomethane                             | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Carbon Disulfide                         | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Carbon Tetrachloride                     | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Chlorobenzene                            | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Chloroethane                             | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Chloroform                               | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Chloromethane                            | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| cis-1,2-Dichloroethene                   | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| cis-1,3-Dichloropropene                  | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |
| Cyclohexane                              | 200 U     | 220 U                     | 170 U                     | 180 U     | 230 U     | 200 U     |           |

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| Sample Number              | PC-SO-SB1-0608 | PC-SO-SB3-0810            | PC-SO-DUP-01              | PC-SO-SB5-0608 | PC-SS-SB1-0001 | PC-SS-SB2-0001 |
|----------------------------|----------------|---------------------------|---------------------------|----------------|----------------|----------------|
| Sample Location            | SB1            | SB3                       | SB3                       | SB5            | SS1            | SS2            |
| Date Sampled               | 4/22/2002      | 4/22/2002                 | 4/22/2002                 | 4/22/2002      | 4/23/2002      | 4/23/2002      |
| Interval                   | 6.0-8.0        | 8.0-10.0                  | 8.0-10.0                  | 6.0-8.0        | 0.0-1.0        | 0.0-1.0        |
| QC Identifier              | None           | Field Dup: PC-SO-SB3-0810 | Field Dup: PC-SO-SB3-0810 | None           | None           | None           |
| Aroclor-1260               | 43             | U                         | 45                        | U              | 43             | U              |
| beta-BHC                   | 2.2            | U                         | 2.3                       | U              | 2.2            | U              |
| delta-BHC                  | 2.2            | U                         | 2.3                       | U              | 2.2            | U              |
| Dieldrin                   | 4.3            | U                         | 4.5                       | U              | 4.3            | U              |
| Endosulfan I               | 2.2            | U                         | 2.3                       | U              | 2.2            | U              |
| Endosulfan II              | 4.3            | U                         | 4.5                       | U              | 4.3            | U              |
| Endosulfan Sulfate         | 4.3            | U                         | 4.5                       | U              | 4.3            | U              |
| Endrin                     | 4.3            | U                         | 4.5                       | U              | 4.3            | U              |
| Endrin Aldehyde            | 4.3            | U                         | 4.5                       | U              | 4.3            | U              |
| Endrin Ketone              | 4.3            | U                         | 4.5                       | U              | 4.3            | U              |
| gamma-BHC                  | 2.2            | U                         | 2.3                       | U              | 2.2            | U              |
| gamma-Chlordane            | 2.2            | U                         | 2.3                       | U              | 2.2            | U              |
| Heptachlor                 | 2.2            | U                         | 2.3                       | U              | 2.2            | U              |
| Heptachlor Epoxide         | 2.2            | U                         | 2.3                       | U              | 2.2            | U              |
| Methoxychlor               | 22             | U                         | 23                        | U              | 22             | U              |
| Toxaphene                  | 220            | U                         | 230                       | U              | 220            | U              |
| TAL Metal Analysis (MG/KG) |                |                           |                           |                |                |                |
| Aluminum                   | 15400          |                           | 19300                     |                | 14700          |                |
| Antimony                   | 0.45           | UJ                        |                           | R              | 0.38           | UJ             |
| Arsenic                    | 3.4            |                           | 3.7                       |                | 3.3            |                |
| Barium                     | 282            |                           | 235                       |                | 162            |                |
| Beryllium                  | 1.1            | UJ                        | 1.4                       | J              | 1.0            | UJ             |
| Cadmium                    | 0.084          | UJ                        | 0.077                     | UJ             | 0.072          | UJ             |
| Calcium                    | 5800           |                           | 11800                     |                | 15800          |                |
| Chromium                   | 32.7           |                           | 37.8                      |                | 29.0           |                |
| Cobalt                     | 15.8           | J                         | 17.0                      | J              | 13.8           | J              |
| Copper                     | 29.1           | J                         | 30.5                      | J              | 23.8           | J              |
| Iron                       | 29500          |                           | 34700                     |                | 26700          |                |
| Lead                       | 12.9           | J                         | 14.8                      | J              | 11.2           | J              |
| Magnesium                  | 9190           |                           | 13100                     |                | 8650           |                |
| Manganese                  | 1700           |                           | 628                       |                | 616            |                |
| Mercury                    | 0.076          | J                         | 0.067                     | UJ             | 0.050          | UJ             |

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|                                              |                    |                               |                               |                    |                    |                    |
|----------------------------------------------|--------------------|-------------------------------|-------------------------------|--------------------|--------------------|--------------------|
| Sample Number                                | PC-SO-<br>SB1-0608 | PC-SO-SB3-<br>0810            | PC-SO-DUP-<br>01              | PC-SO-<br>SB5-0608 | PC-SO-<br>SS1-0001 | PC-SO-<br>SS2-0001 |
| Sample Location                              | SB1                | SB3                           | SB3                           | SB5                | SS1                | SS2                |
| Date Sampled                                 | 4/22/2002          | 4/22/2002                     | 4/22/2002                     | 4/22/2002          | 4/23/2002          | 4/23/2002          |
| Interval                                     | 6.0-8.0            | 8.0-10.0                      | 8.0-10.0                      | 6.0-8.0            | 0.0-1.0            | 0.0-1.0            |
| QC Identifier                                | None               | Field Dug, PC-<br>SO-SB3-0810 | Field Dug, PC-<br>SO-SB3-0810 | None               | None               | None               |
| Nickel                                       | 31.6 J             | 36.6 J                        | 29.6 J                        | 23.7 J             | 13.3 J             | 12.9 J             |
| Potassium                                    | 2590 J             | 4580 J                        | 3180 J                        | 2240 J             | 655 J              | 878 J              |
| Selenium                                     | 1.8 UJ             | 1.2 UJ                        | 0.73 UJ                       | 0.76 UJ            | 0.85 UJ            | 0.84 UJ            |
| Silver                                       | 0.20 U             | 0.18 U                        | 0.17 U                        | 0.17 U             | 0.15 U             | 0.14 U             |
| Sodium                                       | 377 J              | 421 J                         | 326 J                         | 268 J              | 223 J              | 301 J              |
| Thallium                                     | R                  | R                             | R                             | R                  | R                  | R                  |
| Vanadium                                     | 46.4               | 52.8                          | 43.3                          | 45.1               | 25.5               | 28.1               |
| Zinc                                         | 79.6 J             | 82.4 J                        | 71.3 J                        | 59.3 J             | 53.6 J             | 148                |
| Total Petroleum Hydrocarbon Analysis (MG/KG) |                    |                               |                               |                    |                    |                    |
| Extractable TPH                              | 20                 | 15                            | 15                            | 15                 | 410                | 190                |

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\* - From dilution analysis; R - Rejected; NA - Not Analyzed

ANALYTICAL RESULTS  
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| Sample Number                         | PC-GW-MW1-01            | PC-GW-MW1-01            | PC-GW-MW3-01 | PC-GW-MW5-01 |
|---------------------------------------|-------------------------|-------------------------|--------------|--------------|
| Sample Location                       | MW1                     | MW1                     | MW3          | MW5          |
| Date Sampled                          | 4/24/2002               | 4/24/2002               | 4/24/2002    | 4/24/2002    |
| Interval                              | 0.0-0.0                 | 0.0-0.0                 | 0.0-0.0      | 0.0-0.0      |
| QC Identifier                         | Field Dup: PC-GW-MW1-01 | Field Dup: PC-GW-MW1-01 | None         | None         |
| Volatile Organic Analysis (UG/L)      |                         |                         |              |              |
| 1,1,1-Trichloroethane                 | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 1,1,2,2-Tetrachloroethane             | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 1,1,2-Trichloroethane                 | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 1,1-Dichloroethane                    | 80                      | 80                      | 10 U         | 10 U         |
| 1,1-Dichloroethene                    | 2 J                     | 2 J                     | 10 U         | 10 U         |
| 1,2,4-Trichlorobenzene                | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 1,2-Dibromo-3-chloropropane           | R                       | R                       | R            | R            |
| 1,2-Dibromoethane                     | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 1,2-Dichlorobenzene                   | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 1,2-Dichloroethane                    | 1 J                     | 1 J                     | 2 J          | 10 U         |
| 1,2-Dichloropropane                   | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 1,3-Dichlorobenzene                   | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 1,4-Dichlorobenzene                   | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 2-Butanone                            | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 2-Hexanone                            | 10 U                    | 10 U                    | 10 U         | 10 U         |
| 4-Methyl-2-Pentanone                  | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Acetone                               | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Benzene                               | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Bromodichloromethane                  | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Bromoform                             | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Bromomethane                          | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Carbon Disulfide                      | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Carbon Tetrachloride                  | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Chlorobenzene                         | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Chloroethane                          | 15 J                    | 15 J                    | 10 U         | 10 U         |
| Chloroform                            | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Chloromethane                         | 10 U                    | 10 U                    | 1 J          | 10 U         |
| cis-1,2-Dichloroethene                | 62                      | 62                      | 2 J          | 6 J          |
| cis-1,3-Dichloropropene               | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Cyclohexane                           | 10 U                    | 10 U                    | 10 U         | 10 U         |

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\* - From dilution analysis; R - Rejected; NA - Not Analyzed

ANALYTICAL RESULTS  
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| Sample Number                         | PC-GW-MW1-01            | PC-GW-DUP-01            | PC-GW-MW3-01 | PC-GW-MW5-01 |
|---------------------------------------|-------------------------|-------------------------|--------------|--------------|
| Sample Location                       | MW1                     | MW1                     | MW3          | MW5          |
| Date Sampled                          | 4/24/2002               | 4/24/2002               | 4/24/2002    | 4/24/2002    |
| Interval                              | 0.0-0.0                 | 0.0-0.0                 | 0.0-0.0      | 0.0-0.0      |
| QC Identifier                         | Field Dup: PC-GW-MW1-01 | Field Dup: PC-GW-MW1-01 | None         | None         |
| Dibromochloromethane                  | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Dichlorodifluoromethane               | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Ethylbenzene                          | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Isopropylbenzene                      | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Methyl Acetate                        | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Methyl tert-Butyl Ether               | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Methylcyclohexane                     | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Methylene Chloride                    | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Styrene                               | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Tetrachloroethene                     | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Toluene                               | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Total Xylenes                         | 10 U                    | 10 U                    | 10 U         | 10 U         |
| trans-1,2-Dichloroethene              | 10 U                    | 2 J                     | 10 U         | 10 U         |
| trans-1,3-Dichloropropene             | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Trichloroethene                       | 2 J                     | 2 J                     | 10 U         | 10 U         |
| Trichlorofluoromethane                | 10 U                    | 10 U                    | 10 U         | 10 U         |
| Vinyl Chloride                        | 58 J                    | 58 J                    | 10 UJ        | 3 J          |
| Semi-volatile Organic Analysis (UG/L) |                         |                         |              |              |
| 1,1'-Biphenyl                         | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2,2'-oxybis(1-Chloropropane)          | 13 UJ                   | 13 UJ                   | 13 UJ        | 13 UJ        |
| 2,4,5-Trichlorophenol                 | 31 U                    | 31 U                    | 31 U         | 31 U         |
| 2,4,6-Trichlorophenol                 | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2,4-Dichlorophenol                    | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2,4-Dimethylphenol                    | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2,4-Dinitrophenol                     | 31 UJ                   | 31 UJ                   | 31 UJ        | 31 UJ        |
| 2,4-Dinitrotoluene                    | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2,6-Dinitrotoluene                    | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2-Chloronaphthalene                   | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2-Chlorophenol                        | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2-Methylnaphthalene                   | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2-Methylphenol                        | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 2-Nitroaniline                        | 31 U                    | 31 U                    | 31 U         | 31 U         |

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;  
\* - From dilution analysis; R - Rejected; NA - Not Analyzed

**ANALYTICAL RESULTS  
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| Sample Number              | PC-GW-MW1-01            | PC-GW-DUP-01            | PC-GW-MW3-01 | PC-GW-MW5-01 |
|----------------------------|-------------------------|-------------------------|--------------|--------------|
| Sample Location            | MW1                     | MW1                     | MW3          | MW5          |
| Date Sampled               | 4/24/2002               | 4/24/2002               | 4/24/2002    | 4/24/2002    |
| Interval                   | 0.0-0.0                 | 0.0-0.0                 | 0.0-0.0      | 0.0-0.0      |
| QC Identifier              | Field Dup. PC-GW-MW1-01 | Field Dup. PC-GW-MW1-01 | None         | None         |
| 2-Nitrophenol              | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 3,3'-Dichlorobenzidine     | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 3-Nitroaniline             | 31 U                    | 31 U                    | 31 U         | 31 U         |
| 4,6-Dinitro-2-methylphenol | 31 UJ                   | 31 UJ                   | 31 UJ        | 31 UJ        |
| 4-Bromophenyl-phenylether  | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 4-Chloro-3-methylphenol    | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 4-Chloroaniline            | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 4-Chlorophenyl-phenylether | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 4-Methylphenol             | 13 U                    | 13 U                    | 13 U         | 13 U         |
| 4-Nitroaniline             | 31 U                    | 31 U                    | 31 U         | 31 U         |
| 4-Nitrophenol              | 31 U                    | 31 U                    | 31 U         | 31 U         |
| Acenaphthene               | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Acenaphthylene             | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Acetophenone               | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Anthracene                 | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Atrazine                   | 13 UJ                   | 13 UJ                   | 13 UJ        | 13 UJ        |
| Benzaldehyde               | 13 UJ                   | 13 UJ                   | 13 UJ        | 13 UJ        |
| Benzo(a)anthracene         | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Benzo(a)pyrene             | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Benzo(b)fluoranthene       | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Benzo(g,h,i)perylene       | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Benzo(k)fluoranthene       | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Bis(2-Chloroethoxy)methane | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Bis(2-Chloroethyl)ether    | 13 U                    | 13 U                    | 13 U         | 13 U         |
| bis(2-Ethylhexyl)phthalate | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Butylbenzylphthalate       | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Caprolactam                | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Carbazole                  | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Chrysene                   | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Di-n-Butylphthalate        | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Di-n-octylphthalate        | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Dibenz(a,h)anthracene      | 13 U                    | 13 U                    | 13 U         | 13 U         |

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\* - From dilution analysis; R - Rejected; NA - Not Analyzed

ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT

| Sample Number                 | PC-GW-MW1-01            | PC-GW-DUP-01            | PC-GW-MW3-01 | PC-GW-MW5-01 |
|-------------------------------|-------------------------|-------------------------|--------------|--------------|
| Sample Location               | MW1                     | MW1                     | MW3          | MW5          |
| Date Sampled                  | 4/24/2002               | 4/24/2002               | 4/24/2002    | 4/24/2002    |
| Interval                      | 0.0-0.0                 | 0.0-0.0                 | 0.0-0.0      | 0.0-0.0      |
| QC Identifier                 | Field Dup: PC-GW-MW1-01 | Field Dup: PC-GW-MW1-01 | None         | None         |
| Dibenzofuran                  | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Diethylphthalate              | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Dimethylphthalate             | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Fluoranthene                  | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Fluorene                      | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Hexachlorobenzene             | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Hexachlorobutadiene           | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Hexachlorocyclopentadiene     | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Hexachloroethane              | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Indeno(1,2,3-cd)pyrene        | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Isophorone                    | 13 U                    | 13 U                    | 13 U         | 13 U         |
| N-Nitroso-di-n-propylamine    | 13 U                    | 13 U                    | 13 U         | 13 U         |
| N-Nitroso-diphenylamine       | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Naphthalene                   | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Nitrobenzene                  | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Pentachlorophenol             | 31 UJ                   | 31 UJ                   | 31 UJ        | 31 UJ        |
| Phenanthrene                  | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Phenol                        | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Pyrene                        | 13 U                    | 13 U                    | 13 U         | 13 U         |
| Pesticide/PCB Analysis (UG/L) |                         |                         |              |              |
| 4,4'-DDD                      | 0.13 U                  | 0.13 U                  | 0.13 U       | 0.13 U       |
| 4,4'-DDE                      | 0.13 U                  | 0.13 U                  | 0.13 U       | 0.13 U       |
| 4,4'-DDT                      | 0.13 U                  | 0.13 U                  | 0.13 U       | 0.13 U       |
| Aldrin                        | 0.063 U                 | 0.063 U                 | 0.063 U      | 0.063 U      |
| alpha-BHC                     | 0.063 U                 | 0.063 U                 | 0.063 U      | 0.063 U      |
| alpha-Chlordane               | 0.063 U                 | 0.063 U                 | 0.063 U      | 0.063 U      |
| Aroclor-1016                  | 1.3 U                   | 1.3 U                   | 1.3 U        | 1.3 U        |
| Aroclor-1221                  | 2.5 U                   | 2.5 U                   | 2.5 U        | 2.5 U        |
| Aroclor-1232                  | 1.3 U                   | 1.3 U                   | 1.3 U        | 1.3 U        |
| Aroclor-1242                  | - 1.3 U                 | 1.3 U                   | 1.3 U        | 1.3 U        |
| Aroclor-1248                  | 1.3 U                   | 1.3 U                   | 1.3 U        | 1.3 U        |
| Aroclor-1254                  | - 1.3 U                 | 1.3 U                   | 1.3 U        | 1.3 U        |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
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| Sample Number             | PC-GW-MW1-01            | PC-GW-DUP-01            | PC-GW-MW3-01 | PC-GW-MW5-01 |
|---------------------------|-------------------------|-------------------------|--------------|--------------|
| Sample Location           | MW1                     | MW1                     | MW3          | MW5          |
| Date Sampled              | 4/24/2002               | 4/24/2002               | 4/24/2002    | 4/24/2002    |
| Interval                  | 0.0-0.0                 | 0.0-0.0                 | 0.0-0.0      | 0.0-0.0      |
| QC Identifier             | Field Dup. PC-GW-MW1-01 | Field Dup. PC-GW-MW1-01 | None         | None         |
| Aroclor-1260              | 1.3                     | 1.3                     | 1.3          | 1.3          |
| beta-BHC                  | 0.063                   | 0.063                   | 0.063        | 0.063        |
| delta-BHC                 | 0.063                   | 0.063                   | 0.063        | 0.063        |
| Dieldrin                  | 0.13                    | 0.13                    | 0.13         | 0.13         |
| Endosulfan I              | 0.063                   | 0.063                   | 0.063        | 0.063        |
| Endosulfan II             | 0.13                    | 0.13                    | 0.13         | 0.13         |
| Endosulfan Sulfate        | 0.13                    | 0.13                    | 0.13         | 0.13         |
| Endrin                    | 0.13                    | 0.13                    | 0.13         | 0.13         |
| Endrin Aldehyde           | 0.13                    | 0.13                    | 0.13         | 0.13         |
| Endrin Ketone             | 0.13                    | 0.13                    | 0.13         | 0.13         |
| gamma-BHC                 | 0.063                   | 0.063                   | 0.063        | 0.063        |
| gamma-Chlordane           | 0.063                   | 0.063                   | 0.063        | 0.063        |
| Heptachlor                | 0.063                   | 0.063                   | 0.063        | 0.063        |
| Heptachlor Epoxide        | 0.063                   | 0.063                   | 0.063        | 0.063        |
| Methoxychlor              | 0.63                    | 0.63                    | 0.63         | 0.63         |
| Toxaphene                 | 6.3                     | 6.3                     | 6.3          | 6.3          |
| TAL Metal Analysis (UG/L) |                         |                         |              |              |
| Aluminum                  | 208                     | 284                     | 775          | 115          |
| Antimony                  | 1.9                     | 1.8                     | 1.8          | 1.6          |
| Arsenic                   | 4.2                     | 4.2                     | 4.2          | 4.2          |
| Barium                    | 744                     | 720                     | 129          | 220          |
| Beryllium                 | 0.75                    | 0.78                    | 0.75         | 0.69         |
| Cadmium                   | 0.91                    | 0.82                    | 0.30         | 0.30         |
| Calcium                   | 134000                  | 135000                  | 77800        | 92300        |
| Chromium                  | 0.50                    | 0.50                    | 1.7          | 0.50         |
| Cobalt                    | 13.4                    | 13.2                    | 0.60         | 6.7          |
| Copper                    | 2.7                     | 3.6                     | 0.70         | 0.70         |
| Iron                      | 3640                    | 3180                    | 1460         | 13400        |
| Lead                      | 2.1                     | 2.1                     | 1.3          | 1.5          |
| Magnesium                 | 41300                   | 41700                   | 23400        | 35400        |
| Manganese                 | 13400                   | 13500                   | 331          | 13200        |
| Mercury                   | 0.10                    | 0.10                    | 0.10         | 0.10         |

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**ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT**

|                                             |                         |                         |              |              |
|---------------------------------------------|-------------------------|-------------------------|--------------|--------------|
| Sample Number                               | PC-GW-MW1-01            | PC-GW-DUP-01            | PC-GW-MW3-01 | PC-GW-MW5-01 |
| Sample Location                             | MW1                     | MW1                     | MW3          | MW5          |
| Date Sampled                                | 4/24/2002               | 4/24/2002               | 4/24/2002    | 4/24/2002    |
| Interval                                    | 0.0-0.0                 | 0.0-0.0                 | 0.0-0.0      | 0.0-0.0      |
| QC Identifier                               | Field Dup: PC-GW-MW1-01 | Field Dup: PC-GW-MW1-01 | None         | None         |
| Nickel                                      | 12.1                    | 12.0                    | 2.0          | 2.5 U        |
| Potassium                                   | 2880                    | J                       | 2950 J       | 3020 J       |
| Selenium                                    | 8.2                     | UJ                      | 8.0 UJ       | 2.2 U        |
| Silver                                      | 0.70                    | U                       | 0.70 U       | 10.3 UJ      |
| Sodium                                      | 48300                   |                         | 48300        | 0.70 U       |
| Thallium                                    | 17.2                    |                         | 15.1         | 25300        |
| Vanadium                                    | 0.89                    | UJ                      | 0.98 UJ      | 3.3 U        |
| Zinc                                        | 1.7                     | J                       | 2.0 J        | 2.1 U        |
|                                             |                         |                         |              | 1.4 UJ       |
| Total Petroleum Hydrocarbon Analysis (MG/L) |                         |                         |              |              |
| Extractable TPH                             | 0.65                    | 0.80                    | 0.11         | 0.33         |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT

| Sample Number                         | PC-SD-01  | PC-SD-02               | PC-SD-<br>DUP-01       |
|---------------------------------------|-----------|------------------------|------------------------|
| Sample Location                       | SD-01     | SD-02                  | SD-02                  |
| Date Sampled                          | 4/19/2002 | 4/19/2002              | 4/19/2002              |
| Interval                              | 0.0-0.0   | 0.0-0.0                | 0.0-0.0                |
| QC Identifier                         | None      | Field Dup:<br>PC-SD-02 | Field Dup:<br>PC-SD-02 |
| Volatile Organic Analysis (UG/KG)     |           |                        |                        |
| 1,1,1-Trichloroethane                 | 130 U     | 97 U                   | 91 U                   |
| 1,1,2,2-Tetrachloroethane             | 130 U     | 97 U                   | 91 U                   |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 130 U     | 97 U                   | 91 U                   |
| 1,1,2-Trichloroethane                 | 130 U     | 97 U                   | 91 U                   |
| 1,1-Dichloroethane                    | 130 U     | 97 U                   | 91 U                   |
| 1,1-Dichloroethene                    | 130 U     | 97 U                   | 91 U                   |
| 1,2,4-Trichlorobenzene                | 130 U     | 97 U                   | 91 U                   |
| 1,2-Dibromo-3-chloropropane           | 130 U     | 97 U                   | 91 U                   |
| 1,2-Dibromoethane                     | 130 U     | 97 U                   | 91 U                   |
| 1,2-Dichlorobenzene                   | 130 U     | 97 U                   | 91 U                   |
| 1,2-Dichloroethane                    | 130 U     | 97 U                   | 91 U                   |
| 1,2-Dichloropropane                   | 130 U     | 97 U                   | 91 U                   |
| 1,3-Dichlorobenzene                   | 130 U     | 97 U                   | 91 U                   |
| 1,4-Dichlorobenzene                   | 130 U     | 97 U                   | 91 U                   |
| 2-Butanone                            | 130 UJ    | 97 UJ                  | 91 UJ                  |
| 2-Hexanone                            | 130 UJ    | 97 UJ                  | 91 UJ                  |
| 4-Methyl-2-Pentanone                  | 130 UJ    | 97 UJ                  | 91 UJ                  |
| Acetone                               | 130 UJ    | 97 UJ                  | 91 UJ                  |
| Benzene                               | 130 U     | 97 U                   | 91 U                   |
| Bromodichloromethane                  | 130 U     | 97 U                   | 91 U                   |
| Bromoform                             | 130 U     | 97 U                   | 91 U                   |
| Bromomethane                          | 130 U     | 97 U                   | 91 U                   |
| Carbon Disulfide                      | 130 U     | 97 U                   | 91 U                   |
| Carbon Tetrachloride                  | 130 U     | 97 U                   | 91 U                   |
| Chlorobenzene                         | 130 U     | 97 U                   | 91 U                   |
| Chloroethane                          | 130 U     | 97 U                   | 91 U                   |
| Chloroform                            | 130 U     | 97 U                   | 91 U                   |
| Chloromethane                         | 130 UJ    | 97 UJ                  | 91 UJ                  |
| cis-1,2-Dichloroethane                | 130 U     | 97 U                   | 91 U                   |
| cis-1,3-Dichloropropene               | 130 U     | 97 U                   | 91 U                   |
| Cyclohexane                           | 130 U     | 97 U                   | 91 U                   |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT

| Sample Number                          | PC-SD-01  | PC-SD-02   | PC-SD-01   | PC-SD-02  |
|----------------------------------------|-----------|------------|------------|-----------|
| Sample Location                        | SD-01     | SD-02      | SD-01      | SD-02     |
| Date Sampled                           | 4/19/2002 | 4/19/2002  | 4/19/2002  | 4/19/2002 |
| Interval                               | 0.0-0.0   | 0.0-0.0    | 0.0-0.0    | 0.0-0.0   |
| QC Identifier                          | None      | Field Dup. | Field Dup. | PC-SD-02  |
| Dibromochloromethane                   | 130 U     | 97 U       | 91 U       | 91 U      |
| Dichlorodifluoromethane                | 130 U     | 97 U       | 91 U       | 91 U      |
| Ethylbenzene                           | 130 U     | 97 U       | 91 U       | 91 U      |
| Isopropylbenzene                       | 130 U     | 97 U       | 91 U       | 91 U      |
| Methyl Acetate                         | 130 UJ    | 250 J      | 91 UJ      | 91 UJ     |
| Methyl tert-Butyl Ether                | 130 U     | 97 U       | 91 U       | 91 U      |
| Methylcyclohexane                      | 130 U     | 97 U       | 91 U       | 91 U      |
| Methylene Chloride                     | 130 U     | 97 U       | 91 U       | 91 U      |
| Styrene                                | 130 U     | 97 U       | 91 U       | 91 U      |
| Tetrachloroethene                      | 130 U     | 97 U       | 91 U       | 91 U      |
| Toluene                                | 130 U     | 97 U       | 91 U       | 91 U      |
| Total Xylenes                          | 130 U     | 97 U       | 91 U       | 91 U      |
| trans-1,2-Dichloroethene               | 130 U     | 97 U       | 91 U       | 91 U      |
| trans-1,3-Dichloropropene              | 130 U     | 97 U       | 91 U       | 91 U      |
| Trichloroethene                        | 130 U     | 97 U       | 91 U       | 91 U      |
| Trichlorofluoromethane                 | 130 U     | 97 U       | 91 U       | 91 U      |
| Vinyl Chloride                         | 130 U     | 97 U       | 91 U       | 91 U      |
| Semi-volatile Organic Analysis (UG/KG) |           |            |            |           |
| 1,1'-Biphenyl                          | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2,2'-oxybis(1-Chloropropane)           | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2,4,5-Trichlorophenol                  | 810 U     | 820 UJ     | 780 UJ     | 780 UJ    |
| 2,4,6-Trichlorophenol                  | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2,4-Dichlorophenol                     | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2,4-Dimethylphenol                     | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2,4-Dinitrophenol                      | 810 UJ    | 820 UJ     | 780 UJ     | 780 UJ    |
| 2,4-Dinitrotoluene                     | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2,6-Dinitrotoluene                     | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2-Chloronaphthalene                    | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2-Chlorophenol                         | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2-Methylnaphthalene                    | 320 U     | 46 J       | 310 UJ     | 310 UJ    |
| 2-Methylphenol                         | 320 U     | 330 UJ     | 310 UJ     | 310 UJ    |
| 2-Nitroaniline                         | 810 U     | 820 UJ     | 780 UJ     | 780 UJ    |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
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| Sample Number              | PC-SD-01  | PC-SD-02   | PC-SD-DUP-01 |
|----------------------------|-----------|------------|--------------|
| Sample Location            | SD-01     | SD-02      | SD-02        |
| Date Sampled               | 4/19/2002 | 4/19/2002  | 4/19/2002    |
| Interval                   | 0.0-0.0   | 0.0-0.0    | 0.0-0.0      |
| QC Identifier              | None      | Field Dup. | Field Dup.   |
|                            | PC-SD-01  | PC-SD-02   | PC-SD-02     |
| 2-Nitrophenol              | 320 U     | 330 UJ     | 310 UJ       |
| 3,3'-Dichlorobenzidine     | 320 UJ    | 330 UJ     | 310 UJ       |
| 3-Nitroaniline             | 810 U     | 820 UJ     | 780 UJ       |
| 4,6-Dinitro-2-methylphenol | 810 UJ    | 820 UJ     | 780 UJ       |
| 4-Bromophenyl-phenylether  | 320 U     | 330 UJ     | 310 UJ       |
| 4-Chloro-3-methylphenol    | 320 U     | 330 UJ     | 310 UJ       |
| 4-Chloroaniline            | 320 U     | 330 UJ     | 310 UJ       |
| 4-Chlorophenyl-phenylether | 320 U     | 330 UJ     | 310 UJ       |
| 4-Methylphenol             | 320 U     | 330 UJ     | 310 UJ       |
| 4-Nitroaniline             | 810 UJ    | 820 UJ     | 780 UJ       |
| 4-Nitrophenol              | 810 U     | 820 UJ     | 780 UJ       |
| Acenaphthene               | 320 U     | 160 J      | 310 UJ       |
| Acenaphthylene             | 320 U     | 940 J      | 220 J        |
| Acetophenone               | 320 U     | 330 UJ     | 310 UJ       |
| Anthracene                 | 320 U     | 1800 J     | 190 J        |
| Altrazine                  | 320 U     | 330 UJ     | 310 UJ       |
| Benzaldehyde               | 320 U     | 330 UJ     | 310 UJ       |
| Benzo(a)anthracene         | 270 J     | 8000 J*    | 3200 J*      |
| Benzo(a)pyrene             | 270 J     | 5600 J*    | 2700 J*      |
| Benzo(b)fluoranthene       | 510 J     | 7000 J*    | 4000 J*      |
| Benzo(g,h,i)perylene       | 130 J     | 1900 J     | 1100 J       |
| Benzo(k)fluoranthene       | 200 J     | 2400 J*    | 1800 J       |
| Bis(2-Chloroethoxy)methane | 320 U     | 330 UJ     | 310 UJ       |
| Bis(2-Chloroethyl)ether    | 320 U     | 330 UJ     | 310 UJ       |
| Bis(2-Ethylhexyl)phthalate | 88000 J*  | 3600 J*    | 1800 J       |
| Butylbenzylphthalate       | 320 UJ    | 330 UJ     | 310 UJ       |
| Caprolactam                | 320 UJ    | 330 UJ     | 310 UJ       |
| Carbazole                  | 320 U     | 160 J      | 49 J         |
| Chrysene                   | 140 J     | 8400 J*    | 3500 J*      |
| Di-n-Butylphthalate        | 320 U     | 330 UJ     | 310 UJ       |
| Di-n-octylphthalate        | 2200 J    | 1200 J     | 250 J        |
| Dibenzo(a,h)anthracene     | 320 UJ    | 630 J      | 350 J        |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
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| Sample Number                  | PC-SD-01  | PC-SD-02               | PC-SD-<br>DUP-01 |
|--------------------------------|-----------|------------------------|------------------|
| Sample Location                | SD-01     | SD-02                  | SD-02            |
| Date Sampled                   | 4/19/2002 | 4/19/2002              | 4/19/2002        |
| Interval                       | 0.0-0.0   | 0.0-0.0                | 0.0-0.0          |
| QC Identifier                  | None      | Field Dup.<br>PC-SD-02 | PC-SD-02         |
| Dibenzofuran                   | 320 U     | 100 J                  | 310 UJ           |
| Diethylphthalate               | 320 U     | 330 UJ                 | 310 UJ           |
| Dimethylphthalate              | 320 U     | 330 UJ                 | 310 UJ           |
| Fluoranthene                   | 440       | 16000 J*               | 5600 J*          |
| Fluorene                       | 320 U     | 920 J                  | 51 J             |
| Hexachlorobenzene              | 320 U     | 330 UJ                 | 310 UJ           |
| Hexachlorobutadiene            | 320 UJ    | 330 UJ                 | 310 UJ           |
| Hexachlorocyclopentadiene      | 320 U     | 330 UJ                 | 310 UJ           |
| Hexachloroethane               | 320 U     | 330 UJ                 | 310 UJ           |
| Indeno(1,2,3-cd)pyrene         | 140 J     | 2100 J                 | 1300 J           |
| Isophorone                     | 320 U     | 330 UJ                 | 310 UJ           |
| N-Nitroso-di-n-propylamine     | 320 U     | 330 UJ                 | 310 UJ           |
| N-Nitroso-diphenylamine        | 320 U     | 330 UJ                 | 310 UJ           |
| Naphthalene                    | 320 U     | 45 J                   | 310 UJ           |
| Nitrobenzene                   | 320 U     | 330 UJ                 | 310 UJ           |
| Pentachlorophenol              | 810 UJ    | 820 UJ                 | 780 UJ           |
| Phenanthrene                   | 190 J     | 13000 J*               | 1000 J           |
| Phenol                         | 320 U     | 330 UJ                 | 310 UJ           |
| Pyrene                         | 1700 J    | 20000 J*               | 6200 J*          |
| Pesticide/PCB Analysis (UG/KG) |           |                        |                  |
| 4,4'-DDD                       | 11        | 3.2 U                  | 3.1 U            |
| 4,4'-DDE                       | 23        | 3.2 U                  | 3.1 U            |
| 4,4'-DDT                       | 6.1       | 4.1 J                  | 11 J             |
| Aldrin                         | 1.7 U     | 1.7 U                  | 1.6 U            |
| alpha-BHC                      | 1.7 U     | 1.7 U                  | 1.6 U            |
| alpha-Chlordane                | 2.0       | 1.7 U                  | 1.6 U            |
| Aroclor-1016                   | 32 U      | 32 U                   | 31 U             |
| Aroclor-1221                   | 66 U      | 66 U                   | 64 U             |
| Aroclor-1232                   | 32 U      | 32 U                   | 31 U             |
| Aroclor-1242                   | 32 U      | 32 U                   | 31 U             |
| Aroclor-1248                   | 32 U      | 32 U                   | 31 U             |
| Aroclor-1254                   | 1100      | 32 U                   | 31 U             |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT

| Sample Number              | PC-SD-01  | PC-SD-02   | PC-SD-01   | PC-SD-02   | PC-SD-01   | PC-SD-02   |
|----------------------------|-----------|------------|------------|------------|------------|------------|
| Sample Location            | SD-01     | SD-02      | SD-01      | SD-02      | SD-01      | SD-02      |
| Date Sampled               | 4/19/2002 | 4/19/2002  | 4/19/2002  | 4/19/2002  | 4/19/2002  | 4/19/2002  |
| Interval                   | 0.0-0.0   | 0.0-0.0    | 0.0-0.0    | 0.0-0.0    | 0.0-0.0    | 0.0-0.0    |
| QC Identifier              | None      | Field Dup. | Field Dup. | Field Dup. | Field Dup. | Field Dup. |
| PC-SD-01                   | PC-SD-02  | PC-SD-01   | PC-SD-02   | PC-SD-01   | PC-SD-02   | PC-SD-01   |
| Aroclor-1260               | 32        | U          | 32         | U          | 31         | U          |
| beta-BHC                   | 1.7       | U          | 1.7        | U          | 1.8        | U          |
| delta-BHC                  | 1.7       | U          | 1.7        | U          | 1.6        | U          |
| Dieldrin                   | 3.2       | U          | 3.2        | U          | 3.1        | U          |
| Endosulfan I               | 1.7       | U          | 1.7        | U          | 1.6        | U          |
| Endosulfan II              | 3.2       | U          | 3.2        | U          | 3.1        | U          |
| Endosulfan Sulfate         | 11        | U          | 3.2        | U          | 3.1        | U          |
| Endrin                     | 3.2       | U          | 3.2        | U          | 3.1        | U          |
| Endrin Aldehyde            | 18        | U          | 3.2        | U          | 3.1        | U          |
| Endrin Ketone              | 3.2       | U          | 3.2        | UJ         | 12         | J          |
| gamma-BHC                  | 1.7       | U          | 1.7        | U          | 1.6        | U          |
| gamma-Chlordane            | 10        | U          | 1.7        | U          | 1.6        | U          |
| Heptachlor                 | 1.7       | U          | 1.7        | U          | 1.6        | U          |
| Heptachlor Epoxide         | 1.7       | U          | 1.7        | U          | 1.6        | U          |
| Methoxychlor               | 17        | U          | 17         | U          | 20         | U          |
| Toxaphene                  | 170       | U          | 170        | U          | 160        | U          |
| TAL Metal Analysis (MG/KG) |           |            |            |            |            |            |
| Aluminum                   | 4830      |            | 7530       |            | 6440       |            |
| Antimony                   | 0.47      | U          | 0.43       | U          | 0.50       | U          |
| Arsenic                    | 3.4       |            | 3.7        |            | 6.8        |            |
| Barium                     | 60.9      |            | 81.8       |            | 102        |            |
| Beryllium                  | 0.30      |            | 0.41       |            | 0.40       |            |
| Cadmium                    | 1.3       | J          | 0.085      | U          | 0.14       | J          |
| Calcium                    | 1170      |            | 3150       |            | 4570       |            |
| Chromium                   | 47.3      | J          | 24.0       | J          | 56.2       | J          |
| Cobalt                     | 5.6       | J          | 7.8        | J          | 8.5        | J          |
| Copper                     | 39.1      | J          | 16.4       | J          | 32.9       | J          |
| Iron                       | 15200     |            | 17900      |            | 21500      |            |
| Lead                       | 23.9      |            | 12.5       |            | 20.4       |            |
| Magnesium                  | 2360      |            | 3660       |            | 3760       |            |
| Manganese                  | 589       | J          | 1280       | J          | 2430       | J          |
| Mercury                    | 0.26      |            | 0.059      | U          | 0.060      | U          |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
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| Sample Number                                | PC-SD-01  | PC-SD-02   | PC-SD-01   |
|----------------------------------------------|-----------|------------|------------|
| Sample Location                              | SD-01     | SD-02      | SD-02      |
| Date Sampled                                 | 4/19/2002 | 4/19/2002  | 4/19/2002  |
| Interval                                     | 0.0-0.0   | 0.0-0.0    | 0.0-0.0    |
| QC Identifier                                | None      | Field Dup. | Field Dup. |
|                                              |           | PC-SD-02   | PC-SD-02   |
| Nickel                                       | 24.8      | 18.5       | 26.0       |
| Potassium                                    | 432       | 821        | 744        |
| Selenium                                     | 1.6 J     | 1.7 J      | 2.3 J      |
| Silver                                       | 0.070 UJ  | 0.065 UJ   | 0.075 UJ   |
| Sodium                                       | 142 U     | 179 U      | 163 U      |
| Thallium                                     | 0.47 U    | 0.43 U     | 0.50 U     |
| Vanadium                                     | 22.6      | 31.1       | 34.6       |
| Zinc                                         | 109       | 61.7       | 96.3       |
| Total Petroleum Hydrocarbon Analysis (MG/KG) |           |            |            |
| Extractable TPH                              | 560       | 80 J       | 170 J      |

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ANALYTICAL RESULTS  
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| Sample Number                         | PC-SW-01  | PC-SW-02               | PC-SW-03               |
|---------------------------------------|-----------|------------------------|------------------------|
| Sample Location                       | SW-01     | SW-02                  | SW-03                  |
| Date Sampled                          | 4/19/2002 | 4/19/2002              | 4/19/2002              |
| Interval                              | 0.0-0.0   | 0.0-0.0                | 0.0-0.0                |
| QC Identifier                         | None      | Field Dup.<br>PC-SW-02 | Field Dup.<br>PC-SW-03 |
| Volatile Organic Analytes (UG/L)      |           |                        |                        |
| 1,1,1-Trichloroethane                 | 10 U      | 2 J                    | 2 J                    |
| 1,1,2,2-Tetrachloroethane             | 10 U      | 10 U                   | 10 U                   |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 10 U      | 10 U                   | 10 U                   |
| 1,1,2-Trichloroethane                 | 10 U      | 10 U                   | 10 U                   |
| 1,1-Dichloroethane                    | 10 U      | 2 J                    | 2 J                    |
| 1,2,4-Trichlorobenzene                | 10 U      | 10 U                   | 10 U                   |
| 1,2-Dibromo-3-chloropropane           | 10 U      | 10 U                   | 10 U                   |
| 1,2-Dibromoethane                     | 10 U      | 10 U                   | 10 U                   |
| 1,2-Dichlorobenzene                   | 10 U      | 10 U                   | 10 U                   |
| 1,2-Dichloroethane                    | 10 U      | 10 U                   | 10 U                   |
| 1,2-Dichloropropane                   | 10 U      | 10 U                   | 10 U                   |
| 1,3-Dichlorobenzene                   | 10 U      | 10 U                   | 10 U                   |
| 1,4-Dichlorobenzene                   | 10 U      | 10 U                   | 10 U                   |
| 2-Butanone                            | 10 U      | 10 U                   | 10 U                   |
| 2-Hexanone                            | 10 U      | 10 U                   | 10 U                   |
| 4-Methyl-2-Pentanone                  | 10 U      | 10 U                   | 10 U                   |
| Acetone                               | 10 U      | 10 U                   | 10 U                   |
| Benzene                               | 10 U      | 10 U                   | 10 U                   |
| Bromodichloromethane                  | 10 U      | 10 U                   | 10 U                   |
| Bromoform                             | 10 U      | 10 U                   | 10 U                   |
| Bromomethane                          | 10 U      | 10 U                   | 10 U                   |
| Carbon Disulfide                      | 10 U      | 10 U                   | 10 U                   |
| Carbon Tetrachloride                  | 10 U      | 0.7 J                  | 0.7 J                  |
| Chlorobenzene                         | 10 U      | 10 U                   | 10 U                   |
| Chloroethane                          | 10 U      | 10 U                   | 10 U                   |
| Chloroform                            | 10 U      | 10 U                   | 10 U                   |
| Chloromethane                         | 10 U      | 10 U                   | 10 U                   |
| cis-1,2-Dichloroethane                | 4 J       | 35                     | 35                     |
| cis-1,3-Dichloropropene               | 10 U      | 10 U                   | 10 U                   |
| Cyclohexane                           | 10 U      | 10 U                   | 10 U                   |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
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| Sample Number                       | PC-SW-01  | PC-SW-02               | PC-SW-<br>DUP-01       |
|-------------------------------------|-----------|------------------------|------------------------|
| Sample Location                     | SW-01     | SW-02                  | SW-02                  |
| Date Sampled                        | 4/19/2002 | 4/19/2002              | 4/19/2002              |
| Interval                            | 0.0-0.0   | 0.0-0.0                | 0.0-0.0                |
| QC Identifier                       | None      | Field Dup.<br>PC-SW-02 | Field Dup.<br>PC-SW-02 |
| Dibromochloromethane                | 10 U      | 10 U                   | 10 U                   |
| Dichlorodifluoromethane             | 10 U      | 10 U                   | 10 U                   |
| Ethylbenzene                        | 10 U      | 10 U                   | 10 U                   |
| Isopropylbenzene                    | 10 U      | 10 U                   | 10 U                   |
| Methyl Acetate                      | 10 U      | 10 U                   | 10 U                   |
| Methyl tert-Butyl Ether             | 10 U      | 1 J                    | 1 J                    |
| Methyldichloromethane               | 10 U      | 10 U                   | 10 U                   |
| Methylene Chloride                  | 10 U      | 10 U                   | 10 U                   |
| Styrene                             | 10 U      | 10 U                   | 10 U                   |
| Tetrachloroethene                   | 0.8 J     | 7 J                    | 7 J                    |
| Toluene                             | 10 U      | 10 U                   | 10 U                   |
| Total Xylenes                       | 10 U      | 10 U                   | 10 U                   |
| trans-1,2-Dichloroethene            | 10 U      | 10 U                   | 10 U                   |
| trans-1,3-Dichloropropene           | 10 U      | 10 U                   | 10 U                   |
| Trichloroethane                     | 0.5 J     | 3 J                    | 3 J                    |
| Trichlorofluoromethane              | 10 U      | 10 U                   | 10 U                   |
| Vinyl Chloride                      | 10 U      | 2 J                    | 2 J                    |
| Semivolatile Organic Analysis (UGL) |           |                        |                        |
| 1,1'-Biphenyl                       | 10 U      | 10 U                   | 10 U                   |
| 2,2'-oxybis(1-Chloropropane)        | 10 U      | 10 U                   | 10 U                   |
| 2,4,5-Trichlorophenol               | 25 U      | 25 U                   | 25 U                   |
| 2,4,6-Trichlorophenol               | 10 U      | 10 U                   | 10 U                   |
| 2,4-Dichlorophenol                  | 10 U      | 10 U                   | 10 U                   |
| 2,4-Dimethylphenol                  | 10 U      | 10 U                   | 10 U                   |
| 2,4-Dinitrophenol                   | 25 U      | 25 U                   | 25 U                   |
| 2,4-Dinitrotoluene                  | 10 U      | 10 U                   | 10 U                   |
| 2,6-Dinitrotoluene                  | 10 U      | 10 U                   | 10 U                   |
| 2-Chloronaphthalene                 | 10 U      | 10 U                   | 10 U                   |
| 2-Chlorophenol                      | 10 U      | 10 U                   | 10 U                   |
| 2-Methylnaphthalene                 | 10 U      | 10 U                   | 10 U                   |
| 2-Methylphenol                      | 10 U      | 10 U                   | 10 U                   |
| 2-Nitroaniline                      | 25 U      | 25 U                   | 25 U                   |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
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| Sample Number              | PC-SW-01  | PC-SW-02   | PC-SW-01   | PC-SW-02   | PC-SW-01   | PC-SW-02   |
|----------------------------|-----------|------------|------------|------------|------------|------------|
| Sample Location            | SW-01     | SW-02      | SW-01      | SW-02      | SW-01      | SW-02      |
| Date Sampled               | 4/19/2002 | 4/19/2002  | 4/19/2002  | 4/19/2002  | 4/19/2002  | 4/19/2002  |
| Interval                   | 0.0-0.0   | 0.0-0.0    | 0.0-0.0    | 0.0-0.0    | 0.0-0.0    | 0.0-0.0    |
| QC Identifier              | None      | Field Dup. | Field Dup. | Field Dup. | Field Dup. | Field Dup. |
| 2-Nitrophenol              | 10        | U          | 10         | U          | 10         | U          |
| 3,3'-Dichlorobenzidine     | 10        | U          | 10         | U          | 10         | U          |
| 3-Nitroaniline             | 25        | U          | 25         | U          | 25         | U          |
| 4,6-Dinitro-2-methylphenol | 25        | U          | 25         | U          | 25         | U          |
| 4-Bromophenyl-phenylether  | 10        | U          | 10         | U          | 10         | U          |
| 4-Chloro-3-methylphenol    | 10        | U          | 10         | U          | 10         | U          |
| 4-Chloroaniline            | 10        | UJ         | 10         | UJ         | 10         | UJ         |
| 4-Chlorophenyl-phenylether | 10        | U          | 10         | U          | 10         | U          |
| 4-Methylphenol             | 10        | U          | 10         | U          | 10         | U          |
| 4-Nitroaniline             | 25        | U          | 25         | U          | 25         | U          |
| 4-Nitrophenol              | 25        | U          | 25         | U          | 25         | U          |
| Acenaphthene               | 10        | U          | 10         | U          | 10         | U          |
| Acenaphthylene             | 10        | U          | 10         | U          | 10         | U          |
| Acetophenone               | 10        | U          | 10         | U          | 10         | U          |
| Anthracene                 | 10        | U          | 10         | U          | 10         | U          |
| Atrazine                   | 10        | U          | 10         | U          | 10         | U          |
| Benzaldehyde               | 10        | UJ         | 10         | UJ         | 10         | UJ         |
| Benzo(a)anthracene         | 10        | U          | 10         | U          | 10         | U          |
| Benzo(a)pyrene             | 10        | U          | 10         | U          | 10         | U          |
| Benzo(b)fluoranthene       | 10        | U          | 10         | U          | 10         | U          |
| Benzo(g,h,i)perylene       | 10        | U          | 10         | U          | 10         | U          |
| Benzo(k)fluoranthene       | 10        | U          | 10         | U          | 10         | U          |
| Bis(2-Chloroethoxy)methane | 10        | U          | 10         | U          | 10         | U          |
| Bis(2-Chloroethyl)ether    | 10        | U          | 10         | U          | 10         | U          |
| bis(2-Ethylhexyl)phthalate | 17        | U          | 10         | U          | 10         | U          |
| Butylbenzylphthalate       | 10        | U          | 10         | U          | 10         | U          |
| Caprolactam                | 10        | U          | 10         | U          | 10         | U          |
| Carbazole                  | 10        | U          | 10         | U          | 10         | U          |
| Chrysene                   | 10        | U          | 10         | U          | 10         | U          |
| Di-n-Butylphthalate        | 10        | U          | 10         | U          | 10         | U          |
| Di-n-octylphthalate        | 10        | U          | 10         | U          | 10         | U          |
| Dibenzo(a,h)anthracene     | 10        | U          | 10         | U          | 10         | U          |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
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| Sample Number                 | PC-SW-01  | PC-SW-02   | PC-SW-     |
|-------------------------------|-----------|------------|------------|
| Sample Location               | SW-01     | SW-02      | SW-02      |
| Date Sampled                  | 4/19/2002 | 4/19/2002  | 4/19/2002  |
| Interval                      | 0.0-0.0   | 0.0-0.0    | 0.0-0.0    |
| QC Identifier                 | None      | Field Dup. | Field Dup. |
|                               | PC-SW-01  | PC-SW-02   | PC-SW-02   |
| Dibenzofuran                  | 10 U      | 10 U       | 10 U       |
| Diethylphthalate              | 10 U      | 10 U       | 10 U       |
| Dimethylphthalate             | 10 U      | 10 U       | 10 U       |
| Fluoranthene                  | 10 U      | 10 U       | 10 U       |
| Fluorene                      | 10 U      | 10 U       | 10 U       |
| Hexachlorobenzene             | 10 U      | 10 U       | 10 U       |
| Hexachlorobutadiene           | 10 U      | 10 U       | 10 U       |
| Hexachlorocyclopentadiene     | 10 U      | 10 U       | 10 U       |
| Hexachloroethane              | 10 U      | 10 U       | 10 U       |
| Indeno(1,2,3-cd)pyrene        | 10 U      | 10 U       | 10 U       |
| Isophorone                    | 10 U      | 10 U       | 10 U       |
| N-Nitroso-di-n-propylamine    | 10 U      | 10 U       | 10 U       |
| N-Nitroso-diphenylamine       | 10 U      | 10 U       | 10 U       |
| Naphthalene                   | 10 U      | 10 U       | 10 U       |
| Nitrobenzene                  | 10 U      | 10 U       | 10 U       |
| Pentachlorophenol             | 25 U      | 25 U       | 25 U       |
| Phenanthrene                  | 10 U      | 10 U       | 10 U       |
| Phenol                        | 10 U      | 10 U       | 10 U       |
| Pyrene                        | 10 U      | 10 U       | 10 U       |
| Pesticide/PCB Analysis (UG/L) |           |            |            |
| 4,4'-DDD                      | 0.10 U    | 0.10 U     | 0.10 U     |
| 4,4'-DDE                      | 0.10 U    | 0.10 U     | 0.10 U     |
| 4,4'-DDT                      | 0.10 U    | 0.10 U     | 0.10 U     |
| Aldrin                        | 0.050 U   | 0.050 U    | 0.050 U    |
| alpha-BHC                     | 0.050 U   | 0.050 U    | 0.050 U    |
| alpha-Chlordane               | 0.050 U   | 0.050 U    | 0.050 U    |
| Aroclor-1016                  | 1.0 U     | 1.0 U      | 1.0 U      |
| Aroclor-1221                  | 2.0 U     | 2.0 U      | 2.0 U      |
| Aroclor-1232                  | 1.0 U     | 1.0 U      | 1.0 U      |
| Aroclor-1242                  | 1.0 U     | 1.0 U      | 1.0 U      |
| Aroclor-1248                  | 1.0 U     | 1.0 U      | 1.0 U      |
| Aroclor-1254                  | 1.0 U     | 1.0 U      | 1.0 U      |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
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| Sample Number             | PC-SW-01  | PC-SW-02               | PC-SW-<br>DUP-01       |
|---------------------------|-----------|------------------------|------------------------|
| Sample Location           | SW-01     | SW-02                  | SW-02                  |
| Date Sampled              | 4/19/2002 | 4/19/2002              | 4/19/2002              |
| Interval                  | 0.0-0.0   | 0.0-0.0                | 0.0-0.0                |
| QC Identifier             | None      | Field Dup.<br>PC-SW-02 | Field Dup.<br>PC-SW-02 |
| Aroclor-1260              | 1.0 U     | 1.0 U                  | 1.0 U                  |
| beta-BHC                  | 0.050 U   | 0.050 U                | 0.050 U                |
| delta-BHC                 | 0.050 U   | 0.050 U                | 0.050 U                |
| Dieldrin                  | 0.10 U    | 0.10 U                 | 0.10 U                 |
| Endosulfan I              | 0.050 U   | 0.050 U                | 0.050 U                |
| Endosulfan II             | 0.10 U    | 0.10 U                 | 0.10 U                 |
| Endosulfan Sulfate        | 0.10 U    | 0.10 U                 | 0.10 U                 |
| Endrin                    | 0.10 U    | 0.10 U                 | 0.10 U                 |
| Endrin Aldehyde           | 0.10 U    | 0.10 U                 | 0.10 U                 |
| Endrin Ketone             | 0.10 U    | 0.10 U                 | 0.10 U                 |
| gamma-BHC                 | 0.050 U   | 0.050 U                | 0.050 U                |
| gamma-Chlordane           | 0.050 U   | 0.050 U                | 0.050 U                |
| Heptachlor                | 0.050 UJ  | 0.050 U                | 0.050 U                |
| Heptachlor Epoxide        | 0.050 U   | 0.050 U                | 0.050 U                |
| Methoxychlor              | 0.050 U   | 0.050 U                | 0.050 U                |
| Toxaphene                 | 5.0 U     | 5.0 U                  | 5.0 U                  |
| TAL Metal Analysis (UG/L) |           |                        |                        |
| Aluminum                  | 19.4 U    | 128 U                  | 265 U                  |
| Antimony                  | 38.2 U    | 38.2 U                 | 38.2 U                 |
| Arsenic                   | 2.1 U     | 2.1 U                  | 2.1 U                  |
| Barium                    | 120       | 102                    | 107                    |
| Beryllium                 | 0.33 U    | 0.33 U                 | 0.33 U                 |
| Cadmium                   | 0.22 U    | 0.22 U                 | 0.33 UJ                |
| Calcium                   | 71100     | 64200                  | 64400                  |
| Chromium                  | 2.5 UJ    | 2.3 UJ                 | 5.1 U                  |
| Cobalt                    | 5.6 U     | 5.6 U                  | 5.6 U                  |
| Copper                    | 4.1 U     | 7.4 J                  | 19.7                   |
| Iron                      | 2530      | 4840                   | 5290                   |
| Lead                      | 4.3       | 6.8                    | 8.7                    |
| Magnesium                 | 15700     | 15800                  | 15800                  |
| Manganese                 | 4440      | 2080                   | 2120                   |
| Mercury                   | 0.10 U    | 0.10 U                 | 0.10 U                 |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT

|                                             |           |                        |                        |
|---------------------------------------------|-----------|------------------------|------------------------|
| Sample Number                               | PC-SW-01  | PC-SW-02               | PC-SW-01<br>DUP-01     |
| Sample Location                             | SW-01     | SW-02                  | SW-02                  |
| Date Sampled                                | 4/19/2002 | 4/19/2002              | 4/19/2002              |
| Interval                                    | 0.0-0.0   | 0.0-0.0                | 0.0-0.0                |
| QC Identifier                               | None      | Field Dup.<br>PC-SW-02 | Field Dup.<br>PC-SW-02 |
| Nickel                                      | 10.2 U    | 10.2 U                 | 10.2 U                 |
| Potassium                                   | 2560      | 2730                   | 2770                   |
| Selenium                                    | 1.8 U     | 1.8 U                  | 1.8 U                  |
| Silver                                      | 3.7 UJ    | 3.7 UJ                 | 3.7 UJ                 |
| Sodium                                      | 28900     | 37600                  | 37500                  |
| Thallium                                    | 3.4 U     | 3.4 U                  | 3.4 U                  |
| Vanadium                                    | 3.7 U     | 3.7 U                  | 3.7 U                  |
| Zinc                                        | 7.1 U     | 23.1 U                 | 25.8 U                 |
| Total Petroleum Hydrocarbon Analysis (MG/L) |           |                        |                        |
| Extractable TPH                             | 0.27      | 0.50                   | 0.45                   |

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ANALYTICAL RESULTS  
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| Sample Number                         | PCSD-TB-01 | PCSD-TB-01 |
|---------------------------------------|------------|------------|
| Sample Location                       | Blank      | Blank      |
| Date Sampled                          | 4/19/2002  | 4/23/2002  |
| Interval                              | 0.0-0.0    | 0.0-0.0    |
| QC Identifier                         | Trip Blank | Trip Blank |
| Volatile Organic Analysis (UG/KG)     |            |            |
| 1,1,1-Trichloroethane                 | 250 U      | 250 U      |
| 1,1,2,2-Tetrachloroethane             | 250 U      | 250 U      |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 250 U      | 250 U      |
| 1,1,2-Trichloroethane                 | 250 U      | 250 U      |
| 1,1-Dichloroethane                    | 250 U      | 250 U      |
| 1,1-Dichloroethene                    | 250 U      | 250 U      |
| 1,2,4-Trichlorobenzene                | 250 U      | 250 U      |
| 1,2-Dibromo-3-chloropropane           | 250 U      | 250 U      |
| 1,2-Dibromoethane                     | 250 U      | 250 U      |
| 1,2-Dichlorobenzene                   | 250 U      | 250 U      |
| 1,2-Dichloroethane                    | 250 U      | 250 U      |
| 1,2-Dichloropropane                   | 250 U      | 250 U      |
| 1,3-Dichlorobenzene                   | 250 U      | 250 U      |
| 1,4-Dichlorobenzene                   | 250 U      | 250 U      |
| 2-Butanone                            | 250 UJ     | 250 UJ     |
| 2-Hexanone                            | 250 UJ     | 250 UJ     |
| 4-Methyl-2-Pentanone                  | 250 UJ     | 250 UJ     |
| Acetone                               | 250 UJ     | 250 UJ     |
| Benzene                               | 250 U      | 250 U      |
| Bromodichloromethane                  | 250 U      | 250 U      |
| Bromoform                             | 250 U      | 250 U      |
| Bromomethane                          | 250 U      | 250 U      |
| Carbon Disulfide                      | 250 U      | 250 U      |
| Carbon Tetrachloride                  | 250 U      | 250 U      |
| Chlorobenzene                         | 250 U      | 250 U      |
| Chloroethane                          | 250 U      | 250 U      |
| Chloroform                            | 250 U      | 250 U      |
| Chloromethane                         | 250 UJ     | 250 U      |
| cis-1,2-Dichloroethene                | 250 U      | 250 U      |
| cis-1,3-Dichloropropene               | 250 U      | 250 U      |
| Cyclohexane                           | 250 U      | 250 U      |
| Dibromochloromethane                  | 250 U      | 250 U      |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
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| Sample Number             | PC-SD-TB-01 | PC-SD-TB-01 |
|---------------------------|-------------|-------------|
| Sample Location           | Blank       | Blank       |
| Date Sampled              | 4/19/2002   | 4/23/2002   |
| Interval                  | 0.0-0.0     | 0.0-0.0     |
| QC Identifier             | Trip Blank  | Trip Blank  |
| Dichlorodifluoromethane   | 250 U       | 250 U       |
| Ethylbenzene              | 250 U       | 250 U       |
| Isopropylbenzene          | 250 U       | 250 U       |
| Methyl Acetate            | 250 UJ      | 250 U       |
| Methyl tert-Butyl Ether   | 250 U       | 250 U       |
| Methylcyclohexane         | 250 U       | 250 U       |
| Methylene Chloride        | 250 U       | 250 U       |
| Styrene                   | 250 U       | 250 U       |
| Tetrachloroethene         | 250 U       | 250 U       |
| Toluene                   | 250 U       | 250 U       |
| Total Xylenes             | 250 U       | 250 U       |
| trans-1,2-Dichloroethene  | 250 U       | 250 U       |
| trans-1,3-Dichloropropene | 250 U       | 250 U       |
| Trichloroethene           | 250 U       | 250 U       |
| Trichlorofluoromethane    | 250 U       | 250 U       |
| Vinyl Chloride            | 250 U       | 250 U       |

U - Not detected; UJ - Detection limit approximate; J - Quantization approximate;  
\* - From dilution analysis; R - Rejected; NA - Not Analyzed



ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT

| Sample Number                         | PC-AQ-RB-02      | PC-AQ-RB-03      | PC-SW-TB-01 | PC-SW-TB-01 | PC-AQ-RB-01      |
|---------------------------------------|------------------|------------------|-------------|-------------|------------------|
| Sample Location                       | Blank            | Blank            | Blank       | Blank       | Blank            |
| Date Sampled                          | 4/23/2002        | 4/24/2002        | 4/24/2002   | 4/19/2002   | 4/19/2002        |
| Interval                              | 0.0-0.0          | 0.0-0.0          | 0.0-0.0     | 0.0-0.0     | 0.0-0.0          |
| QC Identifier                         | Rinsate<br>Blank | Rinsate<br>Blank | Trip Blank  | Trip Blank  | Rinsate<br>Blank |
| Volatile Organic Analysis (UG/L)      |                  |                  |             |             |                  |
| 1,1,1-Trichloroethane                 | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,1,2,2-Tetrachloroethane             | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,1,2-Trichloroethane                 | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,1-Dichloroethane                    | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,1-Dichloroethene                    | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,2,4-Trichlorobenzene                | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,2-Dibromo-3-chloropropane           | 10 U             | 10 U             | R           | 10 U        | 10 U             |
| 1,2-Dibromoethane                     | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,2-Dichlorobenzene                   | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,2-Dichloroethane                    | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,2-Dichloropropane                   | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,3-Dichlorobenzene                   | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 1,4-Dichlorobenzene                   | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 2-Butanone                            | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 2-Hexanone                            | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| 4-Methyl-2-Pentanone                  | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| Acetone                               | 7 J              | 7 J              | 10 U        | 9 J         | 10 U             |
| Benzene                               | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| Bromodichloromethane                  | 10 U             | 10 U             | 10 U        | 0.9 J       | 10 U             |
| Bromoform                             | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| Bromomethane                          | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| Carbon Disulfide                      | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| Carbon Tetrachloride                  | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| Chlorobenzene                         | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| Chloroethane                          | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| Chloroform                            | 10 U             | 10 U             | 1 J         | 7 J         | 10 U             |
| Chloromethane                         | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| cis-1,2-Dichloroethene                | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| cis-1,3-Dichloropropene               | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |
| Cyclohexane                           | 10 U             | 10 U             | 10 U        | 10 U        | 10 U             |

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\* - From dilution analysis; R - Rejected; NA - Not Analyzed

**ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
CONNECTICUT**

| Sample Number                              | PC-AQ-RB<br>02   | PC-AQ-RB<br>03   | PC-GW-TB<br>01 | PC-SW-<br>TB-01 | PC-AQ-RB<br>01   |
|--------------------------------------------|------------------|------------------|----------------|-----------------|------------------|
| Sample Location                            | Blank            | Blank            | Blank          | Blank           | Blank            |
| Date Sampled                               | 4/23/2002        | 4/24/2002        | 4/24/2002      | 4/19/2002       | 4/19/2002        |
| Interval                                   | 0.0-0.0          | 0.0-0.0          | 0.0-0.0        | 0.0-0.0         | 0.0-0.0          |
| QC Identifier                              | Rinsate<br>Blank | Rinsate<br>Blank | Trip Blank     | Trip Blank      | Rinsate<br>Blank |
| Dibromochloromethane                       | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Dichlorodifluoromethane                    | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Ethylbenzene                               | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Isopropylbenzene                           | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Methyl Acetate                             | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Methyl tert-Butyl Ether                    | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Methylcyclohexane                          | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Methylene Chloride                         | 10 U             | 3 J              | 10 U           | 10 U            | 10 U             |
| Styrene                                    | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Tetrachloroethene                          | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Toluene                                    | 12               | 11               | 10 U           | 10 U            | 10 U             |
| Total Xylenes                              | 5 J              | 1 J              | 10 U           | 10 U            | 10 U             |
| trans-1,2-Dichloroethene                   | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| trans-1,3-Dichloropropene                  | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Trichloroethene                            | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Trichlorofluoromethane                     | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| Vinyl Chloride                             | 10 U             | 10 U             | 10 U           | 10 U            | 10 U             |
| <b>Semivolatile Organic Analysis (UGL)</b> |                  |                  |                |                 |                  |
| 1,1'-Biphenyl                              | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2,2'-oxybis(1-Chloropropane)               | 11 UJ            | 11 UJ            | NA             | NA              | 10 U             |
| 2,4,5-Trichlorophenol                      | 28 U             | 28 U             | NA             | NA              | 25 U             |
| 2,4,6-Trichlorophenol                      | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2,4-Dichlorophenol                         | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2,4-Dimethylphenol                         | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2,4-Dinitrophenol                          | 28 UJ            | 28 UJ            | NA             | NA              | 25 UJ            |
| 2,4-Dinitrotoluene                         | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2,6-Dinitrotoluene                         | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2-Chloronaphthalene                        | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2-Chlorophenol                             | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2-Methylnaphthalene                        | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2-Methylphenol                             | 11 U             | 11 U             | NA             | NA              | 10 U             |
| 2-Nitroaniline                             | 28 U             | 28 U             | NA             | NA              | 25 U             |

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;

\* - From dilution analysis; R - Rejected; NA - Not Analyzed

ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT

| Sample Number              | PC-AQ-RB-02       | PC-AQ-RB-03       | PC-GW-TB-01 | PC-SW-TB-01 | PC-AQ-RB-01       |
|----------------------------|-------------------|-------------------|-------------|-------------|-------------------|
| Sample Location            | Blank             | Blank             | Blank       | Blank       | Blank             |
| Date Sampled               | 4/23/2002         | 4/24/2002         | 4/24/2002   | 4/19/2002   | 4/19/2002         |
| Interval                   | 0.0-0.0           | 0.0-0.0           | 0.0-0.0     | 0.0-0.0     | 0.0-0.0           |
| QC Identifier              | Rinseate<br>Blank | Rinseate<br>Blank | Trip Blank  | Trip Blank  | Rinseate<br>Blank |
| 2-Nitrophenol              | 11 U              | 11 U              | NA          | NA          | 10 U              |
| 3,3'-Dichlorobenzidine     | 11 U              | 11 U              | NA          | NA          | 10 U              |
| 3-Nitroaniline             | 28 U              | 28 U              | NA          | NA          | 25 UJ             |
| 4,6-Dinitro-2-methylphenol | 28 UJ             | 28 UJ             | NA          | NA          | 25 U              |
| 4-Bromophenyl-phenylether  | 11 U              | 11 U              | NA          | NA          | 10 U              |
| 4-Chloro-3-methylphenol    | 11 U              | 11 U              | NA          | NA          | 10 U              |
| 4-Chloroaniline            | 11 U              | 11 U              | NA          | NA          | 10 U              |
| 4-Chlorophenyl-phenylether | 11 U              | 11 U              | NA          | NA          | 10 U              |
| 4-Methylphenol             | 11 U              | 11 U              | NA          | NA          | 10 U              |
| 4-Nitroaniline             | 28 U              | 28 U              | NA          | NA          | 25 U              |
| 4-Nitrophenol              | 28 U              | 28 U              | NA          | NA          | 25 U              |
| Acenaphthene               | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Acenaphthylene             | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Acetophenone               | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Anthracene                 | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Atrazine                   | 11 UJ             | 11 UJ             | NA          | NA          | 10 U              |
| Benzaldehyde               | 2 J               | 2 J               | NA          | NA          | 2 J               |
| Benzo(a)anthracene         | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Benzo(a)pyrene             | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Benzo(b)fluoranthene       | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Benzo(g,h,i)perylene       | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Benzo(k)fluoranthene       | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Bis(2-Chloroethoxy)methane | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Bis(2-Chloroethyl)ether    | 11 U              | 11 U              | NA          | NA          | 10 U              |
| bis(2-Ethylhexyl)phthalate | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Butylbenzylphthalate       | 4 J               | 11 U              | NA          | NA          | 10 U              |
| Caprolactam                | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Carbazole                  | 11 U              | 11 U              | NA          | NA          | 10 UJ             |
| Chrysene                   | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Di-n-Butylphthalate        | 7 J               | 11 U              | NA          | NA          | 1 J               |
| Di-n-octylphthalate        | 11 U              | 11 U              | NA          | NA          | 10 U              |
| Dibenzo(a,h)anthracene     | 11 U              | 11 U              | NA          | NA          | 10 U              |

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ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT

| Sample Number                | PC-AQ-RB-02 | PC-AQ-RB-03 | PC-SW-01   | PC-SW-TB-01 | PC-AQ-RB-01 |
|------------------------------|-------------|-------------|------------|-------------|-------------|
| Sample Location              | Blank       | Blank       | Blank      | Blank       | Blank       |
| Date Sampled                 | 4/23/2002   | 4/24/2002   | 4/24/2002  | 4/19/2002   | 4/19/2002   |
| Interval                     | 0.0-0.0     | 0.0-0.0     | 0.0-0.0    | 0.0-0.0     | 0.0-0.0     |
| QC Identifier                | Rinsate     | Rinsate     | Trip Blank | Trip Blank  | Rinsate     |
|                              | Blank       | Blank       |            |             | Blank       |
| Dibenzofuran                 | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Diethylphthalate             | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Dimethylphthalate            | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Fluoranthene                 | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Fluorene                     | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Hexachlorobenzene            | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Hexachlorobutadiene          | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Hexachlorocyclopentadiene    | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Hexachloroethane             | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Indeno(1,2,3-cd)pyrene       | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Isophorone                   | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| N-Nitroso-di-n-propylamine   | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| N-Nitroso-diphenylamine      | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Naphthalene                  | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Nitrobenzene                 | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Pentachlorophenol            | 28 UJ       | 28 UJ       | 28 UJ      | NA          | 25 U        |
| Phenanthrene                 | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Phenol                       | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Pyrene                       | 11 U        | 11 U        | 11 U       | NA          | 10 U        |
| Pesticide/PCB Analysis (UGL) |             |             |            |             |             |
| 4,4'-DDD                     | 0.13 U      | 0.12 U      | 0.12 U     | NA          | 0.10 U      |
| 4,4'-DDE                     | 0.13 U      | 0.12 U      | 0.12 U     | NA          | 0.10 U      |
| 4,4'-DDT                     | 0.13 U      | 0.12 U      | 0.12 U     | NA          | 0.10 U      |
| Aldrin                       | 0.063 U     | 0.059 U     | 0.059 U    | NA          | 0.050 U     |
| alpha-BHC                    | 0.063 U     | 0.059 U     | 0.059 U    | NA          | 0.050 U     |
| alpha-Chlordane              | 0.063 U     | 0.059 U     | 0.059 U    | NA          | 0.050 U     |
| Aroclor-1016                 | 1.3 U       | 1.2 U       | 1.2 U      | NA          | 1.0 U       |
| Aroclor-1221                 | 2.5 U       | 2.4 U       | 2.4 U      | NA          | 2.0 U       |
| Aroclor-1232                 | 1.3 U       | 1.2 U       | 1.2 U      | NA          | 1.0 U       |
| Aroclor-1242                 | 1.3 U       | 1.2 U       | 1.2 U      | NA          | 1.0 U       |
| Aroclor-1248                 | 1.3 U       | 1.2 U       | 1.2 U      | NA          | 1.0 U       |
| Aroclor-1254                 | 1.3 U       | 1.2 U       | 1.2 U      | NA          | 1.0 U       |

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**ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT**

| Sample Number                    | PC-AQ-RB-02   | PC-AQ-RB-03   | PC-GW-TB-01 | PC-SW-TB-01 | PC-AQ-RB-01   |
|----------------------------------|---------------|---------------|-------------|-------------|---------------|
| Sample Location                  | Blank         | Blank         | Blank       | Blank       | Blank         |
| Date Sampled                     | 4/23/2002     | 4/24/2002     | 4/24/2002   | 4/19/2002   | 4/19/2002     |
| Interval                         | 0.0-0.0       | 0.0-0.0       | 0.0-0.0     | 0.0-0.0     | 0.0-0.0       |
| QC Identifier                    | Rinsate Blank | Rinsate Blank | Trip Blank  | Trip Blank  | Rinsate Blank |
| Acetone-1260                     | 1.3 U         | 1.2 U         | NA          | NA          | 1.0 U         |
| beta-BHC                         | 0.063 U       | 0.059 U       | NA          | NA          | 0.050 U       |
| delta-BHC                        | 0.063 U       | 0.059 U       | NA          | NA          | 0.050 U       |
| Dieldrin                         | 0.13 U        | 0.12 U        | NA          | NA          | 0.10 U        |
| Endosulfan I                     | 0.063 U       | 0.059 U       | NA          | NA          | 0.050 U       |
| Endosulfan II                    | 0.13 U        | 0.12 U        | NA          | NA          | 0.10 U        |
| Endosulfan Sulfate               | 0.13 U        | 0.12 U        | NA          | NA          | 0.10 U        |
| Endrin                           | 0.13 U        | 0.12 U        | NA          | NA          | 0.10 U        |
| Endrin Aldehyde                  | 0.13 U        | 0.12 U        | NA          | NA          | 0.10 U        |
| Endrin Ketone                    | 0.13 U        | 0.12 U        | NA          | NA          | 0.10 U        |
| gamma-BHC                        | 0.063 U       | 0.059 U       | NA          | NA          | 0.050 U       |
| gamma-Chlordane                  | 0.063 U       | 0.059 U       | NA          | NA          | 0.050 U       |
| Heptachlor                       | 0.063 U       | 0.059 U       | NA          | NA          | 0.050 U       |
| Heptachlor Epoxide               | 0.063 U       | 0.059 U       | NA          | NA          | 0.050 U       |
| Methoxychlor                     | 0.63 U        | 0.59 U        | NA          | NA          | 0.50 U        |
| Toxaphene                        | 6.3 U         | 5.9 U         | NA          | NA          | 5.0 U         |
| <b>TAL Metal Analysis (UG/L)</b> |               |               |             |             |               |
| Aluminum                         | 55.9 U        | 59.8 U        | NA          | NA          | 6.0 U         |
| Antimony                         | 1.6 U         | 1.6 U         | NA          | NA          | 2.0 U         |
| Arsenic                          | 4.2 U         | 4.2 U         | NA          | NA          | 2.7 U         |
| Barium                           | 0.21 U        | 0.10 U        | NA          | NA          | 13.6 U        |
| Beryllium                        | 0.69 U        | 0.74 U        | NA          | NA          | 0.20 U        |
| Cadmium                          | 0.30 U        | 0.30 U        | NA          | NA          | 0.30 U        |
| Calcium                          | 16.9 UJ       | 16.9 UJ       | NA          | NA          | 72.5 U        |
| Chromium                         | 0.50 U        | 0.50 U        | NA          | NA          | 0.51 U        |
| Cobalt                           | 0.60 UJ       | 0.60 UJ       | NA          | NA          | 1.0 U         |
| Copper                           | 0.70 UJ       | 0.70 UJ       | NA          | NA          | 8.5 U         |
| Iron                             | 12.7 UJ       | 11.4 U        | NA          | NA          | 27.6 U        |
| Lead                             | 1.3 U         | 1.8 U         | NA          | NA          | 0.50 U        |
| Magnesium                        | 12.1 U        | 16.8 UJ       | NA          | NA          | 11.6 U        |
| Manganese                        | 1.9 U         | 1.8 U         | NA          | NA          | 1.8 U         |
| Mercury                          | 0.10 U        | 0.11 UJ       | NA          | NA          | 0.13 U        |

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\* - From dilution analysis; R - Rejected; NA - Not Analyzed

**ANALYTICAL RESULTS  
PORTLAND CHEMICAL  
, CONNECTICUT**

| Sample Number                                      | PC-AQ-RB-02      | PC-AQ-RB-03      | PC-SW-TB-01 | PC-SW-TB-01 | PC-AQ-RB-01      |
|----------------------------------------------------|------------------|------------------|-------------|-------------|------------------|
| Sample Location                                    | Blank            | Blank            | Blank       | Blank       | Blank            |
| Date Sampled                                       | 4/23/2002        | 4/24/2002        | 4/24/2002   | 4/19/2002   | 4/19/2002        |
| Interval                                           | 0.0-0.0          | 0.0-0.0          | 0.0-0.0     | 0.0-0.0     | 0.0-0.0          |
| QC Identifier                                      | Rinsate<br>Blank | Rinsate<br>Blank | Trip Blank  | Trip Blank  | Rinsate<br>Blank |
| Nickel                                             | 0.64 UJ          | 0.50 U           | NA          | NA          | 1.2 U            |
| Potassium                                          | 13.4 U           | 13.4 U           | NA          | NA          | 64.0 U           |
| Selenium                                           | 2.2 UJ           | 2.2 U            | NA          | NA          | 5.0 UJ           |
| Silver                                             | 0.70 U           | 0.70 U           | NA          | NA          | 1.4 UJ           |
| Sodium                                             | 146 U            | 146 U            | NA          | NA          | 240 U            |
| Thallium                                           | 3.3 U            | 3.3 U            | NA          | NA          | 2.0 U            |
| Vanadium                                           | 0.50 U           | 0.50 U           | NA          | NA          | 0.40 U           |
| Zinc                                               | 1.4 UJ           | 1.4 UJ           | NA          | NA          | 8.2              |
| <b>Total Petroleum Hydrocarbon Analysis (MG/L)</b> |                  |                  |             |             |                  |
| Extractable TPH                                    | 0.10 U           | 0.10 U           | NA          | NA          | 0.10 U           |

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;  
\* - From dilution analysis; R - Rejected; NA - Not Analyzed



# SAMPLE COLLECTION SUMMARY RECORD

PROJECT NAME: Portland Chemical  
 SAMPLING EVENT: Spring 2002  
 CASE NO.: 42  
 TETRA TECH NUS JOB NO./PMS: N4128-2640  
 DAS NO.: ALL Sed to DAS

[illegible]



TETRA TECH NUS, INC.

## SAMPLE COLLECTION SUMMARY RECORD

PROJECT NAME: Paviland Channel Works TETRA TECH NUS JOB NO./PMS: 4188-2640SAMPLING EVENT: Spring 2002 CASE NO.: 2002-001

DAS NO.:

| DATE    | TIME | SAMPLE LOCATION | FIELD QC | Vol | P.S. | Field | PRB | Stills | DAS #  | COMMENTS        |
|---------|------|-----------------|----------|-----|------|-------|-----|--------|--------|-----------------|
| 4/22/02 | 0947 | PC-SO-SBS-0810  | DUP      | 1   | 1    | 1     | 1   | 1      | D05202 | A0HK9 CLP INREG |
| 4/22/02 | 0950 | PC-SO-SB-DUP-01 | DUP      | 1   | 1    | 1     | 1   | 1      | D05203 | A0HK9 MA06W1    |
| 4/22/02 | 1210 | PC-SO-SBS-0608  | AS/ASD   | 1   | 1    | 1     | 1   | 1      | D05204 | A0HL0 MA06W2    |
| 4/22/02 | 1533 | PC-SO-SO1-0608  |          | 1   | 1    | 1     | 1   | 1      | D05205 | A0HL1 MA06W3    |
| 4/23/02 | 1070 | PC-SO-TB-01     | TB       | 1   | 1    | 1     | 1   | 1      | D05206 | A0HL2 MA06W4    |
| 4/23/02 | 1035 | PC-AQ-RB-02     | RB       | 1   | 1    | 1     | 1   | 1      | D05207 | A0HL3 MA06W5    |
| 4/23/02 | 1100 | PC-SS-SS1-0001  |          | 1   | 1    | 1     | 1   | 1      | D05208 | A0HL4 MA06W6    |
| 4/23/02 | 1115 | PC-SS-SS2-0001  |          | 1   | 1    | 1     | 1   | 1      | D05209 | A0HL5 MA06W7    |
| 4/24/02 | 0935 | PC-GW-MW3-00    |          | 1   | 1    | 1     | 1   | 1      | D05210 | A0HL6 MA06W8    |
| 4/24/02 | 1020 | PC-GW-MW5-01    | AS/ASD   | 1   | 1    | 1     | 1   | 1      | D05211 | A0HL7 MA06W9    |
| 4/24/02 | 1145 | PC-GW-MW1-01    | DUP      | 1   | 1    | 1     | 1   | 1      | D05212 | A0HL8 MA06X0    |
| 4/24/02 | 1140 | PC-GW-DUP-01    | DUP      | 1   | 1    | 1     | 1   | 1      | D05213 | A0HL9 MA06X1    |
| 4/24/02 | 1130 | PC-AQ-RB-03     | RB       | 1   | 1    | 1     | 1   | 1      | D05214 | A0HMD MA06X2    |
| 4/24/02 | 1140 | PC-GW-TB-01     | TB       | 1   | 1    | 1     | 1   | 1      | —      | A0HMI —         |





**USEPA Contract Laboratory Program**  
**Generic Chain of Custody**

Reference Case: 0290  
Client No: S02-RAC1-209



**R**

|                                             |  |                                |  |                                  |  |                                    |  |
|---------------------------------------------|--|--------------------------------|--|----------------------------------|--|------------------------------------|--|
| Region: 1                                   |  | Date Shipped: 4/19/02          |  | Chain of Custody Record          |  | Sampler Signature: <i>Ben S...</i> |  |
| Project Code: N4128-2640                    |  | Carrier Name: FedEx            |  | Relinquished By: <i>Ben S...</i> |  | Received By: <i>Ben S...</i>       |  |
| Account Code: N4128-2640                    |  | Airbill: 831735885750          |  | (Date / Time)                    |  | (Date / Time)                      |  |
| CERCLIS ID:                                 |  | Shipped to: Milkem Corporation |  | 1 <i>Ben S...</i>                |  | 2                                  |  |
| Spill ID:                                   |  | 175 Metro Center Blvd.         |  | 2                                |  | 3                                  |  |
| Site Name/State: Portland Chemical (DAS)/CT |  | Warwick RI 02886               |  | 3                                |  | 4                                  |  |
| Project Leader: John Meyer                  |  | (401) 732-3400                 |  | 4                                |  |                                    |  |
| Action:                                     |  |                                |  |                                  |  |                                    |  |
| Sampling Co:                                |  |                                |  |                                  |  |                                    |  |

| SAMPLE No. | MATRIX/ SAMPLER                 | CONC/ TYPE | ANALYSIS/ TURNAROUND                         | TAG No./ PRESERVATIVE | STATION LOCATION | SAMPLE COLLECT DATE/TIME | SAMPLE No. | QC Type         |
|------------|---------------------------------|------------|----------------------------------------------|-----------------------|------------------|--------------------------|------------|-----------------|
| D05194     | Surface Water/ Christine Mackey | L/G        | ETPH (21)                                    | (HCL) (2)             | PC-SW-01         | S: 4/19/02 8:30          |            | -               |
| D05195     | Surface Water/ Brandon Smith    | L/G        | ETPH (21)                                    | (HCL) (2)             | PC-SW-02         | S: 4/19/02 8:45          |            | Field Duplicate |
| D05196     | Surface Water/ Christine Mackey | L/G        | ETPH (21)                                    | (HCL) (2)             | PC-SW-DUP-01     | S: 4/19/02 8:50          |            | Field Duplicate |
| D05197     | Sediment/ Brandon Smith         | L/G        | BNA/Pest/P (21), ETPH (21)                   | (Ice Only) (4)        | PC-SD-01         | S: 4/19/02 9:15          |            | -               |
| D05198     | Sediment/ Christine Mackey      | L/G        | PER_SOL (21), T_M (21), VOA_ (21)            | (Ice Only) (6)        | PC-SD-02         | S: 4/19/02 9:30          |            | Field Duplicate |
| D05199     | Sediment/ Christine Mackey      | L/G        | PER_SOL (21), T_M (21), VOA_ (21)            | (Ice Only) (5)        | PC-SD-DUP-01     | S: 4/19/02 9:40          |            | Field Duplicate |
| D05200     | Aqueous/ Christine Mackey       | L/G        | ETPH (21), PER_SOL (21), T_M (21), VOA_ (21) | (Ice Only) (7)        | PC-AQ-RB-01      | S: 4/19/02 10:00         |            | Rinsate         |
| D05201     | Sediment/ Christine Mackey      | L/G        | VOA_ (21)                                    | (MEOH) (2)            | PC-SD-TB-01      | S: 4/19/02 9:55          |            | Trip Blank      |

|                                                                                                                                                                                 |                                                        |                                          |                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------|-------------------------------|
| Shipment for Case Complete? N                                                                                                                                                   | Sample(s) to be used for laboratory QC: D05194, D05197 | Additional Sampler Signature(s):         | Chain of Custody Seal Number: |
| Analysis Key:                                                                                                                                                                   | Concentration: L = Low, M = Low/Medium, H = High       | Type/Designator: Composite = C, Grab = G | Shipment Iced? _____          |
| BNA/Pest/P = Semivolatiles and Pesticides/PCBs, ETPH = Extractable Total Petroleum Hydrocarbons, PER_SOL = Percent Solids, T_M = Total Metals, VOA_ = Volatile Organic Analysis |                                                        |                                          |                               |

**TR Number: 1-303437800-041902-0001**

PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA. 20191-3436 Phone 703/284-9348 Fax 703/284-9222

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# USEPA Contract Laboratory Program Organic Traffic Report & Chain of Custody Record

Case No: 30378

DAS No:

● R

|                  |                            |                       |                                                                                                   |                         |                           |
|------------------|----------------------------|-----------------------|---------------------------------------------------------------------------------------------------|-------------------------|---------------------------|
| Region: 1        |                            | Date Shipped: 4/19/02 |                                                                                                   | Chain of Custody Record |                           |
| Project Code:    | N4128-2640                 | Carrier Name:         | FedEx                                                                                             | Relinquished By         | Signature: <i>R. S.</i>   |
| Account Code:    |                            | Airbill:              | 8317-3588-5738                                                                                    | Received By             | (Date / Time)             |
| CERCLUS ID:      |                            | Shipped to:           | Accura Analytical Laboratory, Inc.<br>6017 Financial Drive<br>Norcross GA 30071<br>(770) 449-8800 | 1                       | <i>R. S.</i> 4/19/02 8:30 |
| Spill ID:        |                            |                       |                                                                                                   | 2                       |                           |
| Site Name/State: | Portland Chemical (CLP)/CT |                       |                                                                                                   | 3                       |                           |
| Project Leader:  | John Meyer                 |                       |                                                                                                   | 4                       |                           |
| Action:          |                            |                       |                                                                                                   |                         |                           |
| Sampling Co:     |                            |                       |                                                                                                   |                         |                           |

| ORGANIC SAMPLE No. | MATRIX/ SAMPLER                    | CONC/ TYPE | ANALYSIS/ TURNAROUND       | TAG No./ PRESERVATIVE                                                                                                                                                                                                                                                                                                       | STATION LOCATION | SAMPLE COLLECT DATE/TIME | INORGANIC SAMPLE No. | QC Type         |
|--------------------|------------------------------------|------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------|----------------------|-----------------|
| A0HK5              | Surface Water/<br>Christine Mackey | L/G        | BNAP/EST (21),<br>VOA (21) | 183101 (HCL), 183102 (HCL), 183103 (HCL), 183104 (HCL), 183105 (HCL), 183106 (HCL), 183113 (Ice Only), 183114 (Ice Only), 183115 (Ice Only), 183116 (Ice Only), 183117 (Ice Only), 183118 (Ice Only), 183119 (Ice Only), 183120 (Ice Only), 183121 (Ice Only), 183122 (Ice Only), 183123 (Ice Only), 183124 (Ice Only) (18) | PC-SW-01         | S: 4/19/02 8:30          | MA0GT8               | -               |
| A0HK6              | Surface Water/<br>Brandon Smith    | L/G        | BNAP/EST (21),<br>VOA (21) | 183107 (HCL), 183108 (HCL), 183125 (Ice Only), 183126 (Ice Only), 183127 (Ice Only), 183128 (Ice Only) (6)                                                                                                                                                                                                                  | PC-SW-02         | S: 4/19/02 8:45          | MA0GT9               | Field Duplicate |
| A0HK7              | Surface Water/<br>Brandon Smith    | L/G        | BNAP/EST (21),<br>VOA (21) | 183109 (HCL), 183110 (HCL), 183129 (Ice Only), 183130 (Ice Only), 183131 (Ice Only), 183132 (Ice Only) (6)                                                                                                                                                                                                                  | PC-SW-DUP-01     | S: 4/19/02 8:50          | MA0GW0               | Field Duplicate |
| A0HK8              | Surface Water/<br>Christine Mackey | L/G        | VOA (21)                   | 183111 (HCL), 183112 (HCL) (2)                                                                                                                                                                                                                                                                                              | PC-SW-TB-01      | S: 4/19/02 9:00          |                      | Trip Blank      |

|                                                                             |                                                  |                                          |                               |
|-----------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------|-------------------------------|
| Shipment for Case Complete? Y                                               | Sample(s) to be used for laboratory QC:<br>A0HK5 | Additional Sampler Signature(s):         | Chain of Custody Seal Number: |
| Analysis Key:                                                               | Concentration: L = Low, M = Low/Medium, H = High | Type/Designator: Composite = C, Grab = G | Shipment Iced? _____          |
| BNAP/EST = CLP TCL Semivolatiles and Pesticides/PC, VOA = CLP TCL Volatiles |                                                  |                                          |                               |

**TR Number: 1-303437800-041902-0002**

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA. 20191-3436 Phone 703/264-9348 Fax 703/264-9222

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F2V6.0.66 Page 1 of 1



# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 30378

R

|                                             |                         |                                         |                  |                    |
|---------------------------------------------|-------------------------|-----------------------------------------|------------------|--------------------|
| Region: 1                                   | Date Shipped: 4/19/02   | Carrier Name: FedEx                     | Station Location | QC Type            |
| Project Code: N4128-2640                    | Airbill: 8317-3588-5749 | Shipped to: Datchern Laboratories, Inc. | DATE/TIME        | ORGANIC SAMPLE No. |
| CERCLIS ID:                                 |                         | 960 West LeVoy Drive                    |                  |                    |
| Spill ID:                                   |                         | Salt Lake City UT 84123                 |                  |                    |
| Site Name/State: Portland Chemical (CLP)/CT |                         | (801) 266-7700                          |                  |                    |
| Project Leader: John Meyer                  |                         |                                         |                  |                    |
| Action:                                     |                         |                                         |                  |                    |
| Sampling Co:                                |                         |                                         |                  |                    |

| INORGANIC SAMPLE No. | MATRIX/ SAMPLER                 | CONC/ TYPE | ANALYSIS/ TURNAROUND | TAG No./ PRESERVATIVE            | STATION LOCATION | SAMPLE COLLECT DATE/TIME | ORGANIC SAMPLE No. | QC Type         |
|----------------------|---------------------------------|------------|----------------------|----------------------------------|------------------|--------------------------|--------------------|-----------------|
| MA0GT8               | Surface Water/ Christine Mackey | L/G        | TM (21)              | 183133 (HNO3), 183134 (HNO3) (2) | PC-SW-01         | S: 4/19/02 8:30          | A0HK5              | -               |
| MA0GT9               | Surface Water/ Brandon Smith    | L/G        | TM (21)              | 183135 (HNO3) (1)                | PC-SW-02         | S: 4/19/02 8:45          | A0HK6              | Field Duplicate |
| MA0GW0               | Surface Water/ Brandon Smith    | L/G        | TM (21)              | 183136 (HNO3) (1)                | PC-SW-DUP-01     | S: 4/19/02 8:50          | A0HK7              | Field Duplicate |

|                                         |                                                  |                                         |                               |
|-----------------------------------------|--------------------------------------------------|-----------------------------------------|-------------------------------|
| Shipment for Case Complete? Y           | Sample(s) to be used for laboratory QC: MA0GT8   | Additional Sampler Signature(s):        | Chain of Custody Seal Number: |
| Analysis Key: TM = CLP TAL Total Metals | Concentration: L = Low, M = Low/Medium, H = High | Type/Designate: Composite = C, Grab = G | Shipment Iced? _____          |

TR Number: 1-303437800-041902-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
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**USEPA Contract Laboratory Program  
Generic Chain of Custody**

Reference Case: 0290  
Client No: S02-RAC1-209

**R**

|                                                                                                                                         |                                                                                               |                                                                                                                                                                           |                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Region:<br>Project Code:<br>Account Code:<br>CERCLIS ID:<br>Spill ID:<br>Site Name/State:<br>Project Leader:<br>Action:<br>Sampling Co: | 1<br>N4128-2840<br>175 Metro Center Blvd.<br>Warwick RI 02886<br>(401) 732-3400<br>John Meyer | Date Shipped: 4/24/02<br>Carrier Name: FedEx<br>Airbill: 8317-3588-5668<br>Shipped to: Milken Corporation<br>175 Metro Center Blvd.<br>Warwick RI 02886<br>(401) 732-3400 | Chain of Custody Record<br>Relinquished By (Date / Time)<br>1 Ben Sin 4/24/02 13:00<br>2<br>3<br>4<br>Sampler Signature: Ben Sin<br>Received By (Date / Time) |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|

| SAMPLE No. | MATRIX/<br>SAMPLER                | CONC/<br>TYPE | ANALYSIS/<br>TURNAROUND | TAG No/<br>PRESERVATIVE | STATION<br>LOCATION | SAMPLE COLLECT<br>DATE/TIME | SAMPLE No. | QC<br>Type      |
|------------|-----------------------------------|---------------|-------------------------|-------------------------|---------------------|-----------------------------|------------|-----------------|
| D05210     | Ground Water/<br>Christine Mackey | L/G           | ETPH (21)               | (HCL) (2)               | PC-GW-MW3-01        | S: 4/24/02 9:35             |            |                 |
| D05211     | Ground Water/<br>Brandon Smith    | L/G           | ETPH (21)               | (HCL) (6)               | PC-GW-MW5-01        | S: 4/24/02 10:20            |            |                 |
| D05212     | Ground Water/<br>Christine Mackey | L/G           | ETPH (21)               | (HCL) (2)               | PC-GW-MW1-01        | S: 4/24/02 11:45            |            | Field Duplicate |
| D05213     | Ground Water/<br>Christine Mackey | L/G           | ETPH (21)               | (HCL) (2)               | PC-GW-DUP-01        | S: 4/24/02 11:50            |            | Field Duplicate |
| D05214     | Aqueous/<br>Christine Mackey      | L/G           | ETPH (21)               | (HCL) (2)               | PC-AQ-RB-03         | S: 4/24/02 11:30            |            | Rinse           |

|                                                                  |                                                                                              |                                  |                               |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------|-------------------------------|
| Shipment for Case Complete? Y                                    | Sample(s) to be used for laboratory QC:<br>D05211                                            | Additional Sampler Signature(s): | Chain of Custody Seal Number: |
| Analysis Key:<br>ETPH = Extractable Total Petroleum Hydrocarbons | Concentration: L = Low, M = Low/Medium, H = High<br>Type/Designator: Composite = C, Grab = G |                                  | Shipment Iced? _____          |

**TR Number: 1-303437800-042402-0003**

PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
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**EPA USEPA Contract Laboratory Program**  
**Organic Traffic Report & Chain of Custody Record**

Case No: 30410  
 DAS No:

**R**

| Region: 1<br>Project Code: 14126-2840<br>Account Code: 8317-3588-5846<br>CERCUS ID:<br>Ship ID:<br>Site Name/State: Portland Chemical (CLP)/OR<br>Project Leader: John Meyer<br>Action:<br>Sampling Co: |               | Date Shipped: 4/24/02<br>Carrier Name: FedEx<br>Airbill: 8317-3588-5846<br>Shipped to:<br>Calinic Corporation<br>10 Dean Krauss Drive<br>Narragansett, RI 02882<br>(401) 782-8800 |             | <b>Chain of Custody Record</b><br><table border="1"> <tr> <th>Relinquished By</th> <th>(Date / Time)</th> <th>Signature</th> <th>Received By</th> <th>(Date / Time)</th> </tr> <tr> <td>1</td> <td>4/29/02 1300</td> <td><i>Russ</i></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |  | Relinquished By | (Date / Time) | Signature | Received By | (Date / Time) | 1 | 4/29/02 1300 | <i>Russ</i> |  |  | 2 |  |  |  |  | 3 |  |  |  |  | 4 |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------|---------------|-----------|-------------|---------------|---|--------------|-------------|--|--|---|--|--|--|--|---|--|--|--|--|---|--|--|--|--|
| Relinquished By                                                                                                                                                                                         | (Date / Time) | Signature                                                                                                                                                                         | Received By | (Date / Time)                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                 |               |           |             |               |   |              |             |  |  |   |  |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 1                                                                                                                                                                                                       | 4/29/02 1300  | <i>Russ</i>                                                                                                                                                                       |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                 |               |           |             |               |   |              |             |  |  |   |  |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 2                                                                                                                                                                                                       |               |                                                                                                                                                                                   |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                 |               |           |             |               |   |              |             |  |  |   |  |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 3                                                                                                                                                                                                       |               |                                                                                                                                                                                   |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                 |               |           |             |               |   |              |             |  |  |   |  |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 4                                                                                                                                                                                                       |               |                                                                                                                                                                                   |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                 |               |           |             |               |   |              |             |  |  |   |  |  |  |  |   |  |  |  |  |   |  |  |  |  |

| ORGANIC SAMPLE No. | MATRIX SAMPLER            | CONC/ TYPE | ANALYSIS TURNAROUND | TAG No/ PRESERVATIVE                                                                                       | STATION LOCATION | SAMPLE COLLECT DATE/TIME | INORGANIC SAMPLE No. | QC Type    |
|--------------------|---------------------------|------------|---------------------|------------------------------------------------------------------------------------------------------------|------------------|--------------------------|----------------------|------------|
| ADHMO              | Aqueous/ Christine Mackey | L/S        | BNAP/16 (21) VOA/14 | 183167 (HCL), 183168 (HCL), 183195 (Ice Only), 183196 (Ice Only), 183197 (Ice Only), 183198 (Ice Only) (6) | PC-AQ-RB-03      | S: 4/24/02 11:30         | MA0GX2               | Rinse      |
| ADHMM              | Aqueous/ Brandon Smith    | L/S        | VOA/21              | 183169 (HCL), 183170 (HCL) (2)                                                                             | PC-GW-TB-01      | S: 4/24/02 11:40         |                      | Trip Blank |

|                                                                                                                               |                                                                                                                                                 |                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Sufficient for Case Complete? Y<br>Analysts Key:<br>BNAP/16 = CLP TCL Semivolatiles and Pesticides/PC-VOA + CLP TCL Volatiles | Samples to be used for laboratory use:<br>AOHL7<br>Concentration: L = Low, M = Low/Medium, H = High<br>Type/Diagnostic: Composite = C, Grab = G | Additional Sampler Signature(s):<br>Chain of Custody Seal Number:<br>Shipment Used? |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

TR Number: 1-303437800-042402-0001  
 PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
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 FZV6.0.66 Page 2 of 2

# USEPA Contract Laboratory Program Organic Traffic Report & Chain of Custody Record

Case No: 30410  
DAS No:

R

|                                             |                                |                         |                            |
|---------------------------------------------|--------------------------------|-------------------------|----------------------------|
| Region: 1                                   | Date Shipped: 4/24/02          | Chain of Custody Record |                            |
| Project Code: N4129-2640                    | Carrier Name: FedEx            | Relinquished By         | Signature: <i>B. S. S.</i> |
| CERCLIS ID:                                 | Attn: 8317-3588-5646           | (Date / Time)           | (Date / Time)              |
| Spill ID:                                   | Shipped to: Celtic Corporation | 1 <i>B. S. S.</i>       | 9/24/02/13:00              |
| Site Name/State: Portland Chemical (CLP)/CT | 10 Dean Krause Drive           | 2                       |                            |
| Project Leader: John Meyer                  | Narragansett RI 02882          | 3                       |                            |
| Action:                                     | (401) 782-8900                 | 4                       |                            |
| Sampling Co:                                |                                |                         |                            |

| ORGANIC SAMPLE No. | MATRIX/ SAMPLER                | CONC/ TYPE | ANALYSIS/ TURNDOWN      | TAG No/ PRESERVATIVE                                                                                                                                                                                                                                                                                                        | STATION LOCATION | SAMPLE COLLECT DATE/TIME | INORGANIC SAMPLE No. | QC Type         |
|--------------------|--------------------------------|------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------|----------------------|-----------------|
| AOHL6              | Ground Water/ Christine Mackey | LG         | BNAP/EST (21), VOA (21) | 183155 (HCL), 183156 (HCL), 183171 (Ice Only), 183172 (Ice Only), 183173 (Ice Only), 183174 (Ice Only) (6)                                                                                                                                                                                                                  | PC-GW-MMV3-01    | S: 4/24/02 9:35          | MAOGW8               | -               |
| AOHL7              | Ground Water/ Brandon Smith    | LG         | BNAP/EST (21), VOA (21) | 183157 (HCL), 183158 (HCL), 183159 (HCL), 183160 (HCL), 183161 (HCL), 183162 (HCL), 183175 (Ice Only), 183176 (Ice Only), 183177 (Ice Only), 183178 (Ice Only), 183179 (Ice Only), 183180 (Ice Only), 183181 (Ice Only), 183182 (Ice Only), 183183 (Ice Only), 183184 (Ice Only), 183185 (Ice Only), 183186 (Ice Only) (18) | PC-GW-MMV5-01    | S: 4/24/02 10:20         | MAOGW9               | -               |
| AOHL8              | Ground Water/ Christine Mackey | LG         | BNAP/EST (21), VOA (21) | 183163 (HCL), 183164 (HCL), 183167 (Ice Only), 183168 (Ice Only), 183169 (Ice Only), 183190 (Ice Only) (6)                                                                                                                                                                                                                  | PC-GW-MMV1-01    | S: 4/24/02 11:45         | MAOGX0               | Field Duplicate |
| AOHL9              | Ground Water/ Christine Mackey | LG         | BNAP/EST (21), VOA (21) | 183185 (HCL), 183186 (HCL), 183191 (Ice Only), 183192 (Ice Only), 183193 (Ice Only), 183194 (Ice Only) (6)                                                                                                                                                                                                                  | PC-GW-DUP-01     | S: 4/24/02 11:50         | MAOGX1               | Field Duplicate |

|                                                                             |                                                  |                                         |                               |
|-----------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-------------------------------|
| Shipment for Case Completed? Y                                              | Sample(s) to be used for laboratory QC:          | Additional Sampler Signature(s):        | Chain of Custody Seal Number: |
| AOHL7                                                                       | Concentration: L = Low, M = Low/Medium, H = High | Type/Denigrate: Composite = C, Grab = G | Shipment Iced? _____          |
| BNAP/EST = CLP TCL Semivolatiles and Pesticides/PC, VOA = CLP TCL Volatiles |                                                  |                                         |                               |

TR Number: 1-303437800-042402-0001  
PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
Send Copy to: Contract Laboratory Analytical Services Support, 2000 Edmund Halley Dr., Reston, VA 20191-3436 Phone 703/264-9348 Fax 703/264-9222

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F2V5.0.66 Page 1 of 2



# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 30410

R

DAS No:

|                                             |                           |                                |                                  |                                    |
|---------------------------------------------|---------------------------|--------------------------------|----------------------------------|------------------------------------|
| Region: 1                                   | Date Shipped: 4/24/02     | Carrier Name: FedEx            | Relinquished By: <i>B. S. in</i> | Sampler Signature: <i>B. S. in</i> |
| Project Code: N4128-2640                    | Airbill #: 8317-3588-5657 | Shipped to: Liberty Analytical | (Date / Time)                    | (Date / Time)                      |
| CERCLUS ID:                                 |                           | 501 Madison Avenue             |                                  |                                    |
| Spill ID:                                   |                           | Cary NC 27513                  |                                  |                                    |
| Site Name/State: Portland Chemical (CLP)/CT |                           | (919) 379-4080                 |                                  |                                    |
| Project Leader: John Meyer                  |                           |                                |                                  |                                    |
| Action:                                     |                           |                                |                                  |                                    |
| Sampling Co:                                |                           |                                |                                  |                                    |

| INORGANIC SAMPLE No. | MATRIX/ SAMPLER                | CONC/ TYPE | ANALYSIS/ TURNAROUND | TAG No./ PRESERVATIVE            | STATION LOCATION | SAMPLE COLLECT DATETIME | ORGANIC SAMPLE No. | QC Type         |
|----------------------|--------------------------------|------------|----------------------|----------------------------------|------------------|-------------------------|--------------------|-----------------|
| MA0GW8               | Ground Water/ Christine Mackey | L/G        | TM (21)              | 183199 (HNO3) (1)                | PC-GW-MW/3-01    | S: 4/24/02 9:35         | A0HL6              | -               |
| MA0GW9               | Ground Water/ Brandon Smith    | L/G        | TM (21)              | 183001 (HNO3), 183200 (HNO3) (2) | PC-GW-MW/5-01    | S: 4/24/02 10:20        | A0HL7              | -               |
| MA0GX0               | Ground Water/ Christine Mackey | L/G        | TM (21)              | 183002 (HNO3) (1)                | PC-GW-MW/1-01    | S: 4/24/02 11:45        | A0HL8              | Field Duplicate |
| MA0GX1               | Ground Water/ Christine Mackey | L/G        | TM (21)              | 183003 (HNO3) (1)                | PC-GW-DUP-01     | S: 4/24/02 11:50        | A0HL9              | Field Duplicate |
| MA0GX2               | Aqueous/ Christine Mackey      | L/G        | TM (21)              | 183004 (HNO3) (1)                | PC-AQ-RB-03      | S: 4/24/02 11:30        | A0HMD              | Rinseate        |

|                                         |                                                  |                                            |                               |
|-----------------------------------------|--------------------------------------------------|--------------------------------------------|-------------------------------|
| Shipment for Case Complete? Y           | Sample(s) to be used for laboratory QC: MA0GW9   | Additional Sampler Signature(s):           | Chain of Custody Seal Number: |
| Analysis Key: TM = CLP TAL Total Metals | Concentration: L = Low, M = Low/Medium, H = High | Typical/Designate: Composite = C, Grab = G | Shipment Iced? _____          |

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PR provides preliminary results. Requests for preliminary results will increase analytical costs.  
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