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Year 2 Annual Groundwater Monitoring Report

for

Area A Landfill

Naval Submarine Base - New London

Groton, Connecticut

Engineering Field Activity Northeast
Naval Facilities Engineering Command

Contract Number N62476-94-D-0888

Contract Task Order 0816

December 2002

TETRA TECH NUS, INC.

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YEAR 2
ANNUAL GROUNDWATER MONITORING REPORT
FOR
AREA A LANDFILL

NAVAL SUBMARINE BASE - NEW LONDON
GROTON, CONNECTICUT

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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TABLE OF CONTENTS

SECTION		PAGE NO.
ACRONYM LIST		**vi**
1.0	**INTRODUCTION**	**1-1**
1.1	PURPOSE	1-1
1.2	SCOPE AND OBJECTIVES	1-2
1.3	REPORT ORGANIZATION	1-3
2.0	**BACKGROUND INFORMATION**	**2-1**
2.1	SITE DESCRIPTION	2-1
2.2	PHYSICAL CHARACTERISTICS	2-1
2.2.1	Topography and Surface Features	2-1
2.2.2	Soil Characteristics	2-2
2.2.3	Geology	2-3
2.2.4	Hydrogeology	2-4
2.2.5	Site Conceptual Model	2-7
2.3	PREVIOUS SITE INVESTIGATIONS	2-11
2.3.1	Phase I RI	2-11
2.3.2	Area A Landfill FFS	2-12
2.3.3	Phase II RI	2-12
2.3.4	Geotechnical Field Investigation	2-12
2.3.5	Area A East End Investigation	2-13
2.3.6	Groundwater/Leachate Modeling Study	2-13
2.3.7	Year 1 of the Monitoring Program	2-15
2.3.8	Basewide Groundwater OU RI	2-17
3.0	**FIELD ACTIVITIES**	**3-1**
3.1	MONITORING ACTIVITIES	3-1
3.2	SAMPLE COLLECTION PROCEDURES	3-2
3.3	INVESTIGATION DERIVED WASTE	3-4
4.0	**DATA EVALUATION**	**4-1**
4.1	METHODS OF ANALYSIS AND DECISION	4-1
4.2	NATURE AND EXTENT OF CONTAMINATION	4-2
4.2.1	Groundwater	4-2
4.2.2	Surface Water	4-5
4.3	HYDROGEOLOGIC EVALUATION	4-6
4.4	STATISTICAL ANALYSIS	4-7
4.4.1	Comparison of Downgradient Wells to Upgradient Wells	4-7
4.4.2	Parametric and Nonparametric Analysis of Variance (ANOVA)	4-9
4.4.3	Statistical Findings	4-16
4.5	OTHER FACTORS	4-18
5.0	**CONCLUSIONS AND RECOMMENDATIONS**	**5-1**
5.1	CONCLUSIONS	5-1
5.2	RECOMMENDATIONS	5-3
REFERENCES		**R-1**

TABLE OF CONTENTS (Continued)

APPENDICES

A	ROUND 8 FIELD ACTIVITIES LOG BOOK
B	ROUND 8 GROUNDWATER LEVEL MEASUREMENT SHEET
C	ROUND 8 MONITORING INSTRUMENT CALIBRATION LOGS
D	ROUNDS 5-8 GROUNDWATER SAMPLE LOG SHEETS AND LOW-FLOW PURGE DATA SHEETS
E	ROUND 8 CHAIN OF CUSTODY RECORDS
F	ROUND 8 DATA VALIDATION LETTERS AND LABORATORY DATA SHEETS
G	SUMMARY OF MONITORING PROGRAM ANALYTICAL DATA, YEARS 1 AND 2
H	STATISTICAL TABLES AND TEMPORAL PLOTS
I	RESPONSES TO COMMENTS

TABLES

NUMBER

2-1	Range of Major Cation Concentrations in Wells at Area A Landfill
3-1	Area A Monitoring Well Construction Details
4-1	Summary of the Monitoring Locations that were Compared for the Statistical Analysis
4-2	Rounds 5-8 Groundwater Analytical Results Summary
4-3	Rounds 5-8 Surface Water Analytical Results Summary
4-4	Background Groundwater Concentrations From Basewide Groundwater Operable Unit Remedial Investigation
4-5	Groundwater Elevations - Rounds 5 through 8
4-6	Downgradient Groundwater Results - Rounds 5 through 8
4-7	Upgradient Groundwater Results - Rounds 5 through 8
4-8	Reference Groundwater Results - Rounds 5 through 8
4-9	Groundwater Rounds 5 through 8, Statistical Test Results for COPCs, Comparison of Downgradient Results with Upgradient Results
4-10	Groundwater - Rounds 5 through 8, Levene's Test of Homogeneity of Variance, Downgradient Results with Upgradient Results
4-11	Groundwater - Rounds 5 through 8, Wilcoxon Rank-Sum Results, Comparing Potential COC, Downgradient Results with Upgradient Results
4-12	Groundwater - Rounds 5 through 8, Test of Proportions Results for Potential COC, Comparison of Downgradient Results with Upgradient Results
4-13	Groundwater - Rounds 5 through 8, Comparison of Potential COCs above Upgradient Concentrations to Site-Specific Background and Primary Monitoring Criteria

FIGURES

NUMBER

2-1 Location Map
2-2 Area "A" Landfill Location
2-3 Site Map
2-4 Area A Landfill Groundwater Conceptual Model
3-1 Sampling Locations for Groundwater and Surface Water Monitoring
3-2 View of rip-rap slope looking north toward wetland from western end of landfill (September 2001)
3-3 View of rip-rap slope and edge of wetland looking east from western end of site (September 2001)
3-4 View of landfill surface and equipment storage looking south across landfill towards the former Bunker A-86 site (September 2001)
3-5 View of gabion baskets along northern side of landfill adjacent to wetland looking west from eastern side of landfill (September 2001)
3-6 View looking south along Drainage Channel C toward Building 460 (September 2001)
3-7 View of condition of Monitorng Well 2LMW20S vault along Thresher Avenue (September 2001)
3-8 View of typical monitoring well location downgradient of landfill within wetland area (September 2001)
3-9 View of low-flow sampling equipment next to locked monitoring well (September 2001)
3-10 View of low-flow sampling equipment setup (September 2001)
3-11 View of low-flow sampling equipment setup with collection bucket and recording sheets (September 2001)
4-1 Groundwater Monitoring Plan Decision Diagram
4-2 Potential COCs in Excess of Monitoring Criteria, Rounds 5-8 Groundwater Sampling Results
4-3 Potential COCs in Excess of Monitoring Criteria, Rounds 5-8 Surface Water Sampling Results
4-4 Potentiometric Surface Map - Round 5 Groundwater Monitoring
4-5 Potentiometric Surface Map - Round 6 Groundwater Monitoring
4-6 Potentiometric Surface Map - Round 7 Groundwater Monitoring
4-7 Potentiometric Surface Map - Round 8 Groundwater Monitoring
4-8 Dissolved Arsenic versus Total Arsenic, All Groundwater Data
4-9 Total Arsenic versus TDS, All Groundwater Data
4-10 Dissolved Arsenic versus TDS, All Groundwater Data
4-11 Total Arsenic versus TDS, Dredge Spoil Wells with High Arsenic
4-12 Dissolved Arsenic versus TDS, Dredge Spoil Wells with High Arsenic
4-13 Arsenic versus Iron for Area A Wetland Soil
4-14 Total Arsenic versus Total Iron in Dredge Spoil Wells (Non-Detects Included)
4-15 Dissolved Arsenic versus Dissolved Iron in Dredge Spoil Wells (Non-Detects Included)
4-16 Total Arsenic versus Total Iron in Dredge Spoil Wells (Non-Detects Eliminated)
4-17 Dissolved Arsenic versus Dissolved Iron in Dredge Spoil Wells (Non-Detects Eliminated)

ACRONYMS

ANOVA	Analysis of Variance
AWQC	Ambient Water Quality Criteria
B&R	Brown & Root
BEHP	Bis(2-ethylhexyl)phthalate
CEC	Cation Exchange Capacity
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
COCs	Chemicals of Concern
COD	Chemical Oxygen Demand
CTDEP	Connecticut Department of Environmental Protection
CTO	Contract Task Order
DD	Department of Defense
DOE	Department of Energy
Eh	Oxidation Reduction Potential
EPA	Environmental Protection Agency
FFS	Focused Feasibility Study
ft	feet
GMP	Groundwater Monitoring Plan
gpm	gallons per minute
HNUS	Halliburton NUS, Inc.
ICP	Inductively Coupled Plasma
msl	mean sea level
Navy	U.S. Department of the Navy
NSB-NLON	Naval Submarine Base New London
NRC	Nuclear Regulatory Commission
OBDA	Over Bank Disposal Area
OU	Operable Unit
OVA	Organic Vapor Analyzer
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
RA	Remedial Action
ROD	Record of Decision
RSR	Remediation Standard Regulation
SCS	Soil Conservation Service
SG	Staff Gauge

SQL	Sample Quantitation Limit
SVOC	Semivolatile Organic Compound
SWPC	Surface Water Protection Criteria
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbon
TtNUS	Tetra Tech NUS, Inc.
US	United States
VOCs	Volatile Organic Compounds
WQS	Water Quality Standard

1.0 INTRODUCTION

This Year 2 Annual Groundwater Monitoring Report for the Area A Landfill [Site 2/Operable Unit (OU) 1] at the Naval Submarine Base New London (NSB-NLON) in Groton, Connecticut was prepared for the U.S. Department of the Navy (Navy) by Tetra Tech NUS, Inc. (TtNUS) under the Comprehensive Long-Term Environmental Action Navy (CLEAN), Contract Number N62476-94-D-0888, Contract Task Order (CTO) 0816. All field activities were performed in accordance with the approved Groundwater Monitoring Plan (GMP) for the Area A Landfill (TtNUS, January 1999).

1.1 PURPOSE

A Remedial Action (RA) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was completed in 1997 at the Area A Landfill to address the overall risks from direct exposure to landfill material and to minimize the risk of migration of potential chemicals of concern (COCs) from the landfill to the surrounding areas via groundwater. The RA consisted of capping the site with a multi-layer, low-permeability cover system and installing a surface water and shallow groundwater interception and diversion system upgradient from the cover system. Groundwater and surface water monitoring is being conducted as part of post-closure activities associated with the Area A Landfill site to evaluate the effectiveness of the RA.

The monitoring program was designed to determine the following:

- The effectiveness of the Area A Landfill RA in preventing the migration of potential COCs at concentrations greater than the monitoring criteria to the underlying groundwater and the surface water in the nearby wetlands.
- The effectiveness of the remedial action to eliminate health risks.
- Whether the criteria used for evaluating the data have been met.
- Whether the groundwater plume interferes with any existing use of the groundwater.
- Whether the IRA can be selected as the final Remedial Action (RA) for the site.

The ultimate goal of the monitoring program is to show compliance with the primary monitoring criteria [i.e, Connecticut Department of Environmental Protection (CTDEP) Surface Water Protection Criteria (SWPC)] for those potential COCs migrating from the site. If compliance is shown, the monitoring requirements for the site would be reduced and no additional remedial actions would be required at the site. Conversely, if the program shows that the RA is not effective in complying with the remedial action objectives, other remedial actions will need to be considered.

1.2 SCOPE AND OBJECTIVES

The results of the first year of monitoring were summarized in the Year 1 Annual Groundwater Monitoring Report for the Area A Landfill (TtNUS, May 2001b). The report recommended continuation of the monitoring program specified in the GMP for the second year of monitoring. The current monitoring program at the Area A Landfill includes:

- Quarterly monitoring of groundwater in two upgradient, one reference, and 13 downgradient monitoring wells.
- Quarterly monitoring of surface water at 10 staff gauges located adjacent to 10 of the downgradient monitoring wells within the Area A Wetland and one surface seep location along the western end of the site.
- Analysis of the samples for the analytical list specified in the GMP.
- Evaluation of the field and analytical results as outlined in the GMP.

The objective of this Year 2 Annual Report is to present and evaluate the four quarterly sampling rounds of groundwater and surface water data collected from the Area A Landfill monitoring network. The quarterly sampling efforts were completed during December 2000 through September 2001. Another objective of the report is to collectively present and evaluate all of the data collected to date under the monitoring program. Long-term trends in the data can be established by evaluating all of the data versus only a portion of the data. This type of evaluation is important for making decisions on the success of the IRA and also the scope of the monitoring program.

The results and supporting field and laboratory documentation for the first three rounds of monitoring performed during the second year (i.e., Rounds 5, 6, and 7) were previously presented in quarterly reports (TtNUS, March 2001; TtNUS, May 2001a; and TtNUS, November, 2001). The results from Rounds 5, 6, and 7 are summarized in this report; however, the supporting documentation, with the exception of the sample log sheets, are not reiterated. The results and supporting documentation for the fourth round (Round 8) of monitoring are presented in this report because they were not previously presented in a separate report. A collective summary of the monitoring program's analytical results (i.e., data from Years 1 and 2) is also provided in this report.

1.3 REPORT ORGANIZATION

This report consists of five sections. Section 1.0 provides a brief introduction and describes the scope, objectives, and purpose of the report. Section 2.0 provides a description of NSB-NLON, Area A Landfill, and previous investigations conducted at the site. Section 3.0 provides a summary of the field sampling activities. Section 4.0 presents and evaluates the results of the monitoring program. Finally, Section 5.0 provides conclusions and recommendations for the monitoring program. Tables and figures are included at the end of each section of the report. Supporting documentation is provided in the appendices of the report.

2.0 BACKGROUND INFORMATION

The following sections describe the Area A Landfill site that is located at NSB-NLON. Section 2.1 provides a brief site description. Section 2.2 provides characteristics and physical features of the Area A Landfill. Finally, Section 2.3 describes the previous field investigations that have been performed at the Area A Landfill.

2.1 SITE DESCRIPTION

Figure 2-1 shows the location of NSB-NLON. NSB-NLON encompasses approximately 576 acres and is located in southeastern Connecticut in the towns of Ledyard and Groton. NSB-NLON is situated on the east bank of the Thames River, approximately 6 miles north of Long Island Sound. NSB-NLON is bounded to the east by Connecticut Route 12, to the south by Crystal Lake Road, and to the west by the Thames River. Figure 2-2 illustrates NSB-NLON's main features and identifies the Area A Landfill. Figure 2-3 is a site map for the Area A Landfill.

The Area A Landfill site is located in the northeastern and north-central part of NSB-NLON and encompasses approximately 13 acres. The Area A Landfill is relatively flat and is bordered by a steep, wooded hillside that rises to the south, a steep wooded ravine to the west, and the Area A Wetland to the north. Access to the west end of the landfill is via a gate off Wahoo Avenue and access to the east end of the landfill is via a paved road and gate adjacent to a parking lot and to the Area A recreational facilities.

2.2 PHYSICAL CHARACTERISTICS

This section presents a summary of the physical characteristics for the Area A Landfill based on information generated during the previous investigations. Topography and surface features, soils, geology, hydrogeology, and a site conceptual model are discussed in the subsections that follow.

2.2.1 Topography and Surface Features

The topography and surface features of the Area A Landfill, with the cover system and adjacent sites including the Area A Wetland and Area A Downstream (Site 3/OU3), are described as follows. The ground surface slopes gently across the Area A Landfill toward the Area A Wetland. A steep hillside (central bedrock high) borders the southern edge of the landfill. The CBU Drum Storage Area (Site 1) was located in the central portion of the landfill along the southern (upgradient) edge. Near the northwestern edge of the landfill, the ground surface drops along a steep ravine to the Over Bank Disposal Area (OBDA). The ground surface increases in elevation to the east from the tennis courts to Route 12 and Baldwin Hill.

The ground surface elevation across the landfill cover system varies from approximately 80 to 87 feet above mean sea level (msl) in the eastern portion of the landfill and from 80 to 100 feet msl in the western portion of the landfill, such that the landfill cover slopes gently to the northeast at a grade of approximately 3 percent toward the Area A Wetland. Adjacent to the toe of the landfill, the Area A Wetland surface is at an elevation of approximately 72 feet above msl, and the newly constructed landfill sideslope angles at a 1:4 (vertical: horizontal) grade from the surface of the wetland. Along this side slope, a layer of riprap at the higher elevations and a gabion basket system (wire-mesh containing stones) at the toe of the landfill provide slope stability and erosion protection.

A concrete structure (for salt storage) is located near the Building 460 (Hobby Shop) entrance to the landfill. The MAA Building previously located at the western end of the landfill has been demolished and replaced by a metal building located on Thresher Avenue at the entrance to the Deployed Parking area. The Deployed Parking area is located at the eastern end of the landfill, where it can be accessed from Thresher Avenue. The Deployed Parking area is a secure area where Navy personnel who are out at-sea for an extended time can store their vehicles. A 7-foot high chain-link fence with a three-strand barbed wire around its perimeter secures the area.

A crane test platform is located within the east-central portion of the landfill. This platform consists of a 24-inch thick, 50 foot x 50 foot concrete slab, with No. 8 metal reinforcing bars used for structural reinforcement. This platform allows testing of cranes where the boom of the crane can be turned through a full 360 degree rotation.

A sand bag storage area is located in the western portion of the landfill. Several thousand sand bags are stored on wooden pallets on the completed asphalt surface and kept on hand by NSB-NLON for use in protecting structures on the Lower Base during severe storm events.

The Public Works Department at NSB-NLON stores equipment and materials on various sections of the completed landfill cover system. Typically, equipment such as trailer trucks, buses, and plows is parked on the plateau of the landfill.

2.2.2 Soil Characteristics

The Soil Conservation Service (SCS) soils map (SCS, 1983) classifies the soil across most of the Area A Landfill as Udorthents-Urban land. This soil type is defined as excessively drained to moderately drained soils that have been disturbed by cutting and filling. Along the southwestern slope of the landfill and in upgradient areas, the soil is classified as the Hollis-Charlton-Rock complex. Stones and boulders are intermingled with a dark, fine, sandy loam. Bedrock outcrops are prevalent in the area.

2.2.3 Geology

The Groundwater/Leachate Modeling Study (B&R Environmental, October 1996) describes the shallow subsurface geology within and surrounding the Area A Landfill as consisting of four units. In order of their occurrence with depth, the units are landfill material, dredge spoil, alluvium, and competent bedrock.

The Area A Landfill contains miscellaneous fill that consists of fine- to coarse-grained sand and gravel as well as refuse including ash, wood fragments, paper, brick fragments, and asphalt. The landfill thickness generally increases from 5 to 10 feet in the western portion of the landfill to 15 to 20 feet in the far eastern portion of the landfill. The landfill material is underlain by dredge spoil within most of the landfill boundary. Where no dredge spoil is present, landfill material directly overlies a thin alluvial layer or the bedrock surface (TtNUS, January 1999).

The dredge spoil is a fine-grained material that is easily identified by its silty texture, sulfurous odor, and the presence of shells. Dredge spoil is present beneath most of the landfill to a thickness up to 25 feet. This dredge spoil layer continues into the wetland and is present at the wetland surface. Dredge spoil is not present in the far western portion of the landfill area or along the southern hillside.

The alluvium includes native surface soils, unconsolidated fluvial and glacial deposits, colluvium, weathered bedrock, and re-worked clean sand and gravel soils (present to the east of the landfill). Upgradient of the landfill boundary along the hillside, alluvium is present at the ground surface but bedrock outcrops are prevalent. Typically, alluvium is present beneath the dredge spoil in the landfill and wetland areas.

Bedrock in the Area A Landfill vicinity has been identified as the biotite-quartz-feldspar gneiss of the Mamacoke Formation. Bedrock is located at or near the ground surface along the southern hillside and beneath the alluvium throughout the landfill and wetland areas. The bedrock surface slopes to the northeast toward the Area A Wetland from the large central bedrock high in the center of the facility. Locally, there is a bedrock high in the western portion of the landfill, a small bedrock valley in the central portion of the landfill, and a bedrock island in the Area A Wetland. In the far northeastern portion of the landfill, there is a bedrock depression that is filled with a significant thickness of weathered bedrock and large boulder-like pieces of bedrock (colluvium).

The landfill is situated along the flank of the hillside such that the depth to bedrock generally increases from west to east. Thicknesses of each of the three overlying units (alluvium, dredge spoil, and landfill material) also generally increase from west to east (TtNUS, January 1999).

2.2.4 Hydrogeology

As stated in Section 2.2.3, there were four subsurface units identified at the Area A Landfill: landfill material, dredge spoil, alluvium, and bedrock. Except for the Groundwater/Leachate Modeling Study, previous investigations grouped the landfill material, dredge spoil, and alluvium together as overburden and most of the overburden wells were screened across some combination of these three units. During the Groundwater/Leachate Modeling Study, unit-specific wells were installed. Based on slug test results, the estimated hydraulic conductivity of the landfill material and alluvium were comparable at 6.0 ft/day and 1.7 ft/day, respectively. The estimated hydraulic conductivity of the dredge spoil and bedrock were comparable at 9.0E-03 ft/day and 1.4E-02 ft/day, respectively. Also, shelby tube permeability test results indicated that the mean vertical hydraulic conductivity of the dredge spoil was 5.4E-04 ft/day. These results in conjunction with the analysis of groundwater potentials prove that the dredge spoil, which is often present between landfill material and alluvium, is a low-permeability confining unit. A summary of groundwater flow characteristics follows.

Water Table

Groundwater flow directions generally reflect surface topography. Groundwater flows from the southern hillside, across the Area A Landfill to the northeast toward the Area A Wetland and across most of the landfill, and to the northwest toward the Area A Downstream in the far western portion of the landfill. In the western and central portions of the landfill, the hydraulic gradient is steepest along the hillside, flatter across the landfill, and nearly flat across the wetland. In these areas, groundwater elevations range from approximately 80 to 90 feet msl along the upgradient landfill boundary to 71 feet msl along the wetland boundary. In the eastern portion of the landfill, the hydraulic gradient is relatively flat across the landfill. The groundwater elevations range between 71 to 72 feet msl. Staff gauge measurements indicate that although the bedrock island in the wetland impedes flow, surface water in the wetland moves slowly northwest toward the dike and the Area A Downstream (B&R Environmental, October 1996).

The saturated thickness of the landfill material typically ranges from approximately 0 to 5 feet in the western and central portions of the landfill and from 5 to 10 feet in the eastern portion of the landfill. The hydraulic gradient was estimated from the water table contour lines at seven locations across the site (TtNUS, 1999). The lowest estimated hydraulic gradients ranged from 0.0007 ft/ft to 0.0018 ft/ft. These gradients occurred in the central portion of the landfill near the wetland boundary and across the entire eastern portion of the landfill. The highest estimated hydraulic gradients ranged from 0.03 ft/ft to 0.09 ft/ft. These gradients occurred in the central portion of the landfill near the hillside boundary and across the entire western portion of the landfill. Assuming these gradient ranges, a hydraulic conductivity of 6.0 ft/day for the landfill material, and a porosity of 0.30, the seepage velocity ranges from 0.014 to 0.036 ft/day

across the areas with lower gradients and from 0.6 to 1.8 ft/day across the areas with higher gradients (B&R Environmental, October 1996).

Dredge Spoil Groundwater

As stated earlier, the dredge spoil has been characterized as a relatively low permeability, confining unit that, where present, separates landfill material from the underlying alluvium and bedrock. During the Groundwater/Leachate Modeling Study, six monitoring wells were installed within the dredge spoil to assess the groundwater characteristics of the dredge spoil at different locations across the landfill. There is a downward hydraulic gradient from the landfill material to the dredge spoil at all locations, except at the 2LMW31 well cluster, which is located at the central portion of the landfill near the southern hillside boundary where the alluvium and dredge spoil are thin and strong upward gradients are present from the bedrock to the overyling units. The observed downward hydraulic gradients indicate that the dredge spoil is inhibiting upward recharge from the bedrock and alluvium to the landfill material.

A groundwater contour map was not generated for the dredge spoil during the Groundwater/Leachate Modeling Study, because of the limited number of monitoring wells and some irregular data. For example, in the eastern portion of the landfill, the measured groundwater elevation at 2LMW33DS was lower than that measured at 2LMW32DS, which is closer to the wetland but screened at a lower elevation within the dredge spoil. Also, the measured groundwater elevation at 2LMW34DS within the dredge spoil depression near the crane test pad was 57.85 ft msl, which is considerably lower than the measured elevations in the landfill material and bedrock at the same location. These irregular groundwater elevations confirm that the dredge spoil cannot be considered to be a continuous water-bearing unit where hydraulic gradients and seepage velocities can be estimated. Rather, the dredge spoil is a low permeability confining unit where groundwater elevations are irregular and dependent on local conditions such as the dredge spoil thickness and overlying and underlying groundwater elevations.

Alluvium Groundwater

During the Groundwater/Leachate Modeling Study, one monitoring well was installed in the alluvium material (2LMW29A) in the western portion of the landfill where dredge spoil is thin. As stated earlier, the estimated hydraulic conductivity of the alluvium is comparable to the landfill material. There is an upward hydraulic gradient from the alluvium to the landfill material at this location, which confirms that where dredge spoil is not present, the upward hydraulic gradient from the bedrock persists to the landfill material. Previously installed monitoring wells that are screened within landfill material and alluvium include 1MW2S, 2LMW8S, and 2LMW20S, which are all located near the hillside boundary of the landfill. There is an upward hydraulic gradient from the bedrock to the alluvium/landfill material at well clusters 2LMW8 and 2LMW20 (there is no bedrock well at 1MW2S).

A groundwater contour map was not generated for the alluvium due to the limited number of monitoring wells. However, based on the observed vertical hydraulic gradients and relatively permeable nature of the alluvium, it can be concluded that bedrock groundwater is recharging the alluvium. Where dredge spoil is present, alluvium groundwater flows preferentially through alluvium material toward the wetland and Area A Downstream. Additionally, where dredge spoil is not present, alluvium recharges the landfill material.

Bedrock Groundwater

Groundwater in the bedrock flows in similar directions as the water table. Similar to the shallow groundwater, the hydraulic gradients in the bedrock are steepest across the western and central portions of the landfill area and are flatter in the eastern portion of the landfill area where the bedrock depression is located and the overlying unconsolidated material is thickest. Between the 2LMW13D and 2LMW9D bedrock wells, there is a significant decrease in the groundwater elevation that is probably related to groundwater discharging to the OBDA groundwater seep indicated by the sampled point 3MSP01. Discharge from this seep was estimated during the Groundwater/Leachate Modeling Study at 109.5 gallons per minute (gpm).

The hydraulic gradient was estimated from the groundwater contours prepared as part of the modeling study. In the western and central portions of the landfill the estimated hydraulic gradient is comparable at 0.09 ft/ft and 0.11 ft/ft, respectively. In the eastern portion of the landfill the estimated hydraulic gradient is 0.02 ft/ft. Based on the minimum and maximum estimated gradients, a hydraulic conductivity of 1.4E-02 ft/day, and a porosity of 0.001, the estimated seepage velocity ranges from 0.3 to 1.5 ft/day.

Vertical Gradients and Hydraulic Connections

Although groundwater flow directions and gradients are similar in the water table and bedrock groundwater, an analysis of vertical flow gradients is necessary to determine possible hydraulic connections. Cross-sections presented in the modeling study (B&R Environmental, October 1996) and the GMP (TtNUS, January 1999) show the water table and the direction of the vertical hydraulic gradients between the units. In all of these cases, except at the 2LMW9 well cluster, there is an upward gradient from the bedrock to the overlying unit (the reduced groundwater potential in the bedrock at the 2LMW9D well is probably due to bedrock groundwater discharging to the OBDA seep and the lack of hydraulic connection between the bedrock and the landfill material due to dredge spoil). Along the hillside near the boundary of the landfill, dredge spoil is either very thin or not present and there is an upward gradient from the bedrock and alluvium to the landfill material. Within the landfill where dredge spoil is present, there is a downward gradient from the landfill material to the dredge spoil.

Based on the analysis of vertical flow gradients, it can be concluded that bedrock groundwater from the hillside is recharging the overlying units. Along the hillside boundary of the landfill and in the western portion of the landfill where the alluvium is thin and dredge spoil is not present, bedrock groundwater recharges landfill material. Where dredge spoil is present, the dredge spoil inhibits upward recharge from the bedrock to the landfill material, and the bedrock groundwater recharges the alluvium (and possibly the deeper dredge spoil) only. Although there is a downward gradient from the landfill material to the dredge spoil, the dredge spoil is relatively impermeable and shallow groundwater flows preferentially from the landfill material toward the wetland.

2.2.5 Site Conceptual Model

The conceptual model for the Area A Landfill groundwater begins with an understanding of the nature of the dredge spoil filling the valley. The dredge spoil material was originally sediment in the Thames River which is an estuarine system. Within the estuarine system, sediments and dissolved metals are co-deposited due to changes in the mix between freshwater and seawater. Typically, estuarine sediments are rich in organic carbon content. Following deposition and only moderate burial, estuarine sediments are typically anaerobic, due to microbial action on the rich deposits of organic carbon. Under anaerobic conditions, manganese and iron oxyhydroxide coatings on sediment grains will undergo reduction and dissolution. The primary result is mobilization of iron in the sediment porewater. Secondarily, trace metals sorbed to the oxyhydroxide coatings are both reduced and mobilized or simply released from the surface coating during dissolution. Redistribution of the major and minor metals within the sediment via concentration gradients in the porewaters may bring the metals to a more oxidizing, sediment-surface environment or areas of sulfate reduction and sedimentary pyrite formation. In either environment the major and minor metals will be precipitated, co-precipitated and/or re-adsorbed. The important point is that, in all likelihood, the dredge spoils deposited beneath and adjacent to the Area A Landfill contained discrete sedimentary iron sulfide minerals in addition to iron and manganese oxyhydroxide coatings. The dredging process created homogenized sediment with sulfide minerals and oxidized grains intimately mixed. The evolving groundwater geochemistry within the dredge spoils represents a process of re-equilibration among the homogenized spoils, entrained estuarine to marine porewater, and fresh groundwater and surface water.

The conceptual model for groundwater in the vicinity of the Area A Landfill continues with the conceptual model of groundwater flow developed for the Area A Landfill groundwater modeling study completed by Brown & Root Environmental in 1996. In that study, several cross-sections were developed showing the groundwater flow lines from the recharge area upgradient of the Area A Landfill to the discharge area downgradient of the Area A Landfill in the Area A Wetland. Two of those cross-sections (i.e., B-B' and C-C'), which were depicted on Figures 2-6 and 2-7 in the Groundwater Monitoring Plan for Area A Landfill (TtNUS, January 1999), were selected for more detailed examination of the major element geochemistry

of samples from the wells. Monitoring wells installed and screened within the dredge spoils downgradient of the landfill for the Groundwater Monitoring Program, but after completion of the modeling study, have been added to the geochemical data set. Monitoring wells are typically distinguished based on whether they are located upgradient or downgradient of a source of contamination. For the Area A Landfill, the wells need to be further discriminated on the basis of the screen interval material. In either selected transect, wells may be screened in one or more of four types of material: alluvium, bedrock, landfill, or dredge spoil. Based on the screen interval elevations and drilling logs, wells in transect B-B' have been divided into four groups, those screened in bedrock, alluvium/bedrock, landfill/dredge spoil and dredge spoil. In transect C-C', wells with geochemical data have been divided into three groups, those screened in bedrock, landfill, and dredge spoil. Figure 2-4 provides a conceptual model of groundwater flow.

The major element data set, taken from the data collected for the Phase II RI and groundwater monitoring program, is somewhat limited with major cation analyses (i.e., sodium, potassium, calcium, magnesium) available for most wells during most sampling events. Complete data for major anions (i.e., chloride, sulfate and alkalinity) are available only for the downgradient wells screened in dredge spoil material that were installed specifically for the monitoring program. Field measurements of stabilization parameters are available but data from wells sampled in the early 1990s do not have a complete set (e.g., missing ORP).

Based on the ranges of the major cation analyses (Table 2-1) and the information provided below, it is apparent that there are several distinct and surprisingly consistent water types present. The lowest concentrations of major cations are present in samples from the bedrock and alluvium/bedrock screened wells. Both of these screen intervals tend to represent groundwater that, even though physically located beneath the landfill and/or dredge spoils, is upgradient or side gradient of the landfill. Wells screened within landfill material have the next highest major cation concentrations with wells screened across the landfill/dredge spoil interface having slightly higher cation concentrations. The highest concentrations are present in wells screened within the dredge spoil material.

Bedrock

- Weathering type environment
- Low pH (5.5-6.5)
- Relatively aerobic (DO>2 mg/L)
- Low specific conductance (<1 mS/cm)
- Low concentration of major cations
- Low concentrations of major anions
- Major anion is alkalinity (predicted)
- Low TOC concentration (predicted)

- ORP positive (predicted)

Alluvium/Bedrock

- Very similar to bedrock

Landfill

- Moderate pH (6.5-7)
- Slightly higher specific conductance (2-4 mS/cm)
- Higher major cation concentrations
- Higher major anion concentrations (predicted)
- Major anion is alkalinity (predicted)
- Borderline aerobic (1<DO<3 mg/L) (predicted)
- Moderate TOC concentration (predicted)
- ORP slightly positive to slightly negative, may fluctuate (predicted)

Dredge Spoil (near freshwater recharge)

- Originally estuarine sediments
- High pH (generally >7)
- Relatively anaerobic (ORP < -300 mV)
- High specific conductance
- High major cation concentrations with sodium dominant
- High major anion concentrations with chloride dominant
- High TOC concentration (generally >20 mg/L)
- High sulfate concentration

Dredge Spoil (far from freshwater recharge)

- Originally estuarine sediments
- Highest pH (generally >7) (predicted)
- Strongly anaerobic (ORP < -400 mV) (predicted)
- High specific conductance (predicted)
- High major cation concentrations with sodium dominant (predicted)
- High major anion concentrations with chloride dominant (predicted)
- High TOC concentration (generally >20 mg/L) (predicted)
- Lower sulfate concentration (predicted)

- Measurable dissolved sulfide concentration (predicted)
- Moderate dissolved iron concentration (predicted)
- Measurable dissolved methane concentration (predicted)
- Measurable dissolved hydrogen concentration (>3nM) (predicted)

Surface water discharge (predominantly dredge spoil groundwater)

- Iron oxyhydroxide precipitation (predicted)
- Trace metal concentrations low (sorbed or co-precipitated on iron floc) (predicted)
- Relatively high specific conductance (predicted)
- Minor carbonate mineral precipitation (predicted)
- Moderate pH (predicted)
- Chloride and sulfate are major anions (predicted)

It is clear that groundwater flow that intersects the landfill or dredge spoil material is dramatically altered. Additional geochemical parameters measured within these two populations of wells should indicate that the anion concentrations are significantly higher than those in either bedrock or alluvium. In addition, specific conductance and groundwater pH are significantly higher in the landfill and dredge spoil samples. The data available to evaluate landfill type groundwater are limited and relatively old (prior to 1995). Based on the limited data from wells screened in landfill material it is unlikely that the landfill has much impact on the groundwater composition observed in the dredge spoils. Geochemical data suggest that landfill groundwater is an intermediate between the alluvium/bedrock type and the dredge spoil groundwater. Major cation concentrations are still five to ten times higher in the dredge spoil monitoring wells.

Based on the likely distribution of sulfide minerals within the dredge spoils and their exposure to relatively oxidizing groundwater, it is likely there will be release of ferrous iron and sulfate along with hydrogen ion. Oxidation of the sulfides may mobilize other metals, e.g., As, that were co-precipitated in the sedimentary environment. Oxidation-reduction conditions within the dredge spoils are more oxidizing than in the sedimentary environment due to exposure to more aerobic groundwater. Dissolved iron released from sulfide mineral weathering may reprecipitate in more oxidizing areas within the wetland as a "green rust" (a mix of ferric and ferrous iron) or oxyhydroxide with subsequent adsorption of trace metals (e.g., As). Other areas of the wetland, more isolated from groundwater recharge may revert to sulfate reduction and subsequent sulfide mineral precipitation. Arsenic has been non-detect in monitoring wells in the Area A Downstream, which is downgradient of the Area A Landfill and Area A Wetland, indicating that arsenic is not migrating from the dredge spoil material and confirming the geochemical conceptual model.

To verify this geochemical conceptual model, the Navy will conduct additional groundwater monitoring during Year 3 of the groundwater monitoring program that will focus on major element geochemistry in two series of wells along two transects that follow the path of groundwater flow through the Area A Landfill. The monitoring wells that were selected cover the major aquifer materials present at the Area A Landfill (i.e., bedrock, alluvium, landfill, and dredge spoil). The results of the study will be provided in the Area A Landfill Year 3 Annual Groundwater Monitoring Report.

2.3 PREVIOUS SITE INVESTIGATIONS

The following eight field investigations have been conducted at the Area A Landfill.

- The field investigation performed for the Phase I RI (Atlantic, August 1992).
- The supplemental field investigation performed for the Area A Landfill Focused Feasibility Study (FFS) (Atlantic, May 1995).
- The field investigation performed for the Phase II RI (B&R Environmental, March 1997).
- The Geotechnical Field Investigation and Area A East End Investigation (B&R Environmental, December 1996a) performed in support of the Area A Landfill Remedial Design (B&R Environmental, December 1996b).
- The field investigation performed for the Groundwater/Leachate Modeling Study, which supported the Area A Landfill Remedial Design (B&R Environmental, October 1996).
- The investigations performed for Year One of the GMP at the Area A Landfill (TtNUS, May 2001b).
- The field investigation performed for the Basewide Groundwater OU RI (TtNUS, August 2001).

2.3.1 Phase I RI

Atlantic conducted a field investigation at the Area A Landfill in 1992 as part of the base-wide Phase I RI. A total of 13 monitoring wells (2LMW7S, 2LMW7D, 2LMW8S, 2LMW8D, 2LMW9S, 2LMW9D, 2LMW13S, 2LMW13D, 2LMW14D, 2LMW17S, 2LMW17D, 2LMW18S, 2LMW18D) and 7 test borings were installed. A total of 12 soil and 12 groundwater samples were collected from these monitoring wells and test borings. Soil samples were analyzed for Target Compound List (TCL) organics, Target Analyte List (TAL) inorganics, Poly-Chlorinated Biphenyls (PCBs), pesticides, and Toxicity Characteristics Leaching

Procedure (TCLP) pesticides and metals. Groundwater samples were analyzed for the same parameters, except TCLP, plus radiological elements.

2.3.2 Area A Landfill FFS

Atlantic conducted a supplemental field investigation at the Area A Landfill in October and November 1993 to support the Area A Landfill FFS. The main purpose of these field activities was to characterize the subsurface soil in the vicinity of the bituminous concrete pad located at the southwestern end of the landfill.

Twenty-four soil borings were drilled to a depth of 16 feet or auger refusal. Based on field screening for Volatile Organic Compounds (VOCs), with an HNu organic vapor analyzer (OVA) and for PCBs with a field gas chromatograph, 13 subsurface soil sample were selected for analysis of TCL organics, PCBs, pesticides and TAL inorganics. Selected samples were also analyzed for organic content, cation exchange capacity (CEC), Total Organic Carbon (TOC), dioxin and geotechnical parameters, including grain-size distribution, moisture content, and specific gravity. Two samples were also analyzed by the TCLP for all toxicity constituents.

2.3.3 Phase II RI

B&R Environmental conducted a field investigation at the Area A Landfill in 1994 as part of the base-wide Phase II RI. A total of 10 monitoring wells (2LPW1S, 2LOW1S, 2LOW1D, 2LOW2S, 2LOW3S, 2LOW4S, 2LMW19S, 2LMW19D, 2LMW20S, and 2LMW20D) were installed. Eleven soil samples were collected from two soil borings (2LTB13, 2LTB23). Two rounds of groundwater level measurements and groundwater sampling were conducted, including one in March and one in August 1994. Groundwater samples were analyzed for TCL organics, TAL inorganics, PCBs, and radiological elements.

2.3.4 Geotechnical Field Investigation

B&R Environmental conducted field activities at the Area A Landfill in February and March 1995 as part of the Geotechnical Field Investigation performed in support of the Remedial Design for a landfill cover system. The purpose of the Geotechnical Field Investigation was to confirm the areal extent of the fill material and to obtain additional geotechnical field data.

Twenty test pits were excavated along the edges of the Area A Landfill to allow for visual observation of subsurface conditions. The purpose of excavating these test pits was primarily to determine the lateral extent of the fill material and, wherever practical (especially along the southern edge of the landfill), establish the depth and competence of bedrock.

Eight soil borings were drilled on the landfill plateau to establish the depth of bedrock and thickness of the fill and dredge spoil material. The soil borings were also used to collect six soil samples to be tested for geotechnical parameters (particle size, moisture content, classification, Atterberg limits, and triaxial compression) and three soil samples to be tested for analytical parameters (TCL organics, TAL inorganics, PCBs, and pesticides). Four borings were advanced through the overburden to auger refusal at the bedrock. Four borings were advanced through the overburden and approximately 5 feet into competent bedrock.

2.3.5 Area A East End Investigation

B&R Environmental conducted field activities at the Area A Landfill in September 1995 as part of the Area A East End Investigation performed in support of the Remedial Design for the landfill cover system. The purpose of the Area A East End Investigation was to verify that the fill used for the construction of the recreational facilities (Racquetball Building, tennis courts, ball field) located at the extreme east end of Area A is of a different nature from that placed in the rest of the Area A Landfill, i.e., does not contain contaminated waste material, and therefore, does not need to be capped.

Six test trenches (LF-TP22 through LF-TP27) were excavated along the eastern boundary of the Area A Landfill cover system as designed to verify the eastern limit of contaminated fill material. The test trenches were field-screened for the presence of VOCs, and four soil samples were collected and analyzed TCL organics, TAL inorganics and cyanide, PCBs, pesticides, and Total Petroleum Hydrocarbon (TPH).

Three soil borings (SB06 through SB08) were drilled in the vicinity of the Area A East End recreational facilities. These soil borings were advanced through the overburden to the bedrock to auger refusal. A total of six soil samples were collected from the fill and dredge spoil material and analyzed for TCL organics, TAL inorganics and cyanide pesticides, PCBs, and TPH.

2.3.6 Groundwater/Leachate Modeling Study

B&R Environmental conducted field activities at the Area A Landfill in November/December 1995 as part of the Groundwater/Leachate Modeling Study performed in support of the Remedial Design for the landfill cover system. The purpose of the Groundwater/Leachate Modeling Study was to evaluate the impact of the proposed landfill cover system on the saturated thickness of landfill material and on the flow and composition of the groundwater/leachate discharge from the landfill.

The Modeling Field Investigation activities included the performance of the following activities:

- Surface infiltration tests at 10 locations (2LT1 thru 2LT10) throughout the surface of the landfill

- Installation of 13 overburden monitoring wells, including 6 in the landfill material (2LMW28F through 2LMW33F) and 7 in the underlying dredge spoil or alluvium (2LMW28DS, 2LMW29A, 2LMW30DS through 2LMW34DS).

- Installation of three bedrock wells, including two located upgradient from the Area A Landfill (2LMW35B and 2LMW36B) and one at the northeast end of the landfill (2LMW32B).

- Installation of 10 piezometers, including 7 (2LPZ1DS thru 2LPZ7DS) along the boundary between the Area A Landfill and Area A Wetland and 3 (2LPZ1F, 2LPZ2F, and 2LMW32PZ) at the northeast end of the landfill.

- Installation of eight staff gauges (SG07 thru SG14) along the boundary between the Area A Landfill and Area A Wetland.

- Slug testing of the newly installed wells and one of the piezometers (2LMW32PZ).

- Water level measurement for all newly installed monitoring wells, piezometers, and staff gauges as well as for all previously existing monitoring wells.

- Flow measurement and sampling of the groundwater seep (3MSP01) from the western face of the Area A Landfill into the OBDA of the adjoining Area A Downstream (Site 3). This sample was analyzed for TCL organics and TAL inorganics.

The Groundwater/Leachate Modeling Study provided a comprehensive analysis of the site geology and hydrogeology. The report provided surface contour maps of the four units (landfill material, dredge spoil, alluvium and bedrock), thickness maps for the landfill material and dredge spoil, surface contour maps for the water table and bedrock groundwater, geologic cross-sections, conceptual flow nets, and an analysis of vertical flow gradients.

Additionally, the Groundwater/Leachate Modeling Study concluded that the Area A Landfill cover system would reduce the thickness of the saturated landfill material by approximately 0.1 foot along the Area A Wetland boundary, by approximately 0.5 foot at the eastern end of the landfill, by approximately 0.2 foot in the center of the landfill, and by over one foot at the western end of the landfill. The study concluded that

the cover system would reduce the flux of groundwater COCs from the Area A Landfill to the Area A Wetland by 16 to 55 percent and that none of these COCs would exceed either the Federal Ambient Water Quality Criteria (AWQC) or the CTDEP SWPC.

2.3.7 Year 1 of the Monitoring Program

Sixteen monitoring wells, seven surface water locations, and one surface seep location were sampled during Year 1 of the monitoring program. During the initial year of monitoring, samples were collected during the months of October 1999 (Rd. 1), January 2000 (Rd. 2), April 2000 (Rd. 3), and July 2000 (Rd. 4). Soil samples were also collected and analyzed during the installation of the downgradient monitoring wells that were installed prior to the initiation of the monitoring program.

Deviations from monitoring program occurred at the following locations during the first year of sampling. Monitoring well 2WMW44DS was not sampled during Round 2 due to the static water being frozen within the monitoring well. The seep sample and all of the surface water samples were not collected during Round 2 because the surface water within the wetland was frozen. The seep sample was not collected during Round 3 because no water was flowing from the seep location. Monitoring well 3MW12S was not sampled during Round 4 because the well was destroyed during the remedial action for the Area A Downstream site. Surface water samples were not collected from staff gauges SG-15, SG-16, and SG-17 during any of the rounds because the locations were always dry. Surface water samples were also not collected from staff gauges SG-22 and SG-24 during Round 4 because the locations were dry.

All of the aqueous samples were analyzed for TCL organics, TAL inorganics, and miscellaneous water quality parameters. The soil samples were analyzed for TCL organics and TAL inorganics.

The results obtained during the initial four rounds of groundwater monitoring for VOCs and semivolatile organic compounds indicated no exceedances of any primary monitoring criteria. Additionally, no VOCs or SVOCs exceeded the secondary monitoring criteria. Results of inorganic analyses indicated some positive results for arsenic that exceeded the primary monitoring criteria. Additionally, zinc exceeded its primary monitoring criteria in one sample. Some positive results for copper, chromium, lead, and zinc were in excess of the secondary screening criteria; however, none of the positive results exceeded the respective primary monitoring criteria.

The statistical comparisons completed with the analytical data indicated that upgradient and downgradient concentrations of both organic and inorganic COCs were found to be similar except for total arsenic. The average arsenic concentrations for each round were plotted as a function of time and compared to the CTDEP SWPC. The plot showed a slight downward temporal trend.

A review of the inorganic results revealed that in several instances total metal concentrations were lower than dissolved metal concentrations. Typically, dissolved metal concentrations are lower since the filtering process removes particulate matter to which the metals bond. For the instances where dissolved metal concentrations exceed total metal concentrations, the concentration variance is primarily attributed to instrumentation fluctuation near the instrument detection limit. Instrumentation signal fluctuation can result in the reporting of concentrations that marginally exceed the instrument detection limit. Another condition suspected of contributing to the variance between total and dissolved metal concentrations is random laboratory contamination.

A cursory review of water chemistry parameters indicated a correlation between elevated turbidity and total dissolved solids (TDS). Similarly, elevated TDS is noted in some samples when dissolved metals are detected at increased levels relative to total metals results. Arsenic has been used widely in pesticides and as a wood preservative. Land-surface applications or disposal of arsenic-containing products may have resulted in arsenic contamination of shallow groundwater. Dissolved arsenic does not react strongly with aquifer solids and its transport in groundwater is not retarded.

A comparison of groundwater analytical data to surface water data collected form the Area A wetland was completed for the report. Detections of arsenic above the SWPC were noted in several surface water samples (SG-22, SG-23, and SG-24) during Round 1. Arsenic was also noted in the adjacent monitoring wells during round 1 at higher concentrations, indicating that groundwater may be mixing with surface water in this area. A similar condition exists with lead at SG-18 and the adjoining well location. Lead was detected in the surface water sample and groundwater sample at a concentration slightly in excess of the secondary screening criteria. Several other metals (copper, chromium and zinc) were detected in some of the surface water samples in excess of secondary screening criteria, however only arsenic was detected above the primary criteria (SWPC).

The following recommendations were made in the Year 1 report.

- Through 4 rounds of groundwater monitoring, no exceedances of primary or secondary monitoring criteria have been noted for VOCs and SVOCs. Consideration should be given to reducing the sampling frequency for VOCs.

- Because arsenic was detected at concentrations above the primary monitoring criteria and several inorganics were detected above the secondary monitoring criteria, monitoring should continue through year two to further evaluate these chemical concentrations.

- At the completion of Rounds 7 and 8 (Year 2), consideration should be given to reducing some of the parameters to be analyzed.

- Maintain monitoring well integrity (well maintenance, well development) in case of extended monitoring.

- Discuss the endpoint for groundwater monitoring if current trends continue.

2.3.8 Basewide Groundwater OU RI

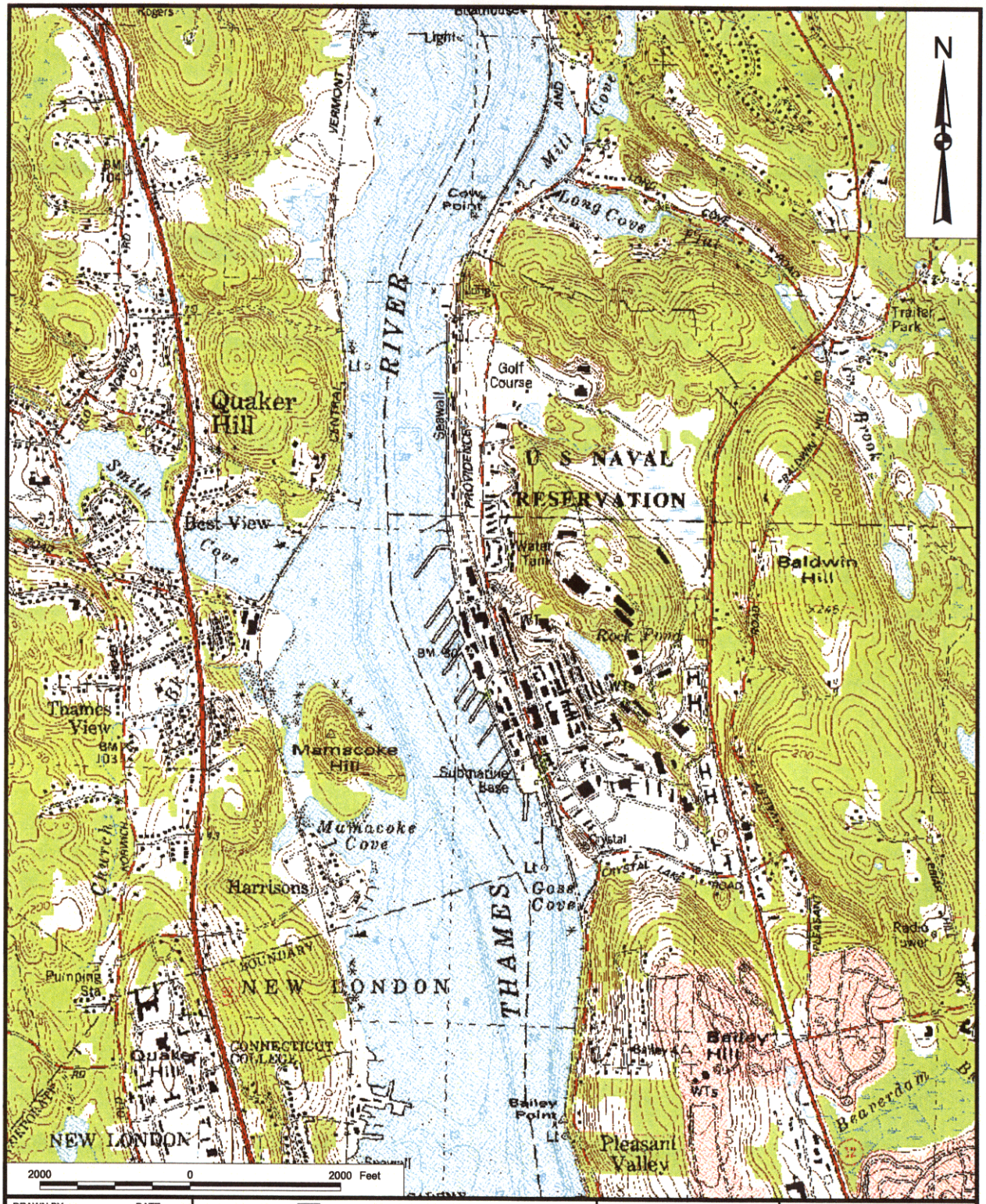
The Area A Landfill site was one of 10 sites investigated during the Basewide Groundwater OU RI. The groundwater media for the Area A Landfill site was the focus of the RI. Groundwater samples were collected from existing monitoring wells to further characterize the Area A Landfill site. The monitoring wells included in the GMP for the Area A Landfill were the only wells sampled and, in fact, the results presented in the RI constituted the results for Round 4 of the GMP for the site.

The results of the human health risk assessment (HHRA) performed with the groundwater data during the RI showed that Incremental Cancer Risks and Hazard Indices for construction workers exposed to groundwater at the Area A Landfill were within the EPA and CTDEP acceptable levels. The HHRA only considered exposures to construction workers. It was recommended in the report that the current groundwater monitoring program be continued to gather data to evaluate long-term trends in contaminant concentrations.

TABLE 2-1

RANGE OF MAJOR CATION CONCENTRATIONS IN WELLS AT AREA A LANDFILL YEAR 2 ANNUAL GROUNDWATER MONITORING REPORT FOR AREA A LANDFILL NSB-NLON, GROTON, CONNECTICUT

Bedrock Screen Interval (Data from wells 4MW4D and 2LMW18D)		
Cations	Section B-B'	Section C-C'
Sodium (mg/L)	31.5-52.5	25.2-27.4
Potassium (mg/L)	2.99-4.33	1.93-4.35
Calcium (mg/L)	21.3-28.6	19.1-21
Magnesium (mg/L)	3.44-4.83	4.34-5.23
Alluvium/Bedrock Screen Interval (Data from wells 4MW4S and 2LMW7D)		
Sodium (mg/L)	28.8-141	
Potassium (mg/L)	2.78-6.36	
Calcium (mg/L)	14.5-30	
Magnesium (mg/L)	2.27-7.3	
Landfill Screen Interval (Data from well 2LMW18S)		
Sodium (mg/L)		251-777
Potassium (mg/L)		29.8-47.1
Calcium (mg/L)		54.6-174
Magnesium (mg/L)		31.2-108
Landfill/Dredge Spoil Screen Interval (Data from well 2LMW7S)		
Sodium (mg/L)	365-5230	
Potassium (mg/L)	16.4-208	
Calcium (mg/L)	26-143	
Magnesium (mg/L)	36.2-563	
Dredge Spoil Screen Interval (Data from 2WMW40DS, 2WMW42DS and 2WMW43DS)		
Sodium (mg/L)	4190-8930	2020-9230
Potassium (mg/L)	181-429	105-390
Calcium (mg/L)	163-251	14.3-280
Magnesium (mg/L)	492-837	164-806



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CHECKED BY	DATE	LOCATION MAP NSB-NLON GROTON, CONNECTICUT	APPROVED BY C. RICH / DATE 2/19/02
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2 - 1 / REV 0

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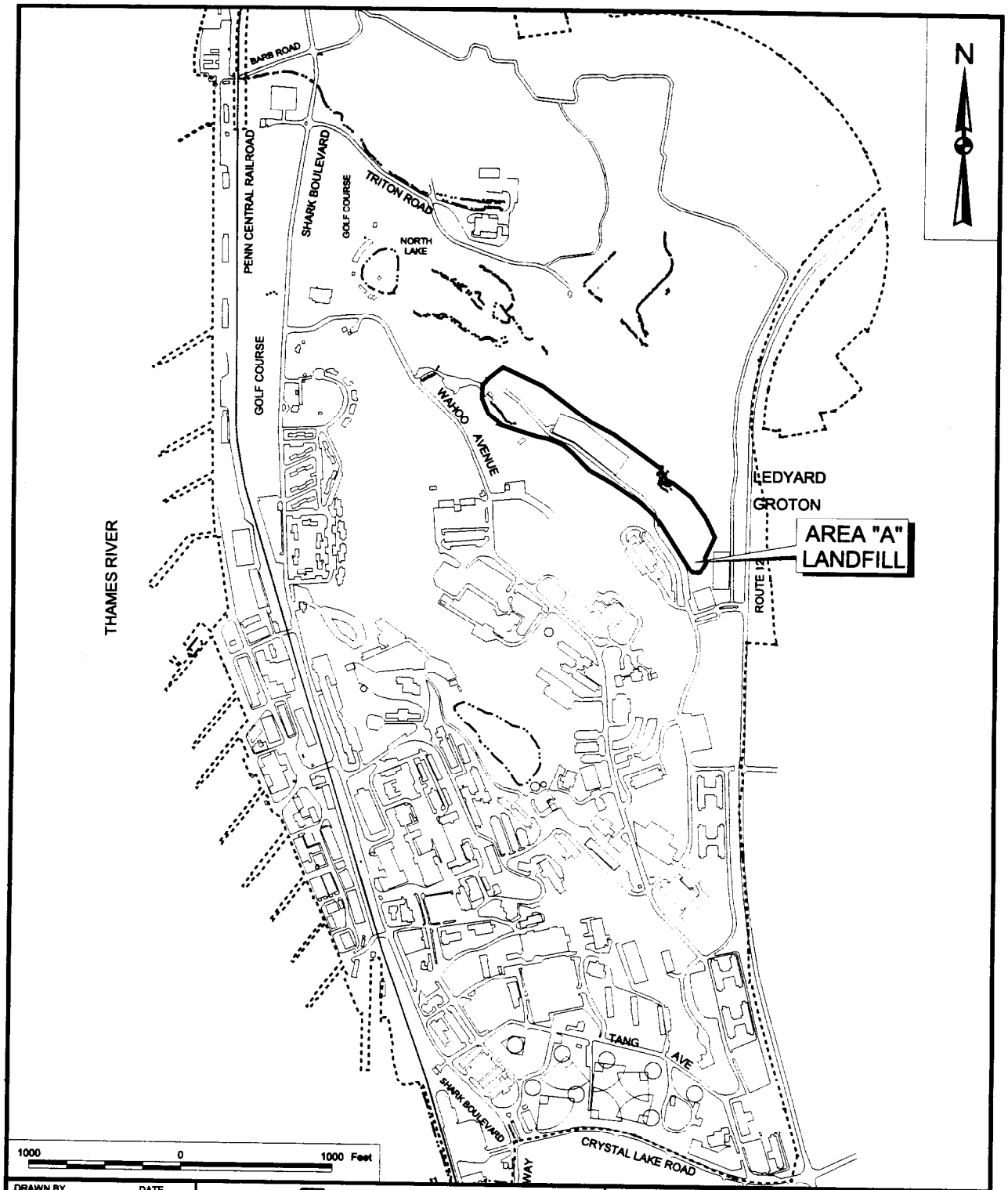

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COST/SCHEDULE-AREA		APPROVED BY —	DATE —
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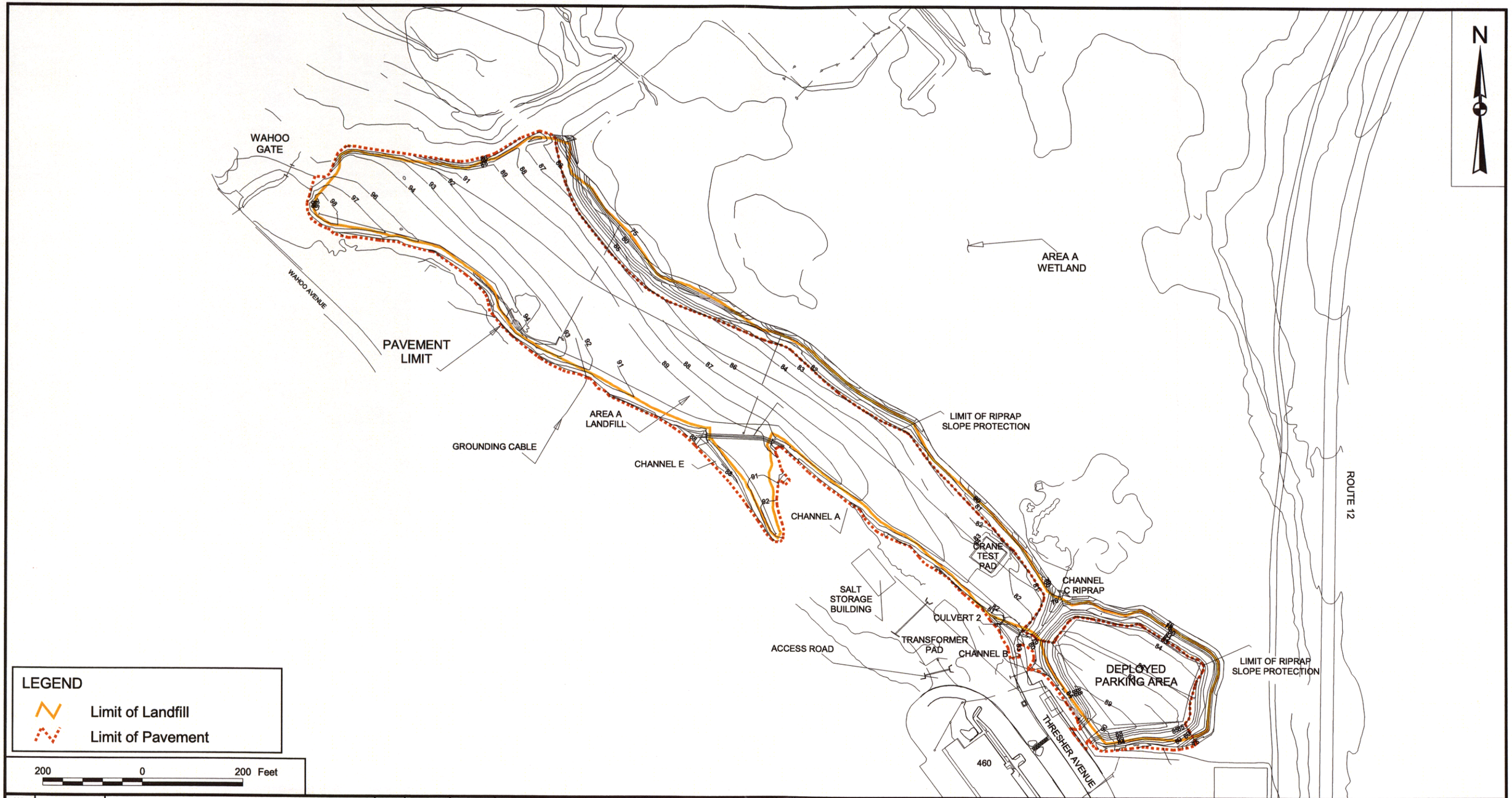

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY J. BELLONE	DATE 1/12/00
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	

Tetra Tech NUS, Inc.

SITE MAP
AREA A LANDFILL
NSB-NEW LONDON, GROTON, CONNECTICUT

CONTRACT NUMBER 2863	OWNER NUMBER CTO 816
APPROVED BY C. RICH	DATE 2/19/02
APPROVED BY —	DATE —
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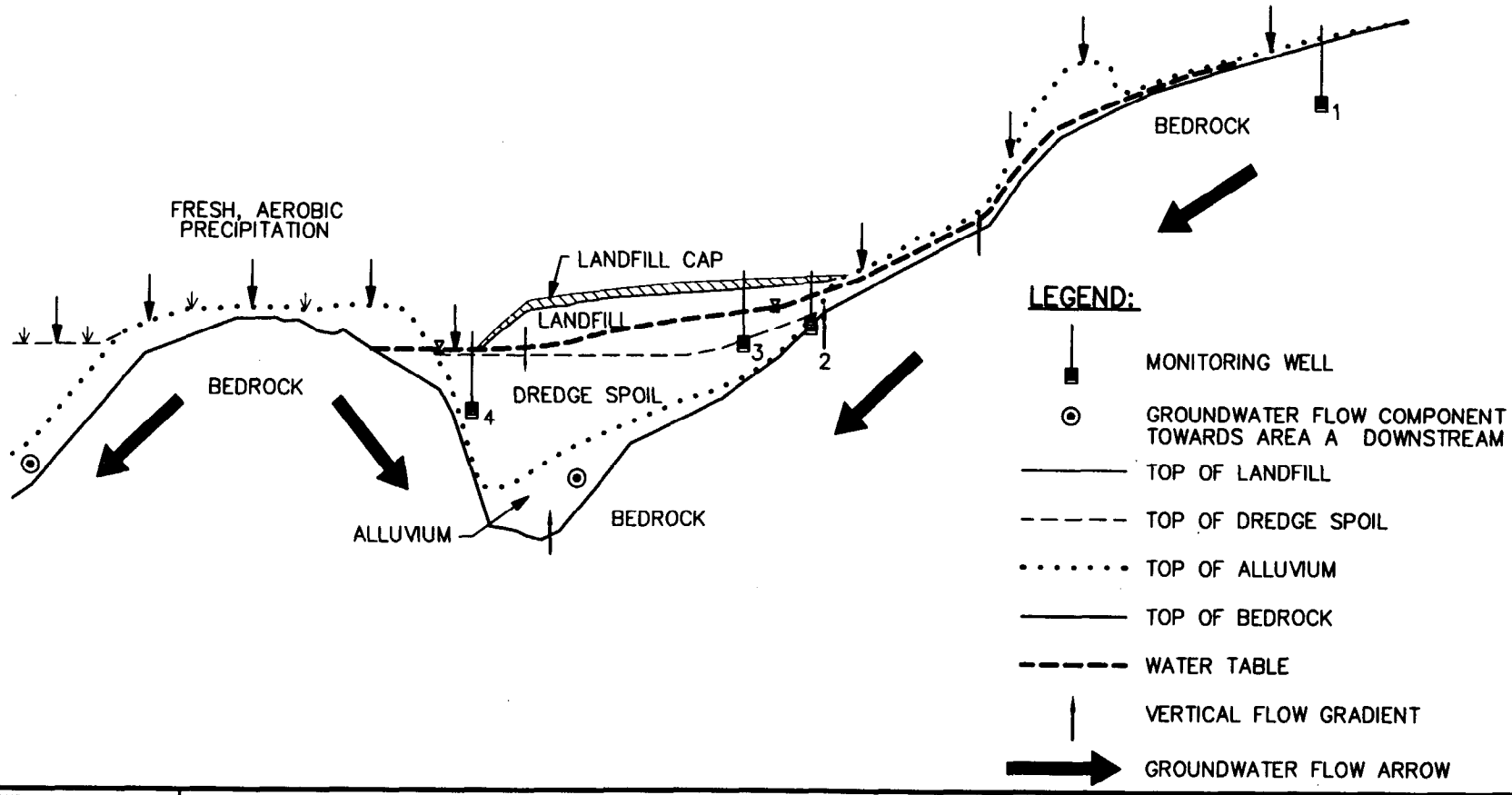

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COST/SCHED-AREA		APPROVED BY	DATE
SCALE NOT TO SCALE		DRAWING NO. FIGURE 2-4	REV. 0

FORM CADD NO. T:NUS_AH.DWG - REV 0 - 1/22/98

3.0 FIELD ACTIVITIES

This section provides a summary of the field activities performed during the second year of the monitoring program at the Area A Landfill. The physical data collected during the four rounds of monitoring are also summarized in this section.

3.1 MONITORING ACTIVITIES

During the second year of monitoring, field activities were performed during the months of December 2000 (Round 5), March 2001 (Round 6), June 2001 (Round 7), and September 2001 (Round 8). Monitoring well locations are shown on Figure 3-1. Photographs of the site that were taken during Round 8 are provided as Figures 3-2 through 3-7. Appendices A through F contain the pertinent field forms for the Round 8 sampling activities. Field forms for activities completed for Rounds 5, 6 and 7 were previously provided in the quarterly reports (TtNUS, March 2001; TtNUS, May 2001; TtNUS, November 2001). The only exception is the sample log sheets and low-flow purge data sheets. Copies of these field forms for Rounds 5 through 8 are included in Appendix D. The appendices are as follows:

- Appendix A - Field Activities Log Book
- Appendix B - Groundwater Level Measurement
- Appendix C - Monitoring Instrument Calibration Logs
- Appendix D - Groundwater Sample Logsheets and Low-Flow Purge Data Sheets
- Appendix E - Chain of Custody Records
- Appendix F - Data Validation Letters and Laboratory Data Sheets

Sixteen monitoring wells (4MW1S, 2LMW20S, 2WMW21S, 3MW37S, 2WMW38DS through 2WMW47DS, 3MW12S, and 3MW12D), ten surface water locations (SG-15 through SG-24), and one surface seep location (3MSP01) were to be sampled as part of the groundwater monitoring program as specified in the GMP (TtNUS, January 1999). However, several deviations in the sampling program occurred during the second year of monitoring. Two monitoring wells sampled during the first year of monitoring (i.e., 3MW12S and 3MW12D) were not sampled during the second year of monitoring because they were destroyed or buried during the remedial action at the Area A Downstream site. Surface water samples were not collected from staff gauges SG-15, SG-16, and SG-17 during Rounds 5 through 8 because there was no surface water at these locations. Surface water samples were not collected at these staff gauges during the first year of monitoring either because of the same reason. Additionally, during Round 8, surface water was not collected from staff gauges SG-22, SG-23, and SG-24 because there was no surface water at these locations. Also during Round 8, enough sample volume could not be collected from monitoring well 2WMW38DS to analyze for the complete parameter list; therefore, analysis for

pesticides/PCBs and a majority of the miscellaneous parameters were not completed. Finally, due to a problem with sample shipment, the samples collected from monitoring well 4MW1S and staff gauges SG-22 and SG-24 were not shipped on time and the holding times for the organic parameters and the miscellaneous parameters were exceeded. Subsequently, these samples were only analyzed for TAL metals (total and dissolved).

Prior to each round of groundwater and surface water sampling, one round of water level measurements was performed. However, survey data for the staff gauges are considered to be suspect due to some of the staff gauges being moved after installation. Therefore, the surface water elevations were not used in preparing potentiometric surface maps.

Groundwater and surface water samples were analyzed for TCL organics, TAL inorganics, and miscellaneous water quality parameters [i.e., alkalinity, chemical oxygen demand (COD), chloride, hardness, sulfate, TDS, and TOC]. Monitoring focused on the following organic and inorganic potential COCs, as identified in the GMP (TtNUS, January 1999):

- Ethylbenzene
- 1,1,2,2-Tetrachloroethane
- Xylenes
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Bis(2-ethylhexyl)phthalate
- Phenanthrene
- Aroclor 1016
- Aroclor 1254
- Aroclor 1260
- Dieldrin
- Heptachlor
- Arsenic
- Beryllium
- Cadmium
- Chromium
- Copper
- Lead
- Zinc

These contaminants were previously detected in soil either at concentrations that could result in exceedances of site-specific SWPC or at concentrations that exceed Connecticut's Pollutant Mobility Criteria for GB groundwater.

3.2 SAMPLE COLLECTION PROCEDURES

Figures 3-8 through 3-11 show pictures of monitoring well sampling activities during Round 8. The monitoring wells were sampled during each of the four sampling rounds using low-flow purging and sampling techniques, in accordance with the TtNUS SOP SA-1.1 (Groundwater Sample Acquisition) and the USEPA Region I Low- Flow Purging and Sampling Procedure (GW-001) (TtNUS, January 1999).

The monitoring wells were purged using a peristaltic pump with disposable Teflon® tubing installed to the middle of the saturated screen interval. Pharmaceutical-grade silicone tubing was used in the rotaries of the peristaltic pump.

Prior to purging, during and before obtaining groundwater samples, water levels were measured to 0.01-foot accuracy using an electronic water-level indicator (M-Scope). Water levels were monitored and recorded every 5 to 10 minutes during the purging. Water quality parameters [pH, specific conductivity, temperature, dissolved oxygen, salinity, and Oxidation Reduction Potential (Eh)] were measured every 5 to 10 minutes using a multi-parameter water quality probe [YSI 6820 (Rounds 5 and 6), YSI 6920 (Round 7), or Horiba U-22 (Round 8)] equipped with a flow-through cell. These parameters were measured until all of the parameters had stabilized and the minimum purge volume was removed (stabilized purge volume plus the extraction tubing volume). Stabilization of the above parameters was defined as follows:

- pH $\pm$ 0.2 standard units
- Turbidity $\pm$ 10 percent for the value greater than 1 NTU
- Specific conductance $\pm$ 10 percent
- Temperature $\pm$ 3 percent
- Eh $\pm$ 10 millivolts
- Dissolved oxygen $\pm$ 10 percent

Turbidity was also measured using a Lamotte 2020 Turbidimeter. Water quality parameters obtained at the time of sample collection for each of the sampling rounds are shown on sample logs sheets in Appendix D. Table D-1 in Appendix D summarizes the water quality parameters collected during Rounds 1 through 8. As noted on the table, several suspect measurements were recorded for several monitoring wells and rounds. It is possible that the suspect measurements are the result of various problems (i.e., faulty probes in the water quality meters, operator error, etc.).

Calibration and standards checks were conducted on the water quality probes/flow-through cells in accordance with the manufacturers' requirements. The cell was cleaned at each well prior to purging and during purging, as necessary (e.g., when fluctuating turbidity readings were observed and confirmed by collection of a turbidity sample before the cell for comparison). A "T" connector with a valve was inserted into the pump's discharge tubing prior to the cell for collection of a turbidity sample. If the cell required cleaning during purging activities, pumping continued and the cell was disconnected for cleaning. When completed, the cell was reconnected and monitoring activities continued. The cell was cleaned by thoroughly rinsing with deionized water.

Precautions were taken to prevent air entrapment and/or air leaks in the purging system so that potential problems with stabilizing dissolved oxygen were minimized. Precautions included: 1) taking care to fill the entire cell with water while minimizing air entrapment, prior to initiating purging and 2) maintaining a full cell of water by pinching the discharge line shut and elevating the discharge at the end of the tubing from

the pump, above the cell. After purging was complete, the flow-through cell was disconnected and samples were collected directly from the pump discharge.

All sample containers were filled by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. Samples analyzed for volatile constituents were collected first and immediately sealed in a pre-preserved container so that no head space existed. For filtered inorganic samples, an in-line 0.45 micron filter was used. The filter was pre-rinsed with approximately 400 ml of deionized water and attached to the discharge end of the pump tubing.

Surface water samples were collected in accordance with TtNUS SOP SA-1.2. Due to the shallow depth of the surface water, a shovel was used to create a depression at some of the surface water locations prior to sampling. If new depressions were created, samples were collected approximately 24 hours later. Samples were collected by direct filling the sample bottles from the created reservoir.

3.3 INVESTIGATION DERIVED WASTE

Purge water generated during the groundwater sampling activities at the Area A Landfill was tested for COCs during the first year of quarterly monitoring. The results of the testing indicated that the purge water was non-hazardous. Subsequently, during the second year of monitoring at the site, the purge water generated during groundwater sampling activities was containerized, transported to the OT-10 wastewater processing facility at NSB-NLON, and disposed at the facility in accordance with the SUBASE NLON Pre-Treatment Permit from the CTDEP.

TABLE 3-1

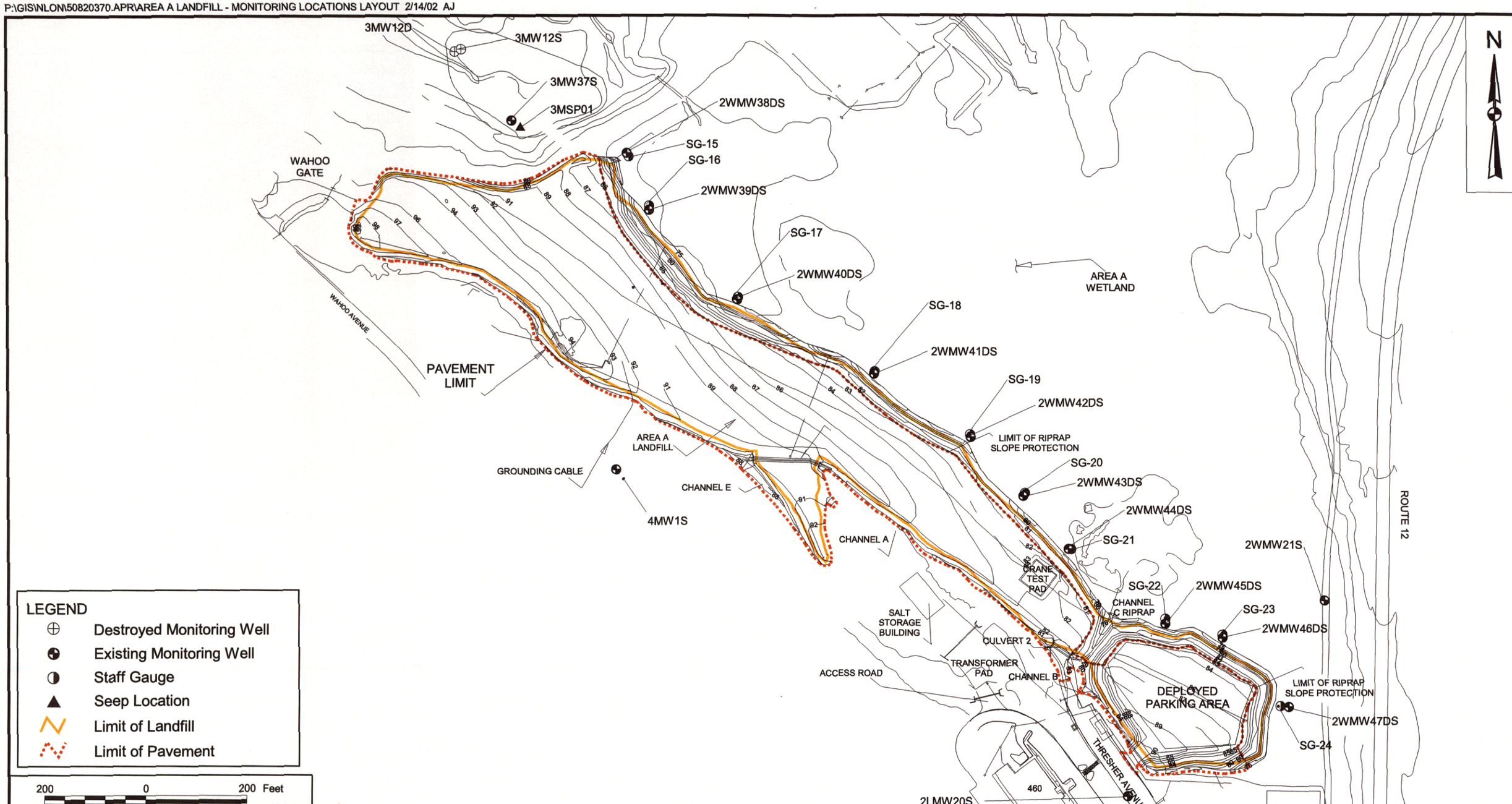
AREA A MONITORING WELL CONSTRUCTION DETAILS
NSB-NLON, GROTON, CONNECTICUT

Well I.D.	Construction Material	Top of Riser/ Ground Surface Elevation (ft msl)	Top/Bottom of Screen (ft BGS)	Elevation of Top/Bottom of Screen (ft msl)	Screened Formation	Total Depth (ft BGS)	Depth to Bedrock (ft BGS)
4MW1S	PVC	129.55/127.98	8.5-18.5	119.48 - 109.48	Bedrock	18.5	2.5
3MW12S(1)	PVC	43.54/41.06	2.5-12.5	38.73 - 28.73	Alluvium	13.0	NA
3MW12D(1)	Steel	42.25/41.23	Open Hole	NA	Bedrock	26.0	15.0
2LMW20S	PVC	86.83/87.23	9.0-19.0	78.23 - 68.23	Fill/Alluvium	19.0	NA
2WMW21S	PVC	76.31/74.62	5.0-15.0	69.62 - 59.62	Dredge Spoil	15.0	NA
3MW37S	PVC	47.26/44.09	4.5-5.5	39.59 - 38.59	Alluvium	5.5	NA
2WMW38DS	PVC	74.06/72.28	4.0-9.0	68.28 - 63.28	Dredge Spoil	12.0	NA
2WMW39DS	PVC	73.53/71.60	4.0-14.0	67.60 - 57.60	Surficial Sand/ Dredge Spoil	15.0	NA
2WMW40DS	PVC	73.21/71.46	4.0-14.0	67.46 - 57.46	Dredge Spoil	15.0	NA
2WMW41DS	PVC	73.39/71.04	4.5-14.5	66.54 - 56.54	Dredge Spoil	15.5	NA
2WMW42DS	PVC	73.65/71.24	6.0-16.0	65.24 - 55.24	Dredge Spoil	17.0	NA
2WMW43DS	PVC	74.36/71.39	4.0-14.0	67.39 - 57.39	Dredge Spoil	15.0	NA
2WMW44DS	PVC	73.72/70.95	4.0-14.0	66.95 - 56.95	Dredge Spoil	15.0	NA
2WMW45DS	PVC	74.24/72.24	4.0-14.0	68.24 - 58.24	Dredge Spoil	15.0	NA
2WMW46DS	PVC	73.53/71.76	4.0-14.0	67.76 - 57.76	Dredge Spoil	15.0	NA
2WMW47DS	PVC	73.39/71.98	4.0-14.0	67.98 - 57.98	Surficial Sand/ Dredge Spoil	15.0	NA

1 Monitoring wells 3MW12S and 3MW12D were destroyed during the Area A Downstream remedial action.

Notes:
Reference elevation is top of well casing (1982 Base Traverse System = NGVD 1988 + 2.39 feet).
BGS means below ground surface.
NA means information is not available or not applicable.

P:\GIS\NLON\50820370.APR\AREA A LANDFILL - MONITORING LOCATIONS LAYOUT 2/14/02 AJ



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY J. BELLONE	DATE 1/12/00
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	

Tetra Tech NUS, Inc.

SAMPLING LOCATIONS FOR GROUNDWATER AND SURFACE WATER MONITORING
AREA A LANDFILL
NSB-NEW LONDON, GROTON, CONNECTICUT

CONTRACT NUMBER 2863	OWNER NUMBER CTO 816
APPROVED BY C. RICH	DATE 2/19/02
APPROVED BY	DATE
DRAWING NO. FIGURE 3 - 1	REV 0

Figure 3-2 View of rip-rap slope looking north toward wetland from western end of landfill (September 2001).

Figure 3-3 View of rip-rap slope and edge of wetland looking east from western end of site (September 2001).

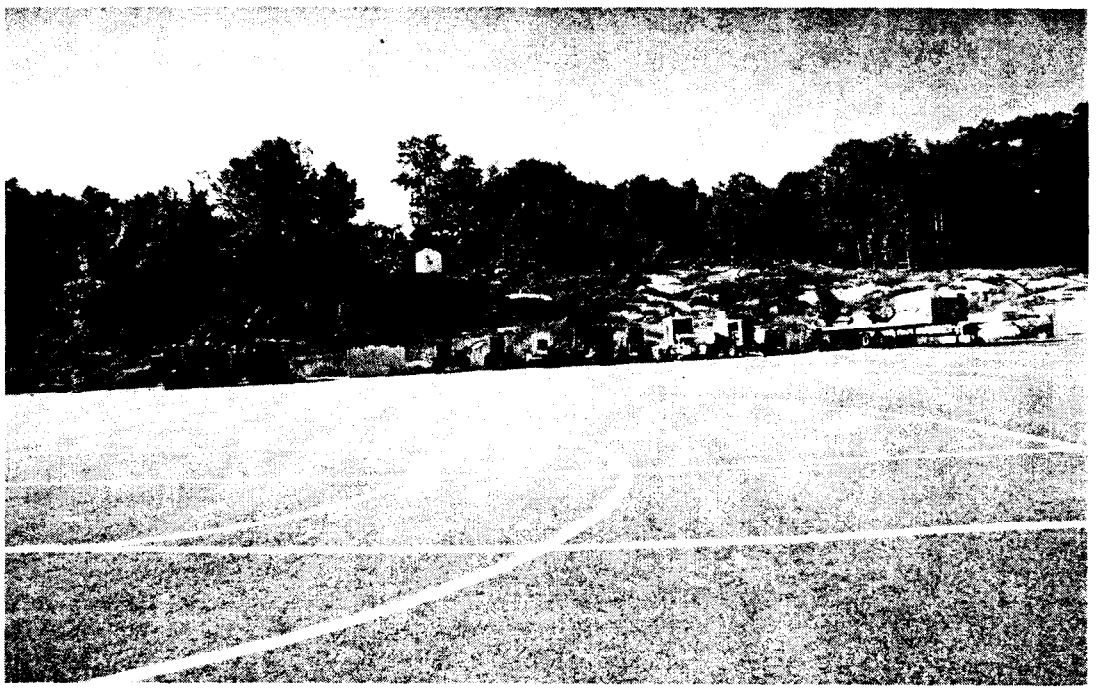


Figure 3-4 View of landfill surface and equipment storage looking south across landfill towards the former Bunker A-86 site (September 2001).

Figure 3-5 View of gabion baskets along northern side of landfill adjacent to wetland looking west from eastern side of landfill (September 2001).

Figure 3-6 View looking south along Drainage Channel C toward Building 460 (September 2001).

Figure 3-7 View of condition of Monitoring Well 2LMW20S vault along Thresher Avenue (September 2001).

Figure 3-8 View of typical monitoring well location downgradient of landfill within wetland area (September 2001).

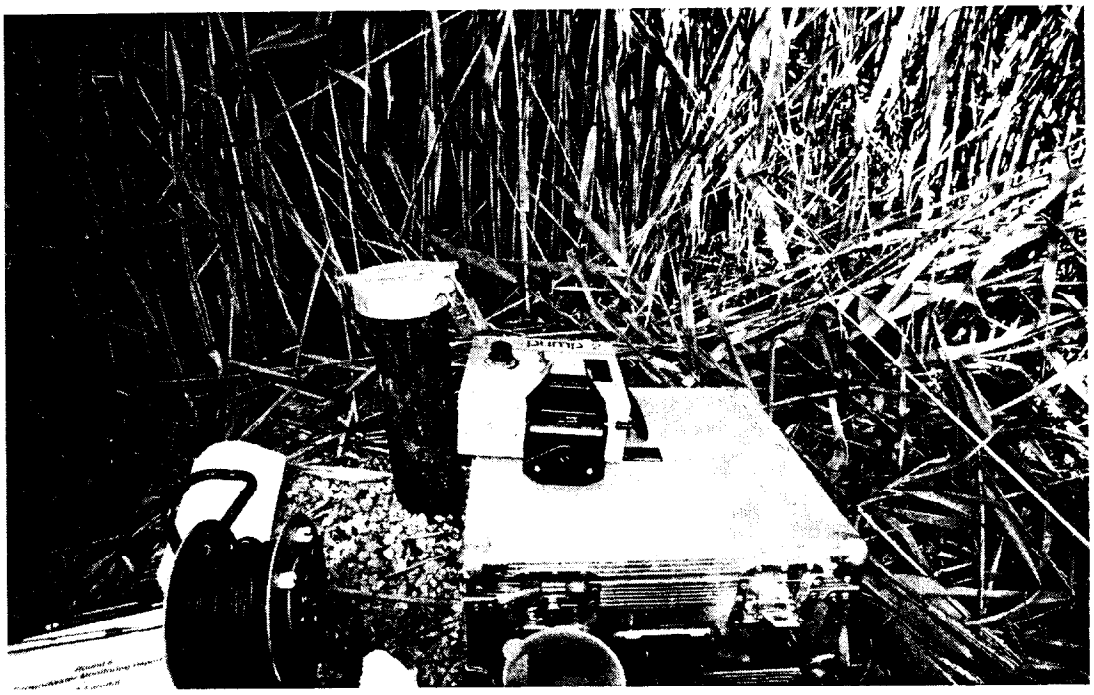


Figure 3-9 View of low-flow sampling equipment next to locked monitoring well (September 2001).

Figure 3-10 View of low-flow sampling equipment setup (September 2001).

Figure 3-11 View of low-flow sampling equipment setup with collection bucket and recording sheets (September 2001).

4.0 DATA EVALUATION

4.1 METHODS OF ANALYSIS AND DECISION

The data evaluation procedures outlined in the Area A Landfill GMP decision diagram (Figure 4-1) were followed to assess the data generated during the monitoring program. The general data evaluation steps include the following:

- Summarize the analytical results from the analyses of the groundwater and surface water samples.
- Compare detected concentrations of potential COCs to primary and secondary monitoring criteria and NSB-NLON background values and identify those compounds that exceed the criteria and background values.
- Statistically compare concentrations of potential COCs detected in upgradient and downgradient monitoring wells to determine if there is a statistically significant difference between them.
- Develop trend graphs for those compounds that are above their respective primary monitoring criteria and background values and show statistically significant differences between upgradient and downgradient monitoring wells.
- Determine if the monitoring results indicate that the IRA is successful and make recommendations on the future of the GMP.

Groundwater and surface water samples were collected and analyzed for the full suite of TCL organic and TAL inorganic parameters and miscellaneous water quality parameters. A complete summary of the analytical results for all rounds of monitoring is provided in Appendix G. The rationale for the grouping of the data in Appendix G is provided below. It should also be noted that soil samples were collected during Round 1 of Year 1 during the installation of the new monitoring wells in the monitoring network. The analytical results for the soil samples are also included in Appendix G.

The potential COCs for the Area A Landfill were identified previously and are listed in Section 3. Only the potential COCs are considered in the data evaluation for this report. As described in the GMP (TtNUS, January 1999), the CTDEP Remediation Standard Regulations (RSRs) require that all groundwater plumes be remediated to attain either a.) SWPC and Volatilization Criteria, or b.) background concentrations for each substance in the plume (CTDEP, January 1996). The volatilization criteria do not apply at the Area A Landfill, because there are no buildings at this site and environmental land use

restrictions exist that will prevent any buildings from being erected on the surface of the landfill. Accordingly, positive detections of potential COCs in groundwater and surface water samples were compared to the SWPC. Additionally, positive groundwater and surface water detections were compared to secondary monitoring criteria, which are the lower of the Federal AWQCs or the Connecticut Water Quality Standards (WQSs) developed for chronic (long-term) exposure of aquatic receptors in freshwater. Finally, if a positive detection of an inorganic in a groundwater sample was above the primary or secondary criteria, the analytical result was also compared to the background groundwater concentration developed in the Basewide Groundwater OU RI (TtNUS, August 2001). The results of the data to criteria comparisons are summarized in Section 4.2.

The next step in the data evaluation was to perform a statistical analysis to determine which potential COCs were present in downgradient monitoring wells at concentrations greater than upgradient monitoring well concentrations. The statistical analysis is described in detail in Section 4.4. Monitoring locations were grouped together for comparison purposes based on the available geologic and hydrogeologic information as well as water quality data. Table 4-1 summarizes the groupings of the monitoring locations and the rationale for the groupings. The data presented in Appendix G is summarized in the same groups as shown on Table 4-1. Additionally, for the compounds detected in downgradient locations at concentrations that were statistically significant as compared to upgradient concentrations, a trend analysis was performed to determine if there is a consistently increasing or decreasing trend in the downgradient concentrations.

4.2 NATURE AND EXTENT OF CONTAMINATION

The Year 2 groundwater and surface water analytical results for potential COCs are summarized in Tables 4-2 and 4-3, respectively. The primary and secondary monitoring criteria are presented in these tables, whereas the basewide background concentrations for inorganics and miscellaneous parameters are presented in Table 4-4. A bolded number in Tables 4-2 and 4-3 denotes an exceedance of the primary or secondary monitoring criteria. Figures 4-1 and 4-2 depict the compounds that were detected in excess of either monitoring criteria at the groundwater and surface water monitoring locations, respectively. A summary of the detections and exceedances is provided below.

4.2.1 Groundwater

No VOCs or pesticides/PCBs were detected in any of the groundwater samples collected during the second year of monitoring.

Benzo(a)anthracene was detected once in the sample from monitoring well 3MW37S during Round 5, but the detected concentration did not exceed the primary criterion of 0.3 µg/L. Benzo(a)pyrene was

detected in five samples, and three of these detections, ranging in concentration from 0.38 to 1.2 µg/L, exceeded the primary monitoring criterion of 0.3 µg/L. The three exceedances were found in the downgradient wetland monitoring wells 2WMW38DS (Round 7) and 2WMW43DS (Rounds 7 and 8). Benzo(a)pyrene was not detected above the monitoring criterion during the first year of monitoring. Benzo(b)fluoranthene was detected in two samples, but neither detection exceeded the primary criterion of 0.3 µg/L. Benzo(k)fluoranthene was not detected in any of the samples collected during the second year of monitoring. Bis(2-ethylhexyl)phthalate (BEHP) was detected in 27 samples, but none of the detections exceeded the primary criterion of 59 µg/L. Phenanthrene was detected in 11 samples, and nine of these detections, ranging in concentration from 0.094 to 22 µg/L, exceeded the primary criterion of 0.077 µg/L. The nine exceedances were found in samples collected from the reference monitoring well 2WMW21S; the downgradient wetland monitoring wells 2WMW40DS, 2WMW42DS, 2WMW43DS, 2WMW45DS, and 2WMW46DS; and the downgradient Area A Downstream monitoring well 3MW37S. Seven of the nine exceedances were detected during Rounds 7 and 8.

Benzo(a)pyrene and phenanthrene were not detected above their respective primary monitoring criteria during the first year of monitoring. It should be noted that a different laboratory was used to analyze the samples collected during Rounds 7 and 8. The new laboratory reported to much lower quantitation limits for polynuclear aromatic hydrocarbons (PAHs) than the previous laboratories. This may be the reason that benzo(a)pyrene and phenanthrene were detected during Rounds 7 and 8. These results may also reflect the impacts of the asphalt pavement that was placed over the landfill. Surface water runoff may be washing the PAHs from the asphalt and into the Area A Wetland.

Total and dissolved concentrations of arsenic, chromium, copper, lead, and zinc and dissolved beryllium were detected in groundwater samples collected during the second year of monitoring. There were no positive detections of cadmium. Total and dissolved metal results were generally similar and did not show any discernable differences, except for zinc. Total zinc concentrations detected in several samples were approximately one order of magnitude higher than dissolved zinc concentrations. Turbidity levels provided in Appendix D for these samples are variable, and it is possible that the differences in zinc concentrations for some samples were caused by turbidity/suspended solids. A summary of the detections and exceedances for total metals results are as follows.

Arsenic was detected in 36 samples, and 30 of these detections, ranging in concentration from 4.4 to 29.5 µg/L, exceeded the primary criterion of 4 µg/L. The background concentration for total arsenic in groundwater was estimated to be 1.92 µg/L during the Basewide Groundwater OU RI. This background value is below the primary monitoring criterion. Arsenic was detected at concentrations in excess of the criteria in at least three of the four rounds of sampling in the following monitoring wells: 2WMW40DS, 2WMW42DS, 2WMW43DS, 2WMW45DS, 2WMW46DS, and 2WMW47DS. Similar arsenic

concentrations were also found in these wells during the first year of monitoring. All of these wells were installed in the Area A Wetland and are screened in dredge spoils. Total arsenic concentrations detected in the reference monitoring well 2WMW21S, which was also screened in dredge spoils and has similar water quality characteristics as the aforementioned downgradient monitoring wells, ranged from 3.3 J µg/L to 6.9 J µg/L. This well was also sampled twice during the Phase II RI and concentrations of total and dissolved arsenic were 109 µg/L and 138 µg/L, respectively, during the first sampling event and 56.1 µg/L and 49.5 µg/L, respectively, during the second sampling event. These results indicate that some of the elevated arsenic concentrations may be due to the dredge spoils instead of the landfill materials, and the reducing conditions present within the wetland. Further evaluation of the arsenic detections is provided at the end of Section 4.

Beryllium and cadmium were not detected in any samples in the total phase.

Chromium was detected in 19 samples, and two of the detections, ranging in concentration from 23.2 to 24.7 µg/L, exceeded the secondary criterion of 11 µg/L. None of the detected concentrations exceeded the primary monitoring criterion or the background concentration (49.9 µg/L). Total chromium concentrations in these two samples [2WMW42DS (Round 8) and 2WMW46DS (Round 7)] were much higher than the dissolved concentrations detected in the samples, indicating that the chromium detections are related to suspended solids.

Copper was detected in 12 samples, and three of these detections, ranging in concentration from 6.7 to 10.7 µg/L, exceeded the secondary criterion of 4.8 µg/L. None of the detected concentrations exceeded the primary criteria or the background concentration (107 µg/L).

Lead was detected in seven samples, and all seven of these detections, ranging in concentration from 3.4 to 12.4 µg/L, exceeded the secondary criterion of 1.2 µg/L. None of the concentrations exceeded the primary monitoring criteria, but two detected concentrations [2WMW42DS (Round 8) and 4MW1S (Round 8)] did exceed the background concentration (6.63 µg/L). Monitoring well 4MW1S is an upgradient monitoring well and should not show any impacts from the Area A Landfill.

Zinc was detected in 26 samples, and four of these detections, ranging in concentration from 69.5 to 369 µg/L, exceeded the secondary criterion of 58.2 µg/L. Only two of the concentrations [2MW40DS (Round 5) and 2MW42DS (Round 8)] exceeded the primary criterion (123 µg/L) and background concentration (131 µg/L). Total concentrations in these two samples were an order of magnitude higher than dissolved concentrations, indicating that suspended solids may be the cause of the elevated concentrations.

4.2.2 Surface Water

VOCs and pesticides/PCBs were not detected in the seep samples collected during the second year of monitoring. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene were detected during Round 6 at concentrations that exceeded the primary criteria of 0.3 µg/L. They were not detected previously during the first year of sampling or subsequently during Rounds 7 or 8. BEHP was detected in two samples, but neither of these detections exceeded the primary criterion of 59 µg/L. Phenanthrene was detected in two samples, and one of these detections (1.1 µg/L during Round 6) exceeded the primary criterion of 0.077 µg/L.

For surface water, there was one detection of total xylene (0.21 µg/L) at SG-19 during Round 5. Otherwise, no positive results were reported for any of the samples analyzed for VOCs or pesticides/PCBs during Year 2. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene were detected in five, seven, three, and four samples, respectively, but none of the detections exceeded the primary criteria of 0.3 µg/L. BEHP was detected in seven samples, but none of these detections exceeded the primary criterion of 59 µg/L. Phenanthrene was detected in 11 samples, and four of the detections, ranging in concentration from 0.14 J to 0.39 µg/L, exceeded the primary criterion of 0.077 µg/L. Phenanthrene concentrations in excess of the primary criterion were only detected once at each of the following locations during the four rounds of monitoring conducted during Year 2: SG-18 (Round 6), SG-19 (Round 5), SG-20 (Round 6), and SG-24 (Round 5).

Similar to the groundwater results, total and dissolved concentrations of arsenic, beryllium, chromium, copper, lead, and zinc were detected in the samples collected during the second year of monitoring. There were no positive detections of cadmium. As in the groundwater results, total and dissolved metal results for surface water were generally similar, with the only exception being the zinc concentrations. Several total zinc concentrations were higher than the corresponding dissolved concentrations. A summary of the detections and exceedances for total metals results are as follows.

Arsenic was detected in 10 samples, and seven of these detections, ranging in concentration from 5.3 to 9.1 µg/L exceeded the primary criterion of 4 µg/L. The seven concentrations were detected in samples collected from staff gauges located adjacent to monitoring wells with high arsenic groundwater concentrations. The concentrations of arsenic in surface water samples were typically lower than the concentrations of arsenic detected in groundwater.

Beryllium was detected in one sample, but this detection did not exceed the primary criterion of 4 µg/L. Cadmium was not detected in any samples in the total phase. Chromium was detected in one sample, and this detection did not exceed the secondary criterion of 11 µg/L.

Copper was detected in 11 samples, and five of these detections, ranging in concentration from 5 to 18.4 µg/L, exceeded the secondary criterion of 4.8 µg/L. None of the concentrations exceeded the primary criterion (48 µg/L). Lead was detected in five samples, and all five of these detections, ranging in concentration from 3.2 to 9.5 µg/L, exceeded the secondary criterion of 1.2 µg/L. None of the concentrations exceeded the primary criterion (13 µg/L).

Zinc was detected in 24 samples, and 18 of these detections, ranging in concentration from 64.5 to 334 µg/L exceeded the secondary criterion of 58.2 µg/L. Five of the detected concentrations exceeded the primary criterion of 123 µg/L. The elevated zinc concentrations were detected at SG-18 (Round 8), SG-21 (Round 6), SG-22 (Round 5), and SG-23 (Rounds 5 and 6). Zinc concentrations detected during the second year of monitoring were generally higher than concentrations detected during the first year of monitoring.

Overall, the surface water results were similar to the groundwater results in that the same compounds were detected and the ranges of concentrations of potential COCs that exceeded criteria were generally similar.

4.3 HYDROGEOLOGIC EVALUATION

Table 4-5 shows the groundwater elevations that were measured during Rounds 5 through 8, and Figures 4-4 through 4-7 show the potentiometric surface maps generated for each round, respectively. In general, groundwater flow directions mimic topography such that groundwater flows from the upgradient hillside, across the Area A Landfill, and toward the Area A Wetland and Area A Downstream. Figures 4-4 through 4-7 demonstrate that groundwater flow patterns are similar throughout the year (as well as being consistent with Year 1), although groundwater elevations are highest in March and June (Rounds 6 and 7) and lowest in September (Round 8).

Based on the current understanding of the site hydrogeology, which is summarized in Section 3 and fully documented in the Groundwater Modeling Report for the Area A Landfill (B&R Environmental, October 1996), monitoring wells 4MW1S (screened in bedrock) and 2LMW20S (screened in fill/alluvium) are upgradient of the landfill. Monitoring well 3MW37S (screened in alluvium) is downgradient of the landfill in the Area A Downstream. Monitoring wells 2WMW38DS through 2WMW47DS (screened in dredge spoil) are downgradient of the landfill in the Area A Wetland. Monitoring well 2LMW21S (screened in dredge spoil) is not upgradient of the landfill, but rather is on the upgradient/eastern edge of the Area A Wetland. Groundwater in 2LMW21S should be representative of the quality of the water flowing into the Area A Wetland from the upland areas to the east of the site.

As discussed earlier, monitoring wells 4MW1S and 2LMW20S are utilized as upgradient wells in the statistical analysis, while monitoring well 2LMW21S is utilized as a reference well. The water quality information collected from the monitoring wells (Table D-1 in Appendix D and Table 4-2) supports the use of these wells in this manner. By comparing the data from the downgradient wells to the data from the upgradient wells and the reference well, it will be possible to separate the effects of the landfill and the dredge spoil on groundwater that reaches the Area A Wetland.

4.4 STATISTICAL ANALYSIS

A statistical analysis was performed on the results from the groundwater monitoring effort to determine if contaminants associated with waste disposed at the Area A Landfill are having an impact on groundwater downgradient of the site. This groundwater monitoring program employed two upgradient wells (2LMW20S and 4MW1S) and eleven downgradient wells (2WMW38DS, 2WMW39DS, 2WMW40DS, 2WMW41DS, 2WMW42DS, 2WMW43DS, 2WMW44DS, 2WMW45DS, 2WMW46DS, 2WMW47DS, and 3MW37S) sampled over four quarterly rounds. Well 2WMW21S was reclassified as a reference well instead of an upgradient well. This well it is not located upgradient of the site, but it is in an area not impacted by the site and also it is installed in dredge spoils similar to most of the downgradient wells. Well 3MW37S is downgradient of the site, but it is not completed in dredge spoils like the rest of the downgradient wells.

The specific tests performed on data collected at the Area A Landfill are identified and described in the next section.

The statistical methods proposed to evaluate the groundwater data are employed in order to:

- Develop summary statistics that describe environmental contaminant concentrations at the Area A Landfill.

- Allow comparisons of concentrations upgradient to the Area A Landfill to those detected in downgradient environmental samples (i.e., samples collected in downgradient areas potentially impacted by contaminant migration).

4.4.1 Comparison of Downgradient Wells to Upgradient Wells

Downgradient data was compared to upgradient data using various statistical methods. No correction for seasonal variability was required since all wells at the facility should be affected similarly. The statistical methods described in the following paragraphs were used to determine if parameter concentrations

detected in downgradient wells are significantly different from those detected in samples from the upgradient wells.

If all the observations were non-detectable results, no statistical analysis was performed and downgradient and upgradient concentrations were declared statistically similar. In those cases where there were detections in the downgradient wells but all upgradient results were non-detects, no statistical analysis was performed but downgradient concentrations were declared statistically higher than upgradient concentrations.

The Analysis of Variance (ANOVA) technique is the preferred method to compare data from upgradient and downgradient monitoring well locations. The ANOVA technique is used to test whether there is statistically significant evidence of contamination. There are two types of ANOVA tests: parametric and non-parametric. The parametric ANOVA method makes two important assumptions: 1) the upgradient and downgradient data sets are both normally (or both lognormally) distributed, and 2) the group variances of the upgradient and downgradient data sets are homogeneous. If either of these crucial assumptions to the parametric ANOVA are violated, a non-parametric test can be conducted using the ranks of the observations rather than the original observations themselves. These assumptions can be checked using the Shapiro-Wilk Test of Normality and Levene's test of Homogeneity of Variance, respectively. If the analysis of the data demonstrated that these assumptions, critical to the parametric ANOVA, were violated, non-parametric ANOVA techniques were conducted using the ranks of the observations rather than the observations themselves. The Wilcoxon Rank-Sum test (also known as the Mann-Whitney U test) was employed as the non-parametric ANOVA technique for comparing the downgradient results to the upgradient results.

According to USEPA guidance (USEPA, 1992), parametric ANOVA tests should not be used in the event that nondetects exceed 50% of the data set. In addition, for analyses using the Wilcoxon Rank Sum Test, several environmental statistics guidance documents limit the percent of nondetects allowable in the test data sets to 50% (US Navy, 1998) or even 40% (US DD, US DOE, USEPA, USNRC 2000). Therefore, a Two-Sample Test of Proportions was performed on all data where nondetects exceed 50% of the data set.

4.4.1.1 Limit of Detection

During the chemical analysis of environmental samples, some analytes may be present at concentrations that are below the sample quantitation limit (SQL) for the analytical procedure. The results are generally reported as not detected (rather than zero), and the appropriate limit of detection is given. The amount of data that are below the detection limit play an important role in selecting the statistical method of addressing the detection limit problem. The non-detects found at the Area A Landfill were replaced with

the SQL, divided by two, prior to the statistical analysis. In addition, results from each field duplicate pair were averaged and counted as one sample for use in the statistical analysis.

4.4.2 Parametric and Nonparametric Analysis of Variance (ANOVA)

ANOVA is widely used in the examination of environmental data sets. A one-way classification ANOVA is used to determine whether or not the difference between average concentrations of a parameter detected in downgradient wells and upgradient wells is statistically significant. Since only two means are compared, an ANOVA test will give the same result as the t-test for independent samples. The data residuals are the values resulting from subtracting each measured value from the arithmetic mean. The assumptions that the residuals are drawn from an underlying normal (or lognormal) distribution must be examined prior to employing a parametric ANOVA.

4.4.2.1 The Shapiro-Wilk "W-test" of Normality (n ≤50)

As stated above, the data must be analyzed to determine whether they were drawn from an underlying normal or lognormal distribution. A number of statistical evaluations may be used to determine which, if either, of the distributions are exhibited by a given data set. As recommended by the EPA, the Shapiro-Wilk "W-test" (for sample sets <50) and the Shapiro-Francia "W-test" (for sample sets >50) will be used to determine whether the data are normally or lognormally distributed (EPA, 1992). If the test is inconclusive, lognormality is assumed.

The Shapiro-Wilk W-test (Gilbert, 1987) is an effective method for determining whether a data set has been drawn from an underlying normal (or lognormal) distribution. By conducting the Shapiro-Wilk W-test on the log-transformed data, the test may be used to determine whether the data have been drawn from an underlying lognormal distribution. The null hypothesis (H_0) that is tested is:

H_O = The population has a normal (or lognormal when the data is log-transformed) distribution.

The alternate hypothesis (H_A) is:

H_A = The population does not have a normal (or lognormal when the data is log-transformed) distribution.

A 'W' statistic (W_{calc}) is computed for a data set and compared to a test statistic (W_{test}). If $W_{calc} < W_{test}$, then the null hypothesis is rejected, H_A is accepted, the data are assumed to not be normally distributed. If $W_{calc} \geq W_{test}$, then the null hypothesis is not rejected. Another 'W' statistic is computed for the log transformed data set and compared to the test statistic as described above. If both the normal and

lognormal W_{calc} are greater than or equal to the W_{test} then the underlying distribution is considered to be that one producing the highest W_{calc} value. If neither 'W' statistic is greater than or equal to the test statistic the underlying distribution is defaulted to lognormal. This is because "EPA's experience with environmental concentration data, and groundwater data in particular, suggests that the Lognormal distribution is generally more appropriate as a default statistical model than the Normal distribution... " (EPA, 1992).

The following equations present a step-by-step procedure for conducting the W-test on the residuals.

- Step 1. Group all of the data from each of the individual (*k*) wells.

- Step 2. Calculate the mean for each of the *k* wells $\overline{x_j}$ by the equation:

$$\overline{x_j} = \frac{\sum_{i=1}^{n} x_i}{n}$$

where *n* is the total number of samples in each well.

- Step 3. Calculate the residuals (R_{ij}) for each ith well and j^{th} sampling round by:

$$R_{ij} = x_{ij} - \overline{x_i}$$

- Step 4. Order the *n* residuals from smallest to largest:

$$R_1 \leq R_2 \leq R_3 \leq \cdots \leq R_n$$

- Step 5. Compute the standard deviation by:

$$S_R = \sqrt{\sum_{i=1}^{n} \frac{\left(R_{ij} - \overline{R}\right)^2}{(n-1)}}$$

where $\overline{R} = \sum_{i=1}^{n} R_i$

- Step 6. Determine the coefficients a_1, $a_2, a_3, .., a_k$ for the sample size n using Table H-1 in Appendix H, where:

$$k = \frac{n}{2} \quad if\, n\ is\ even\text{; and}$$

$$k = \frac{n-1}{2} \quad if\, n\ is\ odd$$

- Step 7. Determine b by the formula:

$$b = \sum_{i=1}^{k} a_i \left(R_{[n-i+1]} - R_i\right) = \sum_{i=1}^{k} b_i$$

- Step 8. Calculate W_{calc} using b from above, where:

$$W_{calc} = \left[\frac{b}{S_R\sqrt{n-1}}\right]^2$$

- Step 9. Determine W_{test} at the 5% significance level from Table H-2.

- Step 10. Reject H_O at the 5% significance level if W_{calc} is less than W_{test}.

To test the null hypothesis for a data set drawn from an underlying lognormal distribution, transform the data to y_{1j}, $y_{2j}, y_{3j}, \ldots, y_{km}$ where $y_{ij} = ln\ R_{ij}$. Repeat steps 1 through 10 as described in the preceding paragraphs.

4.4.2.2 Parametric ANOVA

Assume that a site has k wells and that n_i data points (analyte concentrations) are available for the ith well. The following presents a step-by-step procedure for conducting the parametric ANOVA.

- Step 1 Compute the sums and means of each well (i) using the following equations as follows:

$$X_i = \sum_{j=1}^{n_i} X_{ij}, \Sigma \text{ of all } n_i \text{ observations at well } i$$

$$\overline{X} = \frac{X}{N}, \text{ grand mean of all observations}$$

$$\overline{X_i} = \frac{X_i}{n_i}, \text{average of all } n_i \text{ observations at well } i$$

$$X = \sum_{i=1}^{k} \sum_{j=1}^{n_i} X_{ij}, \text{grand total of all } n_i \text{ observations}$$

$$N = \sum_{i=1}^{k} n_i, \text{total number of observations}$$

- Step 2. Compute the sum of squares of differences between the individual well means and the grand mean by the formula:

$$SS_{wells} = \sum_{i=1}^{k} n_i \left(\overline{X_i} - \overline{X}\right)^2 = \sum_{i=1}^{k} \left[\frac{X_i^{\,2}}{n_i}\right] - \frac{X^2}{N}$$

This sum of squares has (*k-1*) degrees of freedom associated with it and is a measure of the variability between wells.

- Step 3. Compute the corrected total sum of squares by the formula:

$$SS_{total} = \sum_{i=1}^{k} \sum_{j=1}^{n_i} \left(X_{ij} - \overline{X}\right)^2 = \sum_{i=1}^{k} \sum_{j=1}^{n_i} \left[\left(X_{ij}\right)^2\right] - \frac{X^2}{N}$$

This sum of squares has (*N-1*) degrees of freedom associated with it and is a measure of variability in the whole data set.

- Step 4. Compute the sum of squares of differences of observations within wells from the well means. This value is the sum of squares due to error and is obtained by simple subtraction:

$$SS_{Error} = SS_{Total} - SS_{Wells}$$

The sum of squares due to error has associated with it (*N-k*) degrees of freedom and is a measure of the variability within wells.

- Step 5. Set up an ANOVA table as shown below. The sums of squares and their degree of freedom were obtained from Steps 2 through 4. The mean square quantities are simply obtained by dividing each sum of squares by its corresponding degrees of freedom.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sums of Squares	Degrees of Freedom	Mean Squares	F
Between Wells	SS_{Well}	k-1	$MS_{Well}=SS_{Well}/(k-1)$	$F=MS_{Well}/MS_{Error}$
Error (within Wells)	SS_{Error}	N-k	$MS_{Error}=SS_{Error}/(N-k)$	
Total	SS_{Total}	N-1		

- Step 6. To test the hypothesis of equal means for all *k* wells, compute $F = MS_{Well}/MS_{Error}$ (last column in above table). Compare this statistic to the tabulated F statistic with (*k-1*) and (*N-k*) degrees of freedom (Table H-3) at the 5% significance level. If the calculated *F* value exceeds the tabulated value, reject the hypothesis of equal well means. Otherwise, conclude that there is no significant difference between the concentrations of the *k* wells and thus no evidence of contamination.

4.4.2.3 Nonparametric ANOVA

The parametric ANOVA technique is the preferred approach for comparing environmental measurements from downgradient monitoring wells to upgradient well data. However, parametric ANOVA methods make two key assumptions: 1) the data are both normally (or both lognormally) distributed, and 2) the group variances are homogeneous. If these assumptions are violated, non-parametric tests (i.e. Kruskal-Wallis or Wilcoxon Rank-Sum tests) may be used to determine if constituent concentrations present in the downgradient areas significantly exceed those present in the upgradient well.

The Kruskal-Wallis (EPA, 1989) test should be employed when comparing three or more data sets. However, it is not amenable to two data set comparisons. In these situations, the Wilcoxon Rank-Sum test (EPA, 1992) (also known as the Mann-Whitney U test) should be employed.

Non-parametric tests are conducted using the ranks of the analytical results rather than the analytical results themselves. Therefore, the data sets are inspected for extremely high values that may be underestimated as a result of the ranking process.

4.4.2.4 The Wilcoxon Rank-Sum Test

The Wilcoxon Rank-Sum test is described in the following paragraphs.

- Step 1. Combine the upgradient and downgradient data and rank the ordered values from 1 to *N*. Assume there are *n* downgradient samples and m upgradient samples so that $N = m + n$.

- Step 2. Compute the Wilcoxon statistic *W* for the downgradient wells:

$$W = \sum_{i=1}^{n} E_i - \frac{1}{2}n(n+1)$$

where E_i are the ranks of the downgradient samples. Large values of the statistic *W* give evidence of contamination in downgradient wells.

- Step 3. Compute an approximate *Z-score*. To find the critical value of *W*, a normal approximation to its distribution is used. The expected value and standard deviation of *W* under the null hypothesis (i.e., no contamination exists) are given by the formulas

$$E(W) = \frac{1}{2}mn; \qquad SD(W) = \sqrt{\frac{1}{12}mn(N+1)}$$

An approximate *Z-score* for the Wilcoxon Rank-Sum test may be calculated by the following equations:

$$Z = \frac{W - E(W) - \frac{1}{2}}{SD(W)}$$

The factor of 1/2 in the numerator serves as a continuity correction since the discrete distribution of the statistic W is being approximated by the continuous normal distribution. If

$n,m > 10$ and ties are present, an adjustment to the approximate *Z-score* must be made as follows:

$$Z_{RS} = \frac{W - E(W) - \frac{1}{2}}{SD'(W)}$$

where: $$SD'(W) = \left(\frac{mn}{12} \left[N + 1 - \frac{\sum_{j=1}^{g} t_j (t_j^2 - 1)}{N(N-1)} \right] \right)^{\frac{1}{2}}$$

g = the number of tied groups and t_j is the number of tied data in the jth group.

- Step 4. For a one-tailed 0.05 significance level test for H_0 versus H_A (i.e. the measurements from population 1 tend to exceed those from population 2), reject H_0 and accept H_A if $Z_{RS} > Z_{0.95} = +1.645$.

4.4.2.5 Two-Sample Test of Proportions

When more than 50% of the data for a constituent are non-detects, it is difficult to conduct a valid statistical test of whether the average downgradient concentration is significantly higher than the average upgradient concentration. The Two-Sample Test of Proportions is suitable for this situation.

The null and alternative hypotheses are:

$H_0 : P_d \leq P_u$

$H_A : P_d > P_u$

Where P_d and are P_u the true proportion of the downgradient and upgradient distributions of potential measurement that exceed a specified concentration C. The value of the concentration C should be just slightly greater than the largest upgradient non-detect value.

- Step 1. Let K_d and K_u be the number of downgradient and upgradient measurements that exceed C.

- Step 2. Compute $P_d = K_d / n$ and $P_u = K_u / m$ where there are n downgradient samples and m upgradient samples so that $N = m + n$..

- Step 3. Compute $P = (K_d + K_u) / N$.

- Step 4. Compute the Test Statistic: $Z_p = (P_d - P_u) / [P(1-P)(1/n+1/m)]^{1/2}$

- Step 5. At 95% confidence, reject H_0 and accept H_A if $Z_p > Z_{0.95} = + 1.645$.

4.4.3 Statistical Findings

The following tables summarize the results of the statistical analysis that was completed with the Area A Landfill groundwater monitoring data.

- Table 4-6: Detection statistics for downgradient groundwater results for Rounds 5 through 8. Includes results from wells 2WMW38DS, 2WMW39DS, 2WMW40DS, 2WMW41DS, 2WMW42DS, 2WMW43DS, 2WMW44DS, 2WMW45DS, 2WMW46DS, 2WMW47DS, and 3MW37S. Includes Shapiro-Wilk Test of Normality results.

- Table 4-7: Detection statistics for upgradient groundwater results for Rounds 5 through 8. Includes results from wells 2LMW20S and 4MW1S. Includes Shapiro-Wilk Test of Normality results.

- Table 4-8: Detection statistics for reference groundwater results for Rounds 5 through 8. Includes results from well 2WMW21S.

- Table 4-9: Summary of statistical test results for comparison of downgradient results with upgradient results.

- Table 4-10: Summary of Levene's Test of Homogeneity of Variance results.

- Table 4-11: Summary of Wilcoxon-Rank Sum Non-Parametric ANOVA comparison of downgradient results with upgradient results.

- Table 4-12: Summary of Test of Proportions comparison of downgradient results with upgradient results.

- Table 4-13: Comparisons of average and maximum concentrations by round for downgradient and upgradient results to site-specific background and monitoring criteria.

Potential COCs that were not detected in downgradient or upgradient wells during Rounds 5 through 8 include: 1,1,2,2-tetrachloroethane, ethlybenzene, xylene, benzo(k)fluoranthene, Aroclor-1016, Aroclor-1254, Aroclor-1260, dieldrin, heptachlor, and cadmium. Since these compounds were not detected, no statistical comparisons were run for them. With the exception of ethylbenzene, which was detected only once during Year 1, none of these potential COCs have been detected during the two years of groundwater monitoring. It does not appear that these compounds are a concern at the Area A Landfill site.

Potential COCs that were detected in downgradient wells but not in upgradient wells in Rounds 5 through 8 include: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, phenanthrene, and beryllium (dissolved). No statistical comparisons were run on these potential COCs. Downgradient concentrations are considered to be statistically higher than upgradient concentrations for these potential COCs by default.

Temporal plots of these compounds are provided in Appendix H. There are two plots for each compound. The first plot shows concentrations versus time for upgradient and downgradient wells completed in bedrock and alluvium. The second plot shows the same information for downgradient and reference wells completed in dredge spoils. One half the detection limit was used for plotting purposes if a compound was not detected above detection limit. Most of the plots do not show any significant increasing trends in the concentrations of potential COCs in downgradient monitoring locations. As shown in Table 4-13, benzo(a)pyrene and phenanthrene were the only potential COCs of this group that were detected above their respective primary monitoring criteria. The plot of benzo(a)pyrene concentrations in downgradient wells shows an increasing trend over the last two rounds of sampling. The concentration of benzo(a)pyrene shown for Round 4 is not an actual detection, but one-half the detection limit. The plot of phenanthrene concentrations in downgradient wells shows a spike during Round 7, but concentrations dropped significantly during Round 8.

Potential COCs that were detected in the upgradient wells as well as downgradient wells during Rounds 5 through 8 include BEHP, arsenic, chromium, copper, lead, and zinc. The data sets for these potential COCs were examined for total percent non-detects. It was found that data sets for all of them except total arsenic had greater than 50% non-detects, so a test of proportions was used to compare downgradient and upgradient concentrations for these potential COCs. Two-Sample Tests of Proportions were performed for these potential COCs. Results of the Two-Sample Tests of Proportions are presented in Table 4-12. Dissolved arsenic, total and dissolved chromium, total and dissolved copper, and dissolved

lead failed the test which indicates downgradient concentrations are higher than upgradient concentrations. Temporal plots for all of these metals are provided in Appendix H. Based on a review of the plots, it is evident that metals concentrations in downgradient wells completed in dredge spoils have been consistently higher than concentrations detected in upgradient monitoring wells. No consistent increasing trends are evident in the plots. Some of the plots of metals (chromium, copper, and lead) show increasing trends over the past several sampling events in the upgradient monitoring well 4MW1S. From Table 4-13 it can be seen that only dissolved arsenic was detected at concentrations that exceeded background and the primary monitoring criteria. Further discussion on arsenic is provided in Section 4.5.

Because total arsenic met the assumption of less than or equal to 50% non-detects, an ANOVA was performed for this inorganic. Shapiro-Wilk W tests results (performed as part of detection statistics and presented in Tables 4-6 and 4-7 for downgradient and upgradient results, respectively) were examined for total arsenic, and both downgradient and upgradient distributions were determined to be lognormal. Since upgradient and downgradient results demonstrated the same underlying distribution Levene's Test of Homogeneity of Variance was performed. Results of this test (as shown on Table 4-10) indicate non-homogeneous variances. Since there was not homogeneity of variance, a non-parametric ANOVA (Wilcoxon Rank-Sum) test was performed at a 95% level of confidence to compare these data sets. Results of this non-parametric ANOVA (Wilcoxon Rank-Sum) are presented in Table 4-11. Total arsenic failed the ANOVA test which indicates downgradient concentrations are higher than upgradient concentrations. Temporal plots of total arsenic are provided in Appendix H. The plots for total arsenic are similar to the plots for dissolved arsenic. Concentrations of total arsenic in downgradient wells completed in dredge spoils have been consistently higher than concentrations detected in upgradient wells. Concentrations of total arsenic in several of the downgradient wells have also been consistently higher than the concentrations detected in the reference monitoring well. No significant increasing trends are evident from the plots. It is interesting to note that arsenic concentrations detected in monitoring well 3MW37S, which is downgradient of the Area A Landfill and Area A Wetland, are not elevated. This information suggests that the arsenic detected in the downgradient dredge spoil wells is not migrating downgradient to the Area A Downstream site. From Table 4-13 it can be seen that, similar to dissolved arsenic, total arsenic was detected at concentrations that exceeded background and the primary monitoring criteria. Further discussion on arsenic is provided in Section 4.5.

4.5 OTHER FACTORS

The arsenic concentrations detected during the groundwater monitoring program seem to show signs of influence from the Area A Landfill. The statistical evaluation, which showed that downgradient arsenic concentrations were statistically higher than upgradient concentrations, also indicates that the landfill may be the cause of the elevated arsenic concentrations in the groundwater. However, additional information

is provided below that indicates that a variety of factors may be causing the elevated arsenic concentrations.

Concentrations of arsenic detected in soil samples from the Area A Landfill during previous investigations ranged from 0.59 mg/kg to 3.7 mg/kg in surface soil and 0.94 mg/kg to 10.6 mg/kg in subsurface soil. Arsenic concentrations detected in soil samples collected from the Area A Wetland during previous investigations ranged from 1 mg/kg to 14.1 mg/kg in surface soil and sediment and 2.2 mg/kg to 11.7 mg/kg in subsurface soil. Sediment samples collected from the Thames River contained arsenic at concentrations ranging from 2.7 mg/kg to 18.5 mg/kg. Soil samples collected during the installation of the monitoring wells in the Area A Wetland for the Area A Landfill monitoring program ranged from 1.2 mg/kg to 15.1 mg/kg. These ranges of arsenic concentrations are very consistent between the different areas and media and do not indicate that material disposed in the Area A Landfill has elevated arsenic concentrations compared to the wetland soils/dredge spoils.

TCLP test results for soil samples collected from the Area A Landfill and Area A Wetland indicate that natural arsenic is leachable from the soil. For a sample collected from the Area A Landfill, the arsenic concentration in the TCLP leachate was 0.3 mg/L (300 µg/L) for a soil sample with 2.2 mg/kg of arsenic. The test results indicate that if acidic conditions are present within the landfill, arsenic could leach from the natural soil at concentrations exceeding the primary monitoring criteria (4 µg/L). However, the pH measurements taken during groundwater sampling activities (Table D-1 in Appendix D) do not show low pH groundwater in the downgradient wells. Therefore, it does not appear that low pH leachate from the landfill is the cause of the high arsenic concentrations. One other potential cause that is pH-related, is acid rain. Low pH precipitation and runoff deposit in the wetland and may cause some of the elevated arsenic concentrations.

The detected concentrations of arsenic in groundwater samples collected from monitoring wells in the vicinity of the Area A Landfill during previous investigations were variable, but there seems to be a correlation with the dredge spoils. Maximum concentrations of total arsenic detected in groundwater samples collected from within the Area A Landfill during the Phase II RI were 19.6 µg/L (2LMW13S) and 37 µg/L (2LMW7S). Both of these wells were partially completed in dredge spoils. Dissolved concentrations of arsenic detected in these same samples were less than 7 µg/L, indicating suspended solids caused the high arsenic concentrations. Arsenic concentrations detected in the reference monitoring well 2WMW21S during the Phase II RI were 109 µg/L (total) and 138 µg/L (dissolved) during Round 1 and 56.1 µg/L (total) and 49.5 µg/L (dissolved) during Round 2. This well was completed in dredge spoils. The maximum concentrations of arsenic detected in this well during the Area A Landfill monitoring program were 8.8 µg/L (total) and 7.2 J µg/L (dissolved) during Round 1 of the program. These results indicate that changes in groundwater sampling protocol between the Phase II RI and

groundwater monitoring program have resulted in a substantial decrease in arsenic concentrations in well 2WMW21S. It would also appear that the historically elevated arsenic concentrations in this well were the result of mobilization of sub-0.45-micron dredge spoil particles versus filterable suspended solids.

Other factors that could be causing the elevated arsenic levels in the groundwater were also evaluated. Total arsenic concentrations detected during the Area A Landfill monitoring program were compared to dissolved arsenic concentrations. As can be seen on Figure 4-8, there is a fairly good correlation between the concentrations, but there is some scatter to the data. Based on the information recorded on the sample log sheets, the color of many of the groundwater samples collected from monitoring wells installed in the dredge spoils has been gray to black. Turbidity levels have also been high in several of the samples. This information indicates that even though low-flow sampling techniques are being employed, a representative groundwater sample is not being collected and suspended solids may be partially responsible for the elevated arsenic concentrations.

Total and dissolved arsenic concentrations were also compared to Total Dissolved Solids (TDS) to determine if there was a correlation (see Figures 4-9 and 4-10). The figures present all groundwater data collected during the monitoring program for all monitoring wells. The figures indicate that arsenic concentrations are not strongly correlated with TDS. However, as shown on Figures 4-11 and 4-12, when arsenic and TDS are plotted for only the monitoring wells completed within the dredge spoils that had high arsenic concentrations, it appears that there is a relationship between high TDS and sporadically high arsenic concentrations. As can be seen by comparing Figures 4-9 and 4-10 with Figures 4-11 and 4-12, respectively, the high arsenic concentrations occurred almost exclusively in the dredge spoil wells and when the TDS levels were higher than 2,000 mg/L.

The Inductively Coupled Plasma (ICP) method for analysis of aqueous samples for inorganics, which was used by the project laboratories used for the monitoring program to complete the analysis of the samples, was reviewed and it indicates that the method/instrument is susceptible to interferences. The EPA has cautioned that the ICP method can result in false positives for arsenic, lead, and thallium. The ICP methodology cautions that high levels of TDS (>1,500 mg/L) and salts can cause interference with the analysis. The current project laboratory was contacted about this issue and they said that samples are diluted to minimize interferences. The only drawback to dilution of the samples is that high detection limits result. High levels of both TDS and salinity were detected in the groundwater samples collected from the monitoring wells completed in the dredge spoils. Therefore, it is possible that the TDS and salinity may be causing some interferences which are affecting arsenic results.

Based on previous regulator comments, arsenic concentrations were also compared to iron concentrations to determine if there is a correlation. Arsenic is commonly sorbed onto ferric oxyhydroxide

coatings. Reducing groundwater can mobilize the arsenic by dissolution of the coatings. Figure 4-13 shows a comparison of iron and arsenic concentrations detected in shallow soil samples (less than 10 feet bgs) that were collected from the Area A Wetland. These samples consist mainly of dredge spoils. From the graph it can be seen that there is good correlation between the concentrations. Figures 4-14 and 4-15 show total and dissolved concentrations of iron and arsenic, respectively, that were detected in the groundwater samples from downgradient and reference dredge spoil wells in the monitoring program. Non-detects are included in both figures. One-half the detection limit was used for the non-detects. Neither graph indicates a strong correlation between arsenic and iron in groundwater. Figures 4-16 and 4-17 show similar iron and arsenic results as Figures 4-14 and 4-15, respectively, with the exception that all non-detects have been removed from Figures 4-16 and 4-17. The removal of the non-detects did not have any significant impact on the correlation between arsenic and iron.

TABLE 4-1

SUMMARY OF THE MONITORING LOCATIONS THAT WERE COMPARED FOR THE STATISTICAL ANALYSIS AREA A GROUNDWATER MONITORING PROGRAM NSB-NLON, GROTON, CONNECTICUT

UPGRADIENT MONITORING LOCATIONS	DOWNGRADIENT MONITORING LOCATIONS	RATIONALE
4MW1S and 2LMW20S	2WMW38DS, 2WMW39DS, 2WMW40DS, 2WMW41DS, 2WMW42DS, 2WMW43DS, 2WMW44DS, 2WMW45DS, 2WMW46DS, and 2WMW47DS	Monitoring wells 4MW1S and 2LMW20S are upgradient of the landfill and the comparison of concentrations detected in these wells to concentrations detected in the selected downgradient wells will indicate the influence of the landfill on the groundwater within the Area A Wetland.
2WMW21S	2WMW38DS, 2WMW39DS, 2WMW40DS, 2WMW41DS, 2WMW42DS, 2WMW43DS, 2WMW44DS, 2WMW45DS, 2WMW46DS, and 2WMW47DS	Monitoring well 2WMW21S is not located upgradient of the landfill, but it serves as a reference location. The well is completed in dredge spoils similar to the selected downgradient wells and it shows any impacts from groundwater migrating into the Area A Wetland from the east. Comparison of concentrations detected in this well to concentrations detected in the selected downgradient wells will indicate the influence of dredge spoils on the groundwater in the Area A Wetland and the influence of groundwater migrating into the Area A Wetland from the east.
4MW1S and 2LMW20S	3MSP01	Monitoring wells 4MW1S and 2LMW20S are upgradient of the landfill and the comparison of concentrations detected in these wells to concentrations detected in the selected monitoring location will indicate the influence of the landfill on the groundwater that seeps from this location into the OBDA Pond in Area A Downstream.
4MW1S and 2LMW20S	3MW37S	Monitoring wells 4MW1S and 2LMW20S are upgradient of the landfill and the comparison of concentrations detected in these wells to concentrations detected in the selected downgradient well will indicate the influence of the landfill on the groundwater migrating to the Area A Downstream.

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2LMW20S ROUND 5 12/16/2000	2LMW20S ROUND 6 3/12/2001	2LMW20S ROUND 7 6/24/2001	2LMW20S ROUND 8 9/21/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 U	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 U	0.21 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	0.02 UJ
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	1.3 J	15
PHENANTHRENE	0.077	NA	0.2 U	0.2 U	0.004 U	0.004 UJ
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.02 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.01 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	2.2 U/2.2 U	2.6 U/2.6 U	5 U/5 U	8.9 U/6.4 U
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.1 U/0.1 UJ	1 U/1 U
CADMIUM	6	0.62[3]	0.28 U/0.27 U	2.6 UJ/2.6 UJ	3 U/3 U	0.3 U/0.3 U
CHROMIUM[4]	110	11[2]	0.61 U/0.5 U	2.6 U/2.6 U	5 U/5 U	1 U/1.1 J
COPPER	48	4.8[3]	1 U/1 U	4.7 U/2.0 U	2.3 U/2.2 U	4.4 J/3 U
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	3 U/3 U	3 U/3 U
ZINC	123	58.2[3]	24.8 U/15.4 U	49.1/22.8 U	36.9/30.4	41.1/33
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	86.9	152		70
CHEMICAL OXYGEN DEMAND	NA	NA	10 U	10 U	5 U	5 U
CHLORIDE	NA	NA	146	99.4	120	83
HARDNESS	NA	NA	120	160	120	74
SULFATE	NA	NA	6.6	10.2	5	2
TOTAL DISSOLVED SOLIDS	NA	NA	341	323	230 J	240
TOTAL ORGANIC CARBON	NA	NA	1.6 U	1.6 U	3.1 J	10

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW21S ROUND 5 12/14/2000	2WMW21S ROUND 6 3/8/2001	2WMW21S (DUP) ROUND 6 3/8/2001	2WMW21S ROUND 7 6/23/2001	2WMW21S (DUP) ROUND 7 6/23/2001	2WMW21S ROUND 8 9/19/2001	2WMW21S (DUP) ROUND 8 9/19/2001
VOCs (ug/L)									
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SVOCs (ug/L)									
BENZO(A)ANTHRACENE	0.3	NA	0.2 UJ	0.2 U	0.2 UJ	0.012 U	0.012 U	0.012 UJ	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 UJ	0.2 U	0.2 UJ	0.021 U	0.021 U	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 U	0.2 UJ	0.02 U	0.02 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 U	0.2 UJ	0.02 U	0.02 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	10 U	1.4 J	1.4 J	2.1 J	5 UJ
PHENANTHRENE	0.077	NA	0.2 UJ	0.06 J	0.094 J	0.1 J	0.71 J	0.004 UJ	0.004 UJ
Pesticides/PCBs (ug/L)									
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 UJ	0.20 U	0.20 U	0.20 U	0.2 UJ	0.2 UJ
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 UJ	0.20 U	0.20 U	0.20 U	0.2 UJ	0.2 UJ
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 UJ	0.20 U	0.20 U	0.20 U	0.2 UJ	0.2 UJ
DIELDRIN	0.1	0.0019[3]	0.08 U	0.04 U	0.04 U	0.8 U	0.02 U	0.2 U	0.2 U
HEPTACHLOR	0.05	0.0038[2]	0.04 U	0.02 U	0.02 U	0.4 U	0.01 U	0.1 U	0.1 U
Inorganics (total/dissolved) (ug/L)									
ARSENIC	4	150[2]	4 J/3.9 J	3.3 J/4.8 J	2.6 U/3.8 J	5 U/5 U	5 U/5 U	5.5 J/4 U	6.9 J/7.5 J
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.13 U/0.13 U	0.1 UJ/0.1 UJ	0.1 UJ/0.1 UJ	1 U/1 U	1 U/1 U
CADMIUM	6	0.62[3]	0.74 U/0.34 U	2.6 UJ/2.6 UJ	2.6 UJ/2.6 UJ	3 U/3 U	3 U/3 U	0.3 UJ/0.3 UJ	0.3 UJ/0.3 UJ
CHROMIUM[4]	110	11[2]	8.4 J/6.7 J	2.7 U/2.9 U	2.7 U/2.6 U	9.3 J/8.9 J	9 J/12.8	5.8/6.1	6.7/5.6
COPPER	48	4.8[3]	1.2 U/1 UJ	2.0 U/2.0 U	2.0 U/2.0 U	4.3 U/3.5 J	12.2 U/2.2 U	3 U/3 U	3 U/3 U
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	2.0 U/2.0 U	3 U/3 UJ	3 UJ/3 U	3 U/3 U	3 U/3 U
ZINC	123	58.2[3]	8.5 U/7.4 U	2.8 U/2.0 U	2.0 U/2.6 U	20.4/8.5 U	12.2 J/37.4	10.4/14.2	13.6/19.1
Miscellaneous Parameters (mg/L)									
ALKALINITY	NA	NA	2220	283	294			1400	1500
CHEMICAL OXYGEN DEMAND	NA	NA	1670	168	152	590	670	620 J	410 J
CHLORIDE	NA	NA	12200	1380	1360	12040	10060	8800	8200
HARDNESS	NA	NA	4370	411	409	4000	3300	1800	2200
SULFATE	NA	NA	1 U	17.7	17.3	67	62	55 J	52 J
TOTAL DISSOLVED SOLIDS	NA	NA	20400	2430	2290	3300 J	14000 J	15000	14000
TOTAL ORGANIC CARBON	NA	NA	14.8 J	17.0	18.1	30 J	22 J	98	74

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW38DS ROUND 5 12/15/2000	2WMW38DS ROUND 6 3/10/2001	2WMW38DS ROUND 7 6/21/2001	2WMW38DS ROUND 8 9/25/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 U	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 U	0.38	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	1.9 J	6.9
PHENANTHRENE	0.077	NA	0.2 U	0.2 U	0.004 U	0.004 U
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	
DIELDRIN	0.1	0.0019[3]	0.02 U	0.02 U	0.02 U	
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.01 U	0.01 U	
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	4.4	3.0 J/2.6 U	6.6 J/5 U	5 U/5 U
BERYLLIUM	4	NA	0.2 U	0.13 U/0.13 U	0.1 U/0.1 UJ	1.3 U/0.41 U
CADMIUM	6	0.62[3]	0.32 U	2.6 U/2.6 U	3 U/3 U	3 U/3 U
CHROMIUM[4]	110	11[2]	1.5 U	2.6 U/2.6 U	5 U/5 U	5 U/5 U
COPPER	48	4.8[3]	4.6 U	2.0 U/2.0 U	10.8 U/4.6	10.1/9.8
LEAD	13	1.2[3]	1 UJ	2.0 UJ/2.0 UJ	3 U/3 U	3 U/3 U
ZINC	123	58.2[3]	8 U	3.8 J/2.0 U	25.1/12.6 J	39.5 J/47.2 J
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	280	297		
CHEMICAL OXYGEN DEMAND	NA	NA		38.4	30	
CHLORIDE	NA	NA	189	186	290	
HARDNESS	NA	NA	219	210	230	200
SULFATE	NA	NA	99	38.7	32	
TOTAL DISSOLVED SOLIDS	NA	NA	830	665 J	640 J	
TOTAL ORGANIC CARBON	NA	NA	16.2 J	8.0 J	11 J	

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW39DS ROUND 5 12/13/2000	2WMW39DS ROUND 6 3/8/2001	2WMW39DS ROUND 7 6/19/2001	2WMW39DS ROUND 8 9/22/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 UJ	0.2 U	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 UJ	0.2 U	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 U	0.02 U	0.02 UJ
BENZO(K)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	3 J	3.3 J
PHENANTHRENE	0.077	NA	0.2 UJ	0.2 U	0.004 U	0.004 UJ
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 UJ	0.20 U	0.2 UJ
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 UJ	0.20 U	0.2 UJ
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 UJ	0.20 U	0.2 UJ
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	3.1 J/3 J	2.6 U/2.6 U	13.5/12.8 U	5 U/4.7 U
BERYLLIUM	4	NA	0.29 U/0.2 U	0.13 U/0.13 U	0.10 U/0.10 U	1 U/1 U
CADMIUM	6	0.62[3]	0.33 U/0.43 U	2.6 U/2.6 UJ	3.0 U/0.60 U	0.3 U/0.3 U
CHROMIUM[4]	110	11[2]	0.67 U/0.5 U	2.6 UJ/2.6 U	5.0 U/0.60 U	1.2 J/1 U
COPPER	48	4.8[3]	1 U/1 U	2.0 U/2.0 U	2.2 U/1.5 U	3.6 J/3 U
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	3.0 U/3.0 U	5 J/3 U
ZINC	123	58.2[3]	12 U/11.1 U	3.6 U/3.6 U	123/16.0 U	27.8/33
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	129	136	180	160
CHEMICAL OXYGEN DEMAND	NA	NA	22.6	39.3	33.0	5 U
CHLORIDE	NA	NA	297	439	370	300
HARDNESS	NA	NA	96	150	140	140
SULFATE	NA	NA	4.6	1.9	4.0	1 U
TOTAL DISSOLVED SOLIDS	NA	NA	643	821	870	690
TOTAL ORGANIC CARBON	NA	NA	15.7 J	5.2 U	6.1	9.9

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW40DS ROUND 5 12/14/2000	2WMW40DS ROUND 6 3/9/2001	2WMW40DS ROUND 7 6/19/2001	2WMW40DS ROUND 8 9/23/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 UJ	0.2 UJ	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 UJ	0.2 UJ	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 UJ	0.02 U	0.02 UJ
BENZO(K)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 UJ	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	4.1 J	1.9 J
PHENANTHRENE	0.077	NA	0.2 UJ	0.2 UJ	0.1	0.004 UJ
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U	0.01 UJ
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	22.4/36.2	5.8 J/4.8 J	8.1 J/6.2 U	15.1 U/8.5 U
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.10 U/0.29	1 U/1 U
CADMIUM	6	0.62[3]	0.2 UJ/0.37 U	5.2 UJ/2.6 UJ	3.0 U/0.60 U	0.3 UJ/0.3 UJ
CHROMIUM[4]	110	11[2]	3.7 U/4.3 J	2.6 U/2.6 U	5.0 U/1.6 J	3.5/2.2
COPPER	48	4.8[3]	1 UJ/1 UJ	2.0 U/2.0 U	2.2 UJ/1.5 U	3 U/3 U
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	3.0 U/3.0 U	3 U/3 U
ZINC	123	58.2[3]	210 J/14.1 U	3.9 U/3.0 U	8.5 U/17.0 U	4.8 J/4 U
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	1490	1260	1400	1200
CHEMICAL OXYGEN DEMAND	NA	NA	586 J	1300	460	660
CHLORIDE	NA	NA	9420	8500	13000	19000
HARDNESS	NA	NA	3390	2430	2900	3000
SULFATE	NA	NA	840	824	782	980
TOTAL DISSOLVED SOLIDS	NA	NA	16600	14400	20000	22000
TOTAL ORGANIC CARBON	NA	NA	13.8 J	13.0	24.0	42

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW41DS ROUND 5 12/14/2000	2WMW41DS ROUND 6 3/9/2001	2WMW41DS ROUND 7 6/21/2001	2WMW41DS ROUND 8 9/23/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 UJ	0.2 U	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 UJ	0.2 U	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 U	0.02 U	0.02 UJ
BENZO(K)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	2.9 J	2.5 J
PHENANTHRENE	0.077	NA	0.2 UJ	0.2 U	0.004 U	0.004 UJ
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	18.2/14.2	11.5/9.0	5.0 U/5.0 U	11.3 U/13.1 U
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.10 UJ/0.10 UJ	1 U/1 U
CADMIUM	6	0.62[3]	0.36 U/0.44 U	2.6 UJ/2.6 UJ	3.0 U/3.0 U	0.3 UJ/0.3 UJ
CHROMIUM[4]	110	11[2]	8.2 J/7.1 J	2.6 U/2.6 U	5.0 U/8.9 J	6.7/6.2
COPPER	48	4.8[3]	1.1 U/1 UJ	2.0 U/2.0 U	2.2 U/7.0 U	3 U/3 U
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	3.0 UJ/3.0 UJ	3 U/3 U
ZINC	123	58.2[3]	15 U/9.2 U	4.1 U/19.6 U	8.5 U/8.5 U	9.3/4 U
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	2110	1860	1700	2000
CHEMICAL OXYGEN DEMAND	NA	NA	880 J	799	560	540
CHLORIDE	NA	NA	9810	7410	9800	15000
HARDNESS	NA	NA	3400	2400	2600	2300
SULFATE	NA	NA	257	217	580	230
TOTAL DISSOLVED SOLIDS	NA	NA	16400	12000	17380	20000
TOTAL ORGANIC CARBON	NA	NA	44.5 J	19.1	89	41

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW42DS ROUND 5 12/13/2000	2WMW42DS ROUND 6 3/8/2001	2WMW42DS ROUND 7 6/20/2001	2WMW42DS ROUND 8 9/24/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 UJ	0.2 U	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.028 J	0.2 U	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.034 J	0.2 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	3.1 J	27
PHENANTHRENE	0.077	NA	0.023 J	0.2 U	22	0.004 U
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 UJ	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 UJ	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 UJ	0.20 U	0.2 U
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U	0.02 UJ
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U	0.01 UJ
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	12.2/11.1	10.0/7.2	9.7 J/6.2 U	16.4/5 U
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.10 U/0.18 J	1.4 U/0.3 U
CADMIUM	6	0.62[3]	0.58 U/0.23 U	2.6 UJ/2.6 UJ	0.70 U/0.60 U	3 U/3 U
CHROMIUM[4]	110	11[2]	3.4 U/3 U	2.6 U/2.6 U	4.0 J/6.4 J	24.7/5 U
COPPER	48	4.8[3]	1 U/1 UJ	2.0 U/2.0 U	2.2 UJ/1.5 U	10.7/2.1 U
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	3.0 U/3.0 U	12.4 J/3 U
ZINC	123	58.2[3]	16.8 U/27.7 U	5.2 U/2.0 U	8.5 U/13.0 U	369/17.7 J
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	793	865	900	640
CHEMICAL OXYGEN DEMAND	NA	NA	141	310	590	92
CHLORIDE	NA	NA	4270	4310	7330	2700
HARDNESS	NA	NA	1570	1450	1600	940
SULFATE	NA	NA	89.9	108	167	83
TOTAL DISSOLVED SOLIDS	NA	NA	7330	7280	11000	5800
TOTAL ORGANIC CARBON	NA	NA	14.2 J	10.6	24.0	20

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW43DS ROUND 5 12/14/2000	2WMW43DS ROUND 6 3/13/2001	2WMW43DS ROUND 7 6/20/2001	2WMW43DS ROUND 8 9/24/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 UJ	0.2 UJ	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 UJ	0.2 UJ	1.0	1.2
BENZO(B)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 UJ	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 UJ	0.2 UJ	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	4.2 J	40
PHENANTHRENE	0.077	NA	0.2 UJ	0.2 UJ	0.4	0.5
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
DIELDRIN	0.1	0.0019[3]	0.02 U	0.02 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.01 U	0.010 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	6.5/7.4	13.9 J/13.0 J	9.3 J/6.2 U	8.1 J/6.8 J
BERYLLIUM	4	NA	0.4 U/0.2 U	0.13 U/0.13 U	0.10 U/0.22	0.57 U/0.1 U
CADMIUM	6	0.62[3]	0.59 U/0.42 U	2.6 U/5.2 U	0.70 U/0.60 U	3 U/3 U
CHROMIUM[4]	110	11[2]	3.2 U/3.6 U	8.0/3.2 J	7.7 J/5.3 J	5 U/5 U
COPPER	48	4.8[3]	1 UJ/1 UJ	6.7/4.7	2.2 UJ/1.5 U	2.4 U/2.4 U
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 UJ/2.0 UJ	3.0 U/3.0 U	3 U/3 U
ZINC	123	58.2[3]	9.6 U/3.3 U	29.5/10.4	8.5 U/15.3 U	17.4 J/19 J
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	1350	2590	2300	2100
CHEMICAL OXYGEN DEMAND	NA	NA	411 J	969	530	920
CHLORIDE	NA	NA	11400	14800	13000	19000
HARDNESS	NA	NA	3970	3940	3400	3400
SULFATE	NA	NA	400	126	154	530
TOTAL DISSOLVED SOLIDS	NA	NA	18800	25200	25000	24000
TOTAL ORGANIC CARBON	NA	NA	12.4 J	12.6 J	29.0	33

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW44DS ROUND 5 12/15/2000	2WMW44DS ROUND 6 3/9/2001	2WMW44DS ROUND 7 6/22/2001	2WMW44DS ROUND 8 9/24/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 UJ	0.5 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 UJ	0.5 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 UJ	0.5 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 UJ	0.5 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	1.4 J	1.2 J
PHENANTHRENE	0.077	NA	0.2 U	0.2 UJ	0.004 U	0.004 U
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 U
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U	0.02 UJ
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U	0.01 UJ
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	2.2 U/2.2 U	3.4 J/2.6 U	8.2 J/5.0 U	5 U/5 U
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.10 UJ/0.10 UJ	1.1 U/0.24 U
CADMIUM	6	0.62[3]	0.37 U/0.31 U	2.6 UJ/2.6 UJ	3.0 U/3.0 U	3 U/3 U
CHROMIUM[4]	110	11[2]	0.95 U/1.4 U	2.6 U/2.6 U	5.0 U/5.0 U	5 U/5 U
COPPER	48	4.8[3]	1 U/1 U	2.0 U/2.0 U	2.2 U/7.1 U	4.1 J/7.9
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	3.0 UJ/3.0 UJ	3 U/3.6 J
ZINC	123	58.2[3]	10.8 U/16.8 U	3.3 U/6.2 U	11.2 J/11.8 J	31.9 J/41.2 J
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	618	533	750	650
CHEMICAL OXYGEN DEMAND	NA	NA	60.9	128	650	46
CHLORIDE	NA	NA	2470	1590	3410	2800
HARDNESS	NA	NA	722	622	960	750
SULFATE	NA	NA	22.4	13.3	87	36
TOTAL DISSOLVED SOLIDS	NA	NA	4350	2960	7400	4900
TOTAL ORGANIC CARBON	NA	NA	8.2 J	8.9	28	8

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW45DS ROUND 5 12/15/2000	2WMW45DS ROUND 6 3/11/2001	2WMW45DS ROUND 7 6/20/2001	2WMW45DS ROUND 8 9/24/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 UJ	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 UJ	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 UJ	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 UJ	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	1.3 J	1.1 J
PHENANTHRENE	0.077	NA	0.2 U	0.2 UJ	4.5	0.004 U
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 U
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	5.5/4.2 J	9.7/7.4	10.4/11.4 U	14.7/10.7
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.10 U/0.15 J	1.2 U/0.14 U
CADMIUM	6	0.62[3]	0.2 U/0.2 U	2.6 UJ/5.2 UJ	3.0 U/0.60 U	3 U/3 U
CHROMIUM[4]	110	11[2]	1.3 U/2.2 U	2.6 U/2.6 U	5.0 U/0.60 UJ	5 U/5 U
COPPER	48	4.8[3]	1 U/1 U	2.0 U/2.0 U	2.2 UJ/1.5 U	4.1 J/2.7 J
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	3.0 U/3.0 U	3.4 J/3 U
ZINC	123	58.2[3]	12 U/3.8 U	6.1 U/3.9 U	8.5 U/11.4 U	29 J/40.9 J
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	730	384	1800	460
CHEMICAL OXYGEN DEMAND	NA	NA	263	246	750	56
CHLORIDE	NA	NA	4050	1900	15000	2500
HARDNESS	NA	NA	1050	592	3300	510
SULFATE	NA	NA	55.6	20.5	30.0	49
TOTAL DISSOLVED SOLIDS	NA	NA	6400	3260	22000	4400
TOTAL ORGANIC CARBON	NA	NA	14.8 J	10.4	22.0	20

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW46DS ROUND 5 12/15/2000	2WMW46DS ROUND 6 3/11/2001	2WMW46DS ROUND 7 6/21/2001	2WMW46DS ROUND 8 9/20/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 UJ
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 UJ	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 UJ	0.021 U	0.021 UJ
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 UJ	0.02 U	0.02 UJ
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 UJ	0.02 U	0.02 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	1.3 J	5.1 UJ
PHENANTHRENE	0.077	NA	0.2 U	0.2 UJ	2.9	0.004 UJ
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.2 U	0.2 UJ
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.2 U	0.2 UJ
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.2 U	0.2 UJ
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	16.4/13	16.6/24.1	12.9/6.8 J	10.1/29.8
BERYLLIUM	4	NA	0.2 U/0.49 U	0.13 U/0.13 U	0.10 UJ/0.10 UJ	1 U/1 U
CADMIUM	6	0.62[3]	0.25 U/0.53 U	2.6 UJ/2.6 UJ	3.0 U/3.0 U	0.3 UJ/0.3 UJ
CHROMIUM[4]	110	11[2]	4.4 J/3.6 U	2.6 U/2.6 U	23.2 J/13.9 J	5.1/6
COPPER	48	4.8[3]	1 UJ/1 UJ	2.0 U/2.0 U	11.6 U/13.6 U	3 U/3 U
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	3.7 J/6.6 J	3 U/3 U
ZINC	123	58.2[3]	13.4 U/8.8 U	16.2 U/2.0 U	43.7 J/8.5 U	15.8/6.2 J
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	2380	2080	2100	1900
CHEMICAL OXYGEN DEMAND	NA	NA	671	982	1280	1400
CHLORIDE	NA	NA	17300	16700	16650	26000
HARDNESS	NA	NA	5330	4410	6100	3900
SULFATE	NA	NA	273	762	321	840 J
TOTAL DISSOLVED SOLIDS	NA	NA	27100	28000	34400	30000
TOTAL ORGANIC CARBON	NA	NA	14.4 J	12.4	140	26

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	2WMW47DS ROUND 5 12/14/2000	2WMW47DS (DUP) ROUND 5 12/14/2000	2WMW47DS ROUND 6 3/9/2001	2WMW47DS ROUND 7 6/23/2001	2WMW47DS ROUND 8 9/20/2001
VOCs (ug/L)							
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 U	1 U	1 UJ
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U	1 U
SVOCs (ug/L)							
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 U	0.2 UJ	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 U	0.2 UJ	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.2 UJ	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.2 UJ	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	4.1 J	1.6 J	6.3 J
PHENANTHRENE	0.077	NA	0.2 U	0.2 U	0.2 UJ	0.004 U	0.004 UJ
Pesticides/PCBs (ug/L)							
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.20 U	0.2 UJ
DIELDRIN	0.1	0.0019[3]	0.02 U	0.02 U	0.020 U	0.02 U	0.02 UJ
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.01 U	0.010 U	0.01 U	0.01 UJ
Inorganics (total/dissolved) (ug/L)							
ARSENIC	4	150[2]	20.9/21.7	21.3/16.1	7.0/6.8	29.5/31.3	10.7/11
BERYLLIUM	4	NA	0.2 U/0.2 U	0.2 U/0.2 U	0.13 U/0.13 U	0.1 U/0.1 UJ	1 U/1 U
CADMIUM	6	0.62[3]	0.2 UJ/0.2 UJ	0.2 UJ/0.23 U	3.9 U/2.6 UJ	3 U/3 U	0.3 U/0.3 U
CHROMIUM[4]	110	11[2]	0.5 UJ/0.5 UJ	0.5 UJ/0.5 UJ	2.6 U/2.6 U	9.1 J/5 U	2.9/1.6 J
COPPER	48	4.8[3]	1.3 U/1 UJ	1 UJ/1 UJ	2.0 U/2.0 U	11.6 U/2.2 U	4.6 J/4.1 J
LEAD	13	1.2[3]	1 UJ/1 UJ	1 UJ/1 UJ	2.0 U/2.0 U	4.8 J/5.9 J	3 U/3.7 J
ZINC	123	58.2[3]	8.3 U/6.1 U	3 U/5.7 U	7.2 U/11.4 U	33.6/28.6	26.8/35
Miscellaneous Parameters (mg/L)							
ALKALINITY	NA	NA	375	352	343		320
CHEMICAL OXYGEN DEMAND	NA	NA	88.7	2150	230	69	43
CHLORIDE	NA	NA	2270	2210	1750	4800	1800
HARDNESS	NA	NA	605	650	367	540	360
SULFATE	NA	NA	1 U	1 U	1.0 U	33	6 J
TOTAL DISSOLVED SOLIDS	NA	NA	4010	3810	3060	4700 J	3000
TOTAL ORGANIC CARBON	NA	NA	9.8 J	9.3 J	5.9 U	7.9 J	12

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	3MW37S ROUND 5 12/18/2000	3MW37S ROUND 6 3/12/2001	3MW37S ROUND 7 6/19/2001	3MW37S ROUND 8 9/22/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.051 J	0.2 U	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.039 J	0.2 U	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.044 J	0.2 U	0.02 U	0.020 UJ
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	0.020 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	1.7 J	5.2 U
PHENANTHRENE	0.077	NA	0.11 J	0.2 U	0.004 U	0.004 UJ
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 UJ
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.02 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.01 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	2.2 U/2.2 U	2.6 U/2.6 U	5.0 U/5.0 U	4 U/5.2 U
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.1 U/0.10 U	1 U/1 U
CADMIUM	6	0.62[3]	0.29 U/0.29 U	2.6 UJ/2.6 U	3.0 U/3.0 U	0.3 U/0.3 U
CHROMIUM[4]	110	11[2]	0.5 U/0.5 U	2.6 U/2.6 UJ	5.0 U/5.0 U	1.5 J/1 U
COPPER	48	4.8[3]	1.8 J/2.1	2.0 U/2.0 U	3.3 U/4.2 U	3.9 J/3 U
LEAD	13	1.2[3]	1 UJ/1 U	2.0 U/2.0 U	3.0 UJ/3.3 J	3 U/3 U
ZINC	123	58.2[3]	16.8 U/16.7 U	2.4 U/4.3 U	10.8 J/14.4 J	29.3/18.3
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	117	105		130
CHEMICAL OXYGEN DEMAND	NA	NA	19.1	65.1	5.0	5 U
CHLORIDE	NA	NA	244	657	470	300
HARDNESS	NA	NA	165	296	270	160
SULFATE	NA	NA	15.5	28.9	25.0	17
TOTAL DISSOLVED SOLIDS	NA	NA	549	1010	925	520
TOTAL ORGANIC CARBON	NA	NA	2.4	2.7 U	4.7	9.9

TABLE 4-2

ROUNDS 5-8 GROUNDWATER ANALYTICAL RESULTS SUMMARY
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	4MW1S ROUND 5 12/16/2000	4MW1S ROUND 6 3/11/2001	4MW1S (DUP) ROUND 6 3/11/2001	4MW1S ROUND 7 6/25/2001	4MW1S (DUP) ROUND 7 6/25/2001	4MW1S ROUND 8 9/20/2001	4MW1S (DUP) ROUND 8 9/20/2001
VOCs (ug/L)									
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 UJ			1 UJ	1 UJ
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U			1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U			1 U	1 U
SVOCs (ug/L)									
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 U	0.2 U			0.012 UJ	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 U	0.2 U			0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.2 U			0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.2 U			0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	5.6 J	10 U	10 U			3 J	7.9 J
PHENANTHRENE	0.077	NA	0.2 U	0.2 U	0.2 U			0.004 UJ	0.004 UJ
Pesticides/PCBs (ug/L)									
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U			0.2 UJ	0.2 UJ
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U			0.2 UJ	0.2 UJ
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U			0.2 UJ	0.2 UJ
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U			0.02 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U			0.01 U	0.01 U
Inorganics (total/dissolved) (ug/L)									
ARSENIC	4	150[2]	2.4 J/2.3 J	2.6 U/2.6 U	2.6 U/2.6 U	5.0 U/5.0 U	5.0 U/5.0 U	4 U/4 U	4 U/4 U
BERYLLIUM	4	NA	0.21 U/0.2 U	0.13 U/0.13 U	0.13 U/0.13 U	0.10 U/0.10 U	0.10 U/0.10 U	1 U/1 U	1 U/1 U
CADMIUM	6	0.62[3]	0.41 U/0.38 U	2.6 UJ/2.6 UJ	2.6 UJ/2.6 UJ	3.0 U/3.0 U	3.0 U/3.0 U	0.3 U/0.3 U	0.3 U/0.3 U
CHROMIUM[4]	110	11[2]	0.51 U/0.5 U	2.6 U/2.6 U	2.6 U/2.6 U	5.0 U/5.0 U	5.0 U/5.0 U	1.1 J/1.1 J	6.5/1.1 J
COPPER	48	4.8[3]	1 U/1 U	2.0 U/2.0 U	2.0 U/2.0 U	6.1 U/4.6 U	4.8 U/3.1 U	4.5 J/3.8 J	4.4 J/5.6 J
LEAD	13	1.2[3]	1 UJ/1 UJ	2.0 U/2.0 U	2.0 U/2.0 U	5.5 J/3.0 UJ	3.0 UJ/3.0 UJ	4.5 J/3 UJ	10.6 J/4.1 J
ZINC	123	58.2[3]	7.7 U/8.9 U	11.1 U/44.3 J	11.1 U/10.1 U	82.3/58.4	69.5/49.3	39.2/40.1	37.5/41.4
Miscellaneous Parameters (mg/L)									
ALKALINITY	NA	NA	27.6	15.6	15.6			25	25
CHEMICAL OXYGEN DEMAND	NA	NA	10 U	13.8	18.3			5 U	5 U
CHLORIDE	NA	NA	31.8	148	149			34	36
HARDNESS	NA	NA	65.1	98.2	101			69	67
SULFATE	NA	NA	39.3	27.9	28.2			44 J	41 J
TOTAL DISSOLVED SOLIDS	NA	NA	105	294	316			180	190
TOTAL ORGANIC CARBON	NA	NA	1.9 U	0.73 U	0.73 U			3.9	4.3

NOTES:
Bold numbers denote exceedance of secondary and primary monitoring criterion.
1 Surface Water Protection Criteria for substances in groundwater. (CTDEP, January 1996)
2 Federal Ambient Water Quality Criteria for protection of aquatic life (chronic, freshwater). (USEPA, 1999)
3 Connecticut Water Quality Criteria for protection of human health from consumption of organisms. (CTDEP, 1997)
4 Hexavalent Chromium
J Estimated Value
R Rejected Value
U Undetected
NA Not Available

TABLE 4-3

ROUNDS 5-8 SURFACE WATER ANALYTICAL RESULTS
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	3MSP01 ROUND 5 12/16/2000	3MSP01 ROUND 6 3/13/2001	3MSP01 ROUND 7 6/19/2001	3MSP01 ROUND 8 9/25/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 UJ	0.82	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 UJ	0.9	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 UJ	0.83	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 UJ	0.44	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	2.1 J	5.4
PHENANTHRENE	0.077	NA	0.021 J	1.1	0.004 U	0.004 U
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
DIELDRIN	0.1	0.0019[3]	0.02 U	0.02 U	0.02 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.01 U	0.01 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	2.7 J/2.6 J	3.9 J/2.6 U	5.0 U/5.0 U	6.1 J/5 U
BERYLLIUM	4	NA	0.2 U/0.2 U	0.14 J/0.15 J	0.10 U/0.10 U	0.17 U/1.3 U
CADMIUM	6	0.62[3]	0.23 U/0.23 U	2.6 U/2.6 U	3.0 U/3.0 U	3 U/3 U
CHROMIUM[4]	110	11[2]	0.5 U/0.5 U	4.1 J/2.6 U	5.0 U/5.0 U	5 U/5 U
COPPER	48	4.8[3]	1 U/1 U	2.0 U/2.0 UJ	7.0 U/8.1 U	6.3/2.4 U
LEAD	13	1.2[3]	1.2 J/1 UJ	11.6 J/2.0 UJ	5.8 J/3.0 UJ	3 U/3 U
ZINC	123	58.2[3]	28.1 U/24.6 U	116/65.6	68.5/56.6	66.4/61.8
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	93.3	71.4		80
CHEMICAL OXYGEN DEMAND	NA	NA	12.2	31.7	14.0	9
CHLORIDE	NA	NA	210	14.1	20.0	180
HARDNESS	NA	NA	118	85.3	160	99
SULFATE	NA	NA	8.3	7.9	13.0	8
TOTAL DISSOLVED SOLIDS	NA	NA	471	121	173	460
TOTAL ORGANIC CARBON	NA	NA	3.7 J	6.2 J	11.0	6.4

TABLE 4-3

ROUNDS 5-8 SURFACE WATER ANALYTICAL RESULTS
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	SG-18 ROUND 5 12/18/2000	SG-18 ROUND 6 3/13/2001	SG-18 ROUND 7 6/20/2001	SG-18 ROUND 8 9/25/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.061 J	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.11 J	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.083 J	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	2.1 J	5 U
PHENANTHRENE	0.077	NA	0.037 J	0.21	0.004 U	0.004 U
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
DIELDRIN	0.1	0.0019[3]	0.02 U	0.02 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.01 U	0.010 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	2.2 U/2.2 U	2.7 J/2.6 U	5.0 U/6.2 U	7.7/5 U
BERYLLIUM	4	NA	0.26 U/0.2 U	0.42/0.32	0.10 U/0.10 U	0.38 U/1.3 U
CADMIUM	6	0.62[3]	0.2 U/0.2 U	2.6 U/2.6 U	3.0 U/0.60 U	3 U/3 U
CHROMIUM[4]	110	11[2]	0.5 U/0.5 U	2.6 U/2.6 U	5.0 U/0.60 U	5 U/5 U
COPPER	48	4.8[3]	1.8 J/1 U	2.0 U/2.0 U	2.2 U/1.5 U	17.2/4.6 J
LEAD	13	1.2[3]	1.6 U/1.5 U	2.0 UJ/2.0 UJ	3.0 U/3.0 U	8.2 J/3 U
ZINC	123	58.2[3]	72.5/72.4	64.5/56.7	55.9/47.0 J	263/102
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	21.2	13.4	31.0	55
CHEMICAL OXYGEN DEMAND	NA	NA	15.6	10 U	20.0	100
CHLORIDE	NA	NA	90.5	87.6	70.0	70
HARDNESS	NA	NA	38.4	29.4	49.0	63
SULFATE	NA	NA	8.2	6.6	6.0	1 U
TOTAL DISSOLVED SOLIDS	NA	NA	198	160	220	430
TOTAL ORGANIC CARBON	NA	NA	4.5	1.1 U	7.3	16

TABLE 4-3

ROUNDS 5-8 SURFACE WATER ANALYTICAL RESULTS
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	SG-19 ROUND 5 12/19/2000	SG-19 ROUND 6 3/12/2001	SG-19 (DUP) ROUND 6 3/12/2001	SG-19 ROUND 7 6/22/2001	SG-19 ROUND 8 9/25/2001
VOCs (ug/L)							
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	0.21 J	1 U	1 U	1 U	1 U
SVOCs (ug/L)							
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 U	0.2 U	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 U	0.022 J	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.2 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.2 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	10 U	1.5 J	1.3 J
PHENANTHRENE	0.077	NA	0.39	0.2 U	0.067 J	0.004 UJ	0.004 U
Pesticides/PCBs (ug/L)							
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.20 U	0.2 U
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U	0.010 U	0.01 U
Inorganics (total/dissolved) (ug/L)							
ARSENIC	4	150[2]	2.2 U/2.2 U	2.6 U/2.6 UJ	2.6 U/2.6 U	5.0 U/5.0 U	9.1 J/5 U
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.13 U/0.13 U	0.10 UJ/0.10 UJ	0.1 U/0.42 U
CADMIUM	6	0.62[3]	0.2 U/0.2 U	2.6 U/2.6 U	2.6 UJ/2.6 UJ	3.0 U/3.0 U	3 U/3 U
CHROMIUM[4]	110	11[2]	0.5 U/0.5 U	2.6 UJ/2.6 U	2.6 U/2.6 U	5.0 U/5.0 U	5 U/5 U
COPPER	48	4.8[3]	2.2/1 U	2.0 U/2.0 U	2.0 U/2.0 U	2.2 U/6.4 U	16.4/7 J
LEAD	13	1.2[3]	2.1 U/1.3 U	2.0 U/2.0 U	2.0 U/2.0 U	3.0 UJ/3.0 UJ	3 U/3 U
ZINC	123	58.2[3]	74.6/31.8 U	32.9/37.1 J	38.0/35.8 J	30.2/43.7	109/86.1
Miscellaneous Parameters (mg/L)							
ALKALINITY	NA	NA	53	35.7	40.1	27	85
CHEMICAL OXYGEN DEMAND	NA	NA	22.6	13.8	10 U	5 U	43
CHLORIDE	NA	NA	92.3	116	116	60	100
HARDNESS	NA	NA	65.3	55.5	57.3	45	90
SULFATE	NA	NA	7.8	10.5	10.8	7	1 U
TOTAL DISSOLVED SOLIDS	NA	NA	248	240 J	240 J	230	320
TOTAL ORGANIC CARBON	NA	NA	3.4	1.8 U	1.4 U	4.4	15

TABLE 4-3

ROUNDS 5-8 SURFACE WATER ANALYTICAL RESULTS
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	SG-20 ROUND 5 12/19/2000	SG-20 ROUND 6 3/13/2001	SG-20 ROUND 7 6/22/2001	SG-20 ROUND 8 9/25/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.037 J	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.2 U	0.066 J	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.05 J	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	1.1 J	5 U
PHENANTHRENE	0.077	NA	0.024 J	0.14 J	0.004 U	0.004 U
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.2 U	0.20 U	0.2 U
DIELDRIN	0.1	0.0019[3]	0.02 U	0.02 U	0.020 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.01 U	0.010 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	2.2 U/2.2 U	3.0 J/2.6 U	5.3 J/5.0 U	7.2 J/5.6 J
BERYLLIUM	4	NA	0.2 U/0.2 U	0.17 J/0.15 J	0.21 U/0.13 U	0.1 U/0.46 U
CADMIUM	6	0.62[3]	0.2 U/0.2 U	2.6 U/2.6 U	3.0 U/3.0 U	3 U/3 U
CHROMIUM[4]	110	11[2]	0.5 U/0.5 U	2.6 U/2.6 U	5.0 U/5.0 U	5 U/5 U
COPPER	48	4.8[3]	1 U/1 U	2.1 J/2.0 U	7.6 U/5.6 U	18.4/2.4 U
LEAD	13	1.2[3]	1.3 U/1.2 U	2.0 UJ/2.0 UJ	9.5/3.0 UJ	3.8 J/3 U
ZINC	123	58.2[3]	52.2/32.7 U	35.1/25.3	109/41.0	121/51.2 J
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	14.8	11.2	28	25
CHEMICAL OXYGEN DEMAND	NA	NA	26.1	10 U	17	75
CHLORIDE	NA	NA	68.6	66.3	80	70
HARDNESS	NA	NA	28.4	22.8	37	41
SULFATE	NA	NA	9.4	5.7	9	1 U
TOTAL DISSOLVED SOLIDS	NA	NA	167	137	180	280
TOTAL ORGANIC CARBON	NA	NA	3.6	1.6 J	7.6	14

TABLE 4-3

ROUNDS 5-8 SURFACE WATER ANALYTICAL RESULTS
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	SG-21 ROUND 5 12/19/2000	SG-21 ROUND 6 3/11/2001	SG-21 ROUND 7 6/24/2001	SG-21 ROUND 8 9/25/2001
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	1 U
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	1 U
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	1 U
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.029 J	0.2 U	0.012 U	0.012 UJ
BENZO(A)PYRENE	0.3	NA	0.026 J	0.022 J	0.021 U	0.021 U
BENZO(B)FLUORANTHENE	0.3	NA	0.037 J	0.2 U	0.02 U	0.02 U
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	0.02 U
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	1.9 J	4.1 J
PHENANTHRENE	0.077	NA	0.043 J	0.041 J	0.004 U	0.004 U
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 U
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 U
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	0.2 U
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.02 U	0.02 U
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.01 U	0.01 U
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	2.2 U/2.2 U	2.6 U/2.6 U	5 U/5 U	5 U/5 U
BERYLLIUM	4	NA	0.2 U/0.36 U	0.13 U/0.13 U	0.1 U/0.1 UJ	0.13 U/1.3 U
CADMIUM	6	0.62[3]	0.28 U/0.37 U	2.6 UJ/2.6 UJ	3 U/3 U	3 U/3 U
CHROMIUM[4]	110	11[2]	0.5 U/0.5 U	2.6 U/2.6 U	5 U/5 U	5 U/5 U
COPPER	48	4.8[3]	2.2/1.5 J	2.0 U/2.0 U	15.5 U/2.2 U	5.7/3.2 J
LEAD	13	1.2[3]	5 U/1 UJ	2.0 U/2.0 U	5 U/3 U	3 U/3 U
ZINC	123	58.2[3]	86.3/34.5 U	185/161 J	107/29.1	55.3 J/50.1
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	17	5.0 U		57
CHEMICAL OXYGEN DEMAND	NA	NA	15.6	10 U	37	23
CHLORIDE	NA	NA	57	15.7	90	90
HARDNESS	NA	NA	35.8	10.1	1 U	63
SULFATE	NA	NA	8.5	3.8	13	2
TOTAL DISSOLVED SOLIDS	NA	NA	145	46.0	400 J	250
TOTAL ORGANIC CARBON	NA	NA	3.7	2.7 U	12 J	10

TABLE 4-3

ROUNDS 5-8 SURFACE WATER ANALYTICAL RESULTS
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	SG-22 ROUND 5 12/19/2000	SG-22 ROUND 6 3/11/2001	SG-22 ROUND 7 6/25/2001	SG-22 (DUP) ROUND 7 6/25/2001	SG-22 ROUND 8
VOCs (ug/L)							
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ			
ETHYLBENZENE	580,000	NA	1 U	1 U			
XYLENES, TOTAL	NA	NA	1 U	1 U			
SVOCs (ug/L)							
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 U			
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 U			
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 U			
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 U			
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U			
PHENANTHRENE	0.077	NA	0.042 J	0.2 U			
Pesticides/PCBs (ug/L)							
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U			
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U			
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U			
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U			
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U			
Inorganics (total/dissolved) (ug/L)							
ARSENIC	4	150[2]	2.2 U/2.2 U	2.6 U/2.6 U	6.8 J/5.9 J	7.3 J/5.7 J	
BERYLLIUM	4	NA	0.2 U/0.2 U	0.13 U/0.13 U	0.10 U/0.10 U	0.10 U/0.10 U	
CADMIUM	6	0.62[3]	0.2 U/0.2 U	2.6 UJ/3.3 U	3.0 U/3.0 U	3.0 U/3.0 U	
CHROMIUM[4]	110	11[2]	0.5 U/0.5 U	2.6 U/2.6 U	5.0 U/5.0 U	5.0 U/5.0 U	
COPPER	48	4.8[3]	3.5/1 U	2.4 U/2.0 U	7.4 U/6.3 U	7.8 U/4.5 U	
LEAD	13	1.2[3]	2.9 U/1 UJ	2.0 U/2.0 U	3.0 UJ/3.0 UJ	3.2 J/3.0 UJ	
ZINC	123	58.2[3]	217/204	82.3/53.6 J	81.6/60.0	84.9/56.2	
Miscellaneous Parameters (mg/L)							
ALKALINITY	NA	NA	42.4	100			
CHEMICAL OXYGEN DEMAND	NA	NA	10 U	13.8			
CHLORIDE	NA	NA	48	89.0			
HARDNESS	NA	NA	55.5	107			
SULFATE	NA	NA	10.3	5.8			
TOTAL DISSOLVED SOLIDS	NA	NA	154	255			
TOTAL ORGANIC CARBON	NA	NA	2.4	2.8 U			

TABLE 4-3

ROUNDS 5-8 SURFACE WATER ANALYTICAL RESULTS
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	SG-23 ROUND 5 12/19/2000	SG-23 ROUND 6 3/11/2001	SG-23 ROUND 7 6/21/2001	SG-23 ROUND 8
VOCs (ug/L)						
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 UJ	1 U	
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U	
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U	
SVOCs (ug/L)						
BENZO(A)ANTHRACENE	0.3	NA	0.2 U	0.2 U	0.012 U	
BENZO(A)PYRENE	0.3	NA	0.2 U	0.2 U	0.021 U	
BENZO(B)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	
BENZO(K)FLUORANTHENE	0.3	NA	0.2 U	0.2 U	0.02 U	
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	2.1 J	
PHENANTHRENE	0.077	NA	0.031 J	0.2 U	0.004 U	
Pesticides/PCBs (ug/L)						
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.20 U	0.20 U	
DIELDRIN	0.1	0.0019[3]	0.02 U	0.020 U	0.020 U	
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.010 U	0.010 U	
Inorganics (total/dissolved) (ug/L)						
ARSENIC	4	150[2]	2.2 U/2.2 U	2.6 U/2.6 U	7.5 J/5.0 U	
BERYLLIUM	4	NA	0.2 U/0.2 U	0.43 U/0.13 U	0.58 U/0.10 UJ	
CADMIUM	6	0.62[3]	0.2 U/0.2 U	2.6 UJ/2.6 UJ	3.0 U/3.0 U	
CHROMIUM[4]	110	11[2]	0.5 U/0.5 U	2.6 U/2.6 UJ	5.0 U/27.5	
COPPER	48	4.8[3]	1 U/1 U	2.0 U/2.0 U	5.3 U/5.1 U	
LEAD	13	1.2[3]	1.3 U/1.1 U	2.0 U/2.0 U	3.0 UJ/3.0 UJ	
ZINC	123	58.2[3]	240/290	334/342 J	108/41.5	
Miscellaneous Parameters (mg/L)						
ALKALINITY	NA	NA	10.6	8.9	35	
CHEMICAL OXYGEN DEMAND	NA	NA	10 U	10 U	14	
CHLORIDE	NA	NA	8	7.4	80	
HARDNESS	NA	NA	13.3	12.9	41	
SULFATE	NA	NA	3.2	2.9	5	
TOTAL DISSOLVED SOLIDS	NA	NA	41	99.0	210	
TOTAL ORGANIC CARBON	NA	NA	1.8	0.52 U	6.8	

TABLE 4-3

ROUNDS 5-8 SURFACE WATER ANALYTICAL RESULTS
YEAR 2 ANNUAL GROUNDWATER REPORT FOR AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Chemical	Primary Monitoring Criterion [1]	Secondary Monitoring Criterion	SG-24 ROUND 5 12/18/2000	SG-24 (DUP) ROUND 5 12/18/2000	SG-24 ROUND 6 3/13/2001	SG-24 ROUND 7 6/25/2001	SG-24 ROUND 8
VOCs (ug/L)							
1,1,2,2-TETRACHLOROETHANE	110	NA	1 U	1 U	1 UJ		
ETHYLBENZENE	580,000	NA	1 U	1 U	1 U		
XYLENES, TOTAL	NA	NA	1 U	1 U	1 U		
SVOCs (ug/L)							
BENZO(A)ANTHRACENE	0.3	NA	0.093 J	0.093 J	0.2 U		
BENZO(A)PYRENE	0.3	NA	0.05 J	0.039 J	0.2 U		
BENZO(B)FLUORANTHENE	0.3	NA	0.069 J	0.053 J	0.2 U		
BENZO(K)FLUORANTHENE	0.3	NA	0.028 J	0.026 J	0.2 U		
BIS(2-ETHYLHEXYL)PHTHALATE	59	NA	10 U	10 U	10 U		
PHENANTHRENE	0.077	NA	0.19 J	0.14 J	0.2 U		
Pesticides/PCBs (ug/L)							
AROCLOR-1016	0.5	0.014[2]	0.2 U	0.2 U	0.20 U		
AROCLOR-1254	0.5	0.014[2]	0.2 U	0.2 U	0.20 U		
AROCLOR-1260	0.5	0.014[2]	0.2 U	0.2 U	0.20 U		
DIELDRIN	0.1	0.0019[3]	0.02 U	0.02 U	0.020 U		
HEPTACHLOR	0.05	0.0038[2]	0.01 U	0.01 U	0.010 U		
Inorganice (total/dissolved) (ug/L)							
ARSENIC	4	150[2]	2.2 U/2.2 U	2.2 U/2.2 U	2.6 U/2.6 U	6.6 J/5.6 J	
BERYLLIUM	4	NA	0.2 U/0.2 U	0.2 U/0.2 U	0.43 U/0.13 U	0.10 U/0.10 U	
CADMIUM	6	0.62[3]	0.26 U/0.2 U	0.31 U/0.2 U	2.6 UJ/2.6 UJ	3.0 U/3.0 U	
CHROMIUM[4]	110	11[2]	0.5 U/0.5 U	0.5 U/0.5 U	2.6 U/2.6 U	5.0 U/5.0 U	
COPPER	48	4.8[3]	5/1.5 J	2.7/1.8 J	2.1 U/2.1 U	10.2 U/3.3 U	
LEAD	13	1.2[3]	1.8 U/1.5 U	1.5 U/1.2 U	2.0 U/2.0 U	3.0 UJ/3.0 UJ	
ZINC	123	58.2[3]	115/115	120/114	15.8 U/13.5 U	95.4/57.6	
Miscellaneous Parameters (mg/L)							
ALKALINITY	NA	NA	6.4	6.4	5.0 U		
CHEMICAL OXYGEN DEMAND	NA	NA	10 U	10 U	10 U		
CHLORIDE	NA	NA	9.2	9.1	6.1		
HARDNESS	NA	NA	12.6	12.9	6.5 U		
SULFATE	NA	NA	6.9	6.7	1.8		
TOTAL DISSOLVED SOLIDS	NA	NA	43	57	10 U		
TOTAL ORGANIC CARBON	NA	NA	1.6	1.2	4.5 U		

NOTES:
Bold numbers denote exceedance of secondary and primary monitoring criterion.
1 Surface Water Protection Criteria for substances in groundwater. (CTDEP, January 1996)
2 Federal Ambient Water Quality Criteria for protection of aquatic life (chronic, freshwater). (USEPA, 1999)
3 Connecticut Water Quality Criteria for protection of human health from consumption of organisms. (CTDEP, 1997)
4 Hexavalent Chromium
J Estimated Value
R Rejected Value
U Undetected
NA Not Available

TABLE 4-4

BACKGROUND GROUNDWATER CONCENTRATIONS FROM BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION NSB-NLON, GROTON, CONNECTICUT

Parameter	Site-Specific Background Concentration [1]
Total Metals (ug/L)	
Aluminum	3560
Antimony	2.90
Arsenic	1.92
Barium	227
Calcium	188000
Chromium	49.9
Cobalt	48.6
Copper	107
Iron	28200
Lead	6.63
Magnesium	191000
Manganese	11700
Nickel	32.2
Potassium	70800
Selenium	3.19
Sodium	1900000
Vanadium	10.2
Zinc	131
Filtered Metals (ug/L)	
Aluminum	64.4
Antimony	2.01
Arsenic	2.55
Barium	124
Calcium	152000
Chromium	16.0
Cobalt	43.3
Copper	39.4
Iron	25300
Lead	2.52
Magnesium	150000
Manganese	9400
Nickel	15.3
Potassium	60000
Sodium	1580000
Vanadium	9.90
Zinc	109
Miscellaneous Parameters (mg/L)	
Alkalinity	1950
Chemical Oxygen Demand	570
Chloride	133
Sulfate	45.2
Total Dissolved Solids	6260
Total Suspended Solids	236
Total Organic Carbon	37.7

Notes:

1 - The site specific background concentration is the lesser of the 95 percent upper confidence limit and the maximum detected concentration.

TABLE 4-5

GROUNDWATER ELEVATIONS - ROUNDS 5 THROUGH 8
AREA A LANDFILL GROUNDWATER MONITORING PROGRAM
NSB-NLON, GROTON, CONNECTICUT

WELL	Round 5 12/11/00 (feet msl)	Round 6 03/06/01 (feet msl)	Round 7 06/18/01 and 06/19/01 (feet msl)	Round 8 09/13/01 (feet msl)
4MW1S	122.68	124.33	125.60	118.55
2LMW20S	70.40	(1)	71.66	68.80
2WMW21S	71.76	72.34	72.17	70.86
3MW37S	43.56	43.65	43.71	43.42
2WMW38DS	66.79	68.49	68.86	66.29
2WMW39DS	70.15	70.53	71.25	70.03
2WMW40DS	69.68	70.54	70.19	69.30
2WMW41DS	70.66	71.57	71.32	70.25
2WMW42DS	71.31	72.03	71.73	70.82
2WMW43DS	71.61	72.49	72.28	71.06
2WMW44DS	71.90	72.44	(1)	73.55
2WMW45DS	71.70	72.45	72.51	71.19
2WMW46DS	71.79	72.59	72.51	71.35
2WMW47DS	71.84	71.74	72.39	70.18

1 Data not available

TABLE 4-6

DOWNGRADIENT GROUNDWATER RESULTS - ROUNDS 5 THROUGH 8
DETECTION STATISTICS AND 95% UPPER CONFIDENCE LIMITS
AREA A LANDFILL, NSB-NLON, GROTON, CT

PARAMETER	FREQUENCY OF DETECTION	RANGE OF DETECTIONS	AVERAGE	SHAPIRO-WILK W NORMAL	SHAPIRO-WILK W LOGNORMAL	SHAPIRO-WILK W TEST	DISTRIBUTION	95% UCL NORMAL	95% UCL LOGNORMAL	MAXIMUM POSITIVE DETECTION	EPC (1)
Volatile Organics (mg/L)											
1,1,2,2-TETRACHLOROETHANE	0/44	---	0.50	---	---	---	---	---	---	---	---
ETHYLBENZENE	0/44	---	0.50	---	---	---	---	---	---	---	---
XYLENES, TOTAL	0/33	---	0.50	---	---	---	---	---	---	---	---
Semivolatile Organics (mg/L)											
BENZO(A)ANTHRACENE	1/44	0.051	0.06	0.7078	0.6704	0.944	LOGNORMAL	0.07	0.14	0.05	0.05
BENZO(A)PYRENE	5/44	0.028 - 1.2	0.12	0.999	0.7874	0.944	NORMAL	0.17	0.20	1.20	0.17
BENZO(B)FLUORANTHENE	2/44	0.034 - 0.044	0.06	0.7104	0.6933	0.944	LOGNORMAL	0.07	0.10	0.04	0.04
BENZO(K)FLUORANTHENE	0/44	---	0.06	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL)PHTHALATE	21/44	1.1 - 40	5.25	0.2336	0.798	0.944	LOGNORMAL	1.60	3.05	40.0	3.05
PHENANTHRENE	8/44	0.023 - 22	0.74	0.4306	0.8356	0.944	LOGNORMAL	6.92	6.12	22.0	6.12
Pesticides/PCBs (mg/L)											
AROCLOR-1016	0/43	---	0.10	---	---	---	---	---	---	---	---
AROCLOR-1254	0/43	---	0.10	---	---	---	---	---	---	---	---
AROCLOR-1260	0/43	---	0.10	---	---	---	---	---	---	---	---
DIELDRIN	0/43	---	0.01	---	---	---	---	---	---	---	---
HEPTACHLOR	0/43	---	0.01	---	---	---	---	---	---	---	---
Total Metals (mg/L)											
ARSENIC	32/44	3 - 29.5	8.90	0.7337	0.9478	0.943	LOGNORMAL	10.0	11.0	29.5	11.0
BERYLLIUM	0/44	---	0.19	---	---	---	---	---	---	---	---
CADMIUM	0/44	---	0.92	---	---	---	---	---	---	---	---
CHROMIUM	14/44	1.2 - 24.7	3.60	0.6669	0.9424	0.943	LOGNORMAL	3.68	4.19	24.7	4.19
COPPER	9/44	1.8 - 10.7	2.24	0.667	0.8853	0.943	LOGNORMAL	2.42	2.35	10.7	2.35
LEAD	5/44	3.4 - 12.4	1.62	0.6442	0.8605	0.943	LOGNORMAL	1.835	1.7982	12.4	1.7982
ZINC	20/44	3.8 - 369	27.2	0.7545	0.9564	0.943	LOGNORMAL	14.1	17.3	369	17.3
Dissolved Metals (mg/L)											
ARSENIC	21/43	3 - 36.2	7.88	0.9153	0.938	0.944	LOGNORMAL	10.5	12.8	36.2	12.8
BERYLLIUM	4/43	0.15 - 0.29	0.15	0.6562	0.8221	0.943	LOGNORMAL	0.19	0.19	0.29	0.19
CADMIUM	0/43	---	0.87	---	---	---	---	---	---	---	---
CHROMIUM	12/43	1.6 - 16.2	2.82	0.568	0.9481	0.944	LOGNORMAL	4.87	5.01	16.2	5.01
COPPER	7/43	2.1 - 9.8	1.89	0.6892	0.8758	0.944	LOGNORMAL	2.86	2.89	9.8	2.89
LEAD	5/43	3.3 - 6.6	1.50	0.5051	0.8489	0.944	LOGNORMAL	2.1149	1.8975	6.6	1.8975
ZINC	14/43	6.2 - 47.2	11.0	0.4194	0.9331	0.944	LOGNORMAL	43.4	36.9	47.2	36.9

1 EPC is defined as Exposure Point Concentration and is the lesser of the distribution-appropriate 95% UCL and the maximum detection.
Bold indicate parameter has been identified as a potential COC.
Data sets which fail the W test for normality
and lognormality are assumed to be lognormal.

TABLE 4-7

UPGRADIENT GROUNDWATER RESULTS - ROUNDS 5 THROUGH 8
DETECTION STATISTICS AND 95% UPPER CONFIDENCE LIMITS
AREA A LANDFILL, NSB_NLON, GROTON, CT

PARAMETER	FREQUENCY OF DETECTION	RANGE OF DETECTIONS	AVERAGE	SHAPIRO-WILK W NORMAL	SHAPIRO-WILK W LOGNORMAL	SHAPIRO-WILK W TEST	DISTRIBUTION	95% UCL NORMAL	95% UCL LOGNORMAL	MAXIMUM POSITIVE DETECTION	EPC (1)
Volatile Organics (ug/L)											
1,1,2,2-TETRACHLOROETHANE	0/7	---	0.50	---	---	---	---	---	---	---	---
ETHYLBENZENE	0/7	---	0.50	---	---	---	---	---	---	---	---
TOTAL XYLENES	0/5	---	0.50	---	---	---	---	---	---	---	---
Semivolatile Organics (ug/L)											
BENZO(A)ANTHRACENE	0/7	---	0.06	---	---	---	---	---	---	---	---
BENZO(A)PYRENE	0/7	---	0.08	---	---	---	---	---	---	---	---
BENZO(B)FLUORANTHENE	0/7	---	0.06	---	---	---	---	---	---	---	---
BENZO(K)FLUORANTHENE	0/7	---	0.06	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL)PHTHALATE	4/7	1.3 - 15	6.05	0.7243	0.8113	0.803	LOGNORMAL	9.14	15.0	15	15.0
PHENANTHRENE	0/7	---	0.06	---	---	---	---	---	---	---	---
Pesticides/PCB's (ug/L)											
AROCLOR-1016	0/7	---	0.10	---	---	---	---	---	---	---	---
AROCLOR-1254	0/7	---	0.10	---	---	---	---	---	---	---	---
AROCLOR-1260	0/7	---	0.10	---	---	---	---	---	---	---	---
DIELDRIN	0/7	---	0.01	---	---	---	---	---	---	---	---
HEPTACHLOR	0/7	---	0.01	---	---	---	---	---	---	---	---
Total Metals (ug/L)											
ARSENIC	1/8	2.4	2.19	0.8541	0.9229	0.818	LOGNORMAL	2.92	3.33	2.40	2.40
BERYLLIUM	0/8	---	0.18	---	---	---	---	---	---	---	---
CADMIUM	0/8	---	0.78	---	---	---	---	---	---	---	---
CHROMIUM	1/8	3.8	1.56	0.898	0.9086	0.818	LOGNORMAL	2.41	7.08	3.80	3.80
COPPER	2/8	4.4 - 4.45	2.13	0.8621	0.8955	0.818	LOGNORMAL	3.22	6.86	4.45	4.45
LEAD	1/8	7.55	1.91	0.6037	0.877	0.818	LOGNORMAL	3.47	5.19	7.55	5.19
ZINC	5/8	36.9 - 75.9	32.9	0.9211	0.8703	0.818	NORMAL	49.4	191	75.9	49.4
Dissolved Metals (ug/L)											
ARSENIC	1/8	2.3	2.03	0.9231	0.9068	0.818	NORMAL	2.52	2.83	2.30	2.30
BERYLLIUM	0/8	---	0.18	---	---	---	---	---	---	---	---
CADMIUM	0/8	---	0.78	---	---	---	---	---	---	---	---
CHROMIUM	2/8	1.1	1.29	0.8701	0.8229	0.818	NORMAL	1.86	4.40	1.10	1.10
COPPER	1/8	4.7	1.53	0.7282	0.9233	0.818	LOGNORMAL	2.44	3.39	4.70	3.39
LEAD	1/8	2.8	1.29	0.8685	0.9089	0.818	LOGNORMAL	1.78	2.33	2.80	2.33
ZINC	5/8	24.675 - 53.85	25.8	0.9516	0.9169	0.818	NORMAL	37.3	83.7	53.9	37.3

1 EPC is defined as Exposure Point Concentration and is the lesser of the distribution-appropriate 95% UCL and the maximum detection.
Bold indicate parameter has been identified as a potential COC.
Data sets which fail the W test for normality
and lognormality are assumed to be lognormal.

TABLE 4-8

REFERENCE GROUNDWATER RESULTS - ROUNDS 5 THROUGH 8
DETECTION STATISTICS AND 95% UPPER CONFIDENCE LIMITS
AREA A LANDFILL, NSB_NLON, GROTON, CT

PARAMETER	FREQUENCY OF DETECTION	RANGE OF DETECTIONS	AVERAGE	SHAPIRO-WILK W NORMAL	SHAPIRO-WILK W LOGNORMAL	SHAPIRO-WILK W TEST	DISTRIBUTION	95% UCL NORMAL	95% UCL LOGNORMAL	MAXIMUM POSITIVE DETECTION	EPC (1)
Volatile Organics (ug/L)											
1,1,2,2-TETRACHLOROETHANE	0/4	---	0.50	---	---	---	---	---	---	---	---
ETHYLBENZENE	0/4	---	0.50	---	---	---	---	---	---	---	---
TOTAL XYLENES	0/3	---	0.50	---	---	---	---	---	---	---	---
Semivolatile Organics (ug/L)											
BENZO(A)ANTHRACENE	0/4	---	0.05	---	---	---	---	---	---	---	---
BENZO(A)PYRENE	0/4	---	0.06	---	---	---	---	---	---	---	---
BENZO(B)FLUORANTHENE	0/4	---	0.06	---	---	---	---	---	---	---	---
BENZO(K)FLUORANTHENE	0/4	---	0.06	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL)PHTHALATE	2/4	1.4 - 2.1	3.38	---	---	---	---	---	---	2.1	2.1
PHENANTHRENE	2/4	0.077 - 0.405	0.15	---	---	---	---	---	---	0.405	0.405
Pesticides/PCB's (ug/L)											
AROCLOR-1016	0/4	---	0.10	---	---	---	---	---	---	---	---
AROCLOR-1254	0/4	---	0.10	---	---	---	---	---	---	---	---
AROCLOR-1260	0/4	---	0.10	---	---	---	---	---	---	---	---
DIELDRIN	0/4	---	0.09	---	---	---	---	---	---	---	---
HEPTACHLOR	0/4	---	0.05	---	---	---	---	---	---	---	---
Total Metals (ug/L)											
ARSENIC	3/4	2.3 - 6.2	3.75							6.20	6.20
BERYLLIUM	0/4	---	0.18	---	---	---	---	---	---	---	---
CADMIUM	0/4	---	0.83	---	---	---	---	---	---	---	---
CHROMIUM	3/4	6.25 - 9.15	6.29	---	---	---	---	---	---	9.15	9.15
COPPER	0/4	---	1.81	---	---	---	---	---	---	---	---
LEAD	0/4	---	1.13	---	---	---	---	---	---	---	---
ZINC	2/4	12 - 16.3	8.4	---	---	---	---	---	---	16.3	16.3
Dissolved Metals (ug/L)											
ARSENIC	3/4	3.9 - 4.75	3.86	---	---	---	---	---	---	4.75	4.75
BERYLLIUM	0/4	---	0.18	---	---	---	---	---	---	---	---
CADMIUM	0/4	---	0.78	---	---	---	---	---	---	---	---
CHROMIUM	3/4	5.85 - 10.85	6.19	---	---	---	---	---	---	10.85	10.85
COPPER	0/4	---	1.04	---	---	---	---	---	---	---	---
LEAD	0/4	---	1.13	---	---	---	---	---	---	---	---
ZINC	2/4	16.65 - 20.825	10.6	---	---	---	---	---	---	20.8	20.8

1 EPC is defined as Exposure Point Concentration and is the lesser of the distribution-appropriate 95% UCL and the maximum detection.
Bold indicate parameter has been identified as a potential COC.
Data sets which fail the W test for normality
and lognormality are assumed to be lognormal.

TABLE 4-9

GROUNDWATER - ROUNDS 5 THROUGH 8
STATISTICAL TEST RESULTS FOR COPCs
COMPARISON OF DOWNGRADIENT RESULTS WITH UPGRADIENT RESULTS
AREA A LANDFILL, NSB-NLON, GROTON CT

PARAMETER	FREQUENCY OF DETECTION - DOWNGRADIENT	FREQUENCY OF DETECTION - UPGRADIENT	FREQUENCY OF DETECTION - TOTAL	% NON-DETECTS?	LESS THAN 50% NON-DETECTS?	DOWNGRADIENT DISTRIBUTION	UPGRADIENT DISTRIBUTION	SHAPIRO-WILK TEST OF DISTRIBUTION	LEVENE'S TEST OF HOMOGENEITY OF VARIANCE	TYPE OF TEST (1)	Z SCORE	P-LEVEL	DOWNGRADIENT ABOVE UPGRADIENT?
Volatile Organics (ug/L)													
1,1,2,2-TETRACHLOROETHANE	0/44	0/7	0/51	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
ETHYLBENZENE	0/44	0/7	0/51	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
TOTAL XYLENES	0/33	0/5	0/38	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
Semivolatile Organics (ug/L)													
BENZO(A)ANTHRACENE	1/44	0/7	1/51	98.0%	FAIL	---	---	---	---	NO UPGRADIENT DETECTIONS	---	---	YES
BENZO(A)PYRENE	5/44	0/7	5/51	90.2%	FAIL	---	---	---	---	NO UPGRADIENT DETECTIONS	---	---	YES
BENZO(B)FLUORANTHENE	2/44	0/7	2/51	96.1%	FAIL	---	---	---	---	NO UPGRADIENT DETECTIONS	---	---	YES
BENZO(K)FLUORANTHENE	0/44	0/7	0/51	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
BIS(2-ETHYLHEXYL)PHTHALATE	21/44	4/7	25/51	51.0%	FAIL	---	---	---	---	PROPORTIONS	-7.35	>1E-10	NO
PHENANTHRENE	8/44	0/7	8/51	84.3%	FAIL	---	---	---	---	NO UPGRADIENT DETECTIONS	---	---	YES
Pesticides/PCB's (ug/L)													
AROCLOR-1016	0/43	0/7	0/50	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
AROCLOR-1254	0/43	0/7	0/50	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
AROCLOR-1260	0/43	0/7	0/50	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
DIELDRIN	0/43	0/7	0/50	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
HEPTACHLOR	0/43	0/7	0/50	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
Total Metals (ug/L)													
ARSENIC	32/44	1/8	33/52	36.5%	PASS	LOGNORMAL	LOGNORMAL	PASS	FAIL	NON-PARAMETRIC	3.52	0.00043	YES
BERYLLIUM	0/44	0/8	0/52	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
CADMIUM	0/44	0/8	0/52	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
CHROMIUM	14/44	1/8	15/52	71.2%	FAIL	---	---	---	---	PROPORTIONS	9.56	>1E-10	YES
COPPER	9/44	2/8	11/52	78.8%	FAIL	---	---	---	---	PROPORTIONS	8.10	>1E-10	YES
LEAD	5/44	1/8	6/52	88.5%	FAIL	---	---	---	---	PROPORTIONS	2.19	0.014	NO
ZINC	20/44	5/8	25/52	51.9%	FAIL	---	---	---	---	PROPORTIONS	-13.14	>1E-10	NO
Dissolved Metals (ug/L)													
ARSENIC	21/43	1/8	22/51	56.9%	FAIL	---	---	---	---	PROPORTIONS	19.4	>1E-10	YES
BERYLLIUM	4/43	0/8	4/51	92.2%	FAIL	---	---	---	---	NO UPGRADIENT DETECTIONS	---	---	YES
CADMIUM	0/43	0/8	0/51	100.0%	FAIL	---	---	---	---	NO DETECTIONS	---	---	NO
CHROMIUM	12/43	2/8	14/51	72.5%	FAIL	---	---	---	---	PROPORTIONS	8.88	>1E-10	YES
COPPER	7/43	1/8	8/51	84.3%	FAIL	---	---	---	---	PROPORTIONS	3.98	3.4E-05	YES
LEAD	5/43	1/8	6/51	88.2%	FAIL	---	---	---	---	PROPORTIONS	7.34	>1E-10	YES
ZINC	14/43	5/8	19/51	62.7%	FAIL	---	---	---	---	PROPORTIONS	-20.44	>1E-10	NO

Downgradient results are in statistically significant exceedance
of upgradient results when p level is less than 0.05
and Z score is greater than the critical value for that test.

1 Downgradient considered similar to upgradient if no detections in downgradient or upgradient;
Downgradient considered greater than upgradient if detections in downgradient, but no detctions in upgradient;
Test of Proportions run if > 50% non-detects in downgradient and upgradient combined;
Non-Parametric ANOVA run if <50% non-detects and fail Shapiro-Wilk Test or Levene's Test;
Parametric ANOVA run if <50% non-detects and pass Shapiro-Wilk Test and Levene's Test;

TABLE 4-10

GROUNDWATER - ROUNDS 5 THROUGH 8
LEVENE'S TEST OF HOMOGENEITY OF VARIANCE
DOWNGRADIENT RESULTS WITH UPGRADIENT RESULTS
AREA A LANDFILL, NSB-NLON, GROTON, CT

PARAMETER	DISTRIBUTION	MS EFFECT	MS ERROR	F	p-level	LEVENE RESULT
Total Metals (ug/L)						
ARSENIC	LOGNORMAL	124.58	13.455	9.26	0.004	FAIL

Downgradient variance is statistically different from
Upgradient variance when p level is less than 0.05.

TABLE 4-11

GROUNDWATER - ROUND 5 THROUGH 8
WILCOXON RANK-SUM RESULTS COMPARING POTENTIAL COC
DOWNGRADIENT RESULTS WITH UPGRADIENT RESULTS
AREA A LANDFILL, NSB-NLON, GROTON, CT

PARAMETER	Downgradient			Upgradient			Z Score	p-level	Adjusted Z Score (1)	Adjusted p-level (2)	ANOVA RESULT
	Total of Ranks	Number of Samples	Avg Rank	Total of Ranks	Number of Samples	Avg Rank					
Total Metals (ug/L)											
ARSENIC	1296.5	44	32.5	81.5	8	13.8	3.31	0.0009	3.31	0.0009	**FAIL**

1 Adjusted for tied ranks.
2 Downgradient results are in statistically significant exceedance of upgradient results when p-level is less than 0.05 and Z Score is positive.

TABLE 4-12

GROUNDWATER - ROUNDS 5 THROUGH 8
TEST OF PROPORTIONS RESULTS FOR POTENTIAL COC
COMPARISON OF DOWNGRADIENT RESULTS WITH UPGRADIENT RESULTS
AREA A LANDFILL, NSB-NLON, GROTON CT

PARAMETER	HIGHEST UPGRADIENT NON-DETECT	C (1)	k_d (2)	n (3)	p_d(4)	k_u (2)	m (3)	p_u (5)	p (6)	Z SCORE (7)	P-LEVEL (8)	DOWNGRADIENT ABOVE UPGRADIENT?
Semivolatile Organics (ug/L)												
BIS(2-ETHYLHEXYL)PHTHALATE	10	10.1	2	44	0.045	1	7	0.143	0.0588	-7.347	>1E-10	NO
Total Metals (ug/L)												
CHROMIUM	5	5.05	8	44	0.182	0	8	0.000	0.1538	9.561	>1E-10	**YES**
COPPER	5.45	5.5	6	44	0.136	0	8	0.000	0.1154	8.098	>1E-10	**YES**
LEAD	3.5	3.51	4	44	0.091	1	8	0.125	0.0962	-2.194	0.014	NO
ZINC	24.8	24.9	13	44	0.295	5	8	0.625	0.3462	-13.143	>1E-10	NO
Dissolved Metals (ug/L)												
ARSENIC	6.4	6.5	22	43	0.512	0	8	0.000	0.4314	19.38	>1E-10	**YES**
CHROMIUM	5	5.1	7	43	0.163	0	8	0.000	0.1373	8.876	>1E-10	**YES**
COPPER	3.85	3.86	9	43	0.209	1	8	0.125	0.1961	3.984	3.4E-05	**YES**
LEAD	3	3.1	5	43	0.116	0	8	0.000	0.0980	7.336	>1E-10	**YES**
ZINC	22.8	22.9	7	43	0.163	5	8	0.625	0.2353	-20.444	>1E-10	NO

Downgradient results are in statistically significant exceedance of upgradient results when p level < 0.05 and Z score > +1.645.

1 C = cut-off value (slightly larger than the highest upgradient non-detect)
2 k_d, k_u = the number of upgradient and downgradient measurements, respectively that exceeds C
3 n, m = the number of upgradient and downgradient results
4 $p_d = K_d/n$ = proportion of downgradient samples that exceed C
5 $p_u = k_u/n$ = proportion of upgradient samples that exceed C
6 $p = (k_d + k_u) / (n + m)$ = proportion of upgradient samples that exceed C
7 $Z_p = (p_d - p_u) / [p(1-p)(1/n+1/m)]^{1/2}$
8 P-level = probability that upgradient and downgradient concentrations are similar

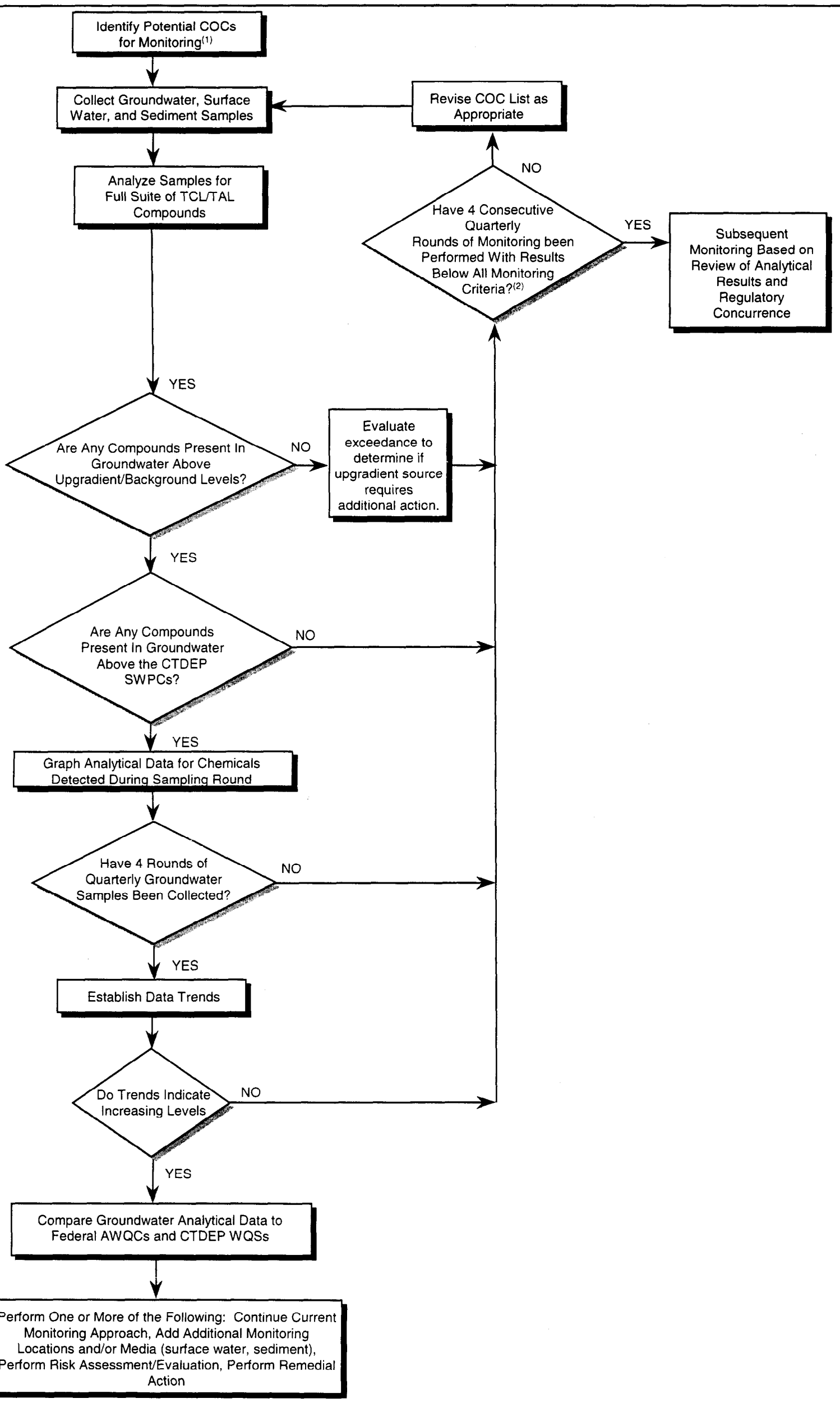
TABLE 4-13

GROUNDWATER - ROUNDS 5 THROUGH 8
COMPARISON OF POTENTIAL COCs ABOVE UPGRADIENT CONCENTRATIONS TO
SITE-SPECIFIC BACKGROUND AND PRIMARY MONITORING CRITERIA
AREA A LANDFILL, NSB-NLON, GROTON, CT

Downgradient Metals (ug/L)	Average (1)				Cummulative	Maximum (2)				Cummulative	Site-Specific	Primary (3)
	Round 5	Round 6	Round 7	Round 8	Average	Round 5	Round 6	Round 7	Round 8	Maximum	Background	Monitoring Criteria
Semivolatile Organics (ug/L)												
BENZO(A)ANTHRACENE	0.10	ND	ND	ND	0.06	0.051	ND	ND	ND	0.051	---	0.3
BENZO(A)PYRENE	0.09	ND	0.028	0.006	0.12	0.039	ND	1.00	1.20	1.20	---	0.3
BENZO(B)FLUORANTHENE	0.09	ND	ND	ND	0.06	0.044	ND	ND	ND	0.044	---	0.3
PHENANTHRENE	0.09	ND	2.72	0.047	0.74	0.11	ND	22.0	0.05	22.0	---	0.077
Total Metals (ug/L)												
ARSENIC	10.2	7.59	10.3	7.52	8.90	22.4	16.6	29.5	16.4	29.5	1.92	4
CHROMIUM	2.57	3.09	7.18	5.96	3.60	8.20	8.00	23.2	24.7	24.7	49.9	110
COPPER	0.79	1.52	ND	4.25	2.24	1.80	6.70	ND	10.7	10.7	107	48
Dissolved Metals (ug/L)												
ARSENIC	11.0	7.05	6.32	7.41	7.88	36.2	24.1	31.3	29.8	36.2	2.55	4
BERYLLIUM	ND	ND	0.11	0.33	0.15	ND	ND	0.29	ND	0.29	---	4
CHROMIUM	2.67	2.65	5.21	4.82	2.82	7.10	3.20	13.9	16.2	16.2	16.0	110
COPPER	0.66	1.34	2.31	3.13	1.89	2.10	4.70	4.60	9.80	9.80	39.4	48
LEAD	ND	ND	2.53	1.89	1.50	ND	ND	6.60	3.70	6.60	2.52	13

Upgradient Metals (ug/L)	Average (1)				Cummulative	Maximum (2)				Cummulative	Site-Specific	Primary (3)
	Round 5	Round 6	Round 7	Round 8	Average	Round 5	Round 6	Round 7	Round 8	Maximum	Background	Monitoring Criteria
Semivolatile Organics (ug/L)												
BENZO(A)ANTHRACENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	0.3
BENZO(A)PYRENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	0.3
BENZO(B)FLUORANTHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	0.3
PHENANTHRENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	0.077
Total Metals (ug/L)												
ARSENIC	1.75	ND	ND	ND	2.19	2.40	ND	ND	ND	2.40	1.92	4
CHROMIUM	ND	ND	ND	2.15	1.56	ND	ND	ND	3.80	3.80	49.9	110
COPPER	ND	ND	ND	4.43	2.13	ND	ND	ND	4.45	4.45	107	48
Dissolved Metals (ug/L)												
ARSENIC	6.45	ND	ND	ND	2.03	2.30	ND	ND	ND	2.30	2.55	4
BERYLLIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	4
CHROMIUM	ND	ND	ND	1.10	1.29	ND	ND	ND	1.10	1.10	16.0	110
COPPER	ND	ND	ND	3.10	1.53	ND	ND	ND	4.70	4.70	39.4	48
LEAD	ND	ND	ND	2.15	1.29	ND	ND	ND	2.80	2.80	2.52	13

1 Average calculated using result for positive detections and 1/2 detection limit for non-detects in each round.
2 Maximum positive detection in each round.
3 Surface Water Protection Criteria for Substances in Groundwater (CTDEP, January 1996).
Bold indicates value exceeds Site-Specific Background (if available) and the Primary Monitoring Criteria.



(1) Evaluate chemicals in groundwater which exceed the site-specific Surface Water Protection Criteria (SWPCs). Also evaluate soil contaminants which exceed the CTDEP Pollutant Mobility Criteria for GB classified groundwater.

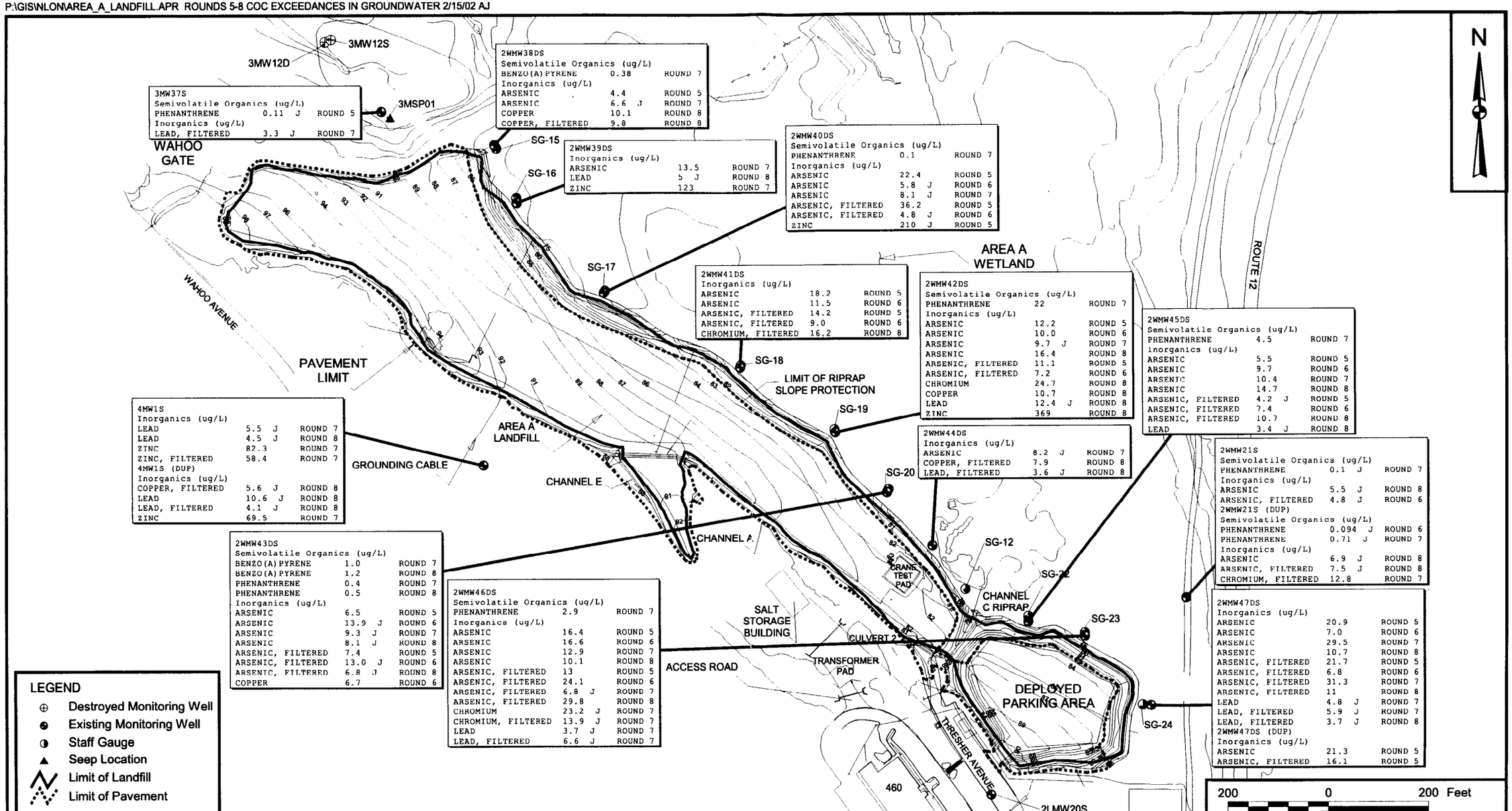
(2) Or, is the concentration of each substance in the plume immediately upgradient of the point at which the groundwater discharge to the receiving surface water body equal to or less than the applicable SWPC, provided that the areal extent of the plume is not increasing over time, and that, except for seasonal variations, the concentration of the subject substance is not increasing, except as a result of natural attenuation at any point over time?

FIGURE 4-1

GROUNDWATER MONITORING PLAN DECISION DIAGRAM
AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

Tetra Tech NUS, Inc.

P:\GIS\NLON\AREA_A_LANDFILL.APR ROUNDS 5-8 COC EXCEEDANCES IN GROUNDWATER 2/15/02 AJ



3MW37S
Semivolatile Organics (ug/L)
PHENANTHRENE 0.11 J ROUND 5
Inorganics (ug/L)
LEAD, FILTERED 3.3 J ROUND 7

2WMW38DS
Semivolatile Organics (ug/L)
BENZO(A)PYRENE 0.38 ROUND 7
Inorganics (ug/L)
ARSENIC 4.4 ROUND 5
ARSENIC 6.6 J ROUND 7
COPPER 10.1 ROUND 8
COPPER, FILTERED 9.8 ROUND 8

2WMW39DS
Inorganics (ug/L)
ARSENIC 13.5 ROUND 7
LEAD 5 J ROUND 8
ZINC 123 ROUND 7

2WMW40DS
Semivolatile Organics (ug/L)
PHENANTHRENE 0.1 ROUND 7
Inorganics (ug/L)
ARSENIC 22.4 ROUND 5
ARSENIC 5.8 J ROUND 6
ARSENIC 8.1 J ROUND 7
ARSENIC, FILTERED 36.2 ROUND 5
ARSENIC, FILTERED 4.8 J ROUND 6
ZINC 210 J ROUND 5

2WMW41DS
Inorganics (ug/L)
ARSENIC 18.2 ROUND 5
ARSENIC 11.5 ROUND 6
ARSENIC, FILTERED 14.2 ROUND 5
ARSENIC, FILTERED 9.0 ROUND 6
CHROMIUM, FILTERED 16.2 ROUND 8

2WMW42DS
Semivolatile Organics (ug/L)
PHENANTHRENE 22 ROUND 7
Inorganics (ug/L)
ARSENIC 12.2 ROUND 5
ARSENIC 10.0 ROUND 6
ARSENIC 9.7 J ROUND 7
ARSENIC 16.4 ROUND 8
ARSENIC, FILTERED 11.1 ROUND 5
ARSENIC, FILTERED 7.2 ROUND 6
CHROMIUM 24.7 ROUND 8
COPPER 10.7 ROUND 8
LEAD 12.4 J ROUND 8
ZINC 369 ROUND 8

2WMW45DS
Semivolatile Organics (ug/L)
PHENANTHRENE 4.5 ROUND 7
Inorganics (ug/L)
ARSENIC 5.5 ROUND 5
ARSENIC 9.7 ROUND 6
ARSENIC 10.4 ROUND 7
ARSENIC 14.7 ROUND 8
ARSENIC, FILTERED 4.2 J ROUND 5
ARSENIC, FILTERED 7.4 ROUND 6
ARSENIC, FILTERED 10.7 ROUND 8
LEAD 3.4 J ROUND 8

4MW1S
Inorganics (ug/L)
LEAD 5.5 J ROUND 7
LEAD 4.5 J ROUND 8
ZINC 82.3 ROUND 7
ZINC, FILTERED 58.4 ROUND 7
4MW1S (DUP)
Inorganics (ug/L)
COPPER, FILTERED 5.6 J ROUND 8
LEAD 10.6 J ROUND 8
LEAD, FILTERED 4.1 J ROUND 8
ZINC 69.5 ROUND 7

2WMW44DS
Inorganics (ug/L)
ARSENIC 8.2 J ROUND 7
COPPER, FILTERED 7.9 ROUND 8
LEAD, FILTERED 3.6 J ROUND 8

2WMW21S
Semivolatile Organics (ug/L)
PHENANTHRENE 0.1 J ROUND 7
Inorganics (ug/L)
ARSENIC 5.5 J ROUND 8
ARSENIC, FILTERED 4.8 J ROUND 6
2WMW21S (DUP)
Semivolatile Organics (ug/L)
PHENANTHRENE 0.094 J ROUND 6
PHENANTHRENE 0.71 J ROUND 7
Inorganics (ug/L)
ARSENIC 6.9 J ROUND 8
ARSENIC, FILTERED 7.5 J ROUND 8
CHROMIUM, FILTERED 12.8 ROUND 7

2WMW43DS
Semivolatile Organics (ug/L)
BENZO(A)PYRENE 1.0 ROUND 7
BENZO(A)PYRENE 1.2 ROUND 8
PHENANTHRENE 0.4 ROUND 7
PHENANTHRENE 0.5 ROUND 8
Inorganics (ug/L)
ARSENIC 6.5 ROUND 5
ARSENIC 13.9 J ROUND 6
ARSENIC 9.3 J ROUND 7
ARSENIC 8.1 J ROUND 8
ARSENIC, FILTERED 7.4 ROUND 5
ARSENIC, FILTERED 13.0 J ROUND 6
ARSENIC, FILTERED 6.8 J ROUND 8
COPPER 6.7 ROUND 6

2WMW46DS
Semivolatile Organics (ug/L)
PHENANTHRENE 2.9 ROUND 7
Inorganics (ug/L)
ARSENIC 16.4 ROUND 5
ARSENIC 16.6 ROUND 6
ARSENIC 12.9 ROUND 7
ARSENIC 10.1 ROUND 8
ARSENIC, FILTERED 13 ROUND 5
ARSENIC, FILTERED 24.1 ROUND 6
ARSENIC, FILTERED 6.8 J ROUND 7
ARSENIC, FILTERED 29.8 ROUND 8
CHROMIUM 23.2 J ROUND 7
CHROMIUM, FILTERED 13.9 J ROUND 7
LEAD 3.7 J ROUND 7
LEAD, FILTERED 6.6 J ROUND 7

2WMW47DS
Inorganics (ug/L)
ARSENIC 20.9 ROUND 5
ARSENIC 7.0 ROUND 6
ARSENIC 29.5 ROUND 7
ARSENIC 10.7 ROUND 8
ARSENIC, FILTERED 21.7 ROUND 5
ARSENIC, FILTERED 6.8 ROUND 6
ARSENIC, FILTERED 31.3 ROUND 7
ARSENIC, FILTERED 11 ROUND 8
LEAD 4.8 J ROUND 7
LEAD, FILTERED 5.9 J ROUND 7
LEAD, FILTERED 3.7 J ROUND 8
2WMW47DS (DUP)
Inorganics (ug/L)
ARSENIC 21.3 ROUND 5
ARSENIC, FILTERED 16.1 ROUND 5

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

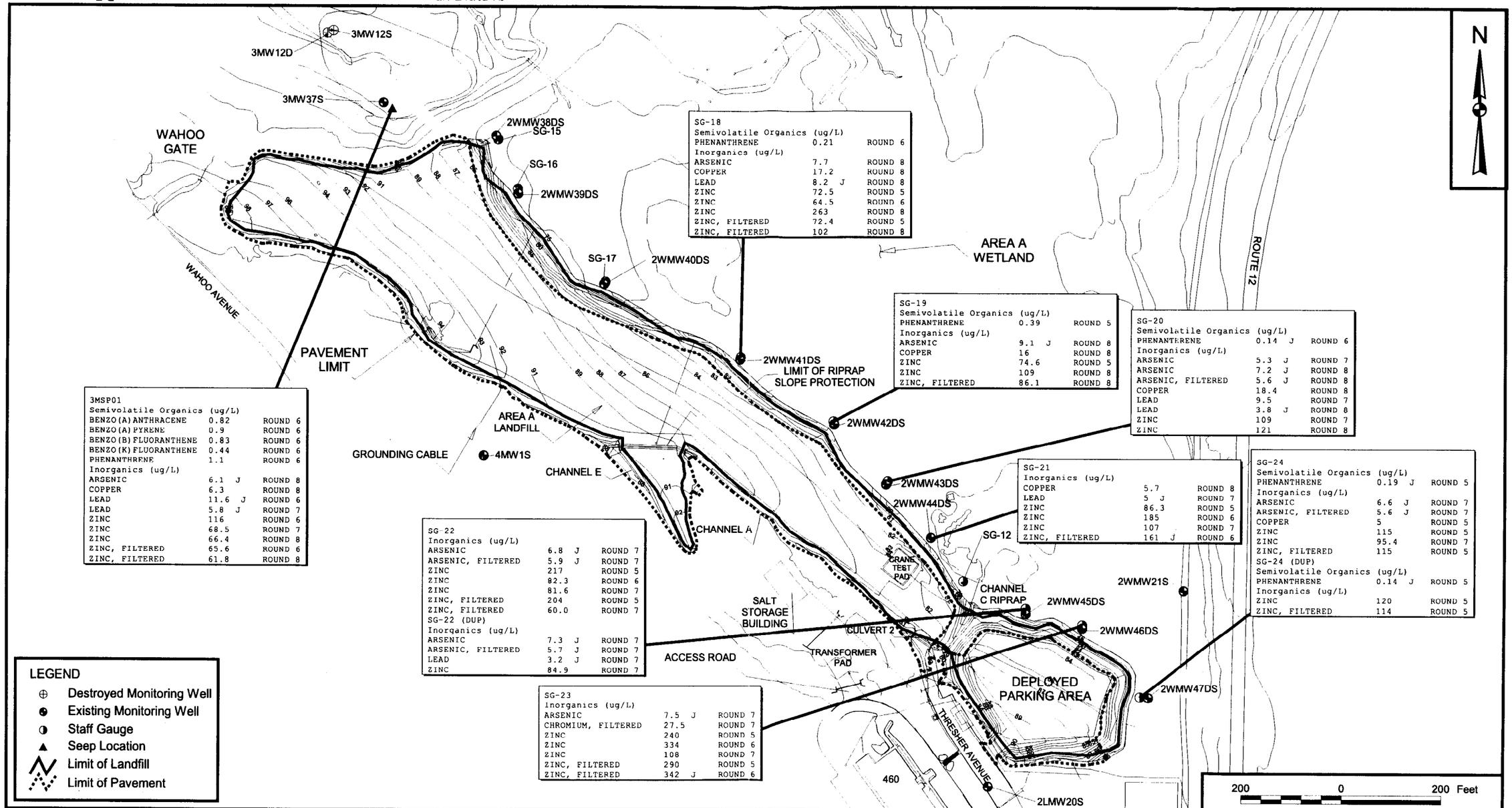
DRAWN BY J. LAMEY DATE 12/13/01
CHECKED BY DATE
COST/SCHEDULE-AREA
SCALE AS NOTED

Tetra Tech NUS, Inc.

POTENTIAL COCs IN EXCESS OF MONITORING CRITERIA
ROUNDS 5 - 8 GROUNDWATER SAMPLING RESULTS
AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

CONTRACT NUMBER 2863
OWNER NUMBER 816
APPROVED BY C. RICH DATE 2/19/02
APPROVED BY DATE
DRAWING NO. FIGURE 4 - 2
REV 0

P:\GIS\NLON\AREA_A_LANDFILL.APR ROUNDS 5-8 COC EXCEEDANCES IN SURFACE WATER 2/15/02 AJ



SG-18
Semivolatile Organics (ug/L)

PHENANTHRENE	0.21	ROUND 6
Inorganics (ug/L)		
ARSENIC	7.7	ROUND 8
COPPER	17.2	ROUND 8
LEAD	8.2 J	ROUND 8
ZINC	72.5	ROUND 5
ZINC	64.5	ROUND 6
ZINC	263	ROUND 8
ZINC, FILTERED	72.4	ROUND 5
ZINC, FILTERED	102	ROUND 8

SG-19
Semivolatile Organics (ug/L)

PHENANTHRENE	0.39	ROUND 5
Inorganics (ug/L)		
ARSENIC	9.1 J	ROUND 8
COPPER	16	ROUND 8
ZINC	74.6	ROUND 5
ZINC	109	ROUND 8
ZINC, FILTERED	86.1	ROUND 8

SG-20
Semivolatile Organics (ug/L)

PHENANTHRENE	0.14 J	ROUND 6
Inorganics (ug/L)		
ARSENIC	5.3 J	ROUND 7
ARSENIC	7.2 J	ROUND 8
ARSENIC, FILTERED	5.6 J	ROUND 8
COPPER	18.4	ROUND 8
LEAD	9.5	ROUND 7
LEAD	3.8 J	ROUND 8
ZINC	109	ROUND 7
ZINC	121	ROUND 8

3MSP01
Semivolatile Organics (ug/L)

BENZO(A)ANTHRACENE	0.82	ROUND 6
BENZO(A)PYRENE	0.9	ROUND 6
BENZO(B)FLUORANTHENE	0.83	ROUND 6
BENZO(K)FLUORANTHENE	0.44	ROUND 6
PHENANTHRENE	1.1	ROUND 6
Inorganics (ug/L)		
ARSENIC	6.1 J	ROUND 8
COPPER	6.3	ROUND 8
LEAD	11.6 J	ROUND 6
LEAD	5.8 J	ROUND 7
ZINC	116	ROUND 6
ZINC	68.5	ROUND 7
ZINC	66.4	ROUND 8
ZINC, FILTERED	65.6	ROUND 6
ZINC, FILTERED	61.8	ROUND 8

SG-21
Inorganics (ug/L)

COPPER	5.7	ROUND 8
LEAD	5 J	ROUND 7
ZINC	86.3	ROUND 5
ZINC	185	ROUND 6
ZINC	107	ROUND 7
ZINC, FILTERED	161 J	ROUND 6

SG-24
Semivolatile Organics (ug/L)

PHENANTHRENE	0.19 J	ROUND 5
Inorganics (ug/L)		
ARSENIC	6.6 J	ROUND 7
ARSENIC, FILTERED	5.6 J	ROUND 7
COPPER	5	ROUND 5
ZINC	115	ROUND 5
ZINC	95.4	ROUND 7
ZINC, FILTERED	115	ROUND 5
SG-24 (DUP)		
Semivolatile Organics (ug/L)		
PHENANTHRENE	0.14 J	ROUND 5
Inorganics (ug/L)		
ZINC	120	ROUND 5
ZINC, FILTERED	114	ROUND 5

SG-22
Inorganics (ug/L)

ARSENIC	6.8 J	ROUND 7
ARSENIC, FILTERED	5.9 J	ROUND 7
ZINC	217	ROUND 5
ZINC	82.3	ROUND 6
ZINC	81.6	ROUND 7
ZINC, FILTERED	204	ROUND 5
ZINC, FILTERED	60.0	ROUND 7
SG-22 (DUP)		
Inorganics (ug/L)		
ARSENIC	7.3 J	ROUND 7
ARSENIC, FILTERED	5.7 J	ROUND 7
LEAD	3.2 J	ROUND 7
ZINC	84.9	ROUND 7

SG-23
Inorganics (ug/L)

ARSENIC	7.5 J	ROUND 7
CHROMIUM, FILTERED	27.5	ROUND 7
ZINC	240	ROUND 5
ZINC	334	ROUND 6
ZINC	108	ROUND 7
ZINC, FILTERED	290	ROUND 5
ZINC, FILTERED	342 J	ROUND 6

LEGEND
- Destroyed Monitoring Well
- Existing Monitoring Well
- Staff Gauge
- Seep Location
- Limit of Landfill
- Limit of Pavement

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

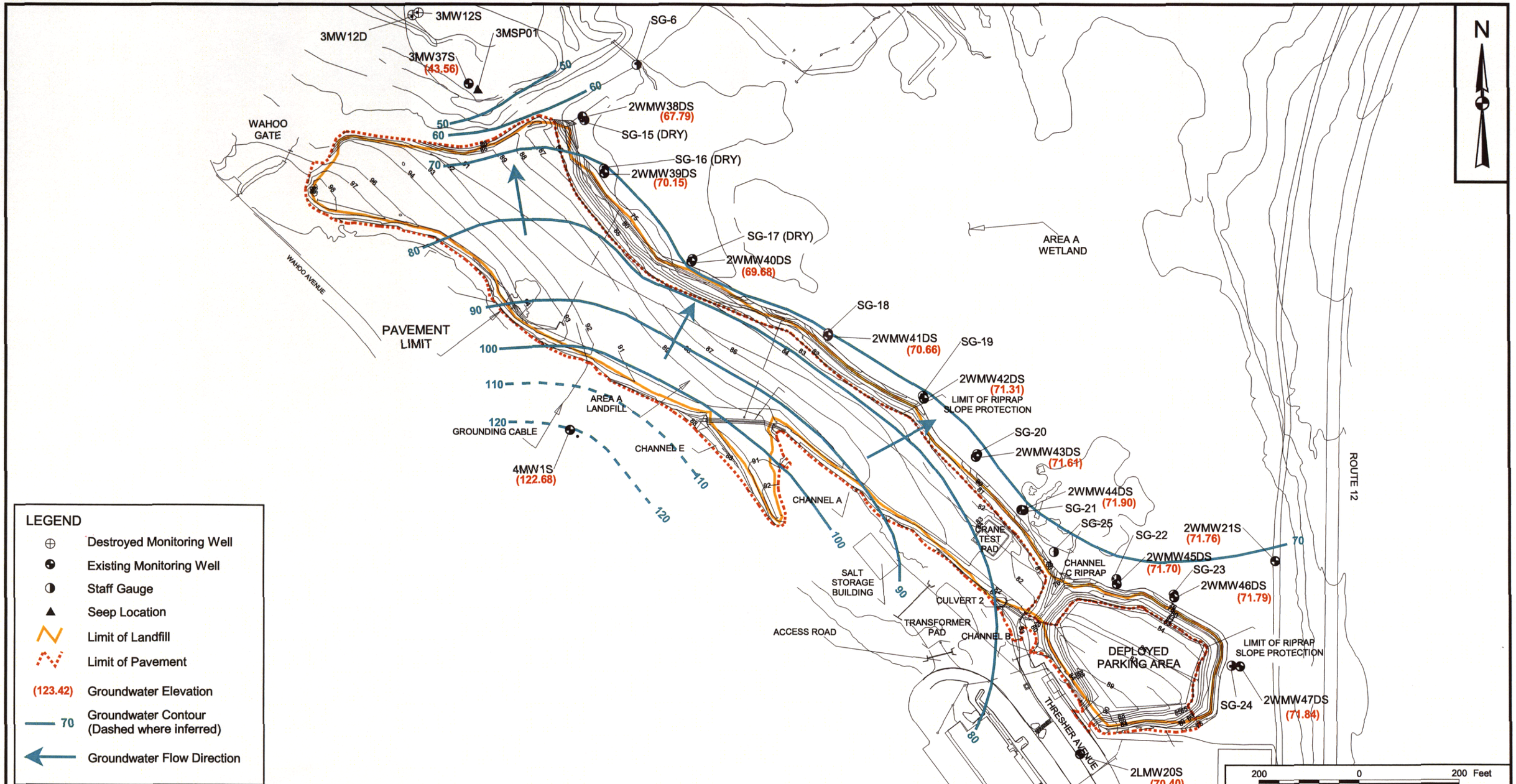
DRAWN BY J. LAMEY DATE 12/13/01
CHECKED BY DATE
COST/SCHEDULE-AREA
SCALE AS NOTED

Tetra Tech NUS, Inc.

POTENTIAL COCs IN EXCESS OF MONITORING CRITERIA
ROUNDS 5 - 8 SURFACE WATER SAMPLING RESULTS
AREA A LANDFILL
NSB-NLON, GROTON, CONNECTICUT

CONTRACT NUMBER 2863
OWNER NUMBER 816
APPROVED BY C. RICH DATE 2/19/02
APPROVED BY DATE
DRAWING NO. FIGURE 4 - 3
REV 0

P:\GIS\NLON\50820370.APR AREA A LANDFILL - POTENTIOMETRIC CONTOURS - ROUND 5 LAYOUT 2/15/02 AJ



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

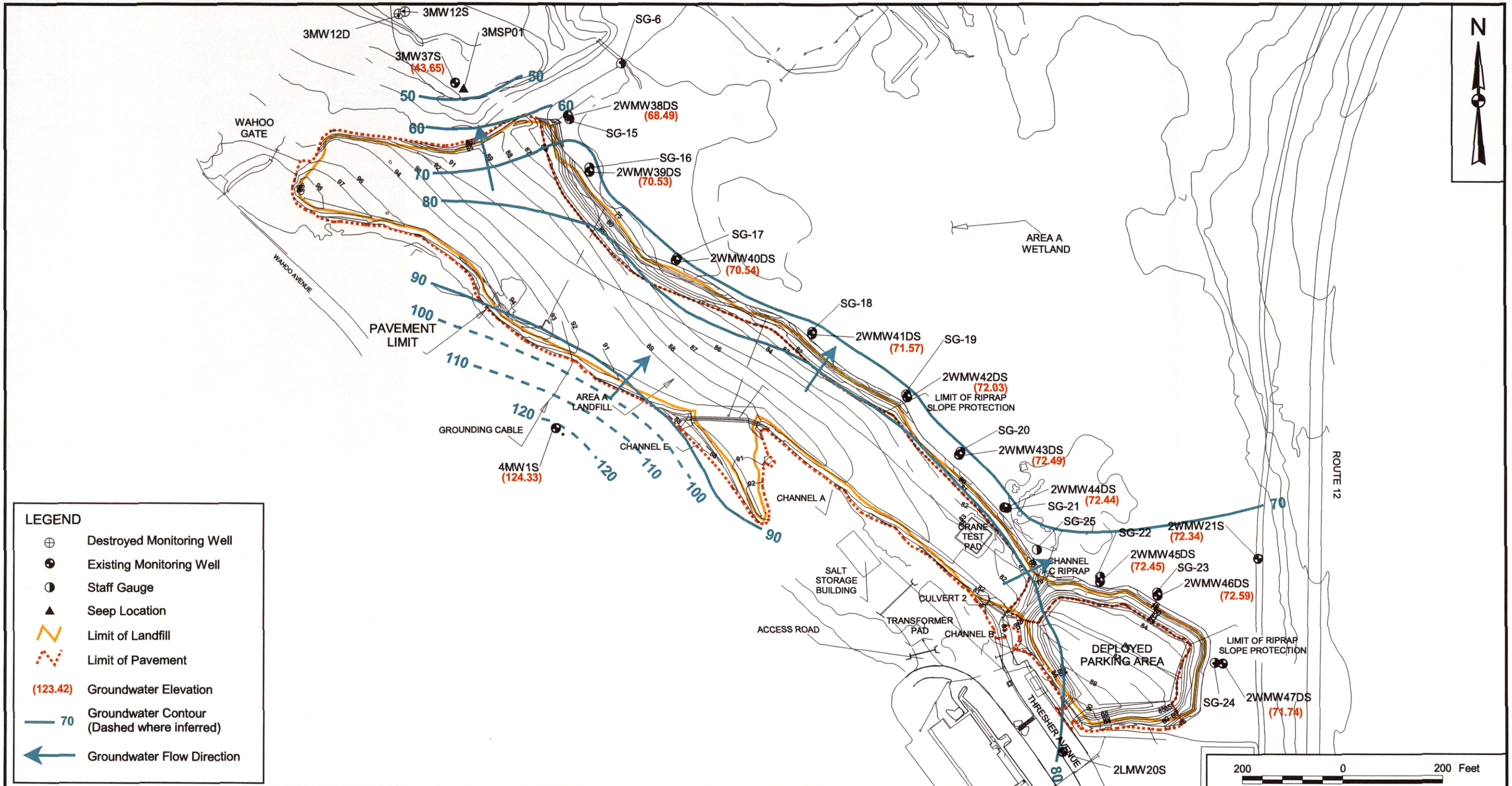
DRAWN BY M. Spangenberg DATE 2-26-01
CHECKED BY DATE
COST/SCHEDULE-AREA
SCALE AS NOTED

Tetra Tech NUS, Inc.

POTENTIOMETRIC SURFACE MAP
ROUND 5 GROUNDWATER MONITORING
AREA A LANDFILL
NSB-NEW LONDON, GROTON, CONNECTICUT

CONTRACT NUMBER 2863
OWNER NUMBER CTO 816
APPROVED BY C. RICH DATE 2/19/02
APPROVED BY DATE
DRAWING NO. FIGURE 4 - 4
REV 0

P:\GIS\NLON\50820370.APR AREA A LANDFILL - POTENTIOMETRIC CONTOURS - ROUND 6 LAYOUT 2/15/02 AJ



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

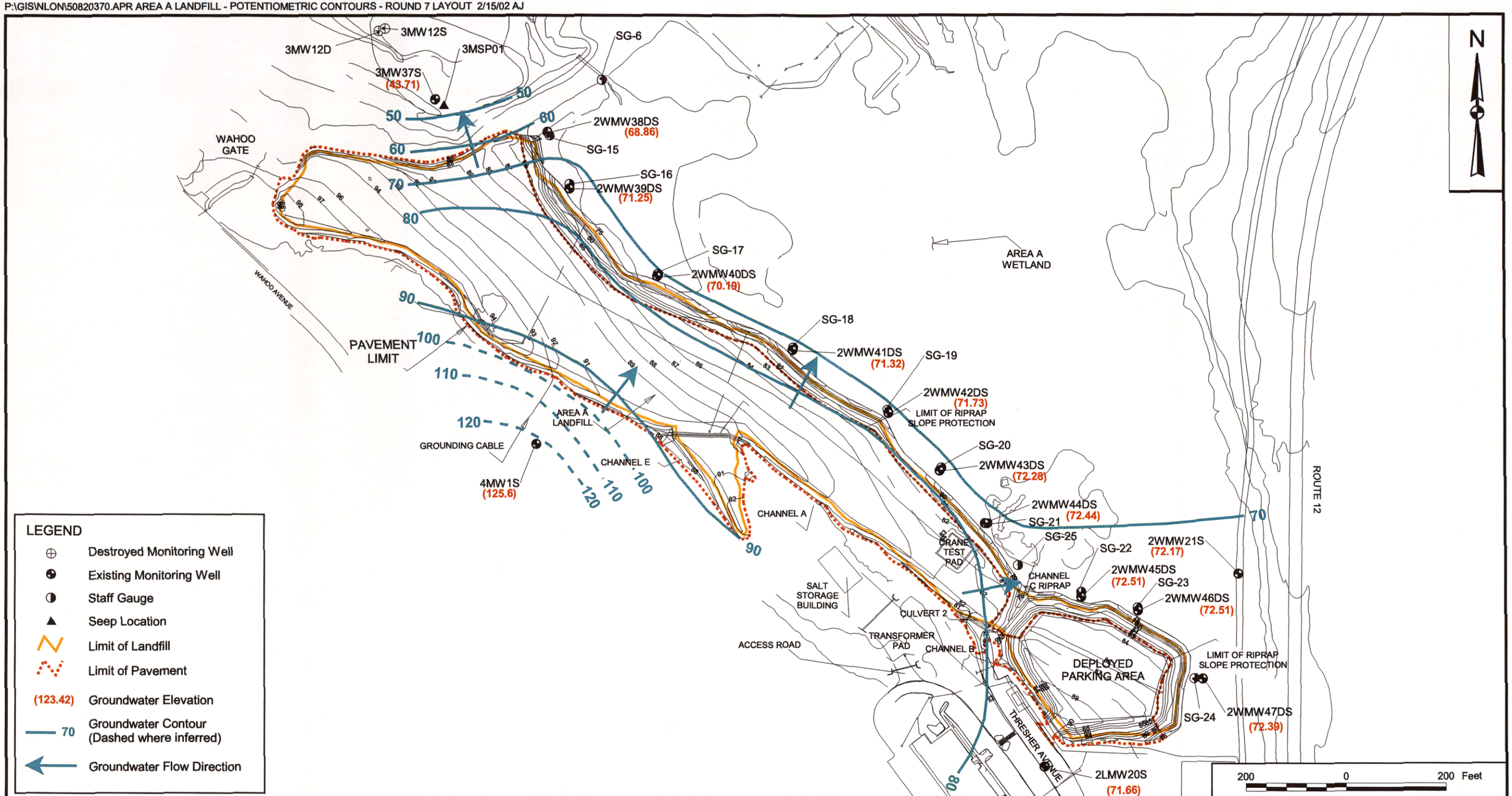
DRAWN BY M. Spangenberg DATE 5-8-01
CHECKED BY DATE
COST/SCHEDULE-AREA
SCALE AS NOTED

Tetra Tech NUS, Inc.

POTENTIOMETRIC SURFACE MAP
ROUND 6 GROUNDWATER MONITORING
AREA A LANDFILL
NSB-NEW LONDON, GROTON, CONNECTICUT

CONTRACT NUMBER 2863
OWNER NUMBER CTO 816
APPROVED BY C. RICH DATE 2/19/02
APPROVED BY DATE
DRAWING NO. FIGURE 4 - 5
REV 0

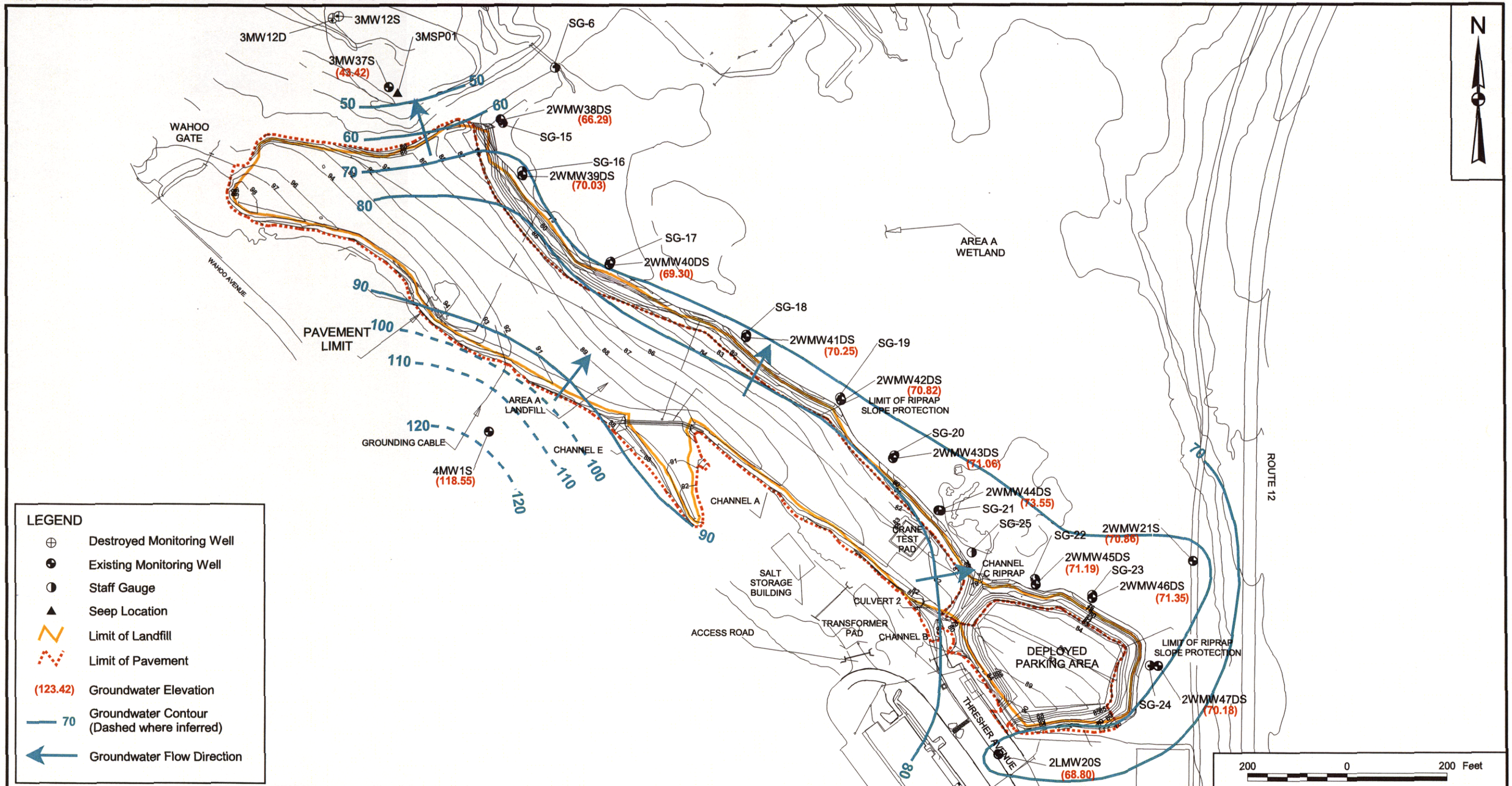
P:\GIS\NLON\50820370.APR AREA A LANDFILL - POTENTIOMETRIC CONTOURS - ROUND 7 LAYOUT 2/15/02 AJ



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY J. LAMEY	DATE 8/15/01	Tetra Tech NUS, Inc.	CONTRACT NUMBER 2863 / OWNER NUMBER CTO 816
CHECKED BY	DATE	POTENTIOMETRIC SURFACE MAP ROUND 7 GROUNDWATER MONITORING AREA A LANDFILL NSB-NEW LONDON, GROTON, CONNECTICUT	APPROVED BY C. Rich / DATE 2/19/02
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 4 - 6 / REV 0

P:\GIS\NLON\50820370.APR AREA A LANDFILL - POTENTIOMETRIC CONTOURS - ROUND 8 LAYOUT 2/15/02 AJ



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY J. LAMEY	DATE 8/15/01
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	

Tetra Tech NUS, Inc.

POTENTIOMETRIC SURFACE MAP
ROUND 8 GROUNDWATER MONITORING
AREA A LANDFILL
NSB-NEW LONDON, GROTON, CONNECTICUT

CONTRACT NUMBER 2863	OWNER NUMBER CTO 816
APPROVED BY C. RICH	DATE 2/19/02
APPROVED BY	DATE
DRAWING NO. FIGURE 4 - 7	REV 0

FIGURE 4-8

Dissolved Arsenic Versus Total Arsenic
All Groundwater Data
Area A Landfill, NSB-NLON, Groton, Connecticut

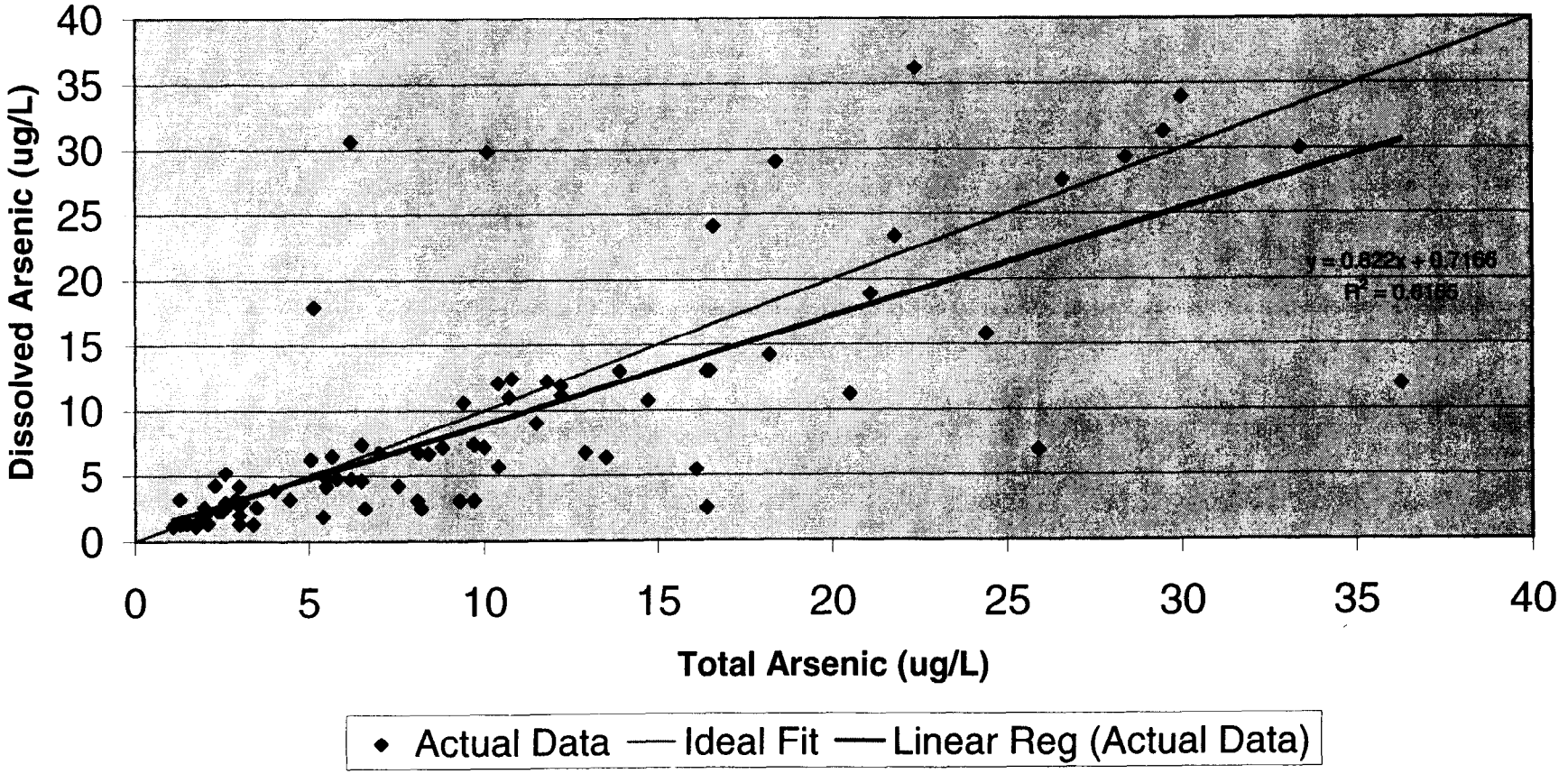


FIGURE 4-9

Total Arsenic Versus TDS
All Groundwater Data
Area A Landfill, NSB-NLON, Groton, Connecticut

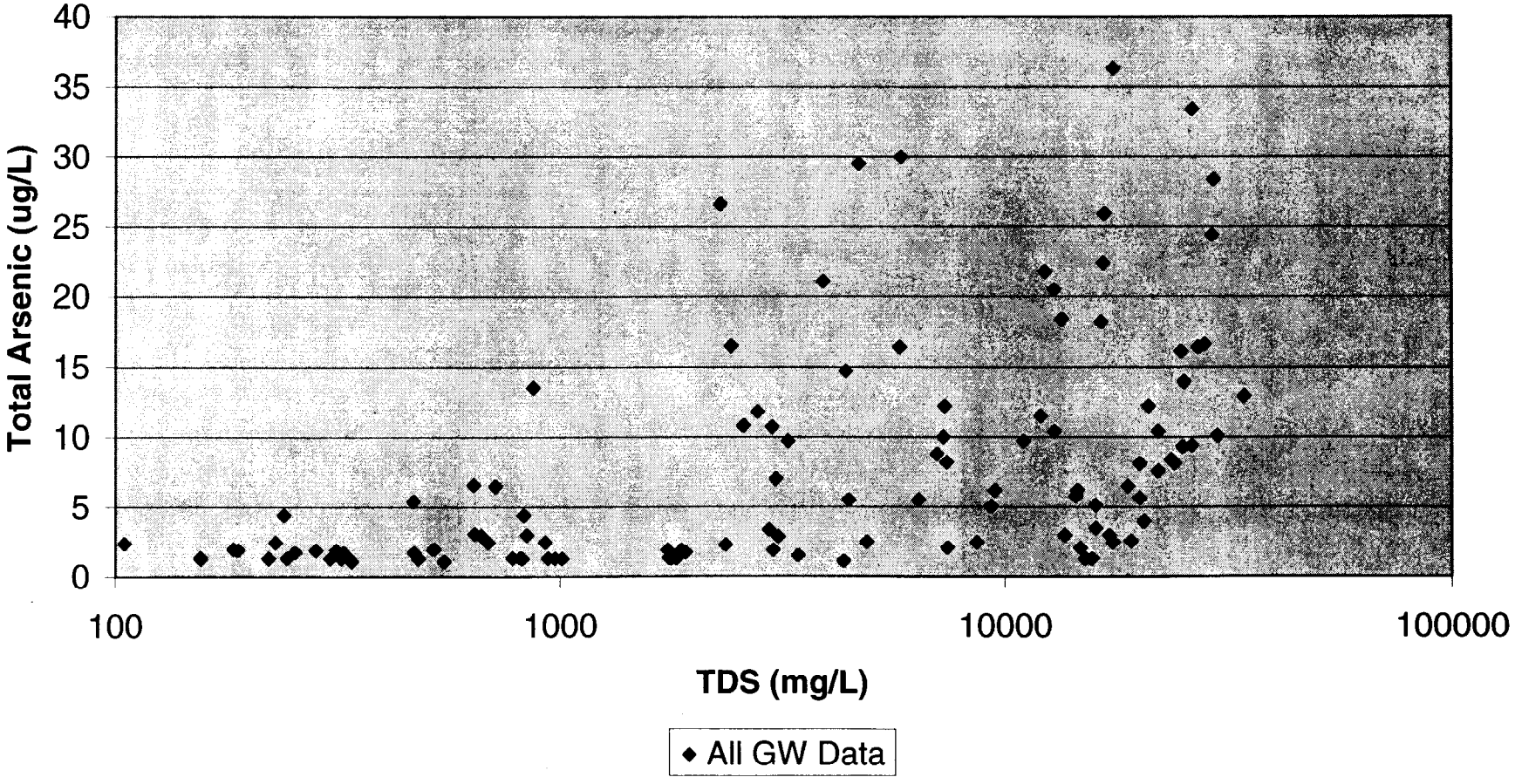


FIGURE 4-10

Dissolved Arsenic Versus TDS
All Groundwater Data
Area A Landfill, NSB-NLON, Groton, Connecticut

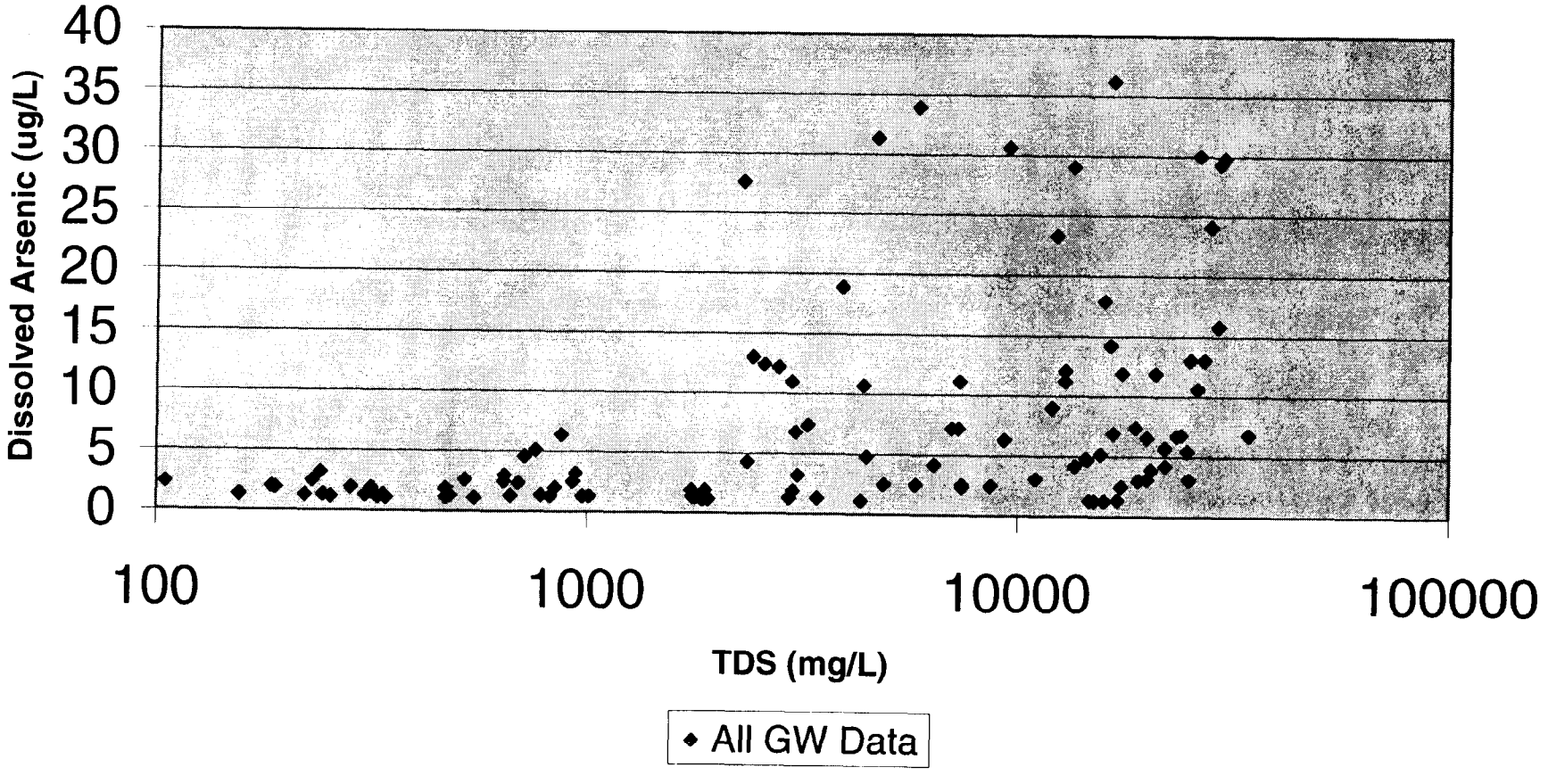


FIGURE 4-11
Total Arsenic Versus TDS
Dredge Spoil Wells With High Arsenic
Area A Landfill, NSB-NLON, Groton, Connecticut

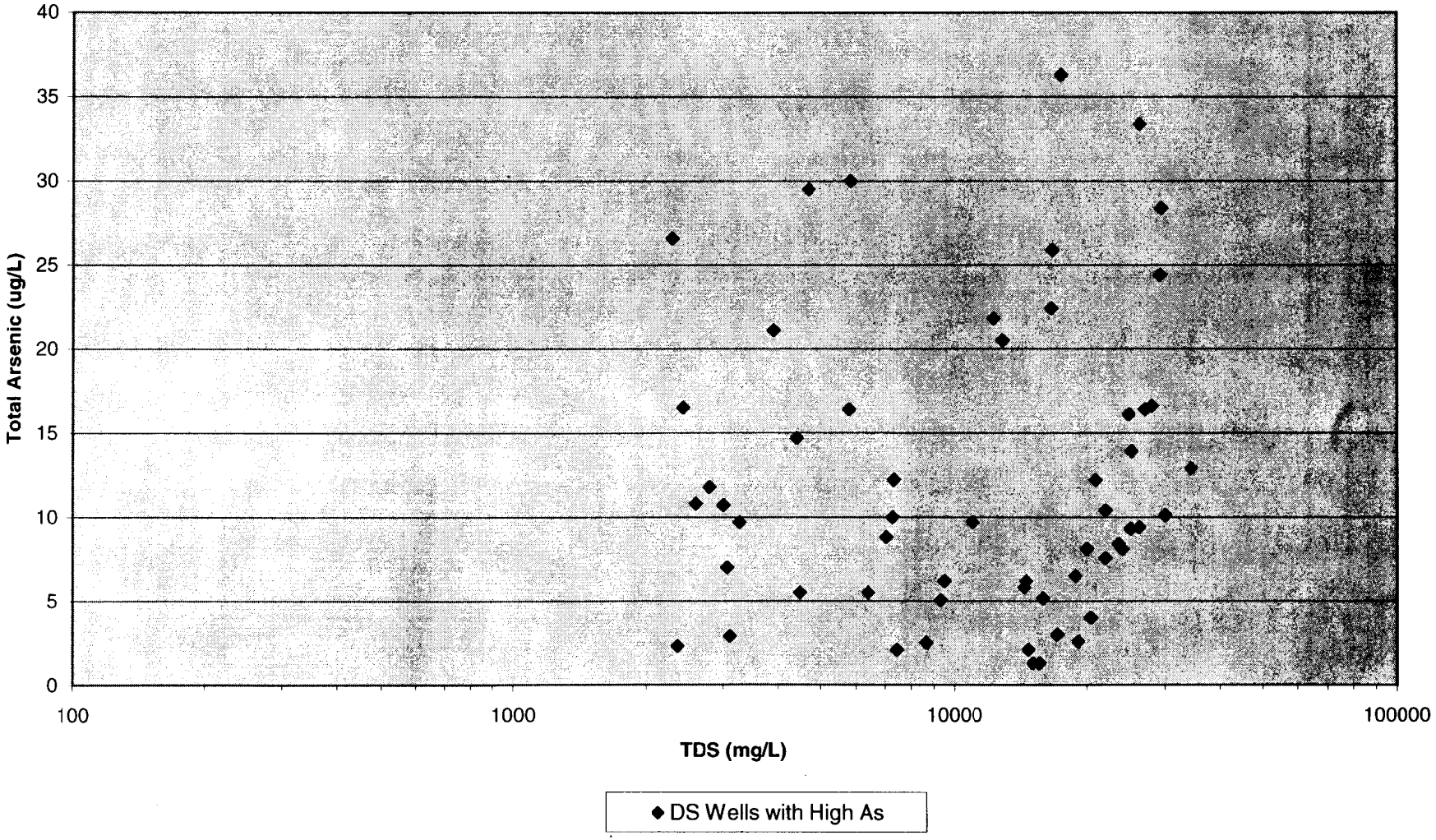


FIGURE 4-12

Dissolved Arsenic Versus TDS
Dredge Spoil Wells with High Arsenic
Area A Landfill, NSB-NLON, Groton, Connecticut

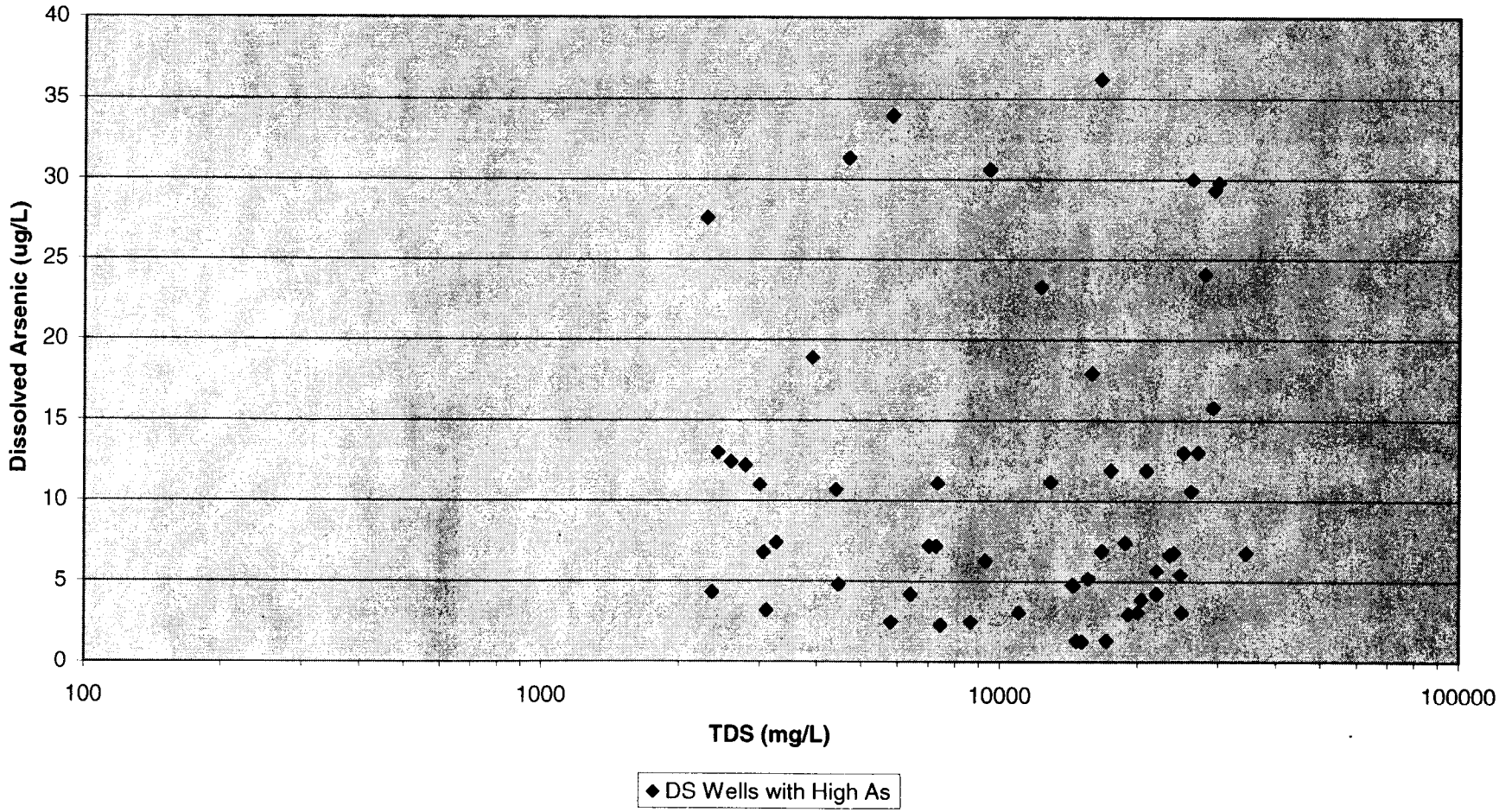


FIGURE 4-13

Arsenic Versus Iron for Area A Wetland Soil
NSB-NLON, Groton, Connecticut

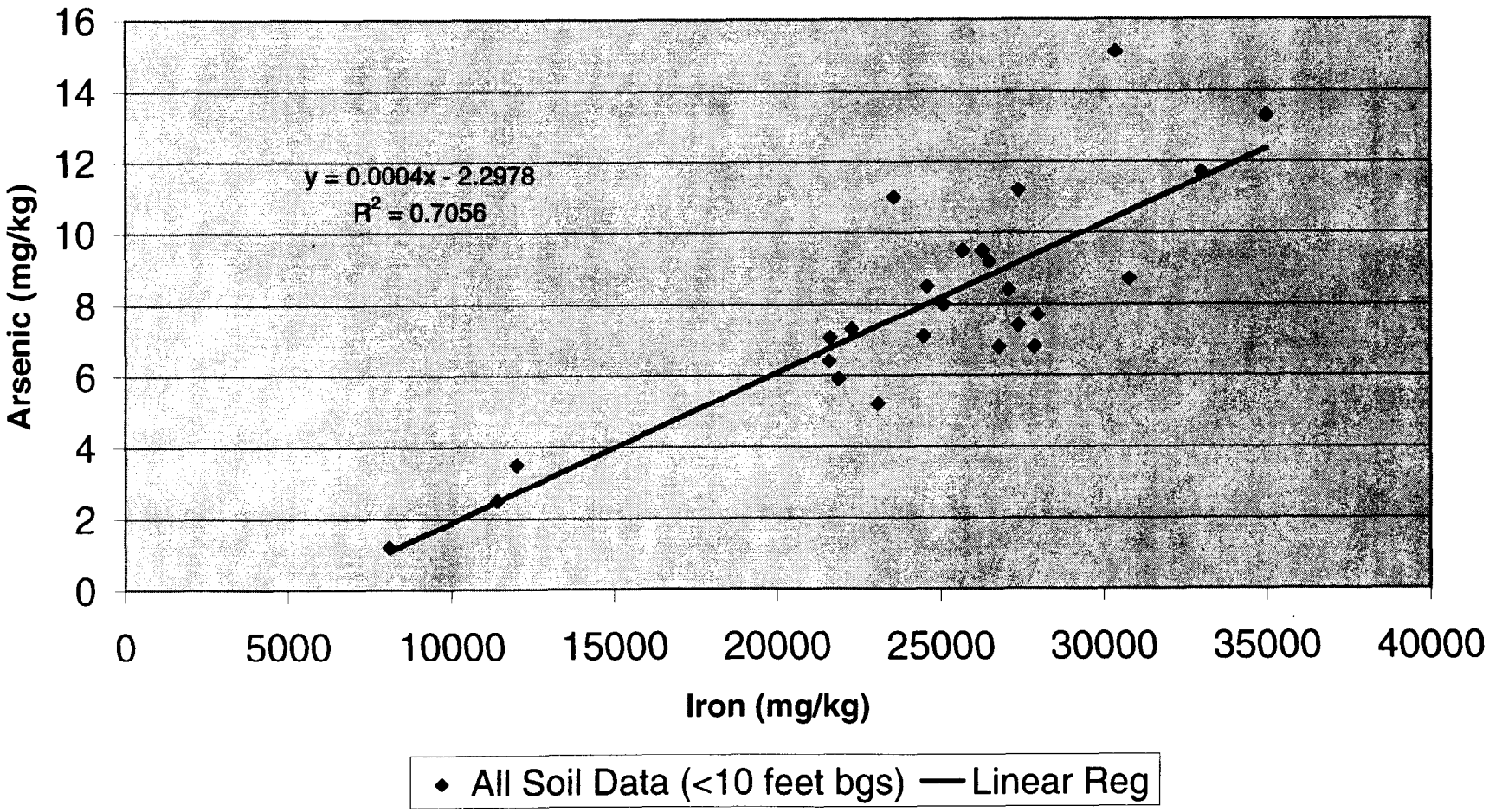


FIGURE 4-14

Total Arsenic Versus Total Iron in Dredge Spoil Wells
Non-Detects Included
Area A Landfill, NSB-NLON, Groton, Connecticut

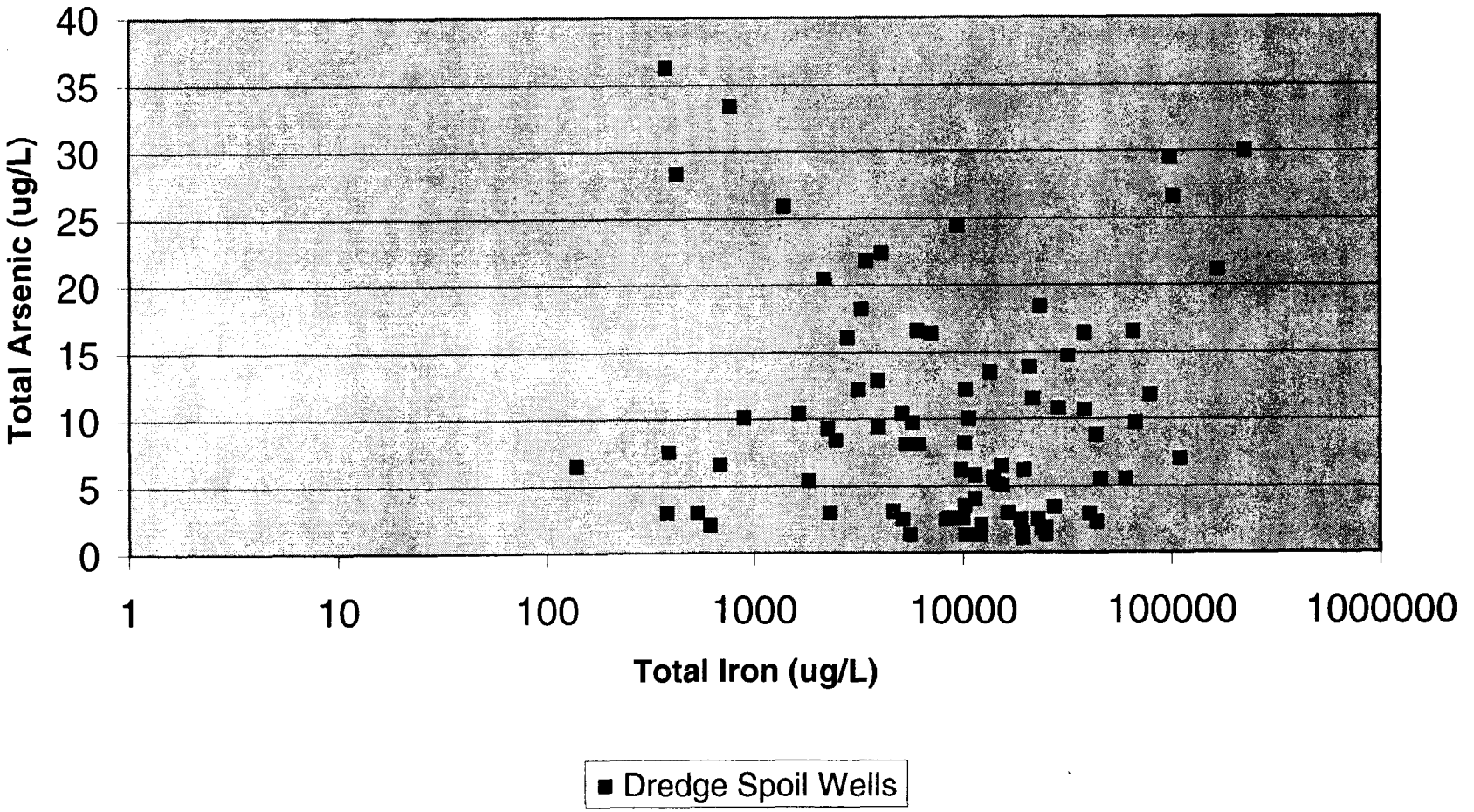


FIGURE 4-15

Dissolved Arsenic Versus Dissolved Iron in Dredge Spoil Wells
Non-Detects Included
Area A Landfill, NSB-NLON, Groton, Connecticut

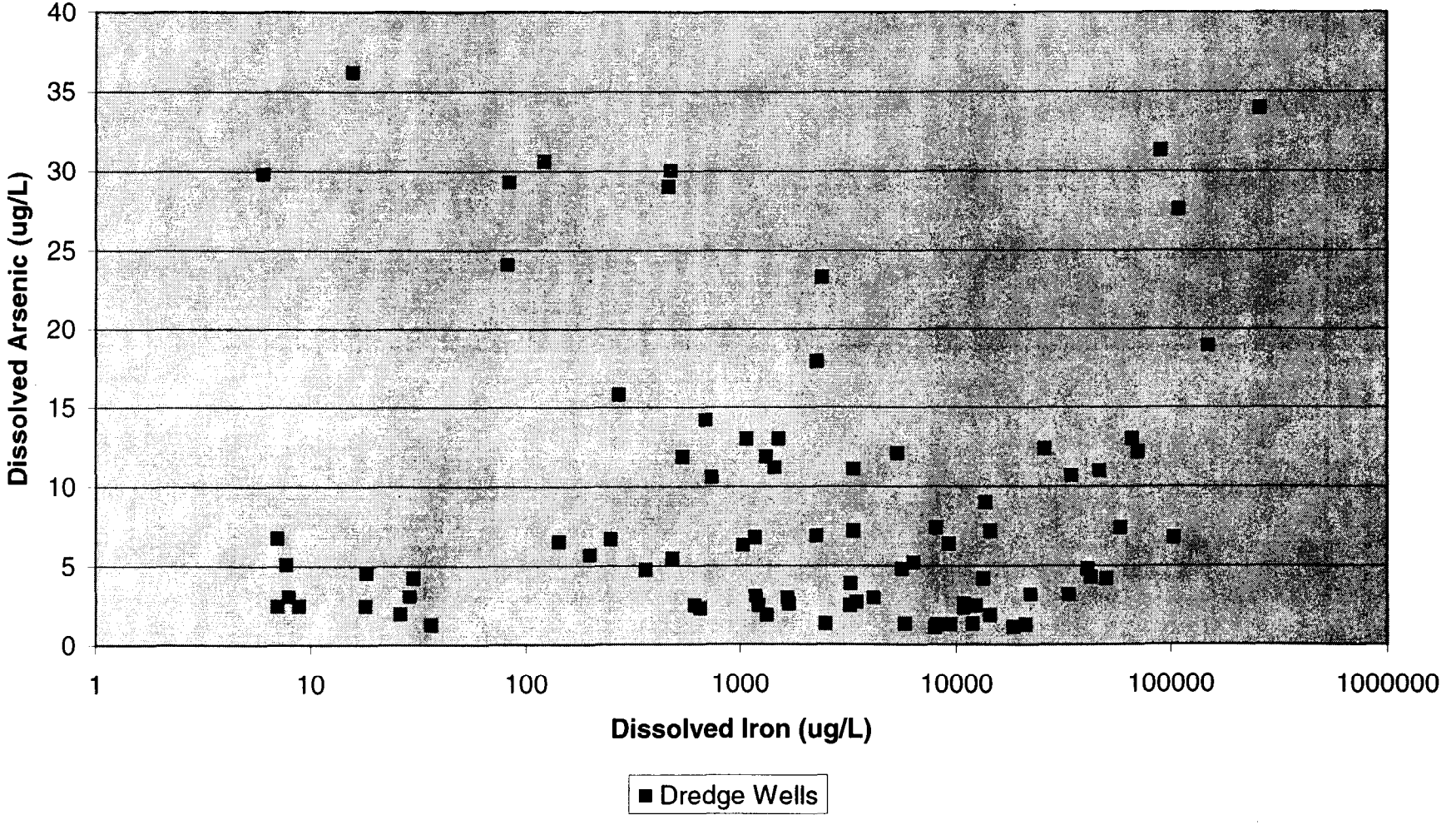


FIGURE 4-16

Total Arsenic Versus Total Iron in Dredge Spoil Wells
Non-Detects Eliminated
Area A Landfill, NSB-NLON, Groton, Connecticut

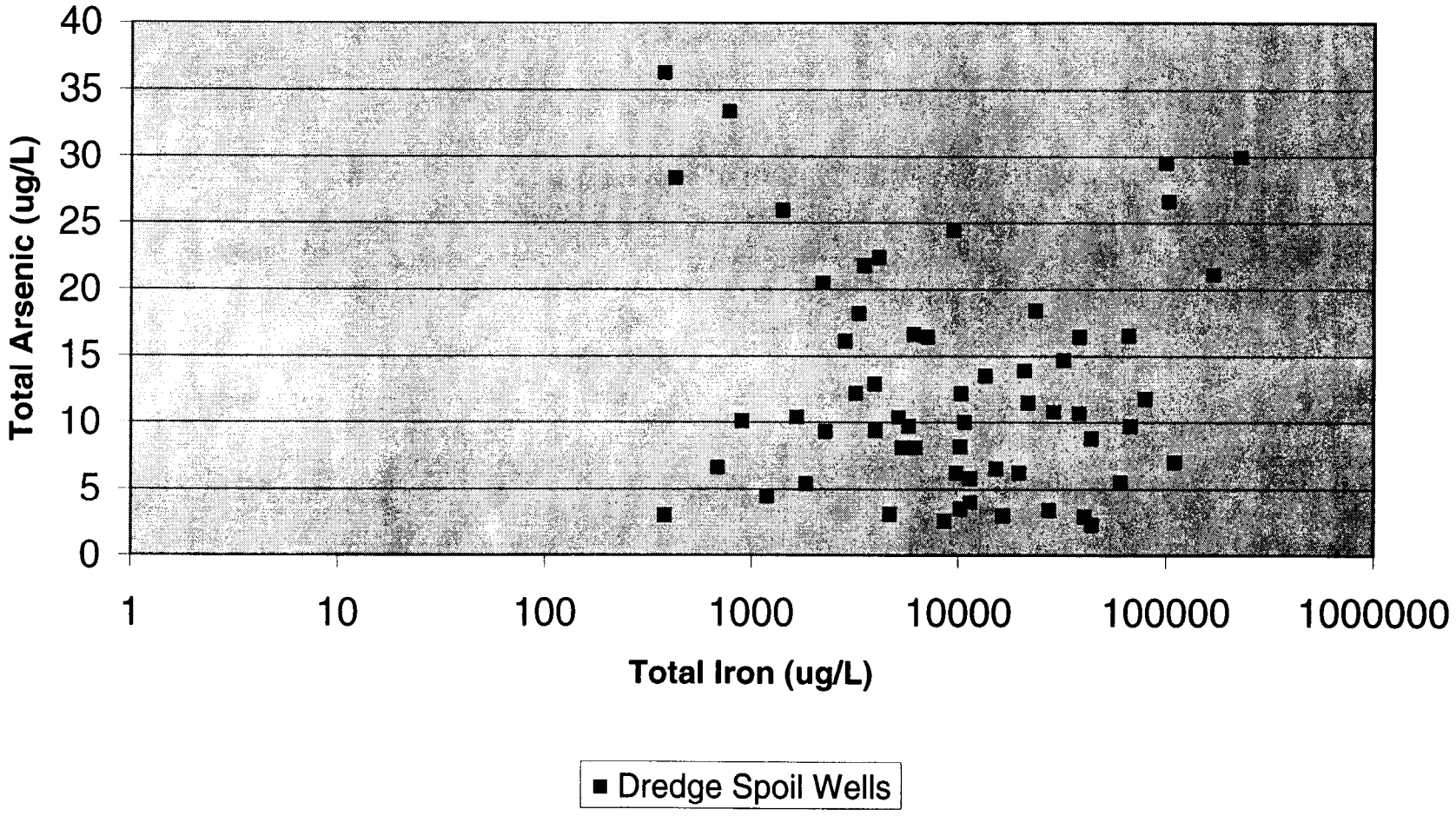
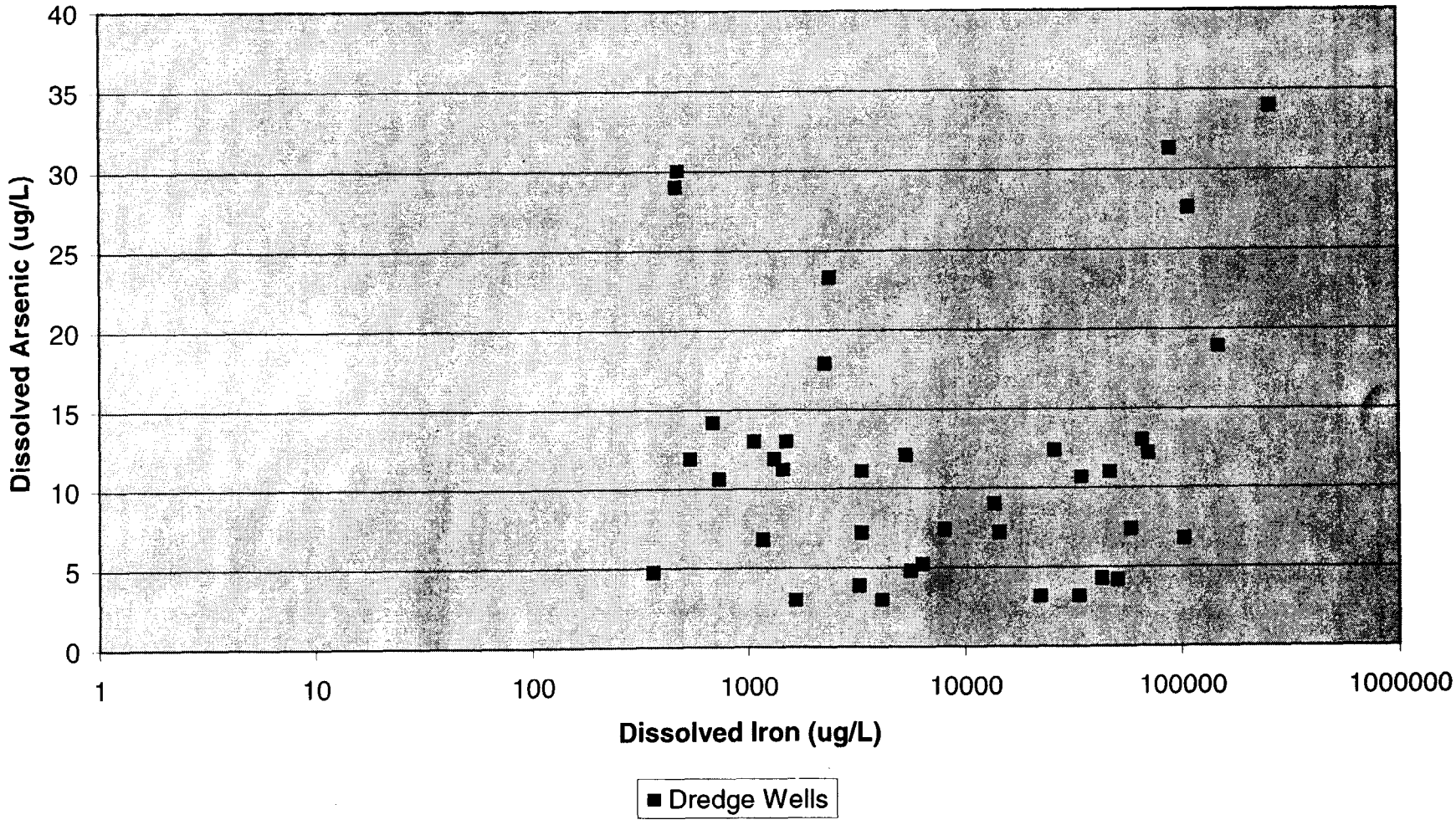


FIGURE 4-17

Dissolved Arsenic Versus Dissolved Iron in Dredge Spoil Wells
Non-Detects Eliminated
Area A Landfill, NSB-NLON, Groton, Connecticut



5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

This report summarizes and evaluates the results of the second year of quarterly monitoring (Rounds 5 through 8) at the Area A Landfill. A comprehensive review of the groundwater monitoring results for the Area A Landfill are also provided in this report. The results of the monitoring program are being used to evaluate the success of the interim remedial action (i.e., installation of a multi-layer, low-permeability cover system and a surface water/shallow groundwater interception and diversion system upgradient of the cover system) at minimizing contaminant migration from Area A Landfill. As previously stated, the potential COCs evaluated for this monitoring program were identified in the Groundwater Monitoring Plan. The concentrations of these potential COCs that were detected in groundwater and surface water samples are summarized in Table 4-2 and Table 4-3, respectively. The steps generally followed during the data evaluation were those shown on Figure 4-1.

Groundwater and surface water samples were analyzed for TCL organics, TAL inorganics, and miscellaneous water quality parameters during the first two years of monitoring. Overall, groundwater and surface water results were similar in that the same compounds were detected and the ranges of concentrations for the potential COCs that exceeded criteria were similar. One exception would be arsenic. Arsenic concentrations at select monitoring well/staff gauge pairs were generally higher in groundwater samples versus surface water samples.

No VOCs or pesticides/PCBs were detected in any of the groundwater samples collected during the second year of monitoring. These results are similar to the results for the first year of monitoring. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, BEHP, phenanthrene were detected in the groundwater samples during the second year of monitoring. PAHs were detected more frequently during the second year of monitoring. Benzo(a)pyrene and phenanthrene were detected at concentrations above their respective primary monitoring criteria during the second year of monitoring. These PAHs were not detected above their respective primary monitoring criteria during the first year of monitoring. The detections of PAHs may be related to the landfill; however, other factors could also be influencing the detections of these compounds. A new laboratory was used to analyze the samples collected during Rounds 7 and 8. The new laboratory reported to much lower quantitation limits for PAHs than the previous laboratories. This may be the reason that benzo(a)pyrene and phenanthrene were detected during Rounds 7 and 8. These results may also reflect the impacts of the asphalt pavement that was placed over the landfill. Surface water runoff may be washing the PAHs from the asphalt and into the Area A Wetland.

Total and dissolved concentrations of arsenic, chromium, copper, lead, and zinc and dissolved concentrations of beryllium were detected in groundwater samples collected during the second year of monitoring. All of these inorganics were also detected in groundwater during the first year of monitoring. Total and dissolved metals results were generally similar; however, there were some differences for arsenic and zinc. Total zinc concentrations detected in several samples were approximately one order of magnitude higher than dissolved concentrations. This may indicate that these samples had high total suspended solids. Arsenic and zinc were also detected at concentrations that exceeded their respective primary criteria. Based on information presented in Section 4, it appears that the high concentrations of arsenic could be attributed to several factors [Area A Landfill, dredge spoils, suspended and dissolved solids in groundwater samples, and interferences (dissolved solids and salinity) with the ICP method of analysis]. Most of the zinc problems appear to be related to high total suspended solids.

Similar to the results for Year 1, VOCs and pesticides/PCBs were not positively detected in the seep samples collected during the second year of monitoring. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene were detected during Round 6 at concentrations that exceeded the primary criteria. They were not detected previously during the first year of sampling or subsequently during Rounds 7 or 8. BEHP was detected in two samples, but neither of these detections exceeded the primary criterion. BEHP was not detected during Year 1. Phenanthrene was detected in two samples, and one of these detections (Round 6) exceeded the primary criterion. Similar concentrations of phenanthrene have not been detected since Round 6.

For surface water, there was one detection of total xylene (0.21 µg/L) at SG-19 during Round 5. Otherwise, no positive results were reported for any of the samples analyzed for VOCs or pesticides/PCBs during Year 2. No VOCs or pesticides/PCBs were detected during Year 1. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and BEHP were detected in surface water samples, but none of the detections exceeded the primary criteria. None of these compounds were detected in surface water samples collected during Year 1. Phenanthrene was detected four samples at concentrations that exceeded the primary criterion. The phenanthrene concentrations in excess of the primary criterion were single detections at four different locations [i.e., SG-18 (Round 6), SG-19 (Round 5), SG-20 (Round 6), and SG-24 (Round 5)]. Phenanthrene was also detected once in SG-19 during Round 4.

The results of the statistical evaluation of the groundwater data indicated that various chemicals were higher in downgradient wells as compared to upgradient wells. However, after further review of the analytical results (i.e., preparation of temporal plots and comparison of data to background and primary monitoring criteria), it appears that only arsenic is a concern at the Area A Landfill. Temporal plots of total and dissolved arsenic data did not show increasing trends in the downgradient wells. Temporal plots of

several other metals (chromium, copper, and lead) also showed similar information (i.e., higher downgradient concentrations but no increasing trends); however, none of these detections exceeded any primary monitoring criterion and most were within the background range. The various factors that may be influencing arsenic were provided in Section 4.0. These factors may also be affecting the other metals that are being detected at elevated concentrations in the downgradient monitoring wells.

5.2 RECOMMENDATIONS

As discussed above, the analytical results for the second year of groundwater monitoring at the Area A Landfill showed several exceedances of the primary monitoring criteria and secondary monitoring criteria. The concentrations of some chemicals detected during the second year of monitoring were generally higher than the results of the first year of groundwater monitoring. However, most of these exceedances appear to be caused by factors unrelated to the Area A Landfill.

Overall, the results of the first two years of monitoring for the Area A Landfill indicate that the interim remedial action at the site is sufficiently reducing infiltration of precipitation through the landfill source material so that significant contaminant migration from the site to the surrounding area is not occurring. Arsenic, zinc, benzo(a)pyrene, and phenanthrene have been detected at concentrations in excess of their respective primary monitoring criterion in some downgradient wells; however, their detections do not appear to warrant further action other than monitoring. There is some uncertainty as to whether the landfill or other sources are contributing to these detections. Therefore, it is recommended that the current interim ROD for the Area A Landfill should be amended and a final ROD should be prepared for the site. Monitoring should continue at the site.

In addition, the following recommendations are made based on the results of the two years of monitoring at the Area A Landfill.

- The sampling frequency should be reduced from quarterly to bi-annually. This recommendation is justified because the causes of detections of chemicals in excess of primary monitoring criteria appear to be unrelated to the Area A Landfill and no significant increasing contaminant trends have been noted in the downgradient wells over two years. Bi-annual sampling will be implemented during Year 3 of the program. Rounds 9 and 10 quarterly sampling events for the third year of monitoring at Area A Landfill have already been completed. A final round of sampling (Round 11) will be completed during the last quarter of Year 3 (September 2002) to complete the monitoring for the year. After Year 3, the sampling frequency will be re-evaluated. This recommendation is based on the decision process presented in Figure 4-1.

- Several modifications should be made to the analytical program. TCL VOCs and TCL pesticides/PCBs should be eliminated from the analytical program since these chemicals have not been identified as a concern through two years of monitoring.

- Project laboratories should continue to be made aware of the presence of high TDS and salinity in the downgradient dredge spoil wells of the monitoring network so that potential interferences can be accounted for during the analysis of the samples.

- Further discussions on the arsenic criteria issue should be conducted between the Navy and regulators during Year 3 of the monitoring program. It appears that it may be technically infeasible to meet the primary monitoring criteria for arsenic (SWPC of 4 µg/L) in the downgradient monitoring wells installed in dredge spoils. Based on potential receptors and site conditions, it may be appropriate to default to Connecticut WQSs or Federal AWQC as the monitoring criteria in the future.

- Modifications to the monitoring network are also warranted. It is recommended that staff gauges SG-15, SG-16, and SG-17 and any associated surface water sampling be eliminated from the monitoring program. Surface water has not been present at these locations during the first two years of monitoring and no samples have been collected to date. Sporadic sample collection from these locations in the future, assuming surface water may be present at them in the future, would not provide meaningful information to determine contaminant trends.

- Monitoring well 3MW12S, which was part of the original monitoring network, should not be re-installed. This well was located in the Area A Downstream and was screened in alluvium. Monitoring well 3MW37S, which is still used for the monitoring program, is also screened in alluvium and is located in the Area A Downstream. Continued monitoring of 3MW37S should provide adequate information to assess contaminant migration issues from the Area A Landfill.

- Monitoring well 3MW12D was installed in bedrock. No other downgradient monitoring well in the current monitoring program is installed in bedrock. It would be prudent to continue monitoring the groundwater in bedrock since some of the waste material included in the Area A Landfill sits on bedrock or on the alluvium that directly overlies the bedrock. Based on conversations with the Remedial Action Contractor, this monitoring well was destroyed during the Area A Downstream remedial action. Mobilization of a drill rig to re-install this well may cause some damage to the vegetation planted in the Area A Downstream. It is recommended that this well be re-installed and measures should be taken to minimize any damage to the new vegetation. If re-installation is determined to be infeasible, bedrock monitoring well 2LMW9D, located along the western side of the landfill, should be considered as a downgradient bedrock monitoring location.

- Routine maintenance should be conducted on the remaining monitoring wells included in the monitoring program to facilitate monitoring activities into the future.

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APPENDIX A

ROUND 8 FIELD ACTIVITIES LOG BOOK

TITLE NSBNLON QUART SAMPLING
TUES SEPT 18 2001

PROJECT NO 2863
BOOK NO 1244

Work continued from page AT SITE: SJC/DW Tt NUS

AM: SUNNY COOL TO WARM
PM: SUNNY WARM.

0600 AT PGH AIRPORT FOR 0745 FLT. MET W/ DW.

0930 ARR PROVEDENCE. DW LUGGAGE NOT HERE.

1030 PICKED UP EQUIP AT US ENV. MEETING PLACE.

1200 ARRIVE AT MOTEL, CHECK IN. GO OVER DAYS ACTIVITIES W/ DW.

1300 HEAD TO BASE, LINE OF TRAFFIC DUE TO INCR SECUR.

1400 ARRIVE @ PASS & ID - GET PASSES.

1415 MET W/ D. CONANT - TOOK US ON TOUR. END UP AT DRMO - TALK TO DAN ABOUT STAYING LATE SO WE COULD GET LO TIDE WL/ HE SAYS OK.

1520 START WL AREA A - SEE WL SHEETS - HAVING SOME TROUBLE FINDING DUE TO OVERGROWTH.

1700 GO TO DRMO - NOT DONE AT AREA A. SIGN IN.

1710 TAKE WL AT DRMO (10 WELLS + SG1) SEE PG 180

1800 RETURN TO AREA A FIND OTHER WELLS - TAKE WL.

1900 RETURN TO BLDG 166 - PUT BATERIES ON CHARGE

1930 LV BASE.

Work continued to Page

SIGNATURE SJ Conti DATE 9/18/01

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

WED (CONT)

1730 DONE PURGING @ 46DS / 47DS - PACK UP VEHICLES
GO TO 1166, WILL SAMPLE TOMORROW.
MADE UP BOTTLE SETS FOR DRMO.

1830 LV SITE. WORK ON NOTES IN ROOM.

VOID SJC 9/19/01

SCIENTIFIC BINDERY PRODUCTS CHICAGO ILL. MADE IN U.S.A.

Work continued from Page AT SITE: SJC/DW.

AM: SUNNY COOL TO WARM
PM: SUNNY, WARM. LO TO MID 70°F

0630 WAIT FOR TRAFFIC AT GATE.

0700 AT BLDG 1666 — CALIBRATE HORIBA U-22S — LOAD EQUIP INTO CAR & VAN. SORT OUT BOTTLES, ETC AT BLDG 166 — CANT USE CONF ROOM UNTIL AFTER NOON.

0900 MOVE TO 2W MW 21S (PERIMETER ROAD)

0930 START PURGING — WELL MAKE WATER, BUT TURBIDITY KEEPS INCR: SPENT 2 HR ± ON PURGING.

1125 TOOK SAMPLE [2W GW21S-08] ALSO TOOK DUP HERE GWFD-091901-01 — COC NSB 091901-1. AB# 828074027172.

1245 QUICK LUNCH, WENT TO BOC TO GET NITROGEN CYLINDERS. DISCOVERED THAT US ENV. DID NOT GIVE ME REGULATORS. HAD TO CALL AND HAVE THEM SENT.

1330 DUMP WATER AT OT-10 - GO TO BLDG 166. GET BOTTLE SETS FOR 46DS & 47DS.

1500 CALL FED EX, CALL CORY R GAVE HIM PROGRESS

1530 GO TO/SET UP AT 46DS & 47DS. ≈ 1600 START PURGING. BOTH WELLS GO DRY (SEE SLS)

SCIENTIFIC BINDERY PRODUCTION

Work continued to Page 176

SIGNATURE SJ Conti
DATE 9-19-01
DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

1700 GO TO 1606 - PACK SAMPLES, GET ICE
PREPARE FOR FRI.

1745 SDC TAKES SAMPLES TO FED EX - 2 COOLERS
COC # NSB 092001-02 AB#

1810 ARR FED EX.

1900 BACK AT SITE - COMPLETE PAPERWORK.

1930 LV SITE - FINISH WORK IN ROOM.

THURS SUMMARY.

— SAMPLED 5 WELLS 46DS
47DS
4MW01S - DUP
6MW06S - DUP
6MW06D - MS/MSD

— PICKED UP REGULATOR & TUBING

— 2 SHIPMENTS (1 PICK UP & 1 DELIVERED)
4 COOLERS TOTAL.

— AS OF THURS TODAY - 6 WELLS DONE.

		AREA A	DRMO		TOTAL	MISC
9-19-01	W	1	—		1	DUP
9-20-01	Th	3	2		5	2 DUP + MS/MSD
9-21-01	F	1	2		3	PURGED 2/ MS/MSD "A"
9-22-01	Sa	2	2		4	+ RES WELL - PURGED 2
9-23-01	Su	2	2	(17)	4	+ PURGED 4 IN AFT.
9-24-01	M	4	2	(23)	6	
9-25-01	T	1 + 4SW	—		5	
		14 + 4SW + 1 SEED	10		29	TOTAL

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605 MADE IN USA

Work continued from Page AT SITE: SJC/DW TtNUS.

AM: SUNNY TO CLOUDY, WARM
PM: CLOUDY WARM - LT DRIZZLE LATE AFT.

0645 IN TRAFFIC AT BASE - WAITING FOR GUARDS TO CHECK ID

0730 AT BLDG 166. GET BATTERY PACKS. TAKE TB 01

0800 BEGIN TO SAMPLE [46DS & 47DS] (PURGED ON 9/19/01.)

0930 GO GET KEY FROM CARMEN (BLDG 562) FOR BUNKER A-816. PREPARE TO PURGE AT 4MW01S.

1040 START TO SAMPLE @ [4MW01S] ALSO TOOK DUP HERE [GWFD-092001-01]. SJC WENT AFTER MORE TUBING AND PICKED UP REGULATORS FOR THE HYDROGEN.

1230 TOOK LUNCH

1300 BACK ON BASE - DUMP PURGE WATER AT OT-10. DW GET ICE, SJC WENT TO BLDG 166 TO PREPARE SAMPLES TAKEN THIS MORN @ AREA "A". (3 WELLS + DUP)

1400 SAMPLES (COC NSB 092001-1) READY FOR PICKUP. 2 COOLERS AB # 828074027253.

1430
~~1500~~ SJC GO TO DRMO - SET UP ON 6MW6S, 6MW6D - USING QED CONTROLLERS - MP-10. START TO PURGE @ ~~1600~~ 1445.

1525 SAMPLE 6MW6D + MS/MSD

1610 SAMPLE 6MW6S + DUP (GWFD-092001-02) (178)

Work continued to Page 3

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60625 MADE IN USA

SIGNATURE SJ Conti DATE 9-20-01

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

WATERS LEVELS DRND TO TIDE. (DID NOT HAVE WL SHEETS AT THE TIME)

GMW1S	7.96	1710
SG1	5.25	1715
GMW2D	5.83	1720
GMW2S	6.38	1723
GMW6S	8.97	1755
GMW6D	9.18	1753
GMW11S	3.77	1735
GMW11D	2.41	1730
GMW10S	1.87	1742 ← HAD TROUBLE GETTING GOOD READING. W/ M SCOPE.
GMW10D	2.72	1738
GMW9S	4.60	1745

9/21/01
SBC
VOID

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60625 MADE IN USA

TITLE NSB NLON
FRI SEPT 21 2001

PROJECT NO 2863
BOOK NO 1244

Work continued from page AT SITE : SJC / DW TtNUS

AM: CLOUDY W/ RAIN.
PM: BECOMES CLEAR.

1. SAMPLED TWO WELLS AT DRMO (10S & 10D) (SEE COC NSB 092101-01.) (RAINING HARD)

2. SAMPLED (1) WELL 2LGW20S AT AREA A- HAD TO PURGE THIS WELL LONGER DUE TO SOME RAIN WATER THAT ENTERED THE WELL (SEE COC 092101-2)

3 PURGED WELL 2W MW 39 DS LATE IN THE DAY.

4 SJC DELIVERED COOLERS OF SAMPLES TO FED EX FOR SAT DELIVERY. SJC CALLED CHEMTECH TO ALERT THEM.

5 SJC PURGED WELL 2W MW 38 DS- WENT AFTER 15 MIN @ 200 ML/MIN - ONLY 4' OF WATER IN WELL.

Work continued to Page

SIGNATURE SJ Comer | DATE

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

RES. WELL

- SAMPLED FROM TAP AFTER 20 MIN OF FLOW.
- NO AERATOR
- BYPASSED SEDIMENT FILTER.
- WELL IS ≈ 200' DEEP (PER OWNER)
- " " " 15 YRS OLD (PER OWNER)

WE TOOK TOTAL TAL METALS + HARDNESS
DISS METALS.

1400 SJC BACK AT 166 TO FILTER RES SAMPLE.

1500 BEGIN TO PURGE 2MW40DS - WENT DRY AFTER ABOUT 50 MIN @ 200 ML/MIN. DW PURGED 2MW41DS. ALSO WENT DRY.

1700 BACK AT BLDG 166, GET MORE ICE, GET BOTTLE SETS READY FOR SUNDAY.

1800 LV SITE - FINISH PAPERWORK AT MOTEL.

VOID
SJC 9-22-01

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60622 MADE IN USA

TITLE NSB NLON
SAT SEPT 22 2001

PROJECT NO. 2863
BOOK NO. 1244

Work continued from Page AT SITE: SJC/DW TH NUS.

AM: MOSTLY SUNNY WARM.
PM: " " WARMER.

0700 AT SITE - GET BOTTLE SETS.

0730 TAKE TRIP BLANK GO TO DRMO - DAN OPENS GATE. SET UP TO PURGE WELLS 6MW11S & 11D.

0845 SAMPLES WELLS 6MW11S & 11 D USING BLADDER PUMPS & CONTROLLERS.

1015 SJC BEGINS TO PURGE 3MW 37S, WHILE DW SAMPLES 2W MW 39DS. @ 1040 HRS.

1110 SJC SAMPLES 3MW 37S (PERISTALTIC) SJC CALLS MS. PACIOREK ABOUT RES. WELL - SAYS OK TO SAMPLE. I WILL CALL HER WHEN READY TO SAMPLE RETURN TO BLDG 166.

1200 GET, ICE, AND PLACE W/ SAMPLES. MAKE MORE BOTTLE SETS.

1230 LUNCH

1300 CALL MS PACIOREK - WILL GET TO HER RES ABOUT 1300.

1325 - SAMPLE RES WELL RW-092201-01
SEE PG 182. 01-F

Work continued to Page 182

SIGNATURE SJ Conte
DATE 9/22/01
DISCLOSED TO AND UNDERSTOOD BY
DATE
WITNESS
DATE

SUN SUMMARY

1. SAMPLED (4) WELLS 2@DRMO, 2@ AREA A
2. PURGED (4) WELLS AT AREA A.
3. ICED UP SAMPLES THAT ARE AT BLDG 166.

VOID
SJC
9/23/01

SCIENTIFIC BINDERY PRODUCTS CHICAGO MADE IN USA

Work continued from Page AT SITE: SJC / DW & NUS

AM: SUNNY, WARM.
PM: " "

0700 AT SITE - LOAD VEHICLES - GET BATTERY PACKS @ BLG 166. GO TO WELLS 40DS, 41DS (AREA A)

0715 SJC SAMPLES 2WMW 40DS - BUT WENT DRY AFTER ABOUT 3L, WILL HAVE TO GO BACK. DW SAMPLES 41DS AT ABOUT THE SAME TIME.

0830 AT DEMO - SIGN IN (JOE) GO TO 6MW 2S, 2D

0850 START PURGING BOTH WELLS USING BLADDER PUMPS.

0940 SAMPLE 6MW2D, DW SAMPLES 6MW2S AT 0925.

1030 TAKE SAMPLES TO BLDG 166 AND PUT ON ICE. GET SAMPLE SETS READY, UP DATE COC FORMS

1200 LUNCH

1230 AT BLDG 166 - PLACE MORE ICE WITH SAMPLES AND PREPARE TO PURGE WELLS AT AREA "A".

FROM ABOUT 1400 TO 1730 SJC / DW PURGED WELLS 42DS, 43DS, 44DS, 45DS - ALL WELLS WERE PUMPED DRY AFTER ≈ 1HR. SEE LOW FLOW PURGE SHEETS

1730 WENT BACK TO 40DS - BUT STILL WENT DRY BEFORE ALL SAMPLES WERE TAKEN.

1830 AT BLDG 166 - CLEAN OFF EQUIP ETC.

1930 LV SITE.

Work continued to Page

SIGNATURE SJ Conte DATE 9/23/01

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

MON (CONT)

1445 SJC TO BLD 1666 - BEGINS TO PACK SAMPLES
DW FINISHES HIS WELL - GETS ICE.
1500 SJC CALLS FED EX FOR P/U.
1545 SAMPLES READY FOR P/U
1600 GO TO DRMO FOR HI TIDE WL. (SEE WL SHEETS)
1700 RETURN TO 1666 - SAMPLES HAVE BEEN PICKED UP. SECOND AB# FOR TODAY IS 828074027210. CLEAN UP ROOM WE ARE USING AND COMPLETE PAPERWORK.
1800 LV SITE - FINISH NOTES IN MOTEL.

MON SUMMARY:

1. SAMPLED 6 WELLS 4@ "A" 2@ DRMO.
2. TOOK HI TIDE WATER LEVELS @ DRMO.
3. SHIPPED OUT 7 COOLERS TO CHEMTECH.
4. DONE @ DRMO.

SJC 9/24/01
VOID

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60605 MADE IN USA

TITLE NSB NLON
MON SEPT 24 2001

PROJECT NO. 2863
BOOK NO 1244

Work continued from Page AT SITE: SJC/DW T+-NUS.

AM: MOSTLY CLDY. WARM
PM: " " WARM.

0645 AT SITE. GO TO BLDG 166. DW GOES AND OBTAINS REST OF SAMPLE FROM 40DS. SJC BEGINS TO PACK COOLERS AND RE FRESH W/ ICE - PACKS 4 COOLERS - AB# 828074027209 - AND COCS NSB 092201-01 AND NSB 092201-02.

0900 CALL FED EX FOR P/U. TALK TO TO CORY AND DICK C. VIA CONF PHONE- SEEP TO SAMPLE IS THE SEEP APPROX MIDDLE OF DIKE AND IS FLOWING AT A HIGH VOLUME- WILL TRY TO SAMPLE ON TUES.

0915 GO TO DRMO TO SAMPLE IS AND 9S USING BLADDER PUMPS

1035 DW SAMPLES 6MW 1S

1045 SJC " 6MW 9S.

1200 QUICK LUNCH / DW GOES TO 42DS.

1230 TOOK TB 092401-02 GO TO AREA "A"

1245 DW SAMPLES 42DS

1300 SJC " 44DS

1350 DW " 43DS

1400 SJC " 45 DS.

SEE COC NSB 092401-02

Work continued to Page 186

SIGNATURE SJ Conti DATE 9/24/01

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

ITEMS TO DO TUES.:

1. TAKE NITROGEN BACK
2. GET CLEAR STRAPPING TAPE
3. INVENTORY (TRAINING)
4. DO SEEP
5. DO SW (@S6)
6. SAMPLE 38DS.

PU/# 67

9/26/01

AB# 8280740027106 – CHEMTECH (3) Extra Bottles

8280740027139 – TtTech (1) Paperwork

8280740027128 – US ENV. (5) Rental Eq.

VOID
9/26/01

SCIENTIFIC BINDERY PRODUCTS CHICAGO 60601 MADE IN USA

Work continued from page AT SITE: SJC/DW.

AM: CLOUDY - W/ RAIN.
PM: " " "

0650 AT SITE - GO TO BLDG 166 - GET BATTERY GO TO 2WMW38DS TO SAMPLE.

0730 SAMPLED 38DS - THIS WELL WAS PURGED ON 9/21/01 AND STILL ONLY ABLE TO GET ≈ 3 L, ie 1L AMBER FOR TAL SVOC AND TAL METALS (TOT & DISS) WILL GO BACK LATER (ALSO PAHS)

0745 TO 0930 SJC/DW SAMPLED (4) SURFACE WATERS @ SGS 18, 19, 20 & 21

1100 SAMPLED THE SEEP 3MSP01 - AT THE LOCATION BELOW THE CENTER OF THE DIKE WHERE THE FLOW IS QUITE RAPID. WENT TO 166 - ICED ALL SAMPLES

1200 LUNCH - GO GET 3 VOAS 38DS - THEN WENT DRY AGAIN.

1230 GET MORE ICE, DUMP PURGE WATER @ OT-10

1330 BEGIN TO PACK SAMPLES, PREPARED AND SHIPPED 3 COOLERS TO CHEMTECH - SEE COC MSB 092501-01 FOR DETAILS.

1500 CALLED FED EX FOR P/U.

1530 BEGIN TO UNLOAD VEHICLES AND PACK EQUIP.

1700 FEDEX PICKS UP 3 SAMPLE COOLERS.

1800 LV SITE - WRITE UP NOTES, ETC.

Work continued to Page

SIGNATURE S. Conti DATE 9/25/01

DISCLOSED TO AND UNDERSTOOD BY | DATE | WITNESS | DATE

VOID
SJE 9/26/01

SCIENTIFIC BINDERY PRODUCTS CHICAGO 606L MADE IN USA

TITLE NSB NLON
WED SEPT 26 2001

PROJECT NO. 2863
BOOK NO 1244

Work continued from Page AT SITE: SJC/DW Tt-NUS

AM: SUNNY COOL TO WARM
PM: " WARM.

0730 AT SITE (45 MIN TRAFFIC JAM TO GET TO GATE)
GO TO 166 PROCEED TO CLEAN UP AND
PACKAGE EQUIPMENT.

0900 SJC/DW INVENTORY OF "DUNGEON" JUST
UPDATED OLD INVENTORY.

1000 DISCARD ALL GARBAGE, INCLUDING SOME TRASH
FROM THE DUNGEON. DW LEAVES SITE SJC
TO STAY AND FINISH PACKING AND SHIPING.

1200 LUNCH.

1230 TOOK SOME PHOTOS OF SITE - ESP WELL LOCATIONS
AND FLUSH MOUNTS.

1500 FINISH CLEANING UP DUNGEON AND CONF. ROOM

1600 FED EX PICKS UP PACKAGES.

1700 LV SITE

Work continued to Page

SIGNATURE SJ Conti
DATE 9/26/01
DISCLOSED TO AND UNDERSTOOD BY
DATE
WITNESS
DATE

APPENDIX B

ROUND 8 GROUNDWATER LEVEL MEASUREMENT SHEET

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NSB-NLON / Area A
Project No.: CTO 816 # 0502
Location: Groton, CT.
Personnel: SJC & DW
Weather Conditions: SUNNY/HIGH 70's
Measuring Device: m SCOPE
Tidally Influenced: Yes ___ No ___
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
2WMW21S	9/13/01	1535	76.31		5.45		70.86	
2WMW47DS	"	1545	73.39		3.21		70.18	
SG24		15:48	76.68		DRY			TOP OF STAFF OFF ~3'
2LMW20S		15:55	86.83		18.03		68.80	
2WMW46DS		16:18	73.53		2.18		71.35	
SG23		16:20	75.83		DRY			
2WMW45DS		16:03	74.24		3.05		71.19	
SG22		16:05	76.13		DRY			PAINT-LIKE SUBSTANCE ON PIP
2WMW44DS		16:30	73.72		2.59		73.55	
SG21		16:32	75.32		4.24		71.08	TO BOTTOM OF CAP ≈ .08'
2WMW43DS		16:42	74.36		3.30		71.06	
SG20		16:40	75.19		DRY			
2WMW42DS		16:47	73.65		2.83		70.82	
SG19		16:45	75.83		DRY			
2WMW41DS		16:50	73.39		3.14		70.25	
SG18		16:51	75.92		DRY			
2WMW40DS		18:33	73.21		3.91		69.30	
SG17		18:35	73.57		DRY			
4MW1S		18:47	129.55		11.00		118.55	
2WMW39DS		18:20	73.53		3.50		70.03	
2WMW38DS		18:11	74.06		7.77		66.29	
3MW37S		18:03	47.26		3.84		43.42	
SG6								
SG15		18:13	74.03		DRY			
SG16		18:22	73.50		DRY			

* All measurements to the nearest 0.01 foot

APPENDIX C

ROUND 8 MONITORING INSTRUMENT CALIBRATION LOGS

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSBNLON

INSTRUMENT NAME/MODEL: TURBIDITY METER - 2020

SITE NAME: Groton CT.

MANUFACTURER: LAMOTTE.

PROJECT No.: CTO 816

SERIAL NUMBER: 1728-1600

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments	
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration			
9/19/01	1728-1600	SJC	AS PER MANUFACTURER.				NA	1 = 1.1	10 = 10
9/20/01	"	"			"		"	1 = 1.0	10 = 10
9/21/01	"	"			"			"	"
9/22/01	"	"			"			"	"
9/23/01	"	"			"			"	"
9/24/01	"	"			"			"	"
9/25/01	"	"			"			"	"

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSBNLON

INSTRUMENT NAME/MODEL: TURBIDITY METER 2020

SITE NAME: Groton CT.

MANUFACTURER: LAMOTTE

PROJECT No.: CTO 816

SERIAL NUMBER: 1758 - 1800

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments	
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration			
9/19/01	1758-1800	SJC	AS PER MANUFACTURER				NA	1=1	10=10
9/20/01	"	"		"			"	"	"
9/21/01	"	"		"			"	"	"
9/22/01	"	"		"			"	"	"
9/23/01	"	"		"			"	"	"
9/24/01	"	"		"			"	"	"
9/25/01	"	"		"			"	"	"

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSBNLON

INSTRUMENT NAME/MODEL: HORIBA - U22

SITE NAME: Groton CT.

MANUFACTURER: HORIBA

PROJECT No.: CTO 816

SERIAL NUMBER: T-0062021

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
9/19/01	T-0062021	SJC	AS PER MANUFACTURER				AUTO	pH = 4.00 SC = 4.49
9/20/01	"	"			"		"	" "
9/21/01	"	"			"		"	" "
9/22/01	"	"			"		"	" "
9/23/01	"	"			"		"	pH = 3.98 SC = 4.49
9/24/01	"	"			"		"	pH = 4.00 "
9/25/01	"	"			"		"	" "

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSBNLON

SITE NAME: Groton CT.

PROJECT No.: CTO 816

INSTRUMENT NAME/MODEL: HORIBA- U-22

MANUFACTURER: HORIBA.

SERIAL NUMBER: 9012039

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
9/19/01	9012039	STC	AS	PER MANUFACTURER			AUTO	pH=3.99, SC=4.49
9/20/01	"	"		"				pH=4.00, " "
9/21/01	"	"		"				pH=3.98 SC=4.48
9/22/01	"	"		"				pH=4.00 SC=4.49
9/23/01	"	"		"				" "
9/24/01	"	"		"				" "
9/25/01	"	"		"				" "

APPENDIX D

ROUNDS 5-8 GROUNDWATER SAMPLE LOGSHEETS AND LOW-FLOW PURGE DATA SHEETS

TABLE D-1

SUMMARY OF GROUNDWATER/SURFACE WATER FIELD PARAMETERS
AREA A LANDFILL GROUNDWATER MONITORING PROGRAM ROUNDS 1 THROUGH 8
NSB-NLON, GROTON, CONNECTICUT

WELL	Round	DATE	pH Standard	SC mS/cm	Temp Degree C	Turb. NTU	DO mg/L	Eh mV	Salinity ppt
4MW1S	1	10/27/1999	5.69	0.293	13.70	0.1	1.37	124	0.14
(UG)	2	1/23/2000	5.70	0.234	8.10	0	1.08	219	0.11
	3	4/8/2000	5.65	0.418	10.20	0	0.06	180	0.20
	4	7/6/2000	5.53	0.35	14.00	0	6.17	214	0.0
	5	12/16/2000	5.80	0.27	10.40	2.8	6.54	66.7	--
	6	3/11/2001	5.38	0.624	7.72	0.02	9.87	195	0.31
	7	6/25/2001	5.61	0.217	12.09	0.02	8.33	--	--
	8	9/20/2001	5.70	0.339	15.30	0	6.13	175	0.0
2LMW20S	1	10/24/1999	6.09	0.568	15.70	0	1.37	32	0.28
(UG)	2	1/22/2000	6.42	0.394	8.80	0.5	2.19	-7	0.19
	3	4/8/2000	6.31	0.439	12.30	3.1	0.02	28	0.21
	4	7/6/2000	6.16	0.503	16.00	2.2	0.99	-18	0.0
	5	12/16/2000	6.23	0.552	12.75	1.59	3.87	-98.5	--
	6	3/12/2001	12.31	0.515	9.90	3.6	0.73	27	0.25
	7	6/24/2001	6.48	0.359	15.19	0.98	6.2	--	--
	8	9/21/2001	6.34	0.431	17.80	7.2	5.01	-114	0.0
2WMW21S	1	10/25/1999	6.72	30.27	13.50	190	5.78	-333	18.79
(REF)	2	1/23/2000	6.84	34.25	7.60	3.2	3.48	-338	21.3
	3	4/8/2000	6.62	34.2	12.10	41	4.49	-366	21.46
	4	7/5/2000	6.91	32.3	15.40	40	0.26	-404	20.0
	5	12/14/2000	6.95	3.38	8.09	19.3	9.85	-310	--
	6	3/8/2001	6.14	4.585	3.38	1.7	1.18	-234	2.4
	7	6/23/2001	6.69	25.575	14.14	45	8.15	--	--
	8	9/19/2001	6.99	28.2	15.20	100	3.32	-390	17.0
3MW37S	1	10/28/1999	6.10	0.581	12.70	5.8	2.08	60	0.28
(DG)	2	1/22/2000	6.22	0.841	4.80	0.5	1.67	55	0.41
	3	4/9/2000	6.21	0.824	7.60	2.4	--	68	0.41
	4	7/20/2000	6.12	0.664	16.50	1.9	1.19	50	0.00
	5	12/18/2000	6.12	0.76	9.12	0.8	2.49	25.5	--
	6	3/12/2001	5.99	2.455	6.11	0.01	4.31	70	1.25
	7	6/19/2001	6.03	1.355	15.36	1.4	0.7	70.9	--
	8	9/22/2001	6.11	0.932	16.12	2.5	3.78	-31	0.0
2WMW38DS	1	10/26/1999	6.83	1.13	14.80	6.8	2.48	199	0.57
(DG)	2	1/21/2000	7.10	0.811	8.60	4.3	4.4	47	0.39
	3	4/7/2000	7.13	1.22	9.10	4.1	3.93	39	0.61
	4	7/20/2000	6.80	1.29	14.70	1.27	2.14	-126	0.10
	5	12/15/2000	6.84	1.11	11.85	12	2.94	-49.6	--
	6	3/12/2001	6.75	0.874	6.80	1.8	3.34	118.2	0.43
	7	6/21/2001	--	--	--	--	--	--	--
	8	9/25/2001	6.69	0.521	15.85	4.64	4.67	-99	0.0
2WMW39DS	1	10/27/1999	6.82	4.4	13.60	112	2.03	-125	2.47
(DG)	2	1/21/2000	7.02	6.45	8.40	4.7	0	-206	3.52
	3	4/6/2000	6.94	5.97	9.20	12	0.13	-110	3.24
	4	7/19/2000	6.85	4.69	13.10	11.5	0.7	-133	0.20
	5	12/13/2000	6.94	3.43	10.91	19	0.6	75.5	--
	6	3/8/2001	6.76	4.32	8.40	37	0.95	-110	2.3
	7	6/19/2001	6.67	1.50	15.10	8.1	0.6	--	--
	8	9/22/2001	6.83	3.43	12.40	32	5.94	-152	2.0
2WMW40DS	1	10/25/1999	7.14	19.23	13.80	11	3.29	-324	11.48
(DG)	2	1/21/2000	7.11	26.2	9.40	42	0.16	-328	15.98
	3	4/7/2000	6.95	25.33	8.90	51	0	-319	15.35
	4	7/20/2000	7.13	35.5	13.86	10.66	0.64	-324	2.30
	5	12/14/2000	7.11	2.52	11.64	8.35	40.31	-320	--
	6	3/9/2001	6.86	20.48	8.30	10.6	0.61	-320.5	12.25
	7	6/19/2001	6.89	12.53	11.32	2.99	0.74	-333.6	--
	8	9/23/2001	7.13	27.9	12.77	8.21	3.36	-372	17.0

TABLE D-1

SUMMARY OF GROUNDWATER/SURFACE WATER FIELD PARAMETERS
AREA A LANDFILL GROUNDWATER MONITORING PROGRAM ROUNDS 1 THROUGH 8
NSB-NLON, GROTON, CONNECTICUT

WELL	Round	DATE	pH Standard	SC mS/cm	Temp Degree C	Turb. NTU	DO mg/L	Eh mV	Salinity ppt
2WMW41DS	1	10/28/1999	6.88	31.86	12.20	14	8.94	-292	19.82
(DG)	2	1/21/2000	6.86	27.73	9.70	32	4.02	-326	17.07
	3	4/7/2000	6.55	27.06	9.10	23	17.06	-325	16.59
	4	7/20/2000	6.93	27.4	13.40	6.4	0.24	-349	17.00
	5	12/14/2000	7.01	2.78	10.80	10.9	40.47	-331	--
	6	3/9/2001	6.56	21.88	8.60	2.9	2.93	-323.5	13.01
	7	6/20/2001	7.03	21.40	19.72	34	7.77	-313.7	--
	8	9/23/2001	7.08	28.2	12.70	6	4.64	-371	17.0
2WMW42DS	1	10/28/1999	6.97	32.56	12.10	142	9.65	-339	20.39
(DG)	2	1/21/2000	6.96	28.94	8.60	22	2.04	-328	19.21
	3	4/6/2000	6.67	29.97	9.10	25	26.81	-338	18.49
	4	7/20/2000	7.09	31.3	12.20	20	0.31	-351	19.00
	5	12/13/2000	6.85	2.96	10.70	55	3.04	-327	--
	6	3/8/2001	6.71	26.7	8.26	32	0.08	-340	16.06
	7	6/20/2001	6.86	11.86	14.65	63.2	2.39	--	--
	8	9/24/2001	7.15	29.1	13.20	23	4.4	-373	18.0
2WMW43DS	1	10/27/1999	6.52	36.5	12.30	109	8.29	-345	23.06
(DG)	2	1/22/2000	6.69	38.66	7.40	90.2	6.3	-320	24.34
	3	4/8/2000	6.46	38.31	10.60	133	11.76	-355	24.31
	4	7/21/2000	6.85	40.6	11.70	50.2	0.28	-371	26.00
	5	12/14/2000	6.60	3.68	10.35	65	4.65	-360	--
	6	3/13/2001	6.27	33.31	8.70	32	7.18	-346	20.74
	7	6/20/2001	6.89	20.29	12.87	5.5	2.88	--	--
	8	9/23/2001	6.96	38.6	13.70	25.4	4.13	-390	25.0
2WMW44DS	1	10/28/1999	6.96	18.73	12.90	145	13.21	-307	11.04
(DG)	2	--	--	--	--	--	--	--	--
	3	4/9/2000	6.85	20.49	11.80	238	1.52	-329	12.26
	4	7/20/2000	7.15	22.2	12.20	49	0.8	-325	13.00
	5	12/15/2000	7.19	1.9	9.90	28.5	13.75	-306.5	--
	6	3/9/2001	6.65	18.25	10.30	34	0.25	-324	10.84
	7	6/22/2001	6.92	27.88	15.74	4.3	5.87	--	--
	8	9/24/2001	7.22	23.9	13.97	39.3	3.11	-346	14.0
2WMW45DS	1	10/26/1999	6.79	42.12	11.30	17	6.22	-321	26.43
(DG)	2	1/23/2000	6.85	39.68	8.10	6.2	5.17	-340	24.93
	3	4/8/2000	6.91	36.19	9.70	12.5	0.95	-350	22.49
	4	7/20/2000	7.03	37.5	11.30	25.7	0.26	-382	23.00
	5	12/15/2000	6.98	3.9	10.61	16.8	40.38	-351.4	--
	6	3/11/2001	6.55	39.59	9.30	33	2.82	-359	25.4
	7	6/20/2001	7.02	18.01	18.33	35	5.68	-324.9	--
	8	9/24/2001	7.05	34.8	13.07	11.4	2.61	-392	22.0
2WMW46DS	1	10/26/1999	6.83	41.17	11.30	223	3.97	-331	26.30
(DG)	2	1/24/2000	7.12	41.45	7.40	67	2.76	-328	26.28
	3	4/7/2000	6.82	42.15	9.20	71	6.94	-366	26.89
	4	7/20/2000	7.28	44.5	15.10	42.4	0.2	-363	28.00
	5	12/15/2000	7.00	4.05	9.40	45	2.24	-370	--
	6	3/11/2001	6.65	37.46	8.30	33	6.84	-357	23.59
	7	6/21/2001	6.94	29.67	14.38	4.7	2.94	--	--
	8	9/20/2001	7.26	51.7	12.69	42	2.23	-378	33.0
2WMW47DS	1	10/25/1999	6.45	7.18	13.20	19	0.6	-187	3.97
(DG)	2	1/24/2000	6.62	7.34	6.50	52	0.76	-308	4.03
	3	4/6/2000	6.76	6.15	10.00	46	0.22	-230	3.31
	4	7/18/2000	6.60	11.6	17.70	101	0.24	-451	7.00
	5	12/14/2000	6.40	9.25	7.56	85	12.22	-233	--
	6	3/9/2001	6.36	19.57	8.20	260	5.49	-379	11.46
	7	6/23/2001	6.68	5.43	14.95	29	2.89	-236.9	--
	8	9/20/2001	6.94	23.9	13.90	35	4.6	-335	15.0

TABLE D-1

SUMMARY OF GROUNDWATER/SURFACE WATER FIELD PARAMETERS
AREA A LANDFILL GROUNDWATER MONITORING PROGRAM ROUNDS 1 THROUGH 8
NSB-NLON, GROTON, CONNECTICUT

WELL	Round	DATE	pH Standard	SC mS/cm	Temp Degree C	Turb. NTU	DO mg/L	Eh mV	Salinity ppt
3MSP01	1	10/24/1999	6.57	0.371	14.00	12.5	7.25	184	0.18
(SP)	2	--	--	--	--	--	--	--	--
	3	--	--	--	--	--	--	--	--
	4	7/22/2000	6.12	1.04	12.50	4.9	6.88	-53	0.00
	5	12/16/2000	6.78	0.926	13.87	26	8.06	-122	--
	6	3/13/2001	6.52	0.172	3.50	42	14.27	66	0.08
	7	6/19/2001	6.50	0.491	16.16	11	7	50.5	--
	8	9/25/2001	6.38	0.843	18.40	5.64	8.9	-62	0.0
SG18	1	10/27/1999	6.45	0.639	10.10	6.1	3.81	-24	0.31
(DG)	2	--	--	--	--	--	--	--	--
	3	4/5/2000	7.70	0.442	9.00	5.3	1.89	-221	0.21
	4	7/18/2000	6.64	0.734	19.00	18	1.18	-161	0.00
	5	12/18/2000	7.34	0.332	3.88	11	3.65	-53.7	--
	6	3/13/2001	6.57	0.285	1.00	11	12.41	104	0.13
	7	6/20/2001	7.87	0.309	24.33	89	6.49	-79.8	--
	8	9/25/2001	6.35	0.405	19.00	159	7.22	-88	0.0
SG19	1	10/27/1999	6.62	0.628	10.50	6.2	5.05	23.3	0.31
(DG)	2	--	--	--	--	--	--	--	--
	3	4/5/2000	8.11	0.536	9.70	22	2.04	-219	0.26
	4	7/19/2000	6.56	1.26	18.50	6.6	0.7	-192	0.10
	5	12/19/2000	6.81	0.395	2.83	8.4	1.01	126	--
	6	3/12/2001	6.56	0.389	2.80	2.9	8.59	-66	0.19
	7	6/22/2001	6.51	0.236	20.07	5.8	4.56	31.6	--
	8	9/25/2001	6.16	0.583	20.10	28	7.67	-61	0.0
SG20	1	10/27/1999	6.63	0.624	11.00	6.3	4.95	7.4	0.31
(DG)	2	--	--	--	--	--	--	--	--
	3	4/4/2000	6.96	0.36	11.80	7.1	6.61	163	0.17
	4	7/19/2000	6.28	0.422	18.00	6.3	0.57	-101	0.00
	5	12/19/2000	6.98	0.267	1.99	7.3	3.44	-17.2	--
	6	3/13/2001	6.67	0.38	1.70	12	7.29	39	0.18
	7	6/22/2001	6.55	0.231	20.23	7.2	6.21	13.6	--
	8	9/25/2001	6.18	0.302	21.00	17.8	6.92	-13	0.0
SG21	1	10/24/1999	6.68	0.568	9.40	6.3	1.8	46	0.28
(DG)	2	--	--	--	--	--	--	--	--
	3	4/4/2000	7.74	0.401	12.10	7	7.68	145	0.19
	4	7/19/2000	6.65	0.599	17.90	14.9	0.43	-172	0.00
	5	12/19/2000	6.53	0.253	2.33	6.1	2.29	-26.4	--
	6	3/11/2001	7.15	0.097	1.20	4.7	11.25	5	0.05
	7	6/24/2001	7.46	0.335	23.69	--	9.7	-9.5	--
	8	9/25/2001	6.44	0.494	20.60	15.2	6.62	-81	0.0
SG22	1	10/27/1999	6.39	0.559	14.00	30.2	4.35	-50	0.27
(DG)	2	--	--	--	--	--	--	--	--
	3	4/5/2000	6.90	0.36	8.60	10.3	0.65	-57	0.17
	4	--	--	--	--	--	--	--	--
	5	12/19/2000	6.69	0.258	3.68	7	1.96	-10.5	--
	6	3/11/2001	7.03	0.491	3.50	10	1.27	-68	0.24
	7	6/25/2001	6.80	0.430	14.83	--	3.16	-102.7	--
	8	9/25/2001	dry	--	--	--	--	--	--
SG23	1	10/27/1999	6.16	0.5	11.00	6.8	4.01	-19	0.24
(DG)	2	--	--	--	--	--	--	--	--
	3	4/6/2000	7.84	0.617	6.00	6.3	5.61	-246	0.30
	4	7/18/2000	6.12	0.65	16.70	13.2	0.79	-82	0.00
	5	12/19/2000	6.57	0.055	2.57	0	4.67	-0.6	--
	6	3/11/2001	8.03	0.069	0.80	5	6.28	-45	0.03
	7	6/21/2001	7.82	0.368	20.09	5.2	5.25	-95.6	--
	8	9/25/2001	dry	--	--	--	--	--	--

TABLE D-1

SUMMARY OF GROUNDWATER/SURFACE WATER FIELD PARAMETERS
AREA A LANDFILL GROUNDWATER MONITORING PROGRAM ROUNDS 1 THROUGH 8
NSB-NLON, GROTON, CONNECTICUT

WELL	Round	DATE	pH Standard	SC mS/cm	Temp Degree C	Turb. NTU	DO mg/L	Eh mV	Salinity ppt
SG24	1	10/27/1999	7.32	0.403	12.70	3.9	6.46	-29	0.19
(DG)	2	--	--	--	--	--	--	--	--
	3	4/5/2000	6.80	4.5	13.70	10.1	1.12	-176	2.54
	4	--	--	--	--	--	--	--	--
	5	12/18/2000	9.29	0.371	3.22	4.88	9.68	-211	--
	6	3/13/2001	7.55	0.037	0.50	6.4	14.47	89	0.02
	7	6/25/2001	6.56	0.253	24.80	--	3.22	-11.8	--
	8	9/25/2001	dry	--	--	--	--	--	--

DG = Downgradient Location
UG = Upgradient Location
REF = Reference Location
SP = Seep Location
MW = Monitoring Well
SG = Staff Gauge
Shaded numbers are suspect results.
Staff Gauges SG-15, SG-16, and SG-17 were dry during Rounds 1 through 8.
Locations marked with -- were either not sampled or had an instrument error.

ROUND 5

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2LGW20S- GW-05
Sample Location: 2LMW20S
Sampled By: RD Munson
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 12-16-05	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 1125								
Method: Peristaltic Pump	Clear	6.23	0.552	12.75	1.59	3.87	-98.5	—

PURGE DATA:

Date: 12-16-05
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 18.85
Static Water Level (WL): 16.58
One Casing Volume(gal): 0.37
Start Purge (hrs): 1030
End Purge (hrs): 1120
Total Purge Time (min): 50
Total Vol. Purged (gal): 2.1

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	7 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	3 Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 Qt. Amber Glass	✓
TCL PAH	4° C	2 Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	2 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	2 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	4 - ~~60~~ mL Glass VIAL	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	2 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	2 L PE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s): RD Munson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2LMW20S

PROJECT: NSB- NLON
PROJECT NUMBER: CTO 203 5082
SITE: AREA A

DATE: 12.16.00
WEATHER: Overcast breezy cold
PERSONNEL: RD Munson

Well Screen Depth: _____ / _____ ft.
Initial Water Level: 16.58 @ _____ hrs.
Pump Type/Material: _____
Pump Intake Depth: _____

Tide Cycle: ☐ High @ _____ ☐ Low @ _____ ☐ Not Affected

Total Purge Volume= 7.1 (gal / L) **Total Purge Time=** 50 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1030	16.58	—	—	—	—	—	—	—	—	—	—	start purge
1035	16.65	900	90		12.39	6.35	1.13	6.88	247		-105.6	cloudy
1040	16.67	1700	80		12.60	6.30	0.926	4.84	144		-104.1	
1045	16.68	2500	80		12.72	6.27	0.783	4.31	60.9		-104.6	
1050	16.67	3300	80		12.74	6.26	0.706	4.09	23.6		-105.4	
1055	16.69	4100	80		12.62	6.25	0.643	4.28	10.53		-104.4	
1100	16.68	4900	80		12.75	6.24	0.607	3.71	5.63		-102.9	
1105	16.68	5700	80		12.63	6.24	0.585	4.05	3.25		-101.6	
1110	16.68	6500	80		12.65	6.23	0.569	3.96	2.71		-100.3	
1115	16.68	7300	80		12.71	6.23	0.558	3.84	1.94		-99.3	
1120	16.68	8100	80		12.75	6.23	0.552	3.87	1.59		-98.5	End purge
	Sample 1125-1408 MS/MSD											

Water Quality Meter (S/N): _____
Control Box Type (S/N): _____

Notes: _____

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW21S -- ~~GW-05~~
Sample Location: Area A
Sampled By: R D Munson
C.O.C. No.: ~~A-13300(c)~~
Type of Sample: A-21300
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 12-14-00								
Time: ~~NED~~ 940								
Method: Peristaltic Pump	Clear	6.95	3.38	8.09	19.3	4.85	-310	—

PURGE DATA:

Date: 12-14-00
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material Type: 2" PVC
Total Well Depth (TD): 17.30
Static Water Level (WL): 4.28
One Casing Volume(gal): 2.12
Start Purge (hrs): 0810
End Purge (hrs): 0940
Total Purge Time (min): 90
Total Vol. Purged (gal): 2.25

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	2 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - 1000ml Qt. Amber Glass	✓
TCL PAH	4° C	~~1~~ 2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 - 500 ml L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 x 40 ml Vial ~~60 mL~~ Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 1000 ml L PE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): R D Munson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW 21S

PROJECT: NSB-NLON / AREA A
PROJECT NUMBER: CTO 203-5082
SITE: AREA A

DATE: 12-14-00
WEATHER: RAIN - COLD
PERSONNEL: RD MUNSON

Well Screen Depth: _____ / _____ ft.
Initial Water Level: 4.28 @ 0800 hrs.

Pump Type/Material: _____
Pump Intake Depth: _____

Tide Cycle: ☐ High @ _____ ☐ Low @ _____ ☐ Not Affected

Total Purge Volume= _____ (gal / L) **Total Purge Time=** _____ (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
0810	4.78	90	90		8.00	7.12	4.40	4.92	7.33		-319.5	Sulfur odor DIaJc fine
0820	5.45	990	90		7.55	7.12	4.31	4.16	3.37		-324.4	
0830	5.52	1890	90		7.93	7.11	4.23	3.90	2.20		-322.0	
0840	5.70	2840	95		8.22	7.09	4.15	3.60	3.14		-39.8	
0850	5.83	3790	95		8.17	7.08	4.02	3.71	2.93		-317.3	
0900	5.85	4740	95		7.95	7.04	3.89	3.94	2.57		-314.1	
0910	5.86	5690	95		7.94	7.01	3.73	4.02	2.78		-311.7	
0920	5.87	6640	95		8.11	6.98	3.59	4.40	5.34		-310.3	
0930	5.87	7590	95		8.02	6.97	3.50	4.60	11.2		-309.9	
0940	5.96	8540	95		8.09	6.95	3.38	4.85	19.3		-310.7	
	Purging completed, begin sampling											
1113	Sample completed											
↳	5.70											

Water Quality Meter (S/N): _____
Control Box Type (S/N): _____
Turbidimeter (S/N): _____

Notes: _____

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 3-GW37S-GW-05
Sample Location: 3MW37S
Sampled By: RD Munson
C.O.C. No.: A-121800
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 12.18.00	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 1330								
Method: Peristaltic Pump	Clear	6.12	0.760	9.12	0.80	2.49	25.5	—

PURGE DATA:

Date: 12.18.00
Method: Peristaltic Pump
Monitor Reading (ppm): →
Well Casing Diameter & Material Type: 2" PVC
Total Well Depth (TD): 8.45
Static Water Level (WL): 3.47
One Casing Volume(gal): 0.81
Start Purge (hrs): 1240
End Purge (hrs): 1330
Total Purge Time (min): 50
Total Vol. Purged (gal): 2.64

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	40 ml Vial	3
TCL SEMIVOLATILES	4° C	Qt. Amber Glass	2
TCL PEST/PCBs	4° C	Qt. Amber Glass	1
TCL PAH	4° C	Qt. Amber Glass	2
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	L PE	1
TAL METALS (DISSOLVED)	HNO_3 / 4° C	L PE	1
Total Organic Carbon (TOC)	HCL / 4° C	3 40ml ~~60 mL Glass~~ vial	3
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	250 mL PE	1
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 1,000 ml L PE	1

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): RD Munson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** Well No.: 3MW37S

PROJECT: NSB- New London
PROJECT NUMBER: 203-5082
SITE: Area A

DATE: 12.18.00
WEATHER: Clear-Windy, cold
PERSONNEL: RD Munson

Well Screen Depth: ____ / ____ ft.
Initial Water Level: 3.47 @ 1231 hrs.
Pump Type/Material:
Pump Intake Depth:
Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☐ Not Affected
Total Purge Volume= 2.64 (gal / L)
Total Purge Time= 50 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
					—	—	—	—	—	—	—	Begin Purge
1237		~~10~~	100	—	8.50	6.28	0.765	5.51	7.3	—	34.6	MW fines
1240	3.82	900	90		8.79	6.24	0.761	4.44	4.2	—	32.1	
1245	3.82	1800	90		8.78	6.23	0.759	4.25	2.5	—	31.1	
1250	3.82	2700	90		8.96	6.22	0.759	4.24	2.9		30.0	
1255	3.82	3600	90		9.23	6.20	0.749	3.81	7.1		29.0	
1300	3.82	4500	90		9.22	6.18	0.734	3.34	1.6		28.2	
1305	3.83	5400	90		9.18	6.15	0.724	2.91	1.5		27.2	
1310	3.84	6400	100		9.13	6.14	0.726	2.67	1.0		26.6	
1315	3.83	7300	90		9.30	6.13	0.734	2.34	0.95		26.3	
1320	3.83	8200	90		9.12	6.13	0.746	2.52	0.85		25.8	
1325 ~~1330~~	3.83	9100	90		9.12	6.12	0.760	2.49	0.80		25.5	
1330	3.82	10000	90									
	1330 Begin sample											
	1500 Sample completed											

Notes:

Water Quality Meter (S/N):
Control Box Type (S/N):
Turbidimeter (S/N):

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W4W38D5-05 ~~GW-05~~
Sample Location: 2W4W38D5
Sampled By: FCW
C.O.C. No.: A-121500
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 12-15-00	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 1620								
Method: Peristaltic Pump	Clear	6.84	1.11	11.85	12	2.44	-476	—

PURGE DATA:

Date: 12-12-00
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 12.51
Static Water Level (WL): 7.19
One Casing Volume(gal): 0.8
Start Purge (hrs): 0716
End Purge (hrs): 0753
Total Purge Time (min): 37
Total Vol. Purged (gal): 1.3

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3x 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	1 Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	— L PE	
Total Organic Carbon (TOC)	HCL / 4° C	2x 40 ~~50~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	— 250 mL PE	
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

Well dry will sample @ later date 10 bottles
Sample 12-15-00
Return on 12-17-00 to finish

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** Well No.: 2WMW38DS

PROJECT: NSB NLON
PROJECT NUMBER: CTO 203
SITE: AREA A

DATE: 12-12-00
WEATHER: OVERCAST
PERSONNEL: F. WUDKWYCH

Well Screen Depth: — / — ft.
Initial Water Level: — @ — hrs.

Pump Type/Material: Peristaltic
Pump Intake Depth: Bottom

Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☑ Not Affected

Total Purge Volume= 1.3 (gal/L) Total Purge Time= 37 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
0716	7.19			Na								START PURGING
0722	7.79		100		11.58	7.05	0.956	5.42	7.7	0	85.4	
0730	8.60		130		11.72	6.88	0.953	4.92	5.7	0	81.6	
0738	9.71		140		11.74	6.85	0.992	3.03	4.9	0	77.5	
0746	10.67		145		11.83	6.86	1.06	2.14	4.0	0	60.8	
0753	11.54		145		11.75	6.84	1.11	2.94	12	0	-49.6	well going dry will sample at later date

Water Quality Meter (S/N):
Control Box Type (S/N):
Turbidimeter (S/N):

Notes:

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW39D5- GW-05
Sample Location: AREA A
Sampled By: R D Munson
C.O.C. No.: A- 121300
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 12·13·00								
Time: 1325								
Method: Peristaltic Pump		6.94	3.43	10.91	~~0.6~~ 19 (RN)	0.6	73.5	—

PURGE DATA:

Date: 12 12 · 00
Method: Peristaltic Pump
Monitor Reading (ppm): –
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.70
Static Water Level (WL): 3.55
One Casing Volume(gal):
Start Purge (hrs): 0733
End Purge (hrs): 0858
Total Purge Time (min): 85
Total Vol. Purged (gal): 3.32

Round 5

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	3
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	2
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	1
TCL PAH	4° C	2 - Qt. Amber Glass	2
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 - LPE 500 mL	1
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - LPE 500 ml	1
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 ml Vial ~~60 mL Glass~~	2
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	1
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml L PE	1

OBSERVATIONS / NOTES:

Pumped well dry - will sample on 12·13·00 if well has recharged enough.

WL = 3.98 on 12·13·00

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): RDMunson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW39DS

PROJECT: NSB - NLON
PROJECT NUMBER: CTO 203 5082
SITE: AREA A

DATE: 12.12.00
WEATHER: OVCST - Windy ocnl Rain, Cold
PERSONNEL: R D MUNSON

Well Screen Depth: ____ / ____ ft.
Initial Water Level: ____ @ ____ hrs.
Pump Type/Material: ____
Pump Intake Depth: ____
Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☐ Not Affected
Total Purge Volume= 3.32 (gal / L) **Total Purge Time=** 85 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
0733	5.17	150	150		10.53	6.81	3.12	1.21	33.3	~~43.6~~	-43.6	
0738	6.27	900	150		10.28	6.80	2.72	0.61	24.3	—	-44.2	
0743	6.67	1650	150		9.95	6.74	1.89	0.50	28.4	—	-25.0	
0748	7.08	2350	140		9.90	6.70	1.71	0.44	33.5	—	-11.5	
0753	7.63	3100	150		9.97	6.69	1.67	0.39	29.8	—	-5.7	
10min ⇒ 0758	8.24	3800	140		10.05	6.67	1.63	0.36	27.4	—	-3.4	Switch to 10min INT.
0808	9.47	5200	140		10.14	6.67	1.59	0.33	27.0	—	-8.3	
0818	10.56	6600	140		10.21	6.69	1.49	0.37	13.8	—	-33.3	
0828	11.83	8100	150		10.42	6.72	1.75	0.41	9.92	—	-53.2	
0838	12.99	9600	150		10.59	6.76	2.29	0.42	9.51	—	-62.0	
0848	14.38	11100	150		10.84	6.84	3.08	0.42	10.79	—	-70.6	
0858	15.58	12600	150		10.91	6.94	3.43	0.60	19.0	—	75.5	Dry
12-13-00 1322	3.98											Sample
1437												Sample done

Water Quality Meter (S/N): ____
Control Box Type (S/N): ____
Turbidimeter (S/N): 0357-4197
Notes: ____

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW40DS GW-05
Sample Location: Area A
Sampled By: RD/MWSON
C.O.C. No.: A-121400
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 12-14-00	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 1340								
Method: Peristaltic Pump	Clear	7.11	252	11.64	8.35	4.31	-320	—

PURGE DATA:

Date: 12-12-00
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material Type: 2" PVC
Total Well Depth (TD): 17.38
Static Water Level (WL): 3.43
One Casing Volume(gal): 2.28
Start Purge (hrs): 0940
End Purge (hrs): 1055
Total Purge Time (min): 75
Total Vol. Purged (gal): 2.77

Round 5

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 – 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 – Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 – Qt. Amber Glass	✓
TCL PAH	4° C	2 – Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 - 500 ml L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 ml Vial 60 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 – 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 – 1000 ml L PE	✓

OBSERVATIONS / NOTES:

Purged dry on 12-12-00. Will sample when well has sufficiently recharged

WL 7.14 12-14-00 1340

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s): RDMunson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW 40 DS-05

PROJECT: NSB-NLON / AREA A - Rounds
PROJECT NUMBER: CTO 203 5082
SITE: AREA A

DATE: 12.12.00
WEATHER: Sunny - Windy - Cool
PERSONNEL: RD Munson

Well Screen Depth: / ft.
Initial Water Level: @ hrs.
Pump Type/Material:
Pump Intake Depth:
Tide Cycle: ☐ High @ ☐ Low @ ☐ Not Affected
Total Purge Volume= 2.77 (gal / L) **Total Purge Time=** 75 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh ORP mV	Comments
0940	4.64	140	140		10.55	7.10	3.06	11.61	3.81		-309.5	strong sulfur odor
0945	5.57	840	140		10.66	7.10	3.01	17.80	3.41		-312.1	Black fines
0950	6.43	1540	140		10.78	7.10	2.93	22.93	5.53		-312.7	
0955	7.04	2190	130		10.85	7.11	2.75	26.78	3.57		-314.1	
1000	7.59	2890	140		10.89	7.11	2.63	29.12	5.50		-324.3	
1005	8.32	3590	140		11.09	7.13	2.45	30.90	4.77		-329.0	
1010	8.89	4290	140		11.18	7.14	2.31	32.15	4.41		-331.3	
1015	9.41	4990	140		11.20	7.16	2.17	33.20	4.27		-330.5	
1020	10.10	5690	140		11.28	7.18	2.06	34.10	4.42		-330.7	
10min → 1030	11.41	7090	140		11.16	7.16	1.99	36.16	4.41		-328.0	Pumping interrupt
1040	12.83	8390	130		11.35	7.13	2.14	37.90	5.46		-327.5	
1050	14.62	9790	140		11.47	7.10	2.41	39.48	8.35		-327.7	
1055	15.35	10490	140		11.64	7.11	2.52	40.31	—		-320.6	Dry
12.14.00 → 1340	7.14	Start sampling										
1520	Finish sampling											

Notes:

Water Quality Meter (S/N):
Control Box Type (S/N):
Turbidimeter (S/N): 0357-4197

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW41DS GW-05
Sample Location: Area A
Sampled By: RD/Hudson
C.O.C. No.: A-121400
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 12-14-00								
Time: 1540								
Method: Peristaltic Pump	clear	7.01	2.78	10.80	10.9	46.97	-351	—

PURGE DATA:

Date: 12-12-00	Round 5
Method: Peristaltic Pump	
Monitor Reading (ppm): —	See Attached Low Flow Purge Data Sheet for Purge Data
Well Casing Diameter & Material Type: 2" PVC	
Total Well Depth (TD): 16.65	
Static Water Level (WL): 2.67	
One Casing Volume(gal): 2.28	
Start Purge (hrs): 1309	
End Purge (hrs): 1429	
Total Purge Time (min): 80	
Total Vol. Purged (gal): 3.26	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 - 500 ml L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 ml Vial ~~60 mL Glass~~	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 1000 ml L PE	✓

OBSERVATIONS / NOTES:

Purged dry on 12-12-00. Will sample when well has sufficiently recharged

WL=6.43 on 12-14-00 - 1540 well ran dry 1635. Collected TCL volatiles TCL semivolatiles, TCL Pest/PCBs + TCL PAH's.
WL = 7.87 on 12-14-00 1100 Complete Sample 1130

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): R Dizzunson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW41DS

PROJECT: NSB New London
PROJECT NUMBER: CTO 203 5082
SITE: Area A

DATE: 12.12.00
WEATHER: Sunny - very windy, cold
PERSONNEL: RD Munson

Well Screen Depth: _____ / _____ ft.
Initial Water Level: 2.67 @ 1302 hrs.
Pump Type/Material: _____
Pump Intake Depth: _____
Tide Cycle: ☐ High @ _____ ☐ Low @ _____ ☐ Not Affected
Total Purge Volume= _____ (gal / L)
Total Purge Time= 80 min (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1309	4.07	150	150		10.78	7.02	2.98	30.50	10.03	—	-332.7	Sulfur odor
1314	5.16	900	150		10.47	7.01	2.81	32.38	7.88	—	-337.1	
1319	6.14	1850	150		10.38	7.00	2.64	37.23	4.13	—	-337.7	
1324	6.96	2600	150		10.86	6.99	2.45	37.90	3.01	—	-335.2	
1329	7.55	3350	150		10.84	6.97	2.27	39.69	2.82	—	-333.8	
1334	8.27	4100	150		10.56	6.94	2.02	41.45	3.29	—	-329.0	
1339	8.84	4850	150		10.42	6.92	1.81	42.33	5.51	—	-322.8	
1349 (10 min)	10.14	6350	150		10.89	7.22	1.58	40.84	7.26	—	-329.1	10 min interval
1359	11.46	7850	150		11.00	7.13	1.62	41.99	7.30	—	-335.4	
1409	12.98	9350	150		10.87	7.04	1.94	43.96	8.12	—	-332.3	BLACK Fines
1419	14.51	10850	150		10.65	7.02	2.25	45.71	6.71	—	-329.7	
1429	15.60	12350	150		10.80	7.01	2.78	46.47	10.96		-331.0	Dry
1540	6.43											
1100 (12 hrs 12:15)	7.87											Dry @1635

Water Quality Meter (S/N): _____
Control Box Type (S/N): _____
Turbidimeter (S/N): _____
Notes: _____

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WMW42DS-05 (R)
Sample Location: 2WMW42DS
Sampled By: FCW
C.O.C. No.: 121300
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 12-13-00	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 1315								
Method: Peristaltic Pump	grey	6.85	2.96	10.7	55	3.04	-327	0

PURGE DATA:

Date: 12-12-00
Method: Peristaltic Pump
Monitor Reading (ppm): –
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.91
Static Water Level (WL): 2.35
One Casing Volume(gal): 2.3
Start Purge (hrs): 0941
End Purge (hrs): 1115
Total Purge Time (min): 94
Total Vol. Purged (gal): 3.5

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3x 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2x Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 ~~2~~ (R) Qt. Amber Glass	✓
TCL PAH	4° C	2x Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x 40 ~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

dry will sample on 12-13-00

WL = 3.25 on 12-13-00

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** Well No.: 2WMW 42DS

PROJECT: NSB NLON
PROJECT NUMBER: CTO- 203
SITE: AREA A

DATE: 12-12-00
WEATHER: 40'S windy
PERSONNEL: F. Wudkwych

Well Screen Depth: — / — ft.
Initial Water Level: — @ — hrs.

Pump Type/Material: Peristaltic
Pump Intake Depth: bottom

Tide Cycle: ☐ High @ ☐ Low @ ☑ Not Affected

Total Purge Volume= 3.5 (gal/L) Total Purge Time= 94 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
0941	2.35			Na								START PURGING
0948	3.51		130		9.11	6.98	3.57	1.27	13	0	-332	
0957	5.41		130		9.42	6.74	3.19	0.77	8.3	0	-352	
1006	6.90		140		10.0	6.54	2.15	0.00	4.9	0	-337	
1015	8.65		140		10.2	6.50	1.84	0.14	3.8	0	-332	
1024	9.80		145		10.3	6.51	1.71	0.51	30	0	-326	
1032	10.70		145		10.3	6.66	1.38	0.30	50	0	-348	
1040	11.71		145		10.3	6.89	1.38	0.18	6.7	0	-344	
1048	12.76		145		10.3	6.86	1.59	0.52	3.1	0	-345	
1056	13.95		145		10.7	6.82	1.94	0.62	4.6	0	-347	
1110	15.81		145		10.8	6.80	2.83	2.41	7.7	0	-349	Switched YSI DO TO BATTERY BEING DEAD
1115	dry		145		10.7	6.85	~~3.04~~ 2.96	3.04	55	0	-327	
12-13 1315												sample
1445												end

Water Quality Meter (S/N): _____
Control Box Type (S/N): _____

Notes: _____

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW43 DS-05 ~~GW-05~~
Sample Location: 2WMW43 DS
Sampled By: FCW
C.O.C. No.: A-121400
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 12-14-00	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 1450								
Method: Peristaltic Pump	DEKGREY	6.60	3.68	10.35	65	4.65	—	-360

PURGE DATA:

Date: 12-12-00
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 15.67
Static Water Level (WL): 2.66
One Casing Volume(gal): 2.1
Start Purge (hrs): 1316
End Purge (hrs): 1455
Total Purge Time (min): 99
Total Vol. Purged (gal): 3.14

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 X 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 X Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 X Qt. Amber Glass	✓
TCL PAH	4° C	2 X Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 X 40 ~~60 mL~~ Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

dry on 12-12-00 will sample @ later date
WL = 7.24 on 12-13-00
will sample 12-14-00
WL = 4.20 on 12-14-00

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	

Signature(s): FCW

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** Well No.: 2WMW 4305

PROJECT: NSB NLON
PROJECT NUMBER: CTO 203
SITE: AREA A

DATE: 12-12-00
WEATHER: 40's windy
PERSONNEL: F. WUOK WYCH

Well Screen Depth: — / — ft.
Initial Water Level: — @ — hrs.

Pump Type/Material: Peristaltic
Pump Intake Depth: bottom

Tide Cycle: ☐ High @ ☐ Low @ ☑ Not Affected

Total Purge Volume= 3.14 (gal/L) Total Purge Time= 99 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
												START PURGING
1316	2.66			Na								
1324	3.65		140		9.31	6.57	4.09	3.60	160	0	-368	
1332	5.28		135		9.54	6.54	3.79	~~12.49~~ 3.25	25	0	-365	
1340	6.75		135		9.66	6.57	3.56	5.62	19	0	-364	
1348	7.72		135		9.62	6.70	3.12	3.79	17	0	-359	
1356	8.65		135		9.68	6.74	3.04	3.51	18	0	-358	
1404	9.45		135		9.71	6.74	3.03	5.33	21	0	-361	
1412	10.40		125		9.75	6.74	3.012	3.00	19	0	-362	
1420	11.16		125		9.79	6.70	3.014	3.03	18	0	-365	
1428	12.03		125		9.96	6.69	3.08	3.29	24	0	-363	
1436 ~~1446~~	13.00		140		10.24	6.68	3.20	4.82	34	0	-363	
1445	14.30		125		10.28	6.64	3.41	4.25	50	0	-363	
1452	15.20		125		10.35	6.60	3.68	4.65	65	0	-360	
1455												dry sample
12-14-00 1450												End
1555												

Notes:

Water Quality Meter (S/N):
Control Box Type (S/N):
Turbidimeter (S/N):

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW44DS ~~GW-05~~
Sample Location: AREA A
Sampled By: [illegible]
C.O.C. No.: A-121500
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 12-15-00								
Time: 1330								
Method: Peristaltic Pump	grey	7.19	1.90	9.90	28.5	13.75	-30.65	—

PURGE DATA:

Round 5

Date: 12-13-00	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm): —	
Well Casing Diameter & Material Type: 2" PVC	
Total Well Depth (TD): 16.77	
Static Water Level (WL): 1.88	
One Casing Volume(gal): 2.43	
Start Purge (hrs): 0740	
End Purge (hrs): 0942	
Total Purge Time (min): 122	
Total Vol. Purged (gal): 4.56	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 - 500 ml L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 ml Vial ~~60 mL Glass~~	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 1000 ml L PE	✓

OBSERVATIONS / NOTES:

Purged dry 12-13-00. Will sample when well has sufficiently recharged

WL = 1.77 on 12-15-00 1330

Circle if Applicable:

MS/MSD —

Duplicate ID No.:

Signature(s): [illegible]

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW44DS

PROJECT: ~~CTO2~~ NSB-NLON
PROJECT NUMBER: CTU203 5082
SITE: AREA A

DATE: 12-13-00
WEATHER: Sunny, Clear, Very Cold
PERSONNEL: R.D. Munro

Well Screen Depth: ____ / ____ ft.
Initial Water Level: 1.88 @ 0720 hrs.
Pump Type/Material:
Pump Intake Depth:
Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☐ Not Affected
Total Purge Volume= 4.56 (gal/L) **Total Purge Time=** 122 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
0740	3.20	180	180		8.57	7.14	4.27	9.79	6.16	—	-347.3	Sulfur odor
0745	3.76	—	140		8.16	7.12	4.19	25.05	4.88	—	-358.4	Black fines
0750	4.53	1580	140		8.21	7.11	4.14	31.78	4.40	—	-357.0	
→ 0800	5.70	2980	140		8.73	7.07	3.97	39.89	6.55	—	354.0	Start 10 min Int
0810	6.75	4380	140		9.08	7.02	3.53	33.02	8.29	—	-348.9	
0820	7.55	5780	140		9.22	7.01	2.57	29.51	13.9	—	-341.3	
0830	8.40	7180	140		9.11	7.13	1.44	24.29	47.5	—	-325.	
0840	9.36	8580	140		9.33	7.07	1.42	22.64	40.7	—	-324.1	
0850	10.26	9980	140		9.64	7.05	1.69	23.48	32.9	—	-327.7	
0900	11.34	11380	140		9.76	7.06	1.71	23.08	31.2	—	-325.0	
0910	12.44	12780	140		9.74	7.10	2.06	21.51	27.7	—	-318.9	
0920	13.28	14180	140		9.87	7.12	2.01	18.81	34.1	—	-315.7	
0930	14.27	15580	140		10.04	7.13	2.11	17.33	35.1	—	-317.0	
0940	15.17	16980	140		9.95	7.18	1.89	14.40	32.8	—	-300.3	
0942	15.28	17260	140		9.90	7.19	1.90	13.75	28.5	—	-306.5	Dry
12-15-00 1330	1.77											

Water Quality Meter (S/N):
Control Box Type (S/N):
Pump (S/N):
Notes:

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW45DS- GW-05
Sample Location: AREA A
Sampled By: R.D. MUNSON
C.O.C. No.: A-121500
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 12-15-00	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 1540								
Method: Peristaltic Pump	Clear	6.98	3.90	10.61	16.8	40.38	-351.4	–

PURGE DATA:

Date: 12-13-00
Method: Peristaltic Pump
Monitor Reading (ppm): –
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.75
Static Water Level (WL): 2.52
One Casing Volume(gal): 2.32
Start Purge (hrs): 1025
End Purge (hrs): 1140
Total Purge Time (min): 75
Total Vol. Purged (gal): 2.98

Round 5

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 – 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 – Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2 Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1-500 ml L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1-500 ml L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2-40 ml Vial ~~60 mL Glass~~	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 – 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 – 1,000 L PE	✓

OBSERVATIONS / NOTES:

Purged dry 12-13-00. Will sample when ~~[illegible]~~ well has sufficiently recharged

WL = 2.28 @ 1540 12-15-00

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): R.D. Munson

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW ~~44~~ 45 DS

PROJECT: NSB-NLON
PROJECT NUMBER: CTO 203 5082
SITE: Area A

DATE: 12-13-00
WEATHER: Clear, Sunny - Cold
PERSONNEL: RD Munson

Well Screen Depth: ____ / ____ ft.
Initial Water Level: 2.52 @ 1018 hrs.
Pump Type/Material:
Pump Intake Depth:
Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☐ Not Affected
Total Purge Volume= 2.98 (gal / L) **Total Purge Time=** 75 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1025	4.11	150	150		9.22	6.97	4.21	17.28	2.65	—	-356.3	Sulfur odor
1030	4.84	900	150		9.15	6.98	4.15	17.65	1.81	—	-358.2	
1035	5.67	1650	150		9.33	6.99	4.04	21.33	1.42	—	-358.6	
1040	6.50	2400	150		9.47	6.99	3.95	24.29	1.67	—	-358.1	Black Fines
→ 1050	7.45	3900	150		9.68	6.98	3.59	29.91	2.60	—	-354.5	switch to 10min Int.
1100	8.86	5400	150		9.60	7.08	2.56	34.88	5.21	—	-345.7	
1110	10.60	6900	150		10.00	7.02	2.59	35.72	4.90	—	-340.1	
1120	12.12	8400	150		10.10	7.01	2.98	38.00	7.08	—	-343.9	
1130	13.10	9900	130		10.55	7.01	3.40	39.56	7.13	—	-348.7	Change Battery
1140	14.80	11300	160		10.61	6.98	3.90	40.38	16.8	—	-351.4	Dry
12-15-00 1540	2.28											

Notes:

Water Quality Meter (S/N):
Control Box Type (S/N):

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WMW46DS-05 ~~GW-05~~ (FW)
Sample Location: 2WMW46DS
Sampled By: FW
C.O.C. No.: A-121500
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Date: 12-15-00								
Time: 1450								
Method: Peristaltic Pump	Clear	7.00	4.05	9.4	45	2.24	-376	—

PURGE DATA:

Date: 12-13-00
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 17.32
Static Water Level (WL): 1.65
One Casing Volume(gal): 2.6
Start Purge (hrs): 0845
End Purge (hrs): 1019
Total Purge Time (min): 91
Total Vol. Purged (gal): 2.9

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3X 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2x Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1x ~~2x~~ Qt. Amber Glass	✓
TCL PAH	4° C	2 x Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x 40 ~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

dry will sample @ later date

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s): FW

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** Well No.: 2WMW46DS

PROJECT: NSB-NLON
PROJECT NUMBER: CTO-203
SITE: AREA A

DATE: 12-13-00
WEATHER: 30's SUNNY
PERSONNEL: F. Wydkwych

Well Screen Depth: — / — ft.
Initial Water Level: — @ — hrs.

Pump Type/Material: Peristaltic
Pump Intake Depth: bottom

Tide Cycle: ☐ High @ ☐ Low @ ☑ Not Affected

Total Purge Volume= (gal / L)
Total Purge Time= 91 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
												START PURGING
0848	1.85			Na								
0856	3.04		120		8.0	6.92	4.33	0.75	12	0	-379	
0904	4.38		125		8.2	6.79	4.31	1.65	4.3	0	-376	
0912	5.95		130		8.4	6.79	4.30	1.67	4.7	0	-376	
0920	6.94		130		8.7	6.80	4.28	2.12	9.3	0	-378	
0928	8.23		130		8.9	6.81	4.24	2.12	11	0	-378	
0936	9.46		130		8.9	6.97	4.04	2.13	13	0	-374	
0944	10.64		130		8.8	7.08	3.93	1.63	20	0	-366	
0952	11.97		125		9.0	7.06	3.93	1.35	29	0	-367	
1000	13.30		120		9.2	7.03	3.95	1.77	37	0	-373	
1008	14.58		120		9.3	7.02	3.99	2.04	50	0	-374	
1016	15.75		120		9.4	7.00	4.05	2.24	45	0	-376	
1019												DRY
1450												End Sample
1600												End

12-13-00

Notes:

Water Quality Meter (S/N):
Control Box Type (S/N):
Turbidimeter (S/N):

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW47DS-05 ~~GW-05~~
Sample Location: 2WMW47DS
Sampled By: FCW
C.O.C. No.: A-121300
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 12-14-00	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 0900								
Method: Peristaltic Pump	grey	6.40	9.25	7.56	85	12.22	-233	—

PURGE DATA:

Date: 12-14-00
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.20
Static Water Level (WL): 1.49
One Casing Volume(gal): 2.3
Start Purge (hrs): 0708
End Purge (hrs): 0920
Total Purge Time (min): 112
Total Vol. Purged (gal): 2.9

Turbidity = 30 @ 1040 will sample metals

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3x 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2x Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1x Qt. Amber Glass	✓
TCL PAH	4° C	2x Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x 40 ~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.: GWFD 121400-01

Signature(s): FCW

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** Well No.: 2WMW4705

PROJECT: NSB-NLON
PROJECT NUMBER: CTO -203
SITE: AREA A

DATE: 12-14-00
WEATHER: RAINING
PERSONNEL: F. WODKWYCH

Well Screen Depth: — / — ft.
Initial Water Level: — @ — hrs.

Pump Type/Material: Peristatic
Pump Intake Depth: bottom

Tide Cycle: ☐ High @ ☐ Low @ ☑ Not Affected

Total Purge Volume= 2.9 (gal/L)
Total Purge Time= 112 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
												START PURGING
0708	1.49				6.83	7.00	3.87	0.30	24	–	-370	
0717	2.26		100		7.15	6.84	3.60	0.25	7.8	–	-362	
0725	2.89		100		7.37	6.77	3.13	0.70	4.3	–	-349	
0733	3.44		100		7.46	6.67	2.68	1.85	6.9	–	-342	
0741	3.81		100		7.56	6.38	2.21	3.09	100	–	-354	
0750	4.18		100		7.71	6.38	1.68	4.92	170	–	-343	
0800	4.50		100		7.75	6.33	1.25	5.26	170	–	-310	
0810	4.78		100		7.71	6.34	5.78	1.09	150	–	-257	
0820	4.92		100		7.67	6.33	1.03	7.71	130	–	-250	
0830	5.06		100		7.66	6.35	~~10.3~~	10.33	100	–	-249	
0840	5.15		100		7.58	6.39	1.00	10.92	100	–	-241	
0850	5.20		100		7.56	6.40	9.25	12.22	85	–	-233	Sample End
900	5.27											
1135												

Notes: End @

Water Quality Meter (S/N):
Control Box Type (S/N):
Turbidimeter (S/N):

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 46W015-05 ~~GW05~~
Sample Location: 46MW015
Sampled By: FCU
C.O.C. No.: A-121500
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 12-16-00	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 1210								
Method: Peristaltic Pump	Clear	5.80	0.270	10.40	2.8	6.54	66.7	—

PURGE DATA:

Date: 12-16-00
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 20.30
Static Water Level (WL): 6.92
One Casing Volume(gal): 2.1
Start Purge (hrs): 1116
End Purge (hrs): 1210
Total Purge Time (min): 54
Total Vol. Purged (gal): 1.6

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3X 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2X Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1X Qt. Amber Glass	✓
TCL PAH	4° C	2X Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 x 40 ~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): [illegible]

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** Well No.: 4MW015

PROJECT: NSB-NLON 1
PROJECT NUMBER: CTO -203
SITE: AREA A

DATE: 12-16-00
WEATHER: 30's RAINING
PERSONNEL: F. WUDKWYCH

Well Screen Depth: / ft.
Initial Water Level: 6.92 @ 1116 hrs.

Pump Type/Material: Peristaltic
Pump Intake Depth: bottom

Tide Cycle: ☐ High @ ☐ Low @ ☑ Not Affected

Total Purge Volume= (gal / L)
Total Purge Time= 54 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
1116	6.92											START
1125	6.96		75		10.08	6.10	0.320	7.00	4.7	–	14.6	
1135	6.98		110		10.30	5.87	0.292	6.63	3.0	–	32.7	
1145	6.99		120		10.51	5.83	0.278	6.66	2.8	–	46.7	
1153	7.00		125		10.43	5.80	0.276	7.06	3.2	–	55.9	
1200	7.00		120		10.54	5.80	0.271	6.55	2.5	–	60.9	
1205	7.01		120		10.49	5.80	0.271	6.58	2.6	–	64.7	
1210	7.00		115		10.40	5.80	0.270	6.54	2.8		66.7	sample
1310												End.

Water Quality Meter (S/N):
Control Box Type (S/N):
Turbidimeter (S/N):

Notes:

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB - NLON AREA A
Project No.: CTO -203

Sample ID No.: 3M SP01 -05
Sample Location: AREA A
Sampled By: FCW/DM
C.O.C. No.: A-121500

[] Stream
[] Spring
[] Pond
[] Lake
[x] Other: SEEP
[] QA Sample Type:

Type of Sample:
[x] Low Concentration
[] High Concentration

SAMPLING DATA:

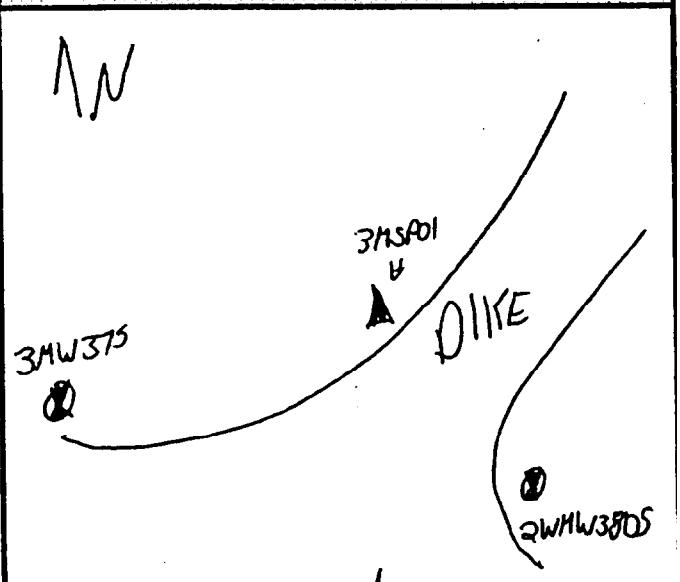
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-16-00	Clear	6.78	0.926	13.87	26	8.06	—	-122
Time: 0930								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3X 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2X Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1X Qt. Amber Glass	✓
TCL PAH	4° C	2X Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2X40 ~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NL ON
Project No.: CTO 203

Sample ID No.: SWSG18-005
Sample Location: AREA A
Sampled By: FaulDM
C.O.C. No.: A-121800

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetlands
[] QA Sample Type:

Type of Sample:
[✓] Low Concentration
[] High Concentration

SAMPLING DATA:

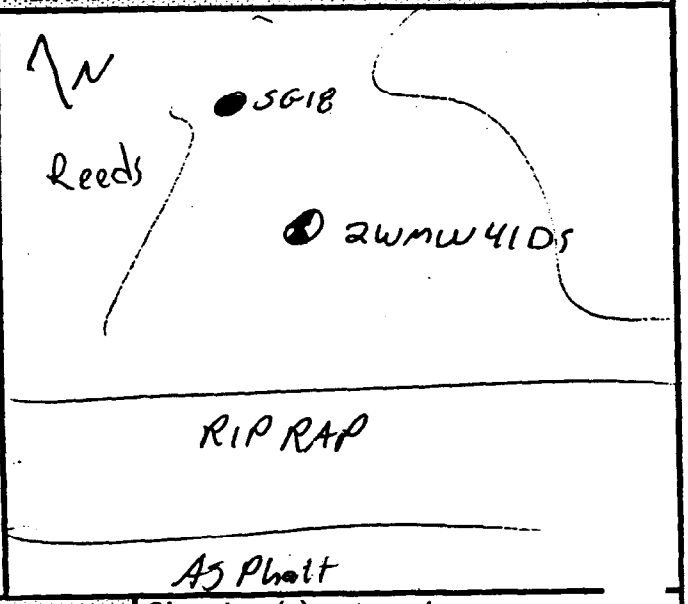
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-18-00								
Time: 1620								
Depth: —	Clear	7.34	0.332	3.88	11	3.65	—	-53.7
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3X 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2X Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2X Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x40 ~~50 ml~~ Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO 203

Sample ID No.: SWSG19-0.5
Sample Location: AREA A
Sampled By: PCW/DM
C.O.C. No.: A-121800

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetland
[] QA Sample Type:

Type of Sample:
[✓] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-19-00								
Time: 0700								
Depth: —	Clear	6.81	0.395	2.93	8.4	1.01	—	126
Method: —								

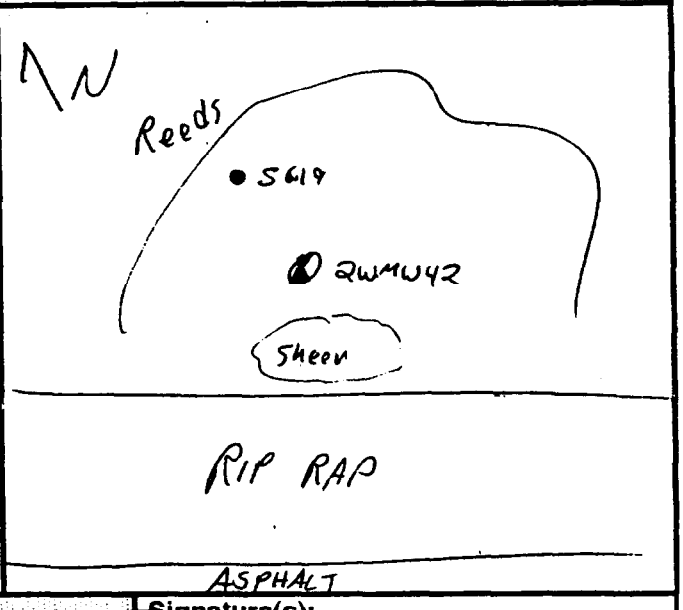
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3X 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2X Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2X Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x40 ~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

Sheen on water

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO -203

Sample ID No.: SWSG20-05
Sample Location: AREA A
Sampled By: PL / DM
C.O.C. No.: A-121800

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetland
[] QA Sample Type:

Type of Sample:
[✓] Low Concentration
[] High Concentration

SAMPLING DATA:

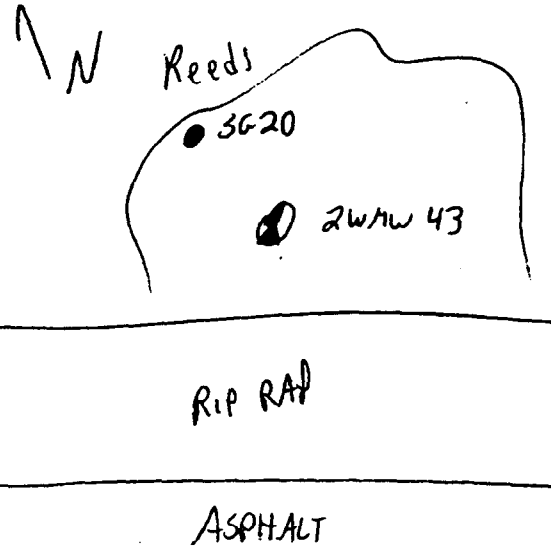
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-19-00								
Time: 0730								
Depth: —								
Method: —	Clear	6.98	0.267	1.99	~~1.53~~ 7.3	3.44	—	-17.2

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 x 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 x Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2x Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x40 ~~60 mL~~ Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO -203

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetland
[] QA Sample Type:

Sample ID No.: SWS621-05
Sample Location: AREA A
Sampled By: FCW / OM
C.O.C. No.: A-1218-00

Type of Sample:
[✓] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-19-00								
Time: 0800								
Depth: —	Clear	6.53	0.253	2.33	6.1	2.29	—	-26.4
Method: —								

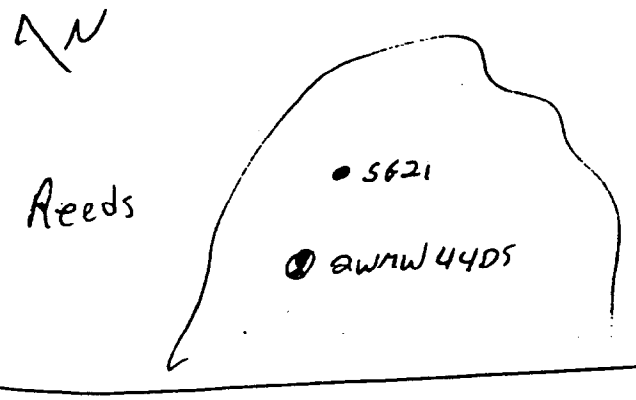
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3X 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2X Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2X Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x40 ~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

HAD TO BREAK ICE

MAP:



RIP RAP

ASPHALT

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): FCW

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO- 203

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetlands
[] QA Sample Type:

Sample ID No.: SWSG22-Q5
Sample Location: AREA A
Sampled By: FW/DM
C.O.C. No.: A-121800

Type of Sample:
[✓] Low Concentration
[] High Concentration

SAMPLING DATA:

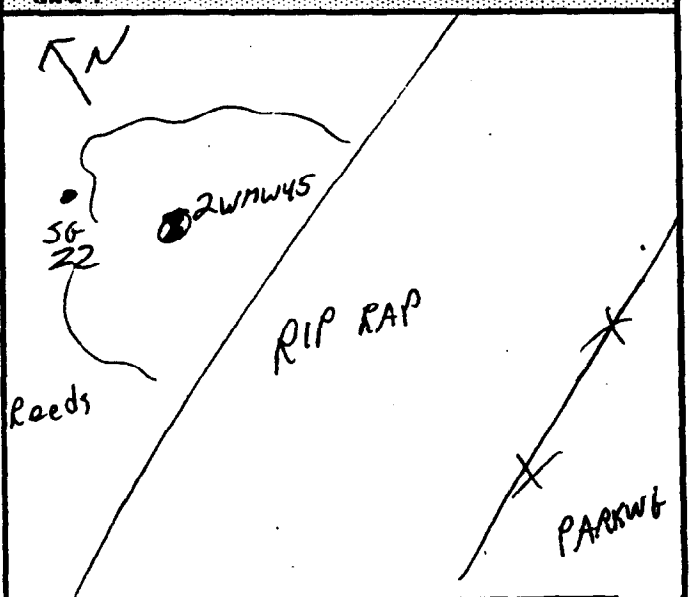
Date: 12-19-00	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Time: 1300								
Depth: –	Clear	6.69	0.258	3.68	7	1.96	—	-10.5
Method: –								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3x 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2x Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2x Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x40-60 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO-203

Sample ID No.: SW5623-05
Sample Location: AREA A
Sampled By: RWIOM
C.O.C. No.: A-121800

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wet land
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

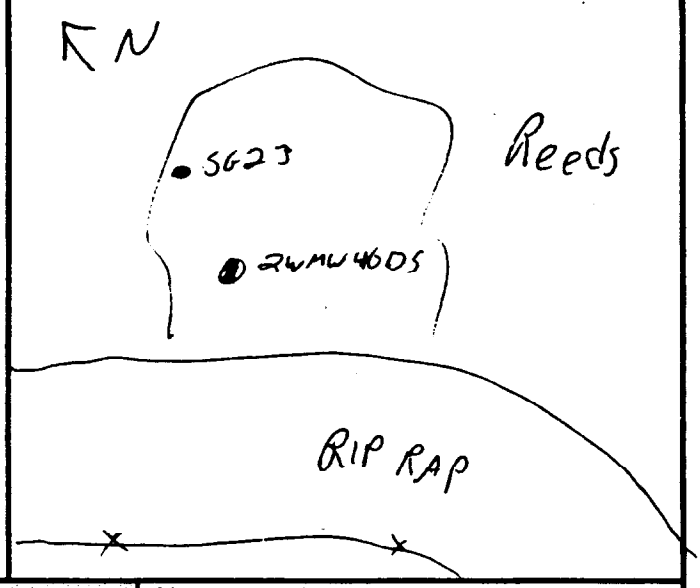
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-19-00								
Time: 1320								
Depth: —	Clear	6.57	0.055	2.57	0	4.67	—	-0.6
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3x 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2x Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2x Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x40 ~~60mL~~ Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO 203

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetland
[] QA Sample Type:

Sample ID No.: SWS624-05
Sample Location: AREA A
Sampled By: FCW
C.O.C. No.: A-121800

Type of Sample:
[✓] Low Concentration
[] High Concentration

SAMPLING DATA:

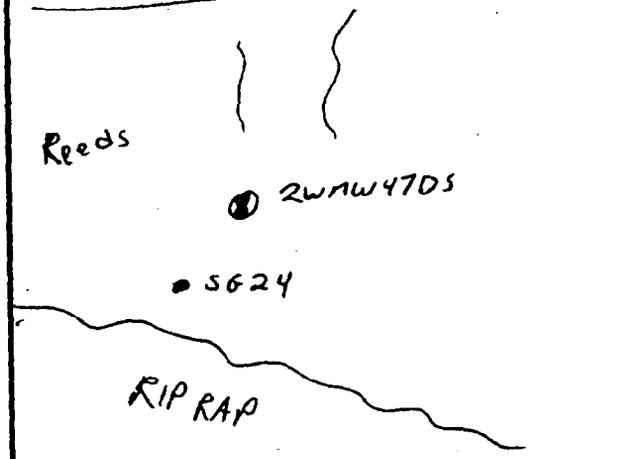
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-18-06								
Time: 1245								
Depth: –	Clear	9.29	0.571	3.22	~~10.82~~ 4.8	9.68	–	-211
Method: –								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements		Collected
TCL VOLATILES	HCL / 4° C	3 x	40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 x	Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 ~~2~~	Qt. Amber Glass	✓
TCL PAH	4° C	2 x	Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1	L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1	L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 x 40	~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1	250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1	L PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle If Applicable:

MS/MSD	Duplicate ID No.:
–	FD-SW-121800-01

Signature(s):

ROUND 6

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO -203

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetland
[] QA Sample Type:

Sample ID No.: SWS621-05
Sample Location: AREA A
Sampled By: FCW / OM
C.O.C. No.: A-1218-00

Type of Sample:
[✓] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 12-19-00	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Time: 0800								
Depth: —	Clear	6.53	0.253	2.33	6.1	2.29	—	-26.4
Method: —								

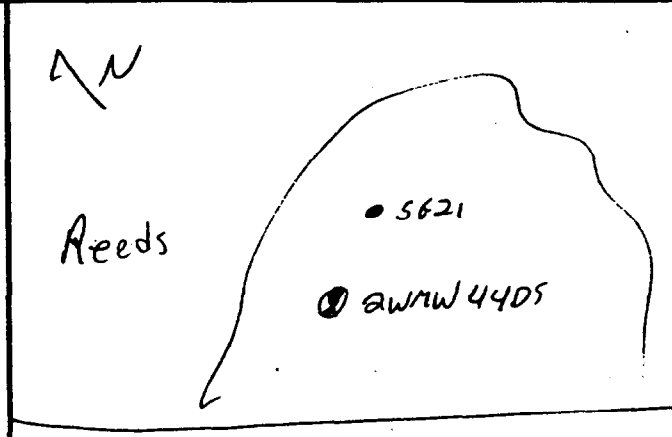
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3X 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2X Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2X Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x40 ~~60~~ 60 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

HAD TO BREAK ICE

MAP:



RIP RAP

ASPHALT

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): FCW

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO- 203

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetlands
[] QA Sample Type:

Sample ID No.: SWSG22-Q5
Sample Location: AREA A
Sampled By: FWLOM
C.O.C. No.: A-121800

Type of Sample:
[✓] Low Concentration
[] High Concentration

SAMPLING DATA:

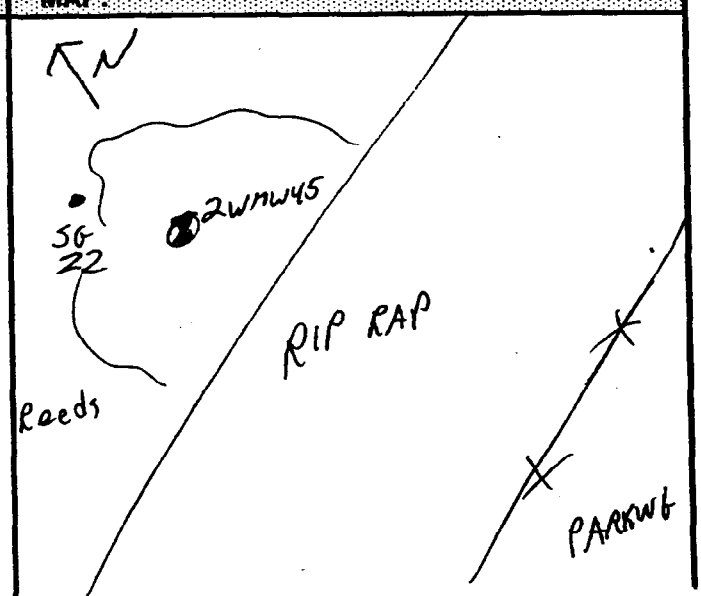
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-19-00								
Time: 1300								
Depth: –	Clear	6.69	0.258	3.68	7.	1.96	—	-10.5
Method: –								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3x 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2x Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2x Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x40-~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	—
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO-203

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetland
[] QA Sample Type:

Sample ID No.: SWS623-05
Sample Location: AREA A
Sampled By: FWIOM
C.O.C. No.: A-121800

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

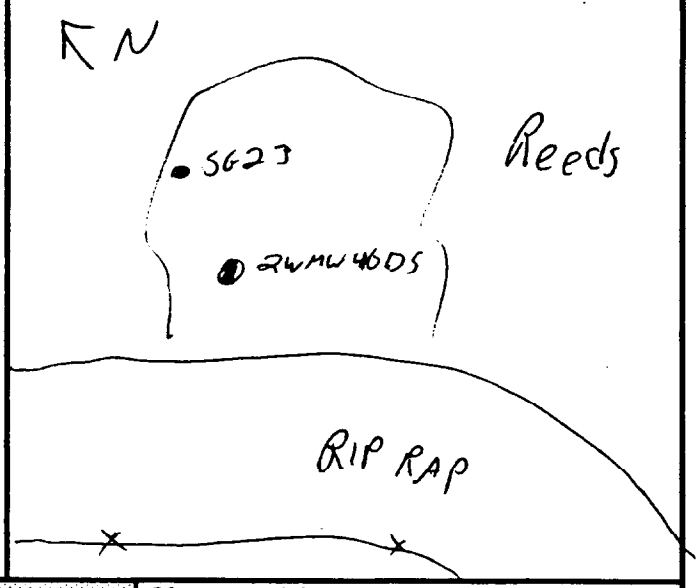
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-19-00								
Time: 1320								
Depth: —	Clear	6.57	0.055	2.57	0	4.67	—	-0.6
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3X 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2X Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 Qt. Amber Glass	✓
TCL PAH	4° C	2X Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2x40 ~~60 mL~~ Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB NLON
Project No.: CTO 203

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetland
[] QA Sample Type:

Sample ID No.: SWSG24-05
Sample Location: AREA A
Sampled By: FEW
C.O.C. No.: A-121800

Type of Sample:
[✓] Low Concentration
[] High Concentration

SAMPLING DATA:

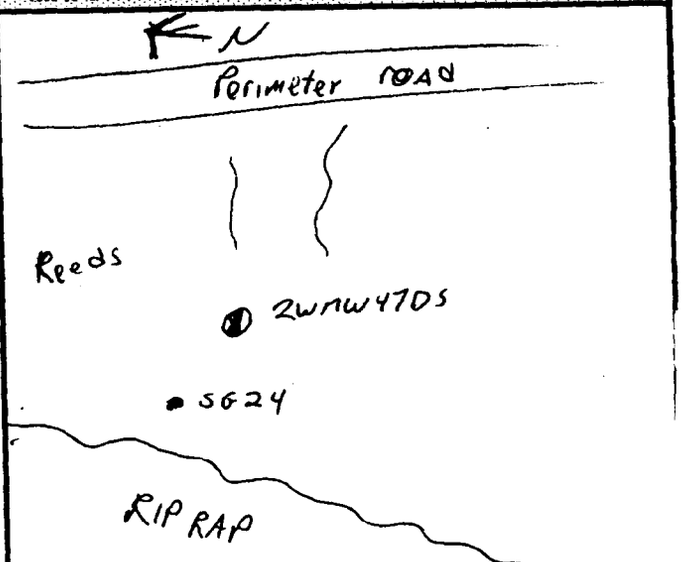
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Eh mV
Date: 12-18-06								
Time: 1245								
Depth: –	Clear	9.29	0.571	3.22	~~10.82~~ 4.8	9.68	—	-211
Method: ✓								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 x 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 x Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 ~~2~~ Qt. Amber Glass	✓
TCL PAH	4° C	2 x Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1 L PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 L PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 x 40 ~~60~~ mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-SW-121800-01

Signature(s):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 4-GW01S - ~~GW-06~~
Sample Location: 4MW01S
Sampled By: T. ROJAHN
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 3/11/01	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time: 0915	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Method:Peristaltic Pump	CLEAR	5.38	0.624	7.72	0.02	9.87	195	0.31

PURGE DATA:

Date: 3/11/01
Method:Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 20.30
Static Water Level (WL): 5.36
One Casing Volume(~~gal~~): 9.3L
Start Purge (hrs): 0820
End Purge (hrs): 0910
Total Purge Time (min): 50
Total Vol. Purged (gal): 2.6

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	(2) ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	(1) ~~2~~ Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	(1)L ~~1-500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	(1)L ~~1-500 ml~~ PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	(1)L ~~1-500 ml~~ PE	✓

x2

OBSERVATIONS / NOTES:

Also Collected 4-GW01S-06-F & ~~4-GW~~ (TR) GWFD-031101-01-F

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	GWFD-031101-01

Signature(s): Terry Rojahn

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 job# 5082

WELL ID.: 4MW015
DATE: 3/11/01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (ml/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
0820	5.36	200								Start Purge
0830	5.36	150	5.60	0.642	0.83	11.79	7.36	148	0.31	2000ml CLEAR
0840	5.36	150	5.45	0.635	0.42	11.34	7.27	173	0.31	3500ml "
0850	5.39	200	5.39	0.628	0.16	9.32	7.62	189	0.31	5500ml "
0900	5.41	200	5.38	0.627	0.21	9.61	7.69	192	0.31	7500ml "
0910	5.42	200	5.38	0.624	0.02	9.37	7.72	195	0.31	9500ml "
0915										Start SAMPLING

SIGNATURE(S): Terry Rozeboom

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2LGW20S ~~GW~~-06
Sample Location: 2LMW20S
Sampled By: R. SIMPSON
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 3.12.01	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 0910								
Method: Peristaltic Pump	CLEAR	12.31	0.515	9.9	3.6	0.73	27	0.25

PURGE DATA:

Date: 3.12.01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 18.90
Static Water Level (WL): 13.64
One Casing Volume(gal):
Start Purge (hrs): 0803
End Purge (hrs): 0910
Total Purge Time (min): 67
Total Vol. Purged (gal):

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	—
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	—
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	—
TCL PAH	4° C	2 - Qt. Amber Glass	—
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 1- ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	—
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 1 - ~~500~~ ml PE	✓

OBSERVATIONS / NOTES:

FLUSH MNT. IS IN BAD SHAPE, PAD BUSTED & LOWER THAN ROAD, ≈ 3" OF WATER ON PAD & IN VAULT. PUMPED WATER OUT OF VAULT PRIOR TO START OF PURGE

WELL PAD SHOULD BE REPLACED

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 Job# 5082

WELL ID.: 2CMW20S
DATE: 3.12.01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
0803	13.64	—								START PURGE
0807	13.85	120	12.22	0.663	65	4.44	10.0	0	0.32	
0815	↓	↓	12.32	0.620	38	2.38	9.8	13	0.30	CLEAR, NO ODOR
0825			12.31	0.550	19	1.09	9.6	27	0.27	
0835			12.36	0.525	16	0.95	9.8	22	0.26	
0845			12.33	0.544	11	0.74	9.7	19	0.26	
0850			12.36	0.528	6.9	0.78	9.9	24	0.26	
0855			12.33	0.516	4.2	0.74	10.0	26	0.25	
0900			12.31	0.515	3.6	0.73	9.9	27	0.25	END PURGE

SIGNATURE(S): _____

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: ZW-GW215 ~~GW-06~~
Sample Location: ZWGW215
Sampled By: T. ROHAN
C.O.C. No.: 030801-01
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 3-08-01								
Time: 1815								
Method: Peristaltic Pump	CLEAR	6.14	4.585	3.38	1.7	1.18	-234	2.40

PURGE DATA:

Date: 3-08-01	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm): —	
Well Casing Diameter & Material Type: 2" PVC	
Total Well Depth (TD): 17.3	
Static Water Level (WL): 4.23	
One Casing Volume(gal): 8.1 L	
Start Purge (hrs): 1555	
End Purge (hrs): 1810	
Total Purge Time (min): 135	
Total Vol. Purged (gal): 25 L	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	(10) ~~3~~ 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	~~2~~ Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	(12) 1 - Qt. Amber Glass	✓
TCL PAH	4° C	~~2~~ Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	(3) L ~~1 - 500 mL~~ PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	(3) L ~~1 - 500 ml~~ PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	(6) ~~2~~ 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	(2) 1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	(2) L ~~1 - 500 ml~~ PE	✓

OBSERVATIONS / NOTES:

ALSO Collected GWFD-030801-01-F & ZW-GW215-06-01

SULFUR ODOR

Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	GWFD-030801-01

Signature(s): Tony Grahn

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 job# 5082

WELL ID.: 2WMW215
DATE: 3-08-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1555	4.23									→ Start Purge Black Fine SILENT GRAB
1605	5.13	150	6.79	44.02	7.8	0.08	7.52	-358	28.19	1500 BLACK FINES
1615	5.25	100	~~7.39~~ 7.35	42.70	6.2	0.07	7.34	-252	26.96	2500 " "
1625	5.32	100	6.68	38.95	6.2	2.25	7.22	-347	24.43	3500 " "
1635	5.48	100	6.61	35.70	6.9	4.21	7.11	-344	22.38	4500 " "
1645	5.65	100	6.55	33.60	34	3.61	6.86	-366	20.75	5500 " "
1655	5.83	100	6.48	31.55	52	3.11	6.82	-385	18.93	6500 " "
1705	6.35	250	6.37	21.50	7999	2.36	6.77	-500	12.30	9000 " " Note 1
1715	6.25	250	6.60	42.54	39.6	1.91	7.73	-436	27.16	11500 " "
1725	6.32	250	6.46	21.36	165	3.20	6.64	-444	12.57	14000 " "
1735	6.34	250	6.38	17.97	83	4.11	6.15	-465	10.53	16500 " "
1745	6.37	250	6.21	11.10	7.7	3.15	5.20	-251	8.15	19000 " " Note 2
1755	6.39	250	6.17	4.786	4.0	1.83	3.51	-242	2.53	21500 " "
1800	6.39	250	6.16	4.732	2.5	1.17	3.37	-239	2.51	22750 " "
1805	6.38	250	6.15	4.625	3.0	1.04	3.34	-236	2.45	24000 " "
1810	6.38	250	6.14	4.595	1.7	1.18	3.38	-234	2.40	25250 " "
1815	—									→ Start Sampling

SIGNATURE(S): Terry Rogers

Note 1 = Clean out near bottom of screen
Decrease pump speed
Note 2 = Move intake to mid screen again.

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 3-GW375 ~~GW-06~~
Sample Location: 3MW375
Sampled By: T. ROJAHN
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 3/12/01 Time: 0905 Method: Peristaltic Pump	CLEAR	5.99	2.455	6.11	0.01	4.31	+70	1.25

PURGE DATA:

Date: 3/12/01
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material Type: 2" PVC
Total Well Depth (TD): 8.45
Static Water Level (WL): 3.53
One Casing Volume(~~gal~~): 3.1L
Start Purge (hrs): 0813
End Purge (hrs): 0903
Total Purge Time (min): 50
Total Vol. Purged (~~gal~~): 4.6L

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1L ~~1 - 500 ml~~ PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1L ~~1 - 500 ml~~ PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1L ~~1 - 500 ml~~ PE	✓

OBSERVATIONS / NOTES:

Also Collected 3-GW375-06-F
Intake @ MID SCREEN

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tony Rojahn

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 Job# 5082

WELL ID.: 3MW37S
DATE: 3/12/01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
0813	3.53	100							→	Start PURGE
0823	3.92	100	6.24	2.552	3.35	8.15	6.20	+ 80	1.32	1000ml CLEAR
0833	3.73	100	6.11	2.507	0.01	5.34	5.91	+ 79	1.29	2000ml "
0843	3.77	100	6.05	2.468	0.02	4.42	5.92	+ 75	1.27	3000ml "
0853	3.78	80	6.02	2.457	0.00	4.37	6.08	+ 72	1.26	3800ml "
0903	3.78	80	5.99	2.455	0.01	4.31	6.11	+ 70	1.25	4600ml "
0905	→									Start Sampling

SIG' 'JRE(S): T. R.

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WMW38DS GW-06
Sample Location: 2WMW38DS
Sampled By: K SIMPSON
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 3.10.12.14.01	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time:	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Method:Peristaltic Pump	CLEAR	6.75	0.874	6.8	1.0	3.34	118.2	0.43

PURGE DATA:

Date: 3.7.01
Method:Peristaltic Pump
Monitor Reading (ppm): 0
Well Casing Diameter & Material
Type: 2" PVC KS
Total Well Depth (TD): ~~12.57~~ 11.90
Static Water Level (WL): 5.58
One Casing Volume(gal): 1.0
Start Purge (hrs): 0800
End Purge (hrs): 0900
Total Purge Time (min): 60
Total Vol. Purged (gal): 1.7

See Attached Low Flow Purge Data Sheet for Purge Data

PURGED DRY 3.7.01
3.12.01 @ 1015 WL = 8.85 START SAMPLING

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	0800 Hrs 3/10
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	0800 Hrs 3/10
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	0800 Hrs 3/10
TCL PAH	4° C	2 - Qt. Amber Glass	1015 HRS 3/12
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 ML 1- ~~500~~ ml PE	1015 HRS 3/12
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 ML 1 - ~~500~~ ml PE	0730 HRS 3/14
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	0800 Hrs 3/10
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	1015 HRS 3/12
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 ML 1 - ~~500~~ ml PE	1015 HRS 3/12

OBSERVATIONS / NOTES:

3.9.01 @ 0835 WL = 9.15'
3.10.01 @ 0755 WL = 8.27'
DRIED out Sampling 3/10/01

Circle if Applicable:

MS/MSD — Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 job# 5082

WELL ID.: 2WMW39DS
DATE: 3.7.01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
0900	KJ ~~12~~ 5.59	—	—	—	—	—	—	—	—	START PURGE
0906	6.76	100	7.04	0.733	1.3	7.60	6.4	317.9	0.36	CLEAR, NO ODOR
0915	7.31	↓	6.73	0.708	1.3	6.46	6.1	331.7	0.35	
0923	8.14	↓	6.63	0.719	1.2	5.06	6.1	277.0	0.35	
0933	8.95	↓	6.65	0.745	1.1	4.04	6.2	178.0	0.36	
0945	10.48	120	6.75	0.854	1.1	2.79	6.7	129.9	0.42	
0953	11.67	↓	6.75	0.874	1.0	3.34	6.8	118.2	0.43	DRY

SIGNATURE(S): KJ Eh

KJ

PAGE 2 of 2

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW3905-06 ~~2W-MW3905-GW-00~~ TR
Sample Location: 2W MW3905
Sampled By: T. ROJAHN
C.O.C. No.: 030801-01
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 3/8/01								
Time: 0735								
Method: Peristaltic Pump	CLEAR	6.76	4.320	8.4	37	0.95	-110	2.30

PURGE DATA:

Date: 3/7/01
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.70
Static Water Level (WL): 3.00
One Casing Volume(gal): 5.7L
Start Purge (hrs): 0812
End Purge (hrs): 0944
Total Purge Time (min): 92
Total Vol. Purged (gal): 3.9

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	(2) ~~4~~ - Qt. Amber Glass	✓
TCL PAH	4° C	(1) ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 ML 1 - ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 ML 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 ML 1 - ~~500~~ ml PE	✓

OBSERVATIONS / NOTES:

Also Collected 2W-GW3905-06-F

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s): Troy Rogal

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 job# 5082

WELL ID.: 2WMW39DS
DATE: 03-07-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
0812	3.00	200	—	—	—	—	—	—	—	
0822	6.79	200	6.64	3.522	70	2.88	7.21	-86	1.95	3000 Clear w/BRN Partic.
0832	8.40	200	6.64	3.505	100	2.78	7.21	-78	1.84	5000 " w/ " "
0842	9.52	125	6.64	3.491	100	2.89	7.01	-74	1.83	6250 " w/ " "
0852	10.68	150	6.63	3.440	100	2.75	7.26	-71	1.81	7750 " w/ " "
0902	11.74	150	6.62	3.250	55	2.28	7.49	-73	1.70	9250 " Sl. Particulate
0912	13.05	150	6.61	3.534	20	1.48	7.68	-84	1.87	10750 " " "
0922	14.08	150	6.63	3.965	12	1.10	7.84	-95	2.10	12250 " Trace "
0932	15.33	150	6.67	4.320	22	1.04	8.17	-104	2.30	13750 " Sl. "
0942	16.34	150	6.76	4.320	37	0.95	8.46	-110	2.30	15250 " " "
0944									→	Dry

SIGI. JRE(S): Tony Iyal

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W/MW 40DS GW-06
Sample Location: 2W MW 40DS
Sampled By: K. SIMPSON
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA: ↓ 3.7.01 ↓

Date: 3.9.01	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time: 0930	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Method: Peristaltic Pump	CLEAR	6.86	20.48	8.3	10.6	0.61	-320.5	12.25

PURGE DATA: ↓ 3.9.01 ↓

Date: 3.7.01	↳ VERY LT. YELLOW TR. BLACK FINES SLIGHT EFFERVESCE IN HCL, SULFUR ODOR
Method: Peristaltic Pump	
Monitor Reading (ppm):	TURB 9.6
Well Casing Diameter & Material	See Attached Low Flow Purge Data Sheet for Purge Data
Type: 2" PVC	
Total Well Depth (TD): 16.62	
Static Water Level (WL): 2.64	PURGED DRY 3.7.01
One Casing Volume(gal): 2.3	3.8.01 @ 0825 WL = 10.10'
Start Purge (hrs): 0920	
End Purge (hrs): 1037	
Total Purge Time (min): 77	
Total Vol. Purged (gal): 2.9	ALL WL MEASUREMENTS @ AREA A ARE TOP OF PVC

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 ML 1 - ~~500 ml~~ PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 ML 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 ML 1 - ~~500~~ ml PE	✓
		LOW VOL ON 1 AMBER	PEST/PCBs
		≈ 1/2 FULL	

OBSERVATIONS / NOTES:

WL 3.9.01 @ 0850 = 7.09'
START SAMPLING 3.9.01 @ 0924 PUMP RATE 110 ML/MIN

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): K. Simpson

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 Job# 5082

WELL ID.: 2WMW40DS
DATE: 3.7.01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
0920	2.64	—	—	—	—	—	—	—	—	START PURGE
0925	4.60	140	6.62	31.23	6.9	0.57	7.4	-304.4	19.27	SULFUR ODOR +
0935	5.99	↓	6.50	29.03	5.2	0.62	7.4	-320.0	17.87	TR. BLACK FINES
0945	7.22		6.50	25.78	4.5	0.71	7.6	-316.8	15.50	
0955	8.59		6.50	21.62	3.8	0.42	7.9	-301.1	12.73	
1005	9.95		6.79	15.40	4.1	0.36	7.8	-295.8	8.99	
1015	12.01		6.79	17.25	4.6	0.41	8.0	-314.9	10.08	
1025	13.26		6.78	17.65	7.9	0.43	8.1	-316.6	10.43	
1035	15.30		6.86	20.48	10.6	0.61	8.3	-320.5	12.25	
1037	15.86									DRY TO PUMP INLET
										LOWERED & PUMPED DRY

SIGNATURE(S): [illegible]

16.6 BTM

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW41DS (SS) GW-06
Sample Location: 2WMW41DS
Sampled By: R. SIMPSON
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 3-9-01 (T.R.)								
Time: 0900								
Method: Peristaltic Pump		6.56	21.88	8.6	2.9	2.93	-323.5	13.01

PURGE DATA:

Date: 3-7-01 (K.S.)
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.65
Static Water Level (WL): 2.15
One Casing Volume(gal): 2.4
Start Purge (hrs): 1610
End Purge (hrs): 1755
Total Purge Time (min): 105
Total Vol. Purged (gal): 4.2

→ CLEAR W/TR. BLACK FINES

See Attached Low Flow Purge Data Sheet for Purge Data

3.8.01 WL @ 0830 = 11.06'

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 ML 1- ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 ML 1 - 500 ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 ML 1 ~~-500~~ ml PE	✓

OBSERVATIONS / NOTES:

ALSO Collected 2WGW41DS-06-F
Significant off-gasing during VOC filling.

Circle if Applicable:

MS/MSD | Duplicate ID No.: —

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 Job# 5082

WELL ID.: 2WMW41DS
DATE: 3.7.01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1610	2.15									START PURGE
1616	3.59	150	6.74	27.37	23	1.52	7.9	-332.1	16.76	SULFUR ODOR
1625	4.98		6.77	24.97	12	0.22	8.2	-328.3	15.03	BLACK FINES
1635	6.57		6.56	21.00	6.4	0.42	7.9	-313.1	12.47	
1645	7.64		6.53	18.77	5.6	0.64	7.8	-320.6	11.16	
1655	9.15		6.56	14.02	4.9	0.63	7.7	-325.5	8.08	
1705	10.41		6.76	13.06	4.7	0.88	7.5	-312.7	7.50	
1715	11.61		6.65	13.91	4.5	0.91	7.7	-308.2	8.08	CLEARING
1725	12.79		6.77	15.67	5.0	1.30	8.0	-313.2	9.19	
1735	13.88		6.60	17.37	3.5	1.58	8.1	-311.2	10.15	
1745	15.01		6.60	19.00	3.1	2.45	8.4	-320.9	11.24	
1755	16.02		6.56	21.88	2.9	2.93	8.6	-323.5	13.01	DRY, TO PUMP INLET

SIGNATURE(S): [illegible]

16.65 BTM

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW42DS ~~GW~~06
Sample Location: 2WMW42DS
Sampled By: T. ROJAHN
C.O.C. No.: 030801-01
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 3/8/01								
Time: 0905								
Method: Peristaltic Pump	Blackish	6.71	26.70	8.26	32	0.08	-340	16.06

PURGE DATA:

Date: 3-07-01
Method: Peristaltic Pump
Monitor Reading (ppm): –
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.91
Static Water Level (WL): 2.05
One Casing Volume(gal): 9.3 L
Start Purge (hrs): 1620
End Purge (hrs): 1745
Total Purge Time (min): 85
Total Vol. Purged (gal): 3.7

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	(2) ~~1~~ Qt. Amber Glass	✓
TCL PAH	4° C	(1) ~~2~~ Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 ML 1- ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 ML 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 ML 1 - ~~500~~ ml PE	✓

OBSERVATIONS / NOTES:

Also Collected 2W-GW42DS-06-F

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s): Terry Rojahn

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 job# 5082

WELL ID.: 2WMW42DS
DATE: 3-07-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1620	2.05	200	—						→	Start Purge
1630	6.35	200	6.83	32.70	3.77	0.16	7.75	-368	19.19	2000 ml Clear w/Plastic
1640	8.20	150	6.62	17.67	2.62	0.16	6.82	-324	10.37	3500 ml " "
1650	9.91	150	6.61	18.17	7.21	0.35	7.01	-322	10.69	5000 ml " "
1700	10.88	150	6.60	17.79	9.09	0.38	7.13	-319	10.35	6500 ml " "
1710	11.96	150	6.69	14.38	15.00	0.33	6.95	-342	8.29	8000 ml " "
1720	13.27	150	6.71	16.55	35.00	0.30	7.20	-342	9.75	9500 ml Blackish
1730	14.58	150	6.73	20.86	24.9	0.08	7.25	-340	12.38	11000 ml Blackish
1740	16.10	200	6.71	26.70	32.0	0.08	8.26	-340	16.06	1300 ml "
1745	—								→	DRY

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW43DS ~~GW-06~~
Sample Location: 2WMW43 DS
Sampled By: K. SIMPSON
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 3.13-01								
Time: 1410								
Method: Peristaltic Pump	CLEAR	6.27	33.31	8.7	32	7.18	-346	20.74

PURGE DATA:

Date: 3.11.01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 15.68
Static Water Level (WL): 1.97
One Casing Volume(gal): 2.2
Start Purge (hrs): 0852
End Purge (hrs): 1037
Total Purge Time (min): 105
Total Vol. Purged (gal): 3.5

COLOR TURNS DARK GRAY AS WL DROPS

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE EFFERVESCING IN HCL

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	4 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	4 ~~2~~ - Qt. Amber Glass	✓
TCL PAH	4° C	3 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 1- ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 1 - ~~500~~ ml PE	✓
		X VOL FOR MS/MSD	
		ON SVOC, PEST/PCB & PAHs	

OBSERVATIONS / NOTES:

MS/MSD ON; SVOC, PEST/PCB & PAHs ONLY

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s): [illegible]

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 job# 5082

WELL ID.: 2WMW43DS
DATE: 3.11.01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
										START PURGE
0852	1.97									CLEAR w/BLACK FINES
0856	3.66	125	6.40	32.57	18	2.41	7.2	-330	23.57	SULFUR ODOR
0905	4.69		6.34	35.94	19	1.36	7.3	-348	22.49	
0915	5.82		6.16	33.65	19	0.64	7.4	-337	20.94	
0925	6.78		6.25	29.37	19	4.05	7.4	-341	18.07	
0935	7.69		6.35	27.49	19	4.01	7.4	-332	16.77	
0945	8.71		6.68	26.97	21	4.88	7.6	-339	16.44	
0955	9.79		6.39	26.82	25	4.13	7.9	-337	16.35	
1005	11.03		6.37	22.00	25	5.86	8.1	-341	16.45	
1015	12.92		6.32	29.15	25	5.26	8.6	-343	17.88	
1025	13.76		6.32	29.98	28	6.46	8.6	-347	18.45	
1030	14.36		6.29	31.92	31	6.96	8.6	-347	19.76	
1035	15.04		6.27	33.31	32	7.18	8.7	-346	20.7	
1037	15.30									DRY, TO PUMP INLET

PAGE 2 OF 2

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW44DS GW-06
Sample Location: 2WMW44DS
Sampled By: K. SIMPSON
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 3/9/01								
Time: 1045								
Method: Peristaltic Pump		6.65	18.25	10.3	34	0.25	-324	10.84

PURGE DATA:

Date: 3.9.01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.77
Static Water Level (WL): 1.35 T. PVC
One Casing Volume(gal):
Start Purge (hrs): 0850
End Purge (hrs): 1044
Total Purge Time (min): 114
Total Vol. Purged (gal):

Clear w/ Tr Black Fines

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 ML 1-~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 ML 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 ML 1 - ~~500~~ ml PE	✓

OBSERVATIONS / NOTES:

Also collected 2W-GW44DS-06-F
Significant off gassing while filling 40ml Vials w/HCl

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [illegible]

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 job# 5082

WELL ID.: 2WMW44DS
DATE: 3.9.01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
0850	1.35	—	—	—	—	—	—	—	—	START PURGE
0858	2.92	150	6.84	37.19	27	1.92	7.7	-363	23.37	SULFUR ODOR,
0910	4.85	↓	6.48	34.75	18	0.87	7.9	-337	21.71	BLACK FINES
0920	6.33		6.46	32.35	11	4.49	8.3	-334	20.10	
0930	7.27		6.57	27.74	15	7.84	8.6	-341	16.93	
0940	8.11		6.44	19.99	19	6.74	8.8	-334	12.04	
0950	9.46		6.46	10.56	36	5.54	8.8	-326	6.01	
1000	10.80		6.50	12.01	48	4.40	9.1	-322	6.83	
1010	12.13		6.52	13.75	65	5.67	9.3	-323	7.92	
1020	13.68		6.56	15.68	63	6.27	9.5	-318	9.13	
1030	14.65		6.59	18.04	65	5.86	9.9	-318	10.65	
1040	15.96		6.65	18.25	34	6.25	10.3	-324	10.84	
1044	16.07		—	—	—	—	—	—	—	DRY, TO PUMP INLET

SIGNATURE(S): [illegible]

BTM : 16.77

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: ZW-GW45D5 ~~GW-06~~
Sample Location: ZW~~M~~W45D5
Sampled By: T. ROJAHN
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 3/11/01 Time: 1325								
Method: Peristaltic Pump	Black Flakes → Blackish	6.55	39.59	9.30	33	2.82	-359	25.40

PURGE DATA:

Date: 3-10-01	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm): —	
Well Casing Diameter & Material Type: 2" PVC	
Total Well Depth (TD): 16.75'	
Static Water Level (WL): 1.75'	
One Casing Volume(~~gal~~): 9.3 L	
Start Purge (hrs): 1045	
End Purge (hrs): 1155	
Total Purge Time (min): 70	
Total Vol. Purged (~~gal~~): 12.0 L	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	(1) L ~~1 - 500 ml~~ PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	(1) L ~~1 - 500 ml~~ PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	(1) L ~~1 - 500 ml~~ PE	✓

OBSERVATIONS / NOTES:

Significant off gasing was observed while filling VOA vials

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [signature]

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 job# 5082

WELL ID.: 2WMW45DS
DATE: 3-10-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
10:45	1.75	150							→	START PURGE SULFUR ODOR
1055	4.74	150	6.68	42.63	2.4	0.01	8.28	-379	26.90	1500 TR BLACK FINES → CLEAR
1105	6.68	150	6.61	24.22	2.2	4.37	7.97	-382	24.15	3000 ml CLEAR
1115	8.38	150	6.50	20.10	55	3.63	7.94	-370	11.56	4500 ml BLACK FINES
1125	9.88	150	6.38	16.37	83	2.45	7.71	-360	9.50	6000 ml " "
1135	11.65	200	6.42	21.10	56	2.28	7.68	-357	12.70	8000 ml " "
1145	14.03	200	6.53	29.27	24	2.17	8.31	-359	18.22	10000 ml " "
1155	15.82	200	6.55	39.59	33	2.82	9.30	-359	25.40	12000 ml " "
1150									→	DRY

SIGNATURE(S): Terry Rich

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W GW46DS GW-06
Sample Location: 2W MW46DS
Sampled By: R. SIMPSON
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 3-11-01								
Time: 1325								
Method: Peristaltic Pump	CLEAR	6.65	37.46	8.3	33	6.84	-357	23.59

PURGE DATA:

Date: 3-10-01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 17.32
Static Water Level (WL): 1.03
One Casing Volume(gal): 2.7
Start Purge (hrs): 1046
End Purge (hrs): 1218
Total Purge Time (min): 92
Total Vol. Purged (gal): 3.0

TURB. 3-11-01 @ 1340 = 5.7 NTU
SULFUR ODOR

See Attached Low Flow Purge Data Sheet for Purge Data

SOME EFFERVESCING IN HCL

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 ML 1- ~~500 ml~~ PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 ML 1 - ~~500 ml~~ PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 ML 1 ~~500 ml~~ PE	✓

OBSERVATIONS / NOTES:

WL 3-11-01 @ 1305 = 5.91

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [illegible]

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 Job# 5082

WELL ID.: 2WMW46DS
DATE: 3.10.01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1046	1.03	—	—	—	—	—	—	—	—	START PURGE.
1052	2.82	125	7.14	36.26	7.7	3.77	7.9	-341	22.72	BLACK COLOUR, SULFUR
1100	4.45	6.75	~~7.53~~ KS	37.30	7.0	0.10	7.5	-365	23.38	ODOR
1110	6.51		6.74	37.31	14	1.07	7.4	-377	23.43	CLEARING AFTER 7 MINS.
1120	8.30		6.62	37.29	28	1.05	7.3	-364	23.41	
1130	9.53		6.61	37.29	31	5.02	7.5	-369	23.41	
1140	10.78		6.64	37.26	30	3.93	7.7	-368	23.39	
1150	12.06		6.62	37.34	32	6.52	7.7	-372	23.44	
1200	13.33		6.61	37.37	34	6.13	8.0	-363	23.46	
1210	14.67		6.62	37.29	33	7.84	8.2	-365	23.45	
1218	15.78		6.65	37.46	33	6.84	8.3	-357	23.59	
~~1218~~ KS										DRY TO PUMP INLET @ 1218

SIGNATURE(S): [signature]

TD = 17.32

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 203 5082

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW47DS GW-06
Sample Location: 2W MW47DS
Sampled By: R. SIMPSON
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA: 3.8.01

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 3.9.01	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Time: 1045								
Method: Peristaltic Pump	CLEAR	6.36	19.57	8.2	260	5.49	-379	11.46

PURGE DATA: 3.9.01

Date: 3.8.01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.20
Static Water Level (WL): 1.19
One Casing Volume(gal): 2.5
Start Purge (hrs): 1548
End Purge (hrs): 1808
Total Purge Time (min): 140
Total Vol. Purged (gal): 6.1

PUMP RATE 3.9.01 = 120 ML/M
TURB = 31
NO ODOR TR BLACK FINES

See Attached Low Flow Purge Data Sheet for Purge Data

T. PVC

WL 3.9.01 @ 1040 = 1.13'
→ MEASURED

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	—
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 ML 1- ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 ML 1 ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 ML 1 - ~~500~~ ml PE	✓

OBSERVATIONS / NOTES:

NO MS/MSD COLLECTED

Circle if Applicable:

MS/MSD ~~YES~~ KS

Duplicate ID No.: —

Signature(s): [illegible]

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 6
PROJECT NUMBER: CTO 203 job# 5082

WELL ID.: 2WMW47DS
DATE: 3·8·01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1548	1.19	—	—	—	—	—	—	—	—	START PURGE
1555	2.33	100	6.64	30.19	6.9	1.27	6.5	-333	18.46	BLACK FINES
1605	3.10		6.53	26.66	4.8	1.44	6.4	-324	16.09	SULFUR ODOR
1615	3.55		6.39	22.34	9.7	2.10	6.3	-323	13.40	
1625	3.85		6.24	18.95	15	2.63	6.3	-369	11.08	
1635	3.91		6.09	16.38	51	4.30	5.9	-419	16.42	
1645	4.03		6.04	13.53	90	3.89	5.9	-432	7.79	TURNING BLACK
1655	4.38	225	6.06	10.50	110	4.05	5.8	-392	5.99	TURN-UP PUMP TO
1705	5.41		6.03	5.399	92	4.49	6.0	-384	2.92	PUMP DRY & SAMPLE
1715	6.20		6.01	5.115	39	4.61	5.8	-357	2.75	FRIDAY 3.9.01
1725	7.95	275	6.11	4.587	43	5.65	5.6	-259	2.44	
1735	10.00		6.06	5.160	50	6.16	5.5	-211	2.75	
1745	11.78		6.11	7.960	41	5.66	6.1	-229	4.50	
1755	13.50		6.17	12.88	30	5.97	6.9	-249	7.53	
1805	15.29		6.36	19.57	260	5.49	8.2	-379	11.46	
1809	15.97									DRY TO PUMP INLET

SIGNATURE(S): [illegible]

WTM = 16.20

PAGE 2 of 2

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 203 5082

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SWSG-18 06
Sample Location: 2W/MW41 DS
Sampled By: SIMPSON/ROJAHN
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 3.13.01 Time: 0920 Depth: 3" BELOW SURF. Method: DIRECT FILL	CLEAR	6.57	0.285	1.0	11	12.41	0.13	104

SAMPLE COLLECTION INFORMATION:

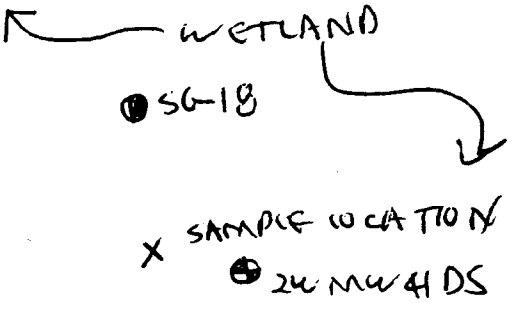
Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 1 - ~~500~~ ml PE	✓

OBSERVATIONS / NOTES:

SOME ORGANIC MATERIAL IN SAMPLE

HIGH WATER LEVEL

MAP:



GABION BASKETS
RIP-RAP
ASPHALT

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 203 5082

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SWSG-24 06
Sample Location: WELL 47 DS
Sampled By: SIMPSON/ROJAHN
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-13-01 / Time: 0910 / Depth: 3" BELOW SURF. / Method: DIRECT FILL	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
	CLEAR	7.55	0.037	0.5	6.4	14.47	0.02	89

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 1- ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 1 - ~~500~~ ml PE	✓

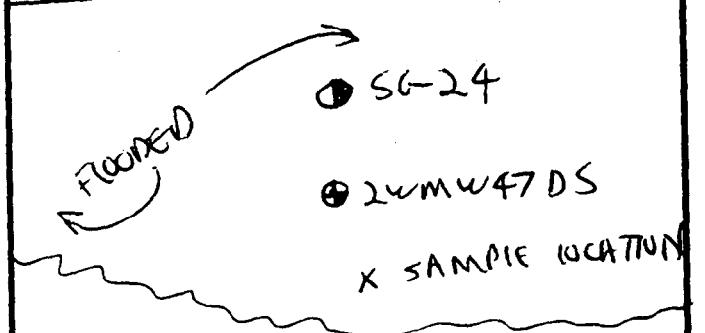
OBSERVATIONS / NOTES:

SOME ORGANIC MATERIAL IN SAMPLE
HIGH WATER LEVEL (RAIN) ≈ 5" OVER WELL PAD

TD = 12" OF WATER @ SAMPLE LOCATION

MAP:

DEPLOYED PARKING
RIP - RAP
GABION BASKETS



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 203 5082

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SWSG 19 06
Sample Location: SG-19
Sampled By: SIMPSON/ROJAHN
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 3-12-01								
Time: 1510								
Depth: 3" BELOW SURF.	CLEAR	6.56	0.389	2.8	2.9	8.59	0.19	-66
Method:								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements		Collected
TCL VOLATILES	HCL / 4° C	10	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	6	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	6	4 - Qt. Amber Glass	✓
TCL PAH	4° C	4	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	3	(000) 1 - ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	3	(000) 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	6	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	2	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	2	(000) 1 - ~~500~~ ml PE	✓
		X VOL FOR: SAMPLE,		
		DUP + MS/MSD		

OBSERVATIONS / NOTES:

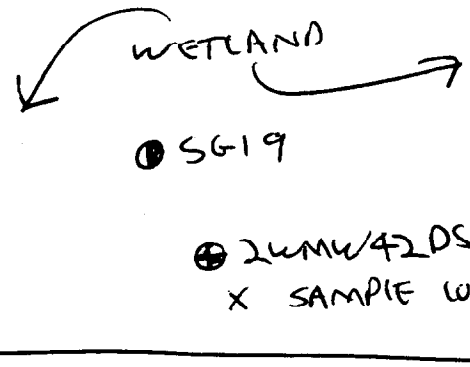
TD OF WATER 12"

SOME ORGANIC MATERIAL IN SAMPLE

WATER ≈ 6" ABOVE WELL PAD.

SLIGHT FLOW NOTED TOWARDS DIKE

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	SWFD 031201 01

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 203 5082

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SWSG-23 06
Sample Location: 2WMW46 DS
Sampled By: SIMPSON/ROJAHN
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 3-11-01 Time: 1525 Depth: 12" * Method: DIRECT FILL	CLEAR	8.03	0.069	0.8	5.0	6.28	0.03	-45

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	—
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	—
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	—
TCL PAH	4° C	2 - Qt. Amber Glass	—
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 1 - ~~500~~ ml PE	✓

OBSERVATIONS / NOTES:

DUG SAMPLE PIT ≈ 19" Ø X 10" DEEP ON 3.9.01

TRACE ORGANIC MATERIAL IN SAMPLE

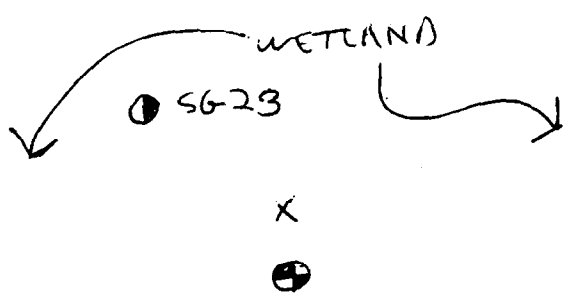
WATER ON ALL SIDES OF WELL PAD

* TD = 12" SAMPLE COLLECTE 3" BELOW SURFACE

STANDING WATER, NO FLOW NOTED

SOME ICE/SNOW @ SAMPLE LOCATION

MAP:



GABION BASKETS
RIP-RAP
DEPLOYED PARKLINS

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 203 5082

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SWSG2006
Sample Location: MW43
Sampled By: SIMPSON/ROJAHN
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3.13.01 / Time: 0950 / Depth: 3" BELOW SURF. / Method: DIRECT FILL	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
	CLEAR	6.67	0.380	1.7	12	7.29	0.18	39

SAMPLE COLLECTION INFORMATION:

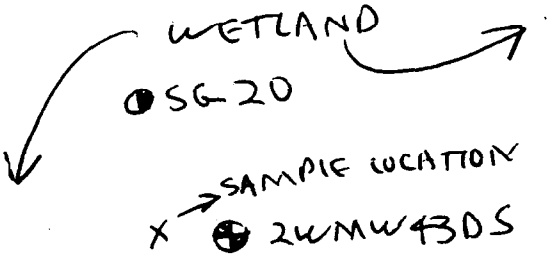
Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 1- ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 1 - ~~500~~ ml PE	✓

OBSERVATIONS / NOTES:

SOME ORGANIC MATERIAL IN SAMPLE

WATER & ICE ≈ 6" ABOVE WELL PAD

MAP:



GABION BASKETS

RIP-RAP

ASPHALT

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 203 5082

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: 3MSP 01 06
Sample Location: SEEP
Sampled By: SIMPSON/ROSATHAL
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 3.13.01 Time: 1008 Depth: 2" BELOW SURFACE Method: DIRECT FILL	CLOUDY	6.52	0.172	3.5	42	14.27	0.08	66

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	—
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	—
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	—
TCL PAH	4° C	2 - Qt. Amber Glass	—
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 1- ~~500~~ ml PE	—
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	—
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	—
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 1 - ~~500~~ ml PE	✓

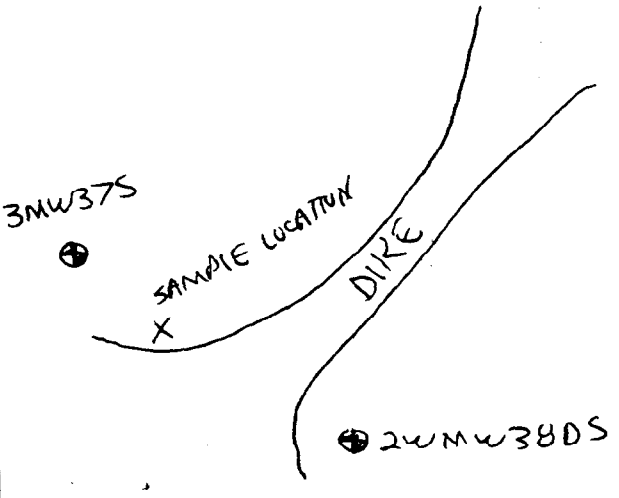
OBSERVATIONS / NOTES:

SOME ORGANIC MATERIAL IN SAMPLE

SAMPLE @ ORIGINAL (SURVEYED) LOCATION

FLOW = APPROX. 25 GPM

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 203 5082

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SWSG22 06
Sample Location: 2WMW45DS
Sampled By: SIMPSON/ROJAHN
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 3-11-01								
Time: 1555								
Depth: 3"	CLEAR	7.03	0.491	3.5	10	1.27	0.24	-68
Method: DIRECT FILL								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 1 - ~~500~~ ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 1 - ~~500~~ ml PE	✓

OBSERVATIONS / NOTES:

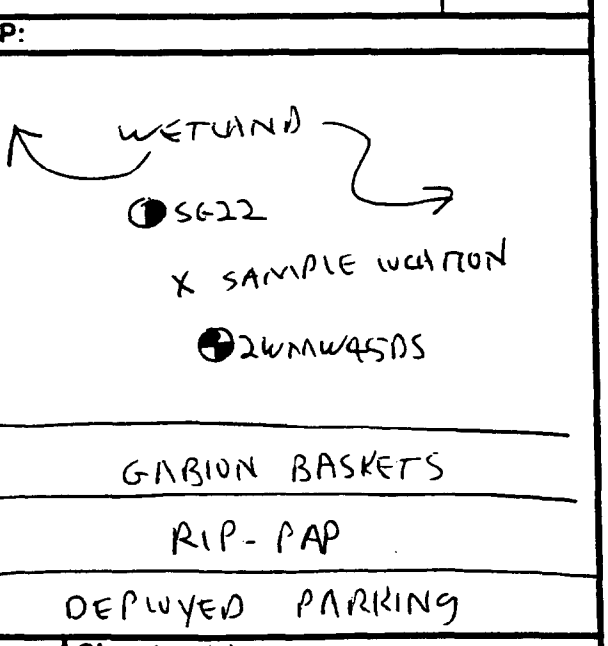
DUG SAMPLE PIT ≈ 19" Ø X 10" DEEP ON 3.9.01

TRACE ORGANIC MATERIAL IN SAMPLE

SOME ICE/SNOW ON SURFACE WATER

STANDING WATER NO FLOW NOTED

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 203 5082

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SWSG-21 06
Sample Location: 2WMW44DS
Sampled By: SIMPSON/ROSMAN
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3 11.01	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Time: 1620								
Depth: 3" BELOW SURF.	CLEAR	7.15	0.097	1.2	4.7	11.25	0.05	5.0
Method: DIRECT FILL								

SAMPLE COLLECTION INFORMATION:

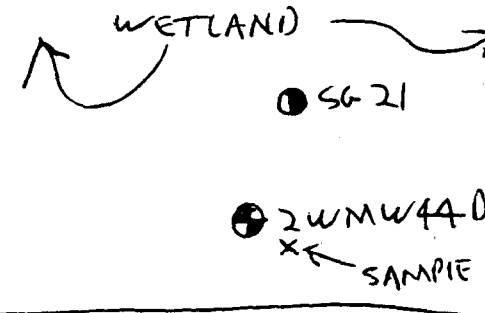
Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1000 1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1000 1 - 500 ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1000 1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

AREA OF PONDED WATER
NO DIGGING REQUIRED
TRACE ORGANIC MATERIAL IN SAMPLE
12" DEEP
ICE/SNOW ON WATER SURFACE

NO FLOW STANDING WATER

MAP:



GABION BASKETS
RIP-RAP
ASPHALT
CRANE TEST PAD

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

ROUND 7

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted]

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 4-GW015-07
Sample Location: 4 MW15
Sampled By: Wellman
C.O.C. No.: 41506
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 6/25/01 Time: 1410 Method: Peristaltic Pump	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	~~Eh~~ ORP mV	Salinity ~~ppt~~
	clear	5.61	217	12.09	0.02	8.33	168.9	

PURGE DATA:

Date: 6/25/01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 20.30
Static Water Level (WL): 6.95
One Casing Volume(~~gal~~): 6 L
Start Purge (hrs): 1325
End Purge (hrs): 1410
Total Purge Time (min): 45
Total Vol. Purged (~~gal~~): 7.0 L

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	6
TCL SEMIVOLATILES	4° C	1 - Qt. Amber Glass	2
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	4
TCL PAH	4° C	1 - Qt. Amber Glass	2
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	2
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	2
Total Organic Carbon (TOC)	HCL / 4° C	1-500mL PE ~~2 - 40 mL Glass~~	2
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	~~1 - 250 mL~~ PE	2
Alkalinity, Chloride, Sulfate, TDS	4° C	1-1 L ~~1 - 500 ml~~ PE	2

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.: GWFD0625010 2

Signature(s): Jennifer C. Wellman

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 4MW15

PROJECT: NSB-NLON
PROJECT NUMBER: CTO 816
SITE: Area A
DATE: 6/24/01
WEATHER: Sunny 80s
PERSONNEL: Wellman/Ramser

Well Screen Depth: 10.30 / 20.30 ft.
Initial Water Level: 6.95 @ 1320 hrs.
Pump Type/Material: peristaltic
Pump Intake Depth: 19.0
Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected
Total Purge Volume= 7.0 (gal (L))
Total Purge Time= 45 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	~~Salinity~~ ppt	ORP Eh mV	Comments
1325	6.95	–	200	—							→	start purge
1330	7.00	1000	150		12.81	5.91	240	8.16	1.1		102.5	
1335	7.00	1750	150		12.72	5.72	229	8.32	0.65		121.9	
1340	7.00	2500	150		12.38	5.64	222	8.33	0.05		138.3	
1345	7.01	3250	150		12.17	5.62	218	8.36	0.00		146.1	
1350	7.01	4000	150		12.13	5.59	217	8.30	0.00		154.1	
1355	7.01	4750	150		12.08	5.60	217	8.35	0.05		158.4	
1400	7.01	5500	150		12.14	5.60	218	8.34	0.20		165.5	
1405	7.02	6250	150		12.11	5.61	217	8.33	0.05		166.9	
1410	7.02	7000	150		12.09	5.61	217	8.33	0.02		168.9	

Water Quality Meter (S/N): 99B1377AA
Control Box Type (S/N): 01B0583 AB
Turbidimeter (S/N): 1728-11000
Notes: GWFD0625010Z

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted]

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2L - GW205 ~~GW-05~~ 07
Sample Location: 2L GW205
Sampled By: Wellman
C.O.C. No.: 41503
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	~~Eh~~ ORP ~~mV~~	~~Salinity ppt~~
Date: 6/24/01								
Time: 1045								
Method: Peristaltic Pump	clear	6.48	359	15.19	0.98	6.20	26.9	

PURGE DATA:

Date: 6/24/01
Method: Peristaltic Pump
Monitor Reading (ppm): ——
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 18.90
Static Water Level (WL): 16.32
One Casing Volume(gal): 1.68L
Start Purge (hrs): 1000
End Purge (hrs): 1045
Total Purge Time (min): 45
Total Vol. Purged (gal): 6.2L

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	9
TCL SEMIVOLATILES	4° C	1 - Qt. Amber Glass	3
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	6
TCL PAH	4° C	1 - Qt. Amber Glass	3
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	3
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	3
Total Organic Carbon (TOC)	HCL / 4° C	1-500mL ~~2 - 40 mL Glass~~	3
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	~~1 - 250 mL~~ PE	
Alkalinity, Chloride, Sulfate, TDS	4° C	1-1L ~~1 - 500 ml~~ PE	3

OBSERVATIONS / NOTES:

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s): Jennifer C. Wellman

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2LGW20S

PROJECT: NSB-NLON / Area A
PROJECT NUMBER: CTO 816
SITE: Area A

DATE: 6/24/01
WEATHER: overcast 70's
PERSONNEL: Wellman / Ramser

Well Screen Depth: 8.9 / 18.9 ft.
Initial Water Level: 16.32 @ 0955 hrs.

Pump Type/Material: peristaltic
Pump Intake Depth: 18.7

Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected

Total Purge Volume= 6.2 (gal/L)
Total Purge Time= 45 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	~~Salinity~~ ppt	ORP Eh mV	Comments
1000	16.32		200	—								Start purge
1010	16.73	2000	120	—	15.65	6.91	511	6.26	53.8	—	-40.3	
1015	16.74	2600	120	—	15.63	6.97	437	7.70	19.9	—	-19.4	
1020	16.74	3200	120	—	15.47	6.68	396	9.70	6.93	—	-4.3	
1025	16.74	3800	120	—	15.31	6.53	381	6.34	2.36	—	16.5	
1030	16.75	4400	120	—	15.30	6.53	365	6.27	2.52	—	20.2	
1035	16.76	5000	120	—	15.25	6.50	361	6.21	1.79	—	25.3	
1040	16.76	5600	120	—	15.16	6.49	358	6.20	1.24	—	26.6	
1045	16.77	6200	120	—	15.19	6.48	359	6.20	0.98		26.9	

Water Quality Meter (S/N): 99B1377AA
Control Box Type (S/N): 01B0583 AB
Turbidimeter (S/N): 1728-1600

Notes:

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted]

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW215-GW-07 ~~GW-06~~
Sample Location: 2WMW215
Sampled By: Wellman
C.O.C. No.: 41503
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	~~Eh~~ ORP mV	Salinity ppt
Date: 6/23/01								
Time: 1115								
Method: Peristaltic Pump	clear/grad	6.69	25575	14.14	45	*8.15	-302.9	

PURGE DATA:

Date: 6/23/01	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm):	
Well Casing Diameter & Material Type: 2" PVC	
Total Well Depth (TD): 17.4	
Static Water Level (WL): 4.24	
One Casing Volume(~~gal~~): 1.62	
Start Purge (hrs): 0925	
End Purge (hrs): 1115	
Total Purge Time (min): 120	
Total Vol. Purged (~~gal~~): 14.4 L	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	6
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	2
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	4
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	2
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	2
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	2
Total Organic Carbon (TOC)	~~HCL / 4° C~~	1-500mL PE ~~2 - 40 mL Glass~~	2
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	~~1 - 250 mL PE~~	
Alkalinity, Chloride, Sulfate, TDS	4° C	1-1L ~~1 - 500 ml PE~~	2

OBSERVATIONS / NOTES:

D.O. - values bounced around dramatically - value is questionable

Circle if Applicable:

MS/MSD

Duplicate ID No.: GWFD062301 01

Signature(s): Jennifer C. Wellman

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW21S

PROJECT: NSB- NLON/Area A
PROJECT NUMBER:
SITE: Area A

DATE: 6/23/01
WEATHER: Overcast, 70s, misty
PERSONNEL: Wellman Ramser

Well Screen Depth: 7.4 / 17.4 ft.
Initial Water Level: 4.24 @ 0925 hrs.
Pump Type/Material: peristaltic/teflon
Pump Intake Depth:
Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected
Total Purge Volume= 14.4 (gal/(L))
Total Purge Time= 120 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp ºC	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	~~Salinity~~ ppt	~~Eh~~ ORP mV	Comments
0925	4.24	—	180	—							→	start purge
0935	5.20	1800	150	—	12.64	7.06	34130	7.48	19	—	-300	
0945	5.61	3300	150	—	13.17	6.90	34227	6.81	3.3	—	-316.2	
0955	5.62	4800	120	—	13.42	6.83	33652	7.77	3.1	—	-313.4	
1005	5.63	6000	120	—	13.57	6.77	32666	8.45	2.5	—	-310.2	
1015	5.63	7200	120	—	13.90	6.76	31627	9.50	3.7	—	-307.6	
1025	5.64	8400	120	—	14.02	6.75	30335	*10.02	7.3	—	-304.5	
1035	5.64	9600	120	—	13.65	6.74	28879	5.33	28	—	-299.7	
1045	5.69	10800	120	—	14.14	6.74	27272	6.28	45	—	-305.7	
1055	5.70	12000	120	—	14.15	6.73	26366	7.24	45	—	-303.6	
1105	5.69	13200	120	—	14.16	6.69	25958	8.15	45	—	-304.1	
1115	5.69	14400	120		14.14	6.69	25575	*	45		-302.9	

Water Quality Meter (S/N): 99B1377A
Control Box Type (S/N): 81B0583 AB
Turbidimeter (S/N): 1728-1600

Notes: * D.O. Questionable - Reading too high - checked probe & it is ok

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted]

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 3-GW375-07 ~~GW-00~~
Sample Location: 3MW375
Sampled By: J. Wellman
C.O.C. No.: 41501
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 06/19/01								
Time: 1115								
Method: Peristaltic Pump	Clear	~~15~~ 6.03	1355	15.36	1.4	0.70	709	—

PURGE DATA:

Date: 06/19/01
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 8.45
Static Water Level (WL): 3.55
One Casing Volume(~~gal~~ L): 3.5L
Start Purge (hrs): 0955
End Purge (hrs): 1115
Total Purge Time (min): 80
Total Vol. Purged (~~gal~~ L): 8.0

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~H_2SO_4 HCL~~ / 4° C	1-500mL PE ~~2-40 mL Glass~~	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1-500mL PE ~~1-250 mL PE~~	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1L ~~1-500 ml~~ PE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD ✓

Duplicate ID No.: ✓

Signature(s): Jennifer C. Wellman

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 3MW37S

PROJECT: NBB-NLON/AREA A
PROJECT NUMBER: CTO 816 / 2863
SITE: AREA A

DATE: 06/18/01
WEATHER: Sunny Upper 80s
PERSONNEL: J. Wellman / F. Ramser

Well Screen Depth: 3.45 / 8.45 ft.
Initial Water Level: 3.55 @ 0943 hrs.
Pump Type/Material: Peristaltic
Pump Intake Depth: 6.45
Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected
Total Purge Volume= 80 (~~gal~~/L) **Total Purge Time=** 80 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	~~Eh~~ ORP mV	Comments
0955	3.55	—	100	—	—						→	start purge
1005	3.74	1000	100	—	15.59	6.14	1375	1.41	5.5	—	102.2	
1015	3.80	2000	100	—	15.62	6.09	1346	0.92	5.1	—	76.3	
1025	3.83	3000	100	—	15.42	6.05	1325	0.78	4.9	—	65.5	
1035	3.85	4000	100	—	15.35	6.03	1327	0.71	3.6	—	66.2	
1045	3.86	5000	100	—	15.70	6.03	1340	0.73	2.4	—	64.2	
1055	3.86	6000	100	—	15.46	6.03	1335	0.78	2.7	—	65.6	
1105	3.86	7000	100	—	15.40	6.03	1353	0.72	1.6	—	69.6	
1115	3.87	8000	100	—	15.36	6.03	1355	0.70	1.4	—	70.9	

Water Quality Meter (S/N): 99B1377AA
Control Box Type (S/N): 01B0583 AB
Turbidimeter (S/N): 1728-1600

Notes:

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted] 816

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW38DS-01
Sample Location: 2WMW38DS
Sampled By: FRED W. RAMSER
C.O.C. No.: 41503
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SEE BELOW

SAMPLING DATA:

Date: 6-19-01 ~~6-21-01~~	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Time: SEE BELOW								
Method: Peristaltic Pump								

PURGE DATA:

Date: 6-19-01
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 11.90
Static Water Level (WL): 5.39
One Casing Volume (~~gal~~ liter): 3.5 l
Start Purge (hrs): 1500 HR
End Purge (hrs): 1550
Total Purge Time (min): 50 min
Total Vol. Purged (~~gal~~ liter): 5.4 l

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements		Collected
TCL VOLATILES	HCL / 4° C	1040	3 - 40 ml Vial	6-24-01
TCL SEMIVOLATILES	4° C	1430	1 - Qt. Amber Glass	6-23-01
TCL PEST/PCBs	4° C	1300 HR	2 - Qt. Amber Glass	6-21-01
TCL PAH	4° C	1430	1 - Qt. Amber Glass	6-23-01
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1300 HR	1- 500 ml PE	6-21-01
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1300 HR	1 - 500 ml PE	6-21-01
Total Organic Carbon (TOC)	HCL / 4° C		~~0 - 40 mL Glass~~	
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1040	1 - 250 mL PE	6-24-01
Alkalinity, Chloride, Sulfate, TDS	4° C	1430	1 - 500 ml PE	6-23-01

OBSERVATIONS / NOTES:

11.90
5.39
(5.51)(0.6) – 3.5 l

PURGED DRY 6-19-01
6-21-01 WL = 8.91 PURGED DRY 1400 HRS

Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):
—	—	Fred W Ramser

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW38DS

PROJECT: AREA A QTR SPL (7TH)
PROJECT NUMBER: CTO 816, JOB# 2863
SITE: AREA A

DATE: 6-19-01
WEATHER: SUNNY 80-90s
PERSONNEL: FRED W. RAMSER

Well Screen Depth: ____ / ____ ft.
Initial Water Level: 5.39 @ 1141 hrs.

Pump Type/Material: PERISTALTIC
Pump Intake Depth: SCREEN MIDPT

Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☒ Not Affected

Total Purge Volume= ____ (gal / L) **Total Purge Time=** ____ (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	ORP ~~Eh~~ mV	Comments
1141/1500	5.39	200	~100ml/m	–	15.77	6.41	716	1.18	0.84	—	-10.8	
1510	6.65	~~1000~~ 1200 (1L)	~100ml/m	–	14.29	6.37	669	0.58	3.13	–	-18.8	
1520	8.45	~~2200~~ 2400	~120ml/m	–	14.13	6.42	655	0.56	0.80	–	5.4	
1530	9.15	3400	~100ml/m	–	14.50	6.54	684	0.86	0.77	–	4.6	
1540	10.19	4400	↓	–	14.11	6.66	723	0.85	2.50	–	-6.5	
1550	11.55	5400	~100ml/m	—	13.65	6.75	748	1.24	0.89		-38.2	DRY WELL
									(END PURGE)			

Water Quality Meter (S/N): 01D1391AA YS16501409 4/6820
Control Box Type (S/N): NA
Turbidimeter (S/N): 1735-1600 LAMOTTE

Notes:

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted]

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW39DS-07 ~~GW-00~~
Sample Location: 2WMW39DS
Sampled By: J. Wellman
C.O.C. No.: 41543
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	ORP mV	Salinity ppt
Date: 6/19/01								
Time: 1651								
Method: Peristaltic Pump	Clear	6.67	1501	15.10	8.1	0.60	-61	

PURGE DATA:

Date: 6/19/01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.7
Static Water Level (WL): 2.50
One Casing Volume(gal): 6.61
Start Purge (hrs): 1441
End Purge (hrs): 1651
Total Purge Time (min): 130
Total Vol. Purged (gal): 166.00

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	1 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	~~HNO_3~~ / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~1+50 HCL~~ / 4° C	1-500mL PE ~~1-40 mL Glass~~	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1-500mL ~~1-250 mL PE~~	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1-L ~~1-500 ml~~ PE	✓

OBSERVATIONS / NOTES:

Well went dry while filling bottles-
will have to fill sample bottles for TOC, COD,
and ALK, Cl, SO_4, TSD, and VOLATILES Tommorrow
6/20/01- Complete sampling (TOC, COD, VOL, ALK, Cl, SO_4, TDS

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s): Jennifer C. Wellman

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2W-GW39QS-07

PROJECT: NSB-NLON AREA A
PROJECT NUMBER: 2863
SITE: AREA A

DATE: 06/19/01
WEATHER: Sunny 80's
PERSONNEL: WELLMAN / RAMSER

Well Screen Depth: 06.7 / 16.7 ft.
Initial Water Level: 2.5 @ 1441 hrs.

Pump Type/Material: PERISTALTIC
Pump Intake Depth: 14.7

Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected

Total Purge Volume= 16600 (gal / L)
Total Purge Time= 130 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	~~Eh~~ ORP mV	Comments
1441	2.50	~	200	—	—							Start purge
1451	5.80	2000	200	—	15.42	6.89	2374	1.31	55	—	-99.4	
1501	5.07	4000	150	—	16.46	6.78	1739	0.61	2.5	—	-94.1	
1511	6.07	5500	150	—	16.55	6.79	1461	0.59	5.4	—	-97.5	
1521	7.52	7000	100	—	16.29	6.74	1091	0.56	14	—	-94.2	
1531	8.02	8000	100	—	16.49	6.74	1030	0.54	13	—	-82.8	
1541	8.37	9000	100	—	16.81	6.89	1915	0.60	17	—	-86.0	
1551	8.95	10000	100	—	16.82	6.78	1305	0.62	18	—	-73.3	
1601	9.65	11000	100	—	16.54	6.69	1140	0.64	12	—	-64.6	
1611	9.96	12000	100	—	17.42	6.86	1720	0.66	35	—	-76.2	
1621	10.35	13000	120	—	15.85	6.78	1255	0.67	16	—	-66.6	
1631	11.01	14200	120	—	15.90	6.81	1746	0.62	17	—	-71.6	
1641	11.65	15400	120	—	15.08	6.67	1438	0.62	11.6	—	-64.6	
1651	12.80	16600	120	—	15.10	6.67	1501	0.60	8.1	—	-67.0	SAMPLED

Water Quality Meter (S/N): 99B1377AA
Control Box Type (S/N): 01B0583 AB
Turbidimeter (S/N): 1728-1600

Notes:

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted] 816

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW40DS-07
Sample Location: 2WMW40DS
Sampled By: RWR
C.O.C. No.: 41543
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 6-19-01, 6-20-01								
Time: 1745								
Method: Peristaltic Pump	GRNish	6.89	12530	11.32	2.99	0.74	-333.6	

PURGE DATA:

Date: 6-19-01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD):
Static Water Level (WL): 2.97
One Casing Volume(gal):
Start Purge (hrs): 1630
End Purge (hrs): 1735
Total Purge Time (min): 65
Total Vol. Purged (~~gal~~ liters): 7.1 l

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	6-20-01
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓6/19/01
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓6/19/01
TCL PAH	4° C	2 - Qt. Amber Glass	✓6/20/01
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	6-20-01
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	6-20-01
Total Organic Carbon (TOC)	HCL / 4° C	~~2 - 40 mL Glass~~	6-20-01
Chemical Oxygen Demand (COD) TOC	H_2SO_4 / 4° C	1 - 250 mL PE	6-20-01
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - ~~500 ml~~ PE 1 l	6-20-01

OBSERVATIONS / NOTES:

WELL WENT DRY DURING CONTAINER FILL UP. 6-19-01
COLLECTED REMAINING CONTAINERS 6/20/01 @ 1130 HRS

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s): Fred Mauser

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2WMW40DS

PROJECT: "AREA A" QTR SPL (7th)
PROJECT NUMBER: 2863
SITE: AREA A

DATE: 6-19-01
WEATHER: SUNNY
PERSONNEL: FRED WRAMSFD

Well Screen Depth: _____ / _____ ft.
Initial Water Level: 2.97 @ 1630 hrs.

Pump Type/Material: PERISTALTIC
Pump Intake Depth: ~1' OFF BOT.

Tide Cycle: ☐ High @ _____ ☐ Low @ _____ ☒ Not Affected

Total Purge Volume= _____ (gal / L) **Total Purge Time=** _____ (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	ORP ~~Eh~~ mV	Comments
1630	2.97		~100 mL/min									
1635	5.18	600 mL	↓		11.77	6.91	25000	0.29	2.19	—	-321.1	
1645	6.29	1600	~120 mL/min		11.68	6.92	22000	0.45	3.01	—		
1655	7.48	2800	~120 mL		11.58	6.93	20500	-0.72	5.84	—	-337.1	
1705	8.47	4000 mL	~120 mL/min		11.77	6.92	17379	-0.11	2.20	—	-330.5	
1715	9.45	5100	~110 mL/min		11.87	6.91	15102	0.32	2.83	—	-330.5	
1725	10.55	6100	100 mL/min		11.86	6.86	12404	0.68	2.95	—	-342.2	
1735	11.45	7100	100 mL		11.32	6.89	12530	0.74	2.99		-333.6	
								(END PURGE)				

Water Quality Meter (S/N): 01D1391 AA YSI 650 MDS w/ 6820 sondes
Control Box Type (S/N): NA
Turbidimeter (S/N): 1735-1600 LA MOTTE

Notes:

Page ___ of ___

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted]

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW41DS-07
Sample Location: 2WMW41DS
Sampled By: JCW
C.O.C. No.: 41513
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 6/20/01								
Time: 1545								
Method: Peristaltic Pump	clear	7.03	21403	19.72	34	7.77	—	-313.7

PURGE DATA:

Date: 6/20/01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.5
Static Water Level (WL): 2.12
One Casing Volume(gal): 6.6 L
Start Purge (hrs): 0800
End Purge (hrs): 0934
Total Purge Time (min): 94
Total Vol. Purged (gal): 15100

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	6/20/01
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	6/20/01 + 6/21/01
TCL PAH	4° C	1 - Qt. Amber Glass	6/21/01
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	6/21/01
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~HCL / 4° C~~	1-500mL PE 2 - 40 mL Glass	6/21/01
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	6/21/01
Alkalinity, Chloride, Sulfate, TDS	4° C	1-1L ~~1 - 500 ml~~ PE	6/21/01

OBSERVATIONS / NOTES:

Collected both semivolatiles + 1 PEST/PCB at 1545 - before well went dry

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s): Jennifer C. Wellman

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2WMW42DS

PROJECT: NSB-NLON Area A
PROJECT NUMBER: 2863
SITE: Area A

DATE: 6/20/01
WEATHER: Sunny 80's
PERSONNEL: Wellman / Ramser

Well Screen Depth: 6.5 / 16.5 ft.
Initial Water Level: 2.12 @ 0753 hrs.

Pump Type/Material: peristaltic
Pump Intake Depth: 16 ft

Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected

Total Purge Volume= 15100 (gal / L)
Total Purge Time= 94 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	~~Eh~~ ORP mV	Comments
0800	2.12	—	250	—	—						→	Start purge
0810	5.49	2500	150	—	17.27	7.23	21836	4.27	13	—	-282.4	
0820	6.68	4000	150	—	17.60	7.18	19475	3.86	7.2	—	-289.2	
0830	8.37	5500	150	—	17.75	7.06	15401	5.13	4.3	—	-290.6	
0840	9.90	7000	150	—	17.80	6.94	11975	7.43	15.0	—	-289.1	
0850	11.48	8500	150	—	18.07	6.98	11915	12.84	25	—	-280.2	D.O.=12.84
0900	13.29	10000	150	—	18.36	7.02	13929	13.75	19	—	-291.8	
0910	14.20	11500	150	—	18.59	7.04	15662	10.31	19	—	-300.8	
0920	15.02	13000	150	—	19.31	7.04	17544	7.49	14	—	-306.1	
0930	15.94	14500	150	—	19.72	7.03	21403	7.77	34	—	-313.1	
0934		15100	—								→	DRY

Water Quality Meter (S/N): 99B1377AA
Control Box Type (S/N): 01B0583AB
Turbidimeter (S/N): 1728-1600

Notes: - Water has swampy smell (sulfur)
organic sheen on top of SW

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted] 816

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW42DS - 07 ~~GW-06~~
Sample Location: 2WMW42DS
Sampled By: FLR
C.O.C. No.: 41543
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh ~~ORP~~ mV	Salinity ppt
Date: 6-20-01								
Time: 0930								
Method: Peristaltic Pump	GREY	6.86	11967	14.65	63.2	2.39	-370.3	—

PURGE DATA:

Date: 6-20-01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16
Static Water Level (WL): 1.30
One Casing Volume(gal): NA
Start Purge (hrs): 0800
End Purge (hrs): 0857
Total Purge Time (min): 57
Total Vol. Purged ~~(gal)~~ LITER: 7.5 l

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	6-20-01
TCL SEMIVOLATILES	4° C	~~1 of 2 6-20-01~~ 2 - Qt. Amber Glass	6-20-01
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	6-20-01
TCL PAH	4° C	1 of 2 2 - Qt. Amber Glass	6-20-01
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	6-20-01
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	6-20-01
Total Organic Carbon (TOC)	~~HCL / 4° C~~	~~2 - 40 ml Glass~~	6-20-01
Chemical Oxygen Demand (COD) ← TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500 ml	6-20-01
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 1 l ~~1 - 500 ml~~ PE	6-20-01

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s): Fred Planor

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2WMW42DS

PROJECT: AREA A QTR SAMPLE
PROJECT NUMBER:
SITE: AREA A

DATE: 6-20-01
WEATHER: SUNNY
PERSONNEL: FRED W RAMSER

Well Screen Depth: / 16' ft.
Initial Water Level: 1.80 @ 758 hrs.

Pump Type/Material: PERISTALTIC
Pump Intake Depth:

Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected

Total Purge Volume= (gal (L))
Total Purge Time= (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	~~Eh~~ ORP mV	Comments
0807	5.25	1000ml	1 l/7min	—	13.79	7.00	25021	0.42	21.8	—	-356.1	
0817	6.18	2300	1.3 l/10min	—	13.86	6.90	20593	3.26	6.56	—	-346.8	
0827	8.27	3600	1.3 l/10min	—	14.28	6.78	14060	3.16	5.51	—	-318.5	
0837	9.55	4900ml	1.3 l/10min		14.51	6.75	13355	3.03	5.25	—	-330.8	
0847	10.75	6200ml	1.3 l/10min		14.54	6.76	12075	2.85	63.2	—	-365.0	
0857	11.57	7500ml			14.65	6.86	11867	2.39		—	-370.3	

Water Quality Meter (S/N):
Control Box Type (S/N):
Turbidimeter (S/N):

Notes: PARAMETERS STABLE @ 0837
WELL IS GOING DRY W/LL ALLOW
TO RECOVER PRIOR TO SPL. COLLECTION

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted] 816

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-6W43DS-07 ~~GW-06~~
Sample Location: 2WMW43DS
Sampled By: FRED W RAMSER
C.O.C. No.: 41542
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	~~Eh~~ ORP mV	Salinity ppt
Date: 6-20-01								
Time: 1800								
Method: Peristaltic Pump	GREY	6.89	20295	12.87	5.5	2.88	-356.5	—

PURGE DATA:

Date: 6-20-01
Method: Peristaltic Pump
Monitor Reading (ppm): NA
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 15.65
Static Water Level (WL): 2.95
One Casing Volume(~~gal~~):
Start Purge (hrs): 1617
End Purge (hrs): 1727
Total Purge Time (min): 70 min
Total Vol. Purged (~~gal~~ liter): 7 l

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	6-20-01
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	6-21-01
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	6-20-01
TCL PAH	4° C	1 - Qt. Amber Glass	6-21-01
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	6-20-01
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE 6-20	~~6-20-01~~ FRS
Total Organic Carbon (TOC)	HCL / 4° C	~~2 - 40 ml Glass~~ 6-21-01	~~6-20-01~~ FRS
Chemical Oxygen Demand (COD) → TOC	H_2SO_4 / 4° C	1 - 250 mL PE 6-21-01	~~6-20-01~~ FRS
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	6-20-01

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Fred W Ramser

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW43DS

PROJECT: AREA A 7th QTR SPL
PROJECT NUMBER:
SITE: AREA A
DATE: 6-20-01
WEATHER: SUNNY
PERSONNEL: FRED W RAMBER

Well Screen Depth: / 15.65 ft.
Initial Water Level: 2.95309 @ _____ hrs.
Pump Type/Material: PERISTALTIC
Pump Intake Depth: ~14'
Tide Cycle: ☐ High @ _____ ☐ Low @ _____ ☒ Not Affected
Total Purge Volume= 7000 (gal / L) **Total Purge Time=** 70 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
~~1717~~ 1617	3.51		~110 mL/min	—	15.26	6.60	32503	-1.11	19	—	-348.2	
1627	5.53	1100	1000 mL/min	—	15.65	6.65	31098	3.43	17	—	-363.7	
1637	6.45	2100	~100 mL/min	—	14.55	6.69	29023	5.78	6.7	—	-364.3	
1647	7.70	3100	100 mL/min	—	13.91	6.73	25228	4.63	4.8	—	-362.1	
1657	8.45	4100	100 mL/min	—	14.33	6.79	23153	3.53	5.5	—	-361.3	
1707	9.83	5000	85 mL/min	—	13.80	6.89	21387	5.14	5.9	—	-359.6	
1717	10.64	6000	100	—	12.98	6.92	20187	3.19	6.5		-357.8	
1727	11.22	7000	100	—	12.87	6.89	20275	2.88	5.5		-356.5	
							PURGING	COMPLETE				

Water Quality Meter (S/N): 0101391
Control Box Type (S/N): —
Turbidimeter (S/N):

Notes: WELL PARAMETERS STABLE @ 1727

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted]

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW44D5-07 ~~GW-06~~
Sample Location: 2WMW44D5
Sampled By: PWR
C.O.C. No.: 41513
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. ~~mS/cm~~ uS	Temp. Degrees C	Turbidity NTU	DO mg/l	ORP Eh ~~mV~~	Salinity ppt
Date: SEE BELOW Time: SEE BELOW Method: Peristaltic Pump	GREY/CLEAR	6.92	27880	15.74	4.3	5.87	-358.6	—

PURGE DATA:

Date: 6-22-01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD):
Static Water Level (WL):
One Casing Volume(gal):
Start Purge (hrs): 0800
End Purge (hrs): 0840
Total Purge Time (min): 40
Total Vol. Purged (gal): 4.0

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	6-22-01
TCL SEMIVOLATILES	4° C	1 - Qt. Amber Glass	6-22-01
TCL PEST/PCBs	4° C	1000 HR 1 - Qt. Amber Glass	6-22-01
TCL PAH	4° C	1 - Qt. Amber Glass	6-22-01
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	6-22-01
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	6-22-01
Total Organic Carbon (TOC)	HCL / 4° C	~~2- 40 mL Glass~~	
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1000 HR 1 - 250 mL PE	6-22-01
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	6-22-01

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):
—	—	Fred Wanser

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: ZW-GW44DS

PROJECT: AREA A 7TH QTR SPL.
PROJECT NUMBER:
SITE: AREA A

DATE: 6-22-01
WEATHER: OVERCAST ~60's
PERSONNEL: FRED W RAMSER

Well Screen Depth: ____ / ____ ft.
Initial Water Level: 1.56 @ 750 hrs.

Pump Type/Material: PERISTALTIC
Pump Intake Depth: ~1' OFF BOTTOM

Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☒ Not Affected

Total Purge Volume= 4.0 (gal (L))
Total Purge Time= ~~50~~ 40 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond µS/cm	DO mg/L	Turbidity NTU	Salinity ppt	ORP ~~Eh~~ mV	Comments
0810	3.02	1000	100 ml/m	–	14.74	6.95	31628	0.85	7.2	–	-341.3	
0820	5.35	2000	|	–	14.53	6.93	30036	3.47	4.8	–	-357.8	
0830	6.54	3000	|		15.28	6.93	29360	5.92	4.0	–	-358.9	
0840	7.31	4000			15.74	6.92	27880	5.87	4.3	–	-358.6	
								(PURGE COMPLETED)				

Water Quality Meter (S/N): 01D1391 AA w/
Control Box Type (S/N):
Turbidimeter (S/N): LA MOTTE 1735-1600

Notes:

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted]

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW45DS-07 ~~GW-06~~
Sample Location: 2WMW45DS
Sampled By: JCW
C.O.C. No.: 41543
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 6/20/01								
Time: 11 50								
Method: Peristaltic Pump	blackish	7.02	18011	18.33	35	5.68	—	-324.9

PURGE DATA:

Date: 6/20/01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.82
Static Water Level (WL): 2.92
One Casing Volume(gal): 6.6 L
Start Purge (hrs): 1050
End Purge (hrs): 1150
Total Purge Time (min): 60
Total Vol. Purged (gal): 10100

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	1 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	1 - 500mL PE - 40 mL Glass 3+	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1-500mL ~~1 - 250 mL~~ PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - ~~500 ml~~ PE	✓

OBSERVATIONS / NOTES:

Strong Sulfur Smell

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): Jennifer C. Wellman

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 3 MW 45DS

PROJECT: NSB - NLON Area A
PROJECT NUMBER: 2863
SITE: Area A

DATE: 6-20-01
WEATHER: Sunny upper 80's
PERSONNEL: Wellman Ramser

Well Screen Depth: 6.82 / 16.82 ft.
Initial Water Level: 2.92 @ 1042 hrs.

Pump Type/Material: Peristaltic
Pump Intake Depth: 16 ft

Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected

Total Purge Volume= 10100 (gal / L)
Total Purge Time= 60 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp ºC	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	Eh mV	Comments
10.50	2.92	—	250	—							→	Start purge
1100	4.45	2500	200	—	15.18	7.38	29609	6.16	11	—	-342.8	
1110	7.05	4500	150	—	15.66	7.12	27575	3.88	5.2	—	-337.2	
1120	8.25	6000	150	—	16.57	7.03	22995	5.30	31	—	-330.5	
1130	9.92	7500	140	—	17.67	6.95	19439	5.47	40	—	-317.6	
1140	11.34	8900	120	—	17.69	7.01	16432	5.66	33	—	-319.0	
1150	12.25	10100	120	—	18.33	7.02	18011	5.68	35	—	-324.9	SAMPLE

Water Quality Meter (S/N): 99B1377AA
Control Box Type (S/N): 91B0583AB
Turbidimeter (S/N): 1728-1609

Notes:

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted]

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW46D5 ~~GW-06~~ 07
Sample Location: 2W-MW46D5
Sampled By: Wellman
C.O.C. No.: 41513
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 6/21/01	Color	pH	S.C.	Temp.	Turbidity	DO	~~ORP~~ Eh	~~Salinity~~
Time: 0917	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt
Method: Peristaltic Pump	Clear	6.94	29678	14.38	4.7	2.94	-32.69	

PURGE DATA:

Date: 6/21/01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.68
Static Water Level (WL): 1.25
One Casing Volume(gal): 6.6 L
Start Purge (hrs): 0817
End Purge (hrs): 0917
Total Purge Time (min): 60
Total Vol. Purged (gal): 8.0 L

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	1 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	1330
Total Organic Carbon (TOC)	~~HCL~~ / 4° C	1-500mL PE ~~2 - 40 mL Glass~~	1330
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	~~1-250 mL PE~~	1330
Alkalinity, Chloride, Sulfate, TDS	4° C	1-1L ~~1-500 ml PE~~	✓

OBSERVATIONS / NOTES:

Strong sulfur smell

Circle if Applicable:

MS/MSD —
Duplicate ID No.:

Signature(s): Jennifer C. Wellman

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Well No.: 2W-MW46DS

PROJECT: NSB-NLON - AREA A
PROJECT NUMBER: 2863
SITE: AREA A

DATE: 6/21/01
WEATHER: overcast 70s
PERSONNEL: Wellman / Ramser

Well Screen Depth: 6.68 / 16.68 ft.
Initial Water Level: 1.25 @ 0817 hrs.
Pump Type/Material: peristaltic
Pump Intake Depth: 16.
Tide Cycle: ☐ High @ ☐ Low @ ☒ Not Affected
Total Purge Volume= (gal / L)
Total Purge Time= (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Salinity ppt	~~Eh~~ ORP mV	Comments
0817	1.25	—	200	—								Start purge
0827	4.01	2000	120	—	13.67	7.39	31356	0.57	27	—	-342.3	
0837	5.97	3200	120	—	14.00	7.09	31542	2.13	4.1	—	-335.6	
0847	7.24	4400	120	—	13.88	7.02	31446	2.80	4.2	—	-334.9	
0857	8.89	5600	120	—	14.08	6.97	31472	2.90	4.1	—	-332.7	
0907	10.30	6800	120	—	14.30	6.96	29687	2.91	4.2	—	-327.8	
0917	11.21	8000	120	—	14.38	6.94	29678	2.94	4.7	—	-326.9	

Water Quality Meter (S/N): 99B1377AA
Control Box Type (S/N): Ø1BØ583AB
Turbidimeter (S/N): 1728-16ØØ

Notes: Water has strong Sulfur smell

Tetra Tech NUS, Inc

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSB-NLON / AREA A
Project No.: CTO [redacted] 816

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW47DS-07 ~~GW-00~~
Sample Location: 2WMW47DS
Sampled By: FWR
C.O.C. No.: 41503
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 6-23-01 / Time: 1115	Color Visual	pH Standard	S.C. µS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh ORP mV	Salinity ppt
Method: Peristaltic Pump	GREY	6.68	5429	14.95	29	2.89	-236.9	—

PURGE DATA:

Date: 6-23-01
Method: Peristaltic Pump
Monitor Reading (ppm): NA
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD):
Static Water Level (WL): 1.45
One Casing Volume(gal): NA
Start Purge (hrs): 0935
End Purge (hrs): 1115
Total Purge Time (min): 100
Total Vol. Purged (~~gal~~ liter): 11 L

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	
TCL SEMIVOLATILES	4° C	1 - Qt. Amber Glass	
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	
TCL PAH	4° C	1 - Qt. Amber Glass	
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	
Total Organic Carbon (TOC)	HCL / 4° C	~~2 - 40 mL Glass~~	
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	

OBSERVATIONS / NOTES:

AN OBVIOUS SHEEN IS SEEN ON PURGE WATER

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s): Fred Klauser

Tetra Tech NUS, Inc. **LOW FLOW PURGE DATA SHEET** **Well No.:** 2WMW47DS

PROJECT: AREA A QTR SPL (7th)
PROJECT NUMBER:
SITE: NSB-NLON GROTON, CT

DATE: 6-23-01
WEATHER: OVERCAST
PERSONNEL: FRED WRAMSER

Well Screen Depth: ____ / ____ ft.
Initial Water Level: 1.45 @ 0930 hrs.

Pump Type/Material: PERISTALTIC
Pump Intake Depth:

Tide Cycle: ☐ High @ ____ ☐ Low @ ____ ☒ Not Affected

Total Purge Volume= 11.0 (gal / L) **Total Purge Time=** 100 (min)

Time	Water Level feet below TOC	Volume mL	Flow Rate mL/min	Pump Settings	Temp °C	pH	Sp Cond ~~mS~~ µS/cm	DO mg/L	Turbidity NTU	Salinity ppt	~~Eh~~ ORP mV	Comments
0935	2.21	1000	100		14.43	7.04	24305	2.31	21	—	-301.9	
0945	3.15	2000			14.49	7.00	24346	0.43	5.1	—	-325.2	
0955	3.80	3000			14.48	6.89	20456	-0.14	2.9	—	-310.4	
1005	4.21	4000			14.43	6.79	17235	0.36	1.8	—	-314.4	
1015	4.57	5000			14.57	6.70	13,548	0.45	~~21.92~~	—	-313.4	
1025	4.80	6000			14.56	6.64	10,923	1.43	34		-420.4	
1035	5.25	7000			14.64	6.66	6659	0.93	50		-368.5	
1045	5.50	8000			14.88	6.67	5832	2.78	40		-336.5	
1055	5.68	9000			14.66	6.67	5505	2.13	34		-296.9	
1105	5.85	10000			14.88	6.68	5305	2.95	28		-238.9	
1115	5.88	11000	100		14.95	6.68	5429	2.89	29		-236.9	
								(PURGING COMPLETED)				

Water Quality Meter (S/N): YSI 01D1391AA
Control Box Type (S/N): NA
Turbidimeter (S/N): LAMOTTE 1735 1600

Notes:

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSB_NLON / Area A
Project No.: CTO [redacted]

[] Stream
[X] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 3MSP 01 07
Sample Location: SEEP
Sampled By: WELLMAN/RAMSER
C.O.C. No.: 41501

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

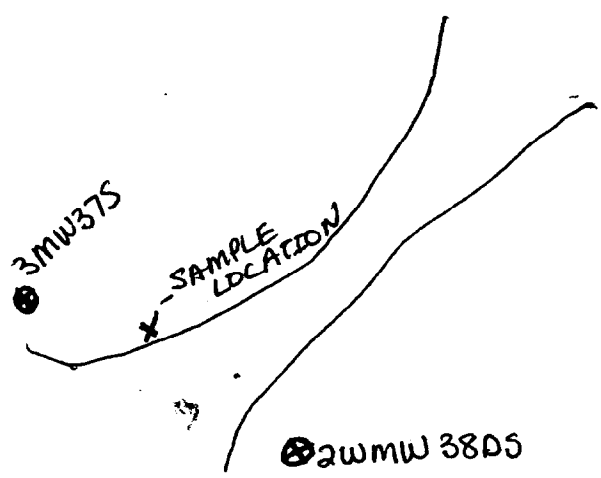
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 06/19/01 Time: 1125 Depth: 2 FEET BELOW SUR. Method: DIRECT FILL	clear ~~clear~~	6.50	491	16.16	11	7.00	—	50.5

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	H_2SO_4 ~~HCL~~ / 4° C	1-500mL PE ~~2-40 mL Glass~~	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1-500mL PE ~~1-250 mL PE~~	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 L ~~1-500 ml~~ PE	✓

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
✓	—

Signature(s): Jennifer C. Wellman

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO [redacted]

[] Stream
[] Spring
[] Pond
[] Lake
[x] Other: Wetland
[] QA Sample Type:

Sample ID No.: SWS18-07
Sample Location: JWMW41PS
Sampled By: JCW
C.O.C. No.: 41543

Type of Sample:
[x] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 6/20/01								
Time: 1600								
Depth:								
Method: Grab	24.41	7.87	309	24.33	89	6.49	—	-79.8

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	1-500mL PE ~~2-40 mL Glass~~	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	~~1-250 mL PE~~	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

Organic sheen on water surface

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jennifer C. Wellman

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO [redacted]

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: Wetland
[] QA Sample Type:

Sample ID No.: SWS619-07
Sample Location: 2WMW42D5
Sampled By: Wellman
C.O.C. No.: 41513

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh ORP mV
Date: 6/22/01								
Time: 0734								
Depth: 8 inches								
Method: Grab	Clear	6.51	236	20.07	5.8	4.56	/	31.6

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	9
TCL SEMIVOLATILES	4° C	1 - Qt. Amber Glass	3
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	6
TCL PAH	4° C	1 - Qt. Amber Glass	3
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	3
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	3
Total Organic Carbon (TOC)	HCL / 4° C	1-500 mL PE } 2 - 40 mL Glass	3
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	
Alkalinity, Chloride, Sulfate, TDS	4° C	1-1 L ~~1 - 500 ml~~ PE	3

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s): Jennifer C. Wellman

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO [redacted]

Sample ID No.: SWS620-07
Sample Location: 2WMW43DS
Sampled By: Wellman
C.O.C. No.: 41513

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetland
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	~~Eh~~ ORP mV
Date: 6/22/01 Time: 0825 Depth: 4 inches Method: Grab	clear	6.55	231	20.23	7.2	6.21	/	13.6

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	3
TCL SEMIVOLATILES	4° C	1 - Qt. Amber Glass	1
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	2
TCL PAH	4° C	1 - Qt. Amber Glass	1
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	1
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	1
Total Organic Carbon (TOC)	HCL / 4° C	1-500 mL PE { ~~2 - 40 mL Glass~~	{1
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - ~~250 mL~~ PE	
Alkalinity, Chloride, Sulfate, TDS	4° C	1-1L ~~1 - 500 mL~~ PE	1

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD — Duplicate ID No.:

Signature(s): Jennifer C Wellman

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSB_NLON / Area A
Project No.: CTO[redacted]

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other:
[] QA Sample Type:

Sample ID No.: SWSG21-07
Sample Location: SWSG21
Sampled By: RWR
C.O.C. No.: 41504

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 1610 6-24-01 Time: 1610 Depth: SURFACE Method: DIRECT FILL	Color Visual	pH Standard	S.C. µS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
	CLEAR	7.46	335	23.69		9.70	—	-9.5

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Fred Wander

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO[redacted]

Sample ID No.: SWSG22-07
Sample Location: SWSG22
Sampled By: PVR
C.O.C. No.: 41506

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. µS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 6-25-01								
Time: 1700								
Depth: SURFACE								
Method: DIRECT PIC	LT BROWN	6.80	430	19.83	—	3.19 ~~4.26~~	T	-102.7

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	~~2 - 40 mL Glass~~	✓
Chemical Oxygen Demand (COD) TOC	H_2SO_4 / 4° C	1 x 0.5 l ~~1 - 250 mL~~ PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 x 1 l ~~1 - 500 ml~~ PE	✓

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD: —
Duplicate ID No.: — SWFD062501-01

Signature(s): Fred M Ranson

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSB_NLON / Area A
Project No.: CTO [redacted]

[] Stream
[] Spring
[] Pond
[] Lake
[✓] Other: Wetland
[] QA Sample Type:

Sample ID No.: SWS623-07
Sample Location: 2W-MW46DS
Sampled By: Wellman
C.O.C. No.: 41513

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	~~Eh mV~~ ORP
Date: 6/21/01								
Time: 1340								
Depth: 8 inches								
Method: Grab	clear	7.82	368	20.09	5.2	5.25		-95.6 ~~[illegible]~~ mV

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~HCL / 4° C~~	1-500 mL PE 2 - 40 mL Glass	✓
Chemical Oxygen Demand (COD)	~~H_2SO_4 / 4° C~~	1 - ~~250 mL~~ PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1-1L ~~1 - 500 ml~~ PE	✓

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:
✓	

Signature(s): Jennifer C. Wellman

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO [redacted]

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other:
[] QA Sample Type:

Sample ID No.: SW5624-07
Sample Location: 5624
Sampled By: PLR
C.O.C. No.: 41506

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. µS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 6-25-01 Time: 1745 Depth: SURFACE Method: DIRECT FILL	YEL BROWN	6.56	253	24.8	—	3.22	—	-11.8

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	1 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	~~2 - 40 ml Glass~~	✓
Chemical Oxygen Demand (COD) TOC	H_2SO_4 / 4° C	1 x 500 ml ~~1 - 250 mL PE~~	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD — Duplicate ID No.: ___

Signature(s): Fred Ranser

ROUND 8

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 4-GW015 08
Sample Location: 4MW015
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt
Date: 9/20/01 Time: 1040 Method: Peristaltic Pump	CLEAR	5.70	.339	15.3	0.00	6.13	175	0.0

PURGE DATA:

Date: 9/20/01
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 20.30
Static Water Level (WL): 11.19
One Casing Volume(gal):
Start Purge (hrs): 0945
End Purge (hrs): 1040
Total Purge Time (min): 55
Total Vol. Purged (gal):

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~4~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 ~~- 500 ml PE~~ ok	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓
		11	

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 4MW01S
DATE: 09- -01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
0945	11.19	-	-	-	-	-	-	-		2300 ml
0955	~~B~~ 11.22	250	5.46	.406	0.00	7.71	16.3	198	0.0	↓ FLOW RT ~~2000~~ 450 ml.
1005	11.25	200	5.67	.355	0.00	6.73	15.6	177	0.0	6500
1015	11.27		5.68	.342	0.15	6.45	15.4	177	0.0	8500
1025	11.30		5.69	.341	0.00	6.27	154	176	0.0	10500
035	11.31		5.70	.339	0.00	6.13	15.3	175	0.0	

SIGNATURE(S): [illegible]

PAGE 1 OF 1

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2LGW205 - 08
Sample Location: 2LMW205
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ~~ppt~~ %
Date: 9-21-01 Time: 1510 Method: Peristaltic Pump	CLEAR	6.34	.431	17.8	7.2	5.01	-114	0.0

PURGE DATA:

Date: 9-21-01
Method: Peristaltic Pump
Monitor Reading (ppm): -
Well Casing Diameter & Material Type: 2" PVC
Total Well Depth (TD): 18.90
Static Water Level (WL): 16.17
One Casing Volume(gal):
Start Purge (hrs): 1245
End Purge (hrs): 1505
Total Purge Time (min): 140
Total Vol. Purged (gal): 8

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~HCL / 4° C~~	~~2 - 40 ml Glass~~	—
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓
		11	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [illegible]

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 2LMW 20S
DATE: 09-21-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
12:45	16.17	250	—	—	—	—	—	—	—	CLEAR - SLIGHTLY
1255	17.01	200	6.12	.017	40	6.02	19.8	-3	0.0	TURBID - WELL
1305	16.79	220	6.09	.049		5.50	20.0	10	0.0	COVER IS IN BAD
1315	16.84	200	6.14	.050	14	5.40	19.6	18	0.0	SHAPE - SURFACE
1325	17.00	220	6.16	.052	10	5.07	19.5	12	0.0	WATER CAN POND
1335	17.17	220	6.13	.057	14	4.56	19.0	9	0.0	UP AT THIS LOC.
1345	17.21	200	6.19	.068	20	4.35	18.7	18	0.0	REPLACE BATT. ERROR #13
1355	17.23	175	6.25	.185	15	4.85	18.4	-35	0.0	
1405	17.29	175	6.35	.261	15	4.19	18.7	-71	0.0	RECALIBRATE HORIBA *
1435	17.34	175	6.15	.388	11	6.08	18.3	-76	0.0	
1445	17.33		6.30	.421	8.6	5.42	18.2	-105	0.0	
1455	17.35		6.32	.426	8.6	5.16	18.1	-111	0.0	
1505	17.33		6.34	.431	7.2	5.01	17.8	-114	0.0	

SIGNATURE(S): [signature]

(*) CELL HAD SOME FINES ON BOTTOM LT. BROWN RESIDUE INSIDE CELL + SENSC, - CLEANED / RECAL, - CONT. PURGED ENTIRE TIME

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW21S-08
Sample Location: Area A - Permitted
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ~~ppt~~ %
Date: 9-19-01								
Time: 1125								
Method: Peristaltic Pump	GRAY	6.99	28.2	15.2	100	3.32	-390	1.7

PURGE DATA:

Date: 9-19-01
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 17.3
Static Water Level (WL): 5.47
One Casing Volume(gal): 7.4
Start Purge (hrs): 0930
End Purge (hrs): 11:20
Total Purge Time (min): 150
Total Vol. Purged (gal): ~5

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~4~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~H2SO4 / 4° C~~	~~2 - 40 mL Glass~~	
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	2 1 - ~~250~~ mL PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.: GWFD-091901-01

Signature(s): SJ Conti

AREA A

pH ± 2
TURB ± 10%
SC "
TEMP 10%
DO 10%

LOW FLOW PURGE DATA SHEET

2W-MW-21S

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 2W-GW21S-08
DATE: 09-19-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
0930	5.47	—	—	—	—	—	—	—	—	BLACK FINES, SULFUR ODOR
0940	7.16	200	7.20	46.2	1.9	4.55	13.6	-380	3.0	"
0950	7.62	200	7.16	43.9	2.4	4.04	14.0	-380	2.8	"
1000	7.90	220	7.09	39.0	29	3.84	14.5	-379	2.4	" ↓ FLOW RT.
1010	8.30	200	7.05	33.8	32	3.73	14.8	-378	2.1	" "
1020	8.48	180	7.03	32.8	50	3.62	14.9	-382	2.0	"
1030	8.67	180	6.98	31.7	70	3.56	14.9	-383	2.0	"
1040	8.85	160	6.98	32.0	80	3.47	14.9	-387	2.0	"
1050	8.97	160	6.99	31.0	80	3.42	15.0	-387	1.9	"
1100	9.14	160	6.98	29.3	95	3.39	15.1	-388	1.8	"
1110	9.23	160	6.96	29.1	95	3.36	15.1	-389	1.8	"
1120	9.31	160	6.99	28.2	100	3.32	15.2	-390	1.7	
11:25	SAMPLE									

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 3GW37S- 08
Sample Location: 3MW37S
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 9/22/01	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	~~ppt~~ %
Time:								
Method: Peristaltic Pump	CLEAR	6.11	.932	16.12	2.5	3.78	-31	0.0

PURGE DATA:

Date: 9/22/01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 8.45
Static Water Level (WL): 3.60
One Casing Volume(gal):
Start Purge (hrs):
End Purge (hrs):
Total Purge Time (min):
Total Vol. Purged (gal):

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓
		11	

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conti

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 3MW37S
SAMPLE ID: 3-GW37S
DATE: 09-22-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ~~ppt~~ %	Comments
1015	3.60	100	~~6.28~~	~~.988~~	—	~~6.43~~	~~16.30~~	~~-36~~	~~0.0~~	START
1025	3.65	100	6.28	.988	13.8	6.43	16.30	-36	0.0	CLEAR - NON TURBID
1035	4.40	100	6.16	.967	6.2	5.08	16.06	-33	0.0	" "
1045	4.35	90	6.11	.918	4.5	4.33	16.16	-31	0.0	" "
1055	4.30	90	6.11	.928	3.4	3.91	16.11	-33	0.0	" "
1105	4.27	90	6.11	.932	2.5	3.78	16.12	-31	0.0	" "
	SAMPLE @	1110 HRS		9/22/01						
FORGOT SHEET	2MW	40DS		←	2MW40DS			→		
										FORGOT SHEET 2 USE
										THIS SHEET UNTIL TRANSFER
1500	3.78	200	—	—	—	—	—	—	—	
1505	6.30	200	7.05	41.4	9.77	6.72	13.96	-368	2.6	LT GREEN - NON TURBID
1510	7.05	200	7.06	40.2	5.22	5.22	13.92	-379	2.5	
~~1520~~	1515 8.19	200	7.06	37.7	4.96	4.69	13.33	-379	2.4	MORE CLEAR NON "
~~1525~~	1520 —	—	—	—	—	—	—	—	—	
~~1530~~	1525 10.12	200	7.03	28.8	2.26	3.73	13.97	-373	1.8	
1535	12.65	200	7.14	22.8	5.60	3.55	13.38	-373	1.4	
1545	15.35	200	7.13	27.9	~~3.36~~ 8.21	3.36	12.77	-372	1.7	
~~1555~~										
1550	PUMPED DRY AT INLET @ 3' FROM BOTM									
	LOWERED PUMP HOSE AND PUMPED DRY.									

SIGNATURE(S): SJ Conti

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW38DS-08
Sample Location: 2W MW38DS
Sampled By: SJC and DW
C.O.C. No.: NSB 092501-01
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Date: 9/25/01	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	~~ppt~~ %
Time: 0730								
Method: Peristaltic Pump	~~6.69~~	6.69	.521	15.85	4.64	4.67	-99	0.0

PURGE DATA: CLEAR

Date: 9-21-01	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm):	
Well Casing Diameter & Material Type: 2" PVC	
Total Well Depth (TD): 11.92 — TPVC	
Static Water Level (WL): 7.95 — "	
One Casing Volume(gal):	
Start Purge (hrs): 1530	
End Purge (hrs): 1545	
Total Purge Time (min): 15	
Total Vol. Purged (gal): ~~L~~ 3	WENT DRY @ 1545

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	—
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	—
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	HCL / 4° C	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500 ml	—
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	—
		G ONLY.	

OBSERVATIONS / NOTES:

PURGED ON 9/21/01 (FRI)
SAMPLED ON 9/25/01 – NOT ENOUGH VOLUME – WENT BACK
END OF DAY - ONLY 0.1' WATER IN WELL.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conti

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8 WELL ID.: 2WMW38DS
PROJECT NUMBER: CTO 816 # 0502 DATE: 09-21-01

LAMOTIE

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1530	7.95	—	—	—	—	—	—	—	—	CLEAR - SL TURBID
1535		200	6.55	-642	8.83	7.19	19.73	-77	0.0	
1540	10.87	200	6.65	.544	5.70	5.12	15.84	-96	0.0	
1545	DRY - NO RDG	200	6.69	-521	4.64	4.67	15.85	-99	0.0	
	WAIT 15 MIN									WENT DRY @ 1545
	WL CAME UP									INTAKE HOSE ON BOTM
	≈ 0.1'.									NO RDG ON WL
										INDICATOR.

SIGNATURE(S): _____

PAGE___OF___

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: ZW-GW39DS-08
Sample Location: ZWMW39DS
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ~~ppt~~ %
Date: 9/22/01								
Time: 1040								
Method: Peristaltic Pump	clear	6.83	3.43	12.4	32	5.44	-152	0.2

PURGE DATA:

Date: 9/21/01
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.70
Static Water Level (WL): 2.70
One Casing Volume(gal):
Start Purge (hrs): 1815
End Purge (hrs): 1912
Total Purge Time (min): 57
Total Vol. Purged (gal):

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~HCL / 4° C~~	1 - 40 mL Glass	~~✓~~ SK
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - 250 mL PE 500ml	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Dalal J Watch J

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: ZWMW 39DS
DATE: 09-21-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ~~ppt~~ %	Comments
1815	2.70	300	–	–	–	–	–	–	–	↓ FLOW RATE
1825	6.53	250	6.74	2.82	2.4	8.68	13.0	-178	0.1	
1835	8.69		6.68	1.45	6.4	6.94	13.5	-165	0.1	
1845	11.01		6.64	1.79	9.0	6.57	13.9	-139	0.1	
1855	13.37		6.73	2.42	8.9	6.10	13.7	-148	0.1	
1905	15.23	↓	6.83	3.43	32	5.94	12.9	-152	0.2	
1912										DRY

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W ~~MW~~ GW 40DS- 08
Sample Location: 2W MW 40SD
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt %
Date: 9/23/01								
Time: 0715								
Method: Peristaltic Pump	CLEAR	7.13	27.9	12.77	8.21	3.36	-372	1.7

PURGE DATA:

Date: 9/22/01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.62
Static Water Level (WL): 3.78
One Casing Volume(gal):
Start Purge (hrs): 1500
End Purge (hrs): 1550
Total Purge Time (min): 50
Total Vol. Purged ~~(gal)~~: 10 L ±

See Attached Low Flow Purge Data Sheet for Purge Data

50
200
10000

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~4~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

SULFHER ODOR. – LT GREEN IN COLOR
PUMPED DRY ON 9-22-01 @ ≈1600 HRS. WILL SAMPLE ON SUN.

17
SG' STILL DRY 9/23/01

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conte

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 2MW40DS
DATE: 09-22-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	S COND ~~pH~~ mS/cm ~~(S.U.)~~	~~S. Cond.~~ pH ~~(mS/cm)~~	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1500	3.78	200	—	—	—	—	—	—	—	
1505	6.30	200	41.4	7.05	9.77	6.72	13.96	-368	2.6	LT. GREEN - NON TURB
1510	7.05	200	40.2	7.05	5.22	5.22	13.92	-379	2.5	
1515	8.19	200	37.7	7.06	4.96	4.69	13.83	-379	2.4	CLEAR - NON TURB
1520	—	—	—	—	—	—	—	—	—	
1525	10.12	200	28.8	7.03	2.26	3.73	13.97	-373	1.8	
1535	12.65	200	22.8	7.14	5.60	3.55	13.38	-373	1.4	
1545	15.35	200	27.9	7.13	8.21	3.36	12.77	-372	1.7	
1550	PUMPED DRY @ INLET, ≈ 3' FROM BOTM									
	LOWERED PUMP HOSE, AND PUMPED DRY.									

SIGNATURE(S): SJConte

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: ~~ZMMW41DS~~ ZMZLXEW41DS-08
Sample Location: ZLMW41DS
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ~~ppt~~ %
Date: 9/23/01 Time: 0710 Method: Peristaltic Pump	Lt. yellow	7.08	28.2	12.7	6.0	4.64	-371	1.7

PURGE DATA:

Date: 9/22/01	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm): —	
Well Casing Diameter & Material Type: 2" PVC	
Total Well Depth (TD): 16.65	
Static Water Level (WL): 3.02	
One Casing Volume(gal):	
Start Purge (hrs): 1500	
End Purge (hrs): 1555 — DRY	
Total Purge Time (min): 55	
Total Vol. Purged (gal):	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	N/A
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - ~~250~~ mL PE (500 ml)	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

START SAMPLE @ 0710 - PURGED DRY ON 9/22/01. @ 0732 GW HAS NOTICEABLE BLACK FINES (COLLECTING TOC/COD). @ 0742 DRY AT PUMP INLET
SULFUR ODOR
FINISHED COLLECTING @ 10:45

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: ZWGW41DS
DATE: 09-22-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1500	3.02	250	–	–	–	–	–	–	–	SULFUR ODOR/BLK FMES/LT. YELLOW COL
1510	~~8.88~~ 6.88	250	7.12	32.0	4.1	5.55	14.7	-339	2.0	↓ PUMP / FLOW RATE
1520	8.56	200	7.02	25.2	7.8	5.06	14.6	-340	1.5	
1530	10.57		7.03	17.7	8.0	5.12	14.4	-344	1	
1540	12.78		7.08	20.5	4.9	4.74	14.2	-362	1.2	
1550	15.15		7.08	28.2	6.0	4.64	12.7	-371	1.2	
~~1600~~ 1555										PUMPED DRY
	@ 15.84'									

SIGNATURE(S): [illegible]

PAGE 1 OF 1

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W-GW42DS-08
Sample Location: ~~2MW~~ 2WMW42DS
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt %
Date: 9/23/01 (DS)								
Time: 1245								
Method: Peristaltic Pump	BLACK	7.15	29.1	13.2	23	4.40	-373	1.8

PURGE DATA:

Date: 9/23/01
Method: Peristaltic Pump
Monitor Reading (ppm): –
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 6.91
Static Water Level (WL): 2.47
One Casing Volume(gal):
Start Purge (hrs): 1347
End Purge (hrs): 1500
Total Purge Time (min): 73
Total Vol. Purged (gal):

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~HCL / 4° C~~	~~2 - 40 ml Glass~~	N/A
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	~~1 - 250 mL PE~~	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 2W MW 42DS
DATE: 09-23-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1347	2.47	300	-	-	-	-	-	-	-	BLACK FLOES / BLACK COLOR (↓ FLOW
1357	6.00	150	7.14	30.3	18	5.04	14.8	-374	1.8	CLEARING
1407	7.69		6.89	20.2	15	4.98	15.2	-374	1.2	
1417	10.13		6.85	18.2	15	4.67	16.1	-372	1.1	
1427	11.67		6.85	15.5	90	4.62	15.5	-380	0.9	MORE BLACK FLOES
1437	12.62		7.12	15.0	110	4.41	15.3	-380	0.9	
14:47	14.10		7.13	21.3	29	4.40	14.3	-375	1.3	
14:57	15.69		7.15	29.1	23	4.40	13.2	-373	1.8	
1500	16.14									DRY

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: ZW-GW43DS - 08
Sample Location: ~~EA~~ ZWMW43DS
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 9/24/01	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time: 1350	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	~~ppt~~ %
Method: Peristaltic Pump	CLEAR	6.96	38.6	13.7	25.4	4.13	-390	2.5

PURGE DATA:

Date: 9/23/01	See Attached Low Flow Purge Data Sheet for Purge Data
Method: Peristaltic Pump	
Monitor Reading (ppm): —	
Well Casing Diameter & Material Type: 2" PVC	
Total Well Depth (TD):	
Static Water Level (WL): 3.07	
One Casing Volume(gal):	
Start Purge (hrs): 1540	
End Purge (hrs): 1637	
Total Purge Time (min): 57	
Total Vol. Purged (gal):	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	2 - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	1 - Qt. Amber Glass	✓
TCL PAH	4° C	2 - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	~~1- 500 ml PE~~ OK (SJC)	✓
Total Organic Carbon (TOC)	~~HCL / 4° C~~	~~2- 40 mL Glass~~	N/A
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	~~1- 250 mL PE~~	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

LOCATION MARKED W/ PINK FLAGS ① AT PERIMETER OF PAVEMENT ② IN RIP RAP/GABION BASKETS. LOCATION IS COVERED W/ FAGMIT. + WEES

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 2WMW43DS
DATE: 09-23-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt	Comments
1540	3.07	≤00	–	–	–	–	–	–	–	YELLOW-ISH W/ BLK FLOES
1550	6.10		6.87	46.1	18.4	4.97	15.3	-395	3.0	SULFUR ODOR
1600	8.54		6.91	38.7	7.97	4.51	14.7	-391	2.4	
1610	10.98		7.03	38.2	7.56	4.43	14.7	-391	2.1	
1620	12.00		7.03	32.7	9.56	4.22	15.0	-388	2.0	
1630	14.30		6.96	38.6	25.4	4.13	13.7	-390	2.5	
~~1640~~										
1637										DRY C

SIGNATURE(S): [signature]

PAGE 1 OF 1

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2W GW44DS-08
Sample Location: 2WMW44DS
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ~~ppt~~ %
Date: 9/23/01								
Time: 1300								
Method: Peristaltic Pump	LT GRAY	7.22	23.9	13.97	39.3	3.11	-346	1.4

PURGE DATA:

Date: 9/23/01
Method: Peristaltic Pump
Monitor Reading (ppm):
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.77
Static Water Level (WL): 1.90
One Casing Volume(gal):
Start Purge (hrs):
End Purge (hrs):
Total Purge Time (min):
Total Vol. Purged (gal):

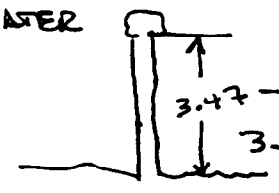
See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~4~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓
		11	

OBSERVATIONS / NOTES:

SG 21 NOW HAS WATER



3.47 — 9.23.01 @ 1500
3.51 9-24-01 @ 1300

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conte

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 2WMW 44DS
DATE: 09-23-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt %	Comments
1400	1.90	300	—	— 4.9	—	—	—	—	—	
1410	6.40	200	7.08	~~7.08~~ 7	7.09	3.85	14.54	-403	2.7	LT GRAY- SL TURBID
1420	8.00	200	7.08	37.7	10.83	2.89	15.77	-409	2.4	LT YELLOW- SL TURBID
1430	11.30	200	7.08	17.7	38.40	2.93	15.36	-389	1.0	GRAY (TURB) TDS = 11 g/l
1440	13.17	200	7.19	18.5	42.3	2.86	14.71	-363	1.1	" "
1450	15.63	200	7.22	23.9	39.3	3.11	13.97	-346	1.4	" " TDS: 15 g/l
1500										

WENT DRY @ PUMP INLET @ 1450 @ WL 15.63.
LOWERED HOSE (TUBING) TO BOTM & PUMPED DRY.

SIGNATURE(S): _____

PAGE___OF___

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: GW ~~2WMW~~ 45DS ~~01~~ 08
Sample Location: 2WMW45DS
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

Date: 9/24/01	Color	pH	S.C.	Temp.	Turbidity	DO	Eh	Salinity
Time: 1400	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	mV	ppt %
Method: Peristaltic Pump	CLEAR	7.05	34.8	13.07	11.4	2.61	-392	2.2

PURGE DATA:

Date: 9-23-01
Method: Peristaltic Pump
Monitor Reading (ppm): ——
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.75
Static Water Level (WL): 2.61
One Casing Volume(gal):
Start Purge (hrs): 1545
End Purge (hrs): 1645
Total Purge Time (min): 60
Total Vol. Purged ~~(gal)~~: 12L±

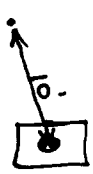
See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 ~~2~~ 500 ml PE	✓
		"	

OBSERVATIONS / NOTES:

STAFF GAUGE ≈ 10' FROM WELL SG
" " DRY 9/24/01 @ 1400



60
200
12000

GABION WALL

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): S. Conti

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 2WMW45DS
DATE: 09-23-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. % ppt	Comments SL.
1545	2.61	250								SLIGHT ODOR LT GRAY/TURBID
1555	5.50	200	6.97	41.9	4.13	4.38	14.47	-402	2.7	TDS = 25 g/l " "
1605	7.30	200	7.02	38.1	3.20	3.26	14.22	-407	2.4	" = 23
1615	9.20	200	7.01	32.9	4.25	3.02	14.38	-397	2.0	CLEAR - SL TURBID - BLACK SUSPENDED SPECS.
1625	10.74	200	7.04	20.6	4.87	3.04	14.25	-384	1.2	TDS = 13 CLEAR W BLACK SUSPENDED PARTICLES
1635	12.90	200	7.06	26.7	5.62	2.83	13.62	-385	1.6	
1645	14.65	200	7.05	34.8	11.4	2.61	13.07	-392	2.2	TDS = 21
1650	PUMPED DRY AT PUMP (TUBING) INLET) WHICH WAS ≈ 2' FROM BOTTOM									
	LOWERED TUBING AND PUMPED DRY									
	WILL SAMPLE ON MONDAY.									

SIGNATURE(S): SJ Conti

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW46DS 08
Sample Location: AREA A
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ~~ppt~~ %
Date: 09/20/01								
Time: 0800/9/20/01								
Method: Peristaltic Pump	SL CLDY	7.26	51.7	12.69	42	2.23	-378	3.3

PURGE DATA:

Date: 9-19-01
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 17.32
Static Water Level (WL): 2.30
One Casing Volume(~~gal~~): 9.3L
Start Purge (hrs): 1615
End Purge (hrs): 1705
Total Purge Time (min): 50
Total Vol. Purged (~~gal~~): ~7.5L

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
Total Organic Carbon (TOC)	~~HCL / 4° C~~	~~2~~ - 40 mL Glass	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - ~~500~~ ml PE	✓
		1 / 1000	

OBSERVATIONS / NOTES:

PURGED 9/19/01 WELL WAS PURGED DRY ON 9/19/01
SAMPLED 9/20/01 — WATER WAS CLEAR INITIALLY, THEN BECOMES DK GRAY W/ BLACK SPECS SUSPENDED IN WATER.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conte

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 2W MW 46D S
DATE: 09-19-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. % ppt	Comments
1615	2.30	200	—	—	—	—	—	—	—	INITIAL
1625	7.58	150	7.19	52.2	1.64	3.70	12.82	-402	3.4	CLEAR.
1635	10.53	150	7.14	50.5	6.13	2.48	13.60	-405	3.3	
1645	12.46	150	7.40	47.2	13.4	2.22	13.93	-410	3.0	CLEAR W/ BLACK SPECS - SUSPENDED
1655	14.93	150	7.42	47.9	38.5	1.99	13.54	-406	3.1	" "
1705	15.95	150	7.26	51.7	42.0	2.23	12.69	-378	3.3	WENT DRY @ PUMP INTAKE AT WL 15.95 @ 50 MIN OF PURGE. SLOW REC. WILL SAMPLE ON THURSDAY.
										CANT PUMP SLOWER THAN 150 - PUMP STOPS AT SUCH A LOW RPM.

SIGNATURE(S): SJ Conti

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSB-NLON / AREA A
Project No.: CTO 816 #0502

[ ] Domestic Well Data
[x] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 2WGW47DS 08
Sample Location: 2WMW47DS
Sampled By: SJC and DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Eh mV	Salinity ppt %
Date: 9/20/01								
Time: 8:00								
Method: Peristaltic Pump	GREY/CL	6.94	23.9	13.9	35	4.60	-335	1.5

PURGE DATA:

Date: 9/19/01
Method: Peristaltic Pump
Monitor Reading (ppm): —
Well Casing Diameter & Material
Type: 2" PVC
Total Well Depth (TD): 16.20
Static Water Level (WL): 4.00
One Casing Volume(gal):
Start Purge (hrs): 16:15
End Purge (hrs): 17:33 – DRY
Total Purge Time (min): 78
Total Vol. Purged (gal):

See Attached Low Flow Purge Data Sheet for Purge Data

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	~~✓~~ SK
Chemical Oxygen Demand (COD) TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓
100 100 100 100			

OBSERVATIONS / NOTES:

PURGED DRY ON 9/19/01 - SAMPLE ON 9/20/01 PURGED ~ 1 LITER BEFORE SAMPLING - LOTS OF BLACK FINES - CLEARED UP SIGNIFICANTLY AFTER 2 LITERS (WORRIED ABOUT WELL GOING DRY AGAIN)

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

(121/hr.)

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSB-NLON / AREA A - ROUND 8
PROJECT NUMBER: CTO 816 # 0502

WELL ID.: 2WMW-47DS
DATE: 09-19-01

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	Eh mV	Sal. ppt.	Comments
16:15	4.00	200	–	–	–	–	–	–	–	START PURGE
16:25	~~4.15~~ 6.15	200	7.22	30.2	12	5.93	15.9	-337	1.8	BLK. FINES / SULFUR ODOR
16:35	7.59	180	6.88	21.1	19	5.49	15.9	-294	1.2	↓ FLOW RT.
16:45	9.03	180	6.75	12.8	55	5.38	16.3	-278	0.7	
16:55	10.37	200	6.72	8.33	70	5.18	16.4	-267	0.5	
17:05	12.24	200	6.72	11.2	50	5.10	15.9	-274	0.6	
17:15	12.85	|	6.81	16.1	30	4.93	15.1	-283	0.9	
17:25	15.18		6.94	23.9	35	4.60	13.9	-335	1.5	
17:33										DRY TO PUMP INLET

SIGNATURE(S): [illegible]

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 816 # 0502

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: 3M SP 01-08
Sample Location: SEEP
Sampled By: SJC and DW
C.O.C. No.: NSB 092501-1

Type of Sample:
[] Low Concentration
[] High Concentration

TDS .549/L

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 9/25/01 Time: 1100 Depth: 2" BELOW Method: DIRECT FILL	CLEAR	6.38	.843	18.4	5.64	8.90	0.0	-62

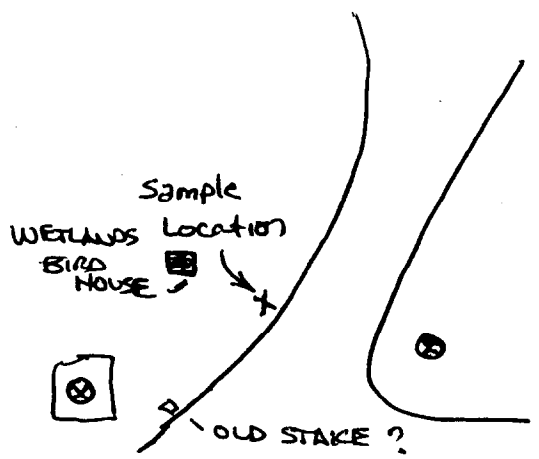
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - ~~250 mL~~ PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓

OBSERVATIONS / NOTES:

HIGH RATE FLOW ?
25/30 GPM ?

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conte

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSB_NLON / Area A
Project No.: CTO 816 # 0502

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SW GS18-08
Sample Location: SG-18 \ 2WMW41DS
Sampled By: SJC and DW
C.O.C. No.: NSB-092501-01

Type of Sample:
[X] Low Concentration
[] High Concentration

430 (HORIBA) TDS .26 g/l

SAMPLING DATA: LAMOTTE

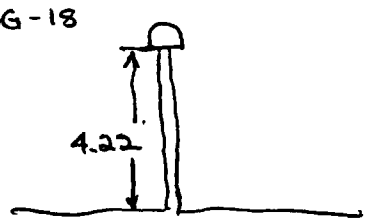
Date: 9/25/01	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Eh
Time: 0930	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	ppt	mV
Depth: ≈3" BELOW SUR.	BROWN	6.35	.405	19.0	159	7.22	0.0	-88
Method: DIRECT FILL	/ORG.							

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	~~1~~ - 500 ml PE 11	✓

OBSERVATIONS / NOTES:

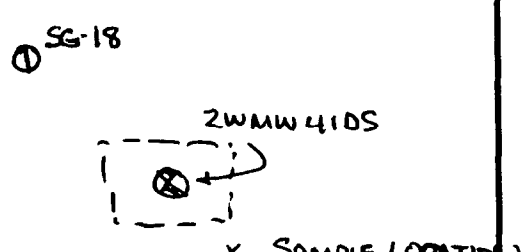
SG-18



@ 0910 HRS 9/25/01

HAD TO DIG A SMALL AREA TO GET SUFFICIENT VOL TO SAMPLE.

MAP:



GABION WALL.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conti

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 816 # 0502

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SWSG19-08
Sample Location: SG 19
Sampled By: SJC and DW
C.O.C. No.: NSB 092501-01

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

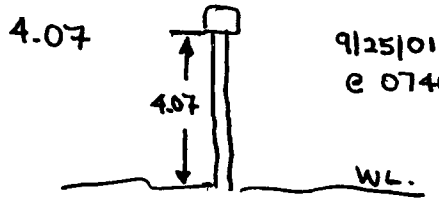
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 9/25/01 Time: 0745 Depth: ≈ 3' BELOW SURF Method: DIRECT FILL	DARK BRN.	6.16	.583	20.1	28	7.67	0.0	-61

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD)	H_2SO_4 / 4° C	1 - ~~250 m~~L PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 500 ml PE	✓
		11	

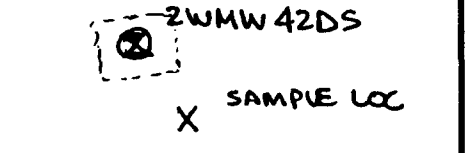
OBSERVATIONS / NOTES:

SOME ORGANICS IN SAMPLE



9/25/01
@ 0740 HRS.

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): S. Conti

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 816 # 0502

Sample ID No.: SWSG 20-08
Sample Location: SG 20/ MW43DS
Sampled By: SJC and DW
C.O.C. No.: NSB 092501-01

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

TDS = .209/1

SAMPLING DATA: LAMOTTE

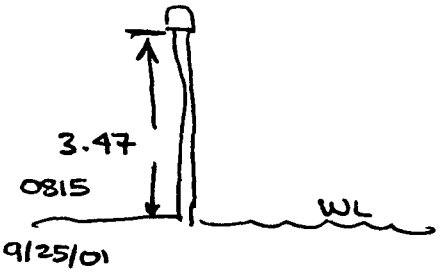
Date: 9/25/01 Time: 0820 Depth: ≈ 3" BELOW SUR. Method: DIRECT FILL	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
	LT YELLOW	6.18	.302	21.0	17.8	6.92	0.0	-13

SAMPLE COLLECTION INFORMATION:

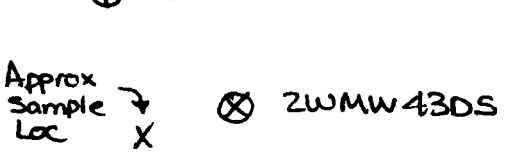
Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ - Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ - Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - ~~250~~ mL PE 500	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 500 ml PE	✓
		11	

OBSERVATIONS / NOTES:

SG 20



MAP:



GABION WALL.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJConti

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSB_NLON / Area A
Project No.: CTO 816 # 0502

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: WETLAND
[] QA Sample Type:

Sample ID No.: SW SG 21 08
Sample Location: SG-21 / ZWMW44DS
Sampled By: SJC and DW
C.O.C. No.: NSB 092501-1

Type of Sample:
[X] Low Concentration
[] High Concentration

.29 TDS 9/1

SAMPLING DATA:

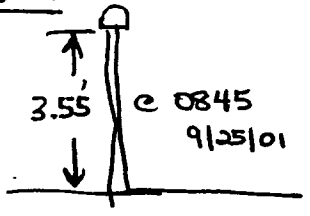
	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity ppt	Eh mV
Date: 9/25/01								
Time: 0850								
Depth: ≈ 3" BELOW	LT YELLOW	6.44	444	20.6	15.2	6.62	0.0	-81
Method: DIRECT FILL								

SAMPLE COLLECTION INFORMATION:

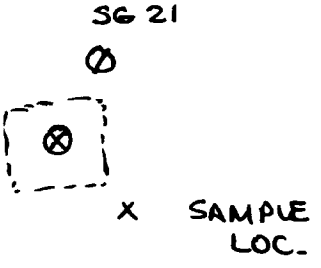
Analysis	Preservative	Container Requirements	Collected
TCL VOLATILES	HCL / 4° C	3 - 40 ml Vial	✓
TCL SEMIVOLATILES	4° C	1 ~~2~~ Qt. Amber Glass	✓
TCL PEST/PCBs	4° C	2 ~~1~~ Qt. Amber Glass	✓
TCL PAH	4° C	1 ~~2~~ Qt. Amber Glass	✓
TAL METALS (TOTAL) + Hardness	HNO_3 / 4° C	1- 500 ml PE	✓
TAL METALS (DISSOLVED)	HNO_3 / 4° C	1 - 500 ml PE	✓
~~Total Organic Carbon (TOC)~~	~~HCL / 4° C~~	~~2 - 40 mL Glass~~	—
Chemical Oxygen Demand (COD) / TOC	H_2SO_4 / 4° C	1 - 250 mL PE	✓
Alkalinity, Chloride, Sulfate, TDS	4° C	1 - 500 ml PE	✓
		11	

OBSERVATIONS / NOTES:

SG 21



MAP:



GABION WALL

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJ Conti

APPENDIX E

ROUND 8 CHAIN OF CUSTODY RECORDS

(SAT/SUN)

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER NSB 092201-02 | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 816 2863	NSB-NLON	CORY RICH 412 921 8984	CHEM TECH / KURT H.
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: SJ CONTI 412 921 8422	ADDRESS
SJ Conti		CARRIER/WAYBILL NUMBER: FED EX AB# 828074027209	CITY, STATE: MOUNTAINSIDE, NJ.

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

AREA A
ROUND 8

DATE YEAR 2001	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TCL VOCs (40ml)	TCL SVOCs	TCL PEST/PCB	TCL PAH	TAL METALS (TOT) + HARDNESS	TAL METALS (DISS)	TOC SOC	COD/TOC ALK, CHLORIDE SULFATE, TDS	COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	G	G	P	P	G	P	P
PRESERVATIVE USED						HCl	-	-	-	HNO3	HNO3	~~HCl~~	H2SO4	-
9/22	1015	TB-092201-02	AQ	G	2	2								
9/22	1110	3GW37S-08	GW	G	10	3	1	2	1	1	+ SK	X	1	1
9/22	1110	3GW37S-08-F	GW	G	1						1	X		
9/22	1040	2W-GW39DS-08	GW	G	10	3	1	2	1	1	—	X	1	1
9/22	1040	2W-GW39DS-08-F	GW	G	1						1	X		
9/22	1325	RW-092201-01	TW	G	1					1		X		Residential Well
9/22	1325	RW-092201-01-F	TW	G	1						1	X		Residential Well (DISS)
9/23	0715	2W-GW40DS-08	GW	G	10	3	1	2	1	1	—	X	1	1
9/23	0715	2W-GW40DS-08-F	GW	G	1						1	X		
9/23	0710	2W-GW41DS-08	GW	G	10	3	1	2	1	1	—	X	1	1
9/23	0710	2W-GW41DS-08-F	GW	G	1						1	X		
												X		
												X		

9/22/01

9/23/01

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY SJ Conti	9/24/01	1300	1. RECEIVED BY FED EX		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS TW = TAP WATER - AERATOR REMOVED - SEDIMENT FILTER BYPASSED.

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TINUS 001

TETRA TECH NUS, INC. (TUES) CHAIN OF CUSTODY | NUMBER NSB-092501-01 | PAGE 1 OF 1

PROJECT NO: CTO 816 2863	SITE NAME: NSB NLON
PROJECT MANAGER AND PHONE NUMBER: CORY RICH 412 921 8984	LABORATORY NAME AND CONTACT: CHEMTECH / KURT H
SAMPLERS (SIGNATURE): SJ Conti	FIELD OPERATIONS LEADER AND PHONE NUMBER: SJ CONTI 412 921 8422
	ADDRESS:
CARRIER/WAYBILL NUMBER: FED EX AB #	CITY, STATE: MOUNTAINSIDE, NJ

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2001	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TCL VOCs (40ml)	TCL SVOCs	TCL PEST/PCBs	TCL PAH	TAL METALS (TOT) + HARDNESS	TAL METALS (DISS)	~~TOC~~ SOC	COD/TOC	ALK, CHLORIDE, TDS SULFATE	COMMENTS
		AREA A ROUND 8													
		CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	G	G	G	P	P	P	P	P	
		PRESERVATIVE USED				HCl	–	–	–	HNO3	HNO3	~~HCl~~	H2SO4	–	
9/25	0700	TB-092501-01	AQ	G	2	2									
9/25	0730	2WGW38DS-08	GW	G	6	3	1		1	1					NOT ENOUGH VOL IN WELL FOR OTHER PARAM.
9/25	0730	2WGW38DS-08 F	GW	G	1						1				
9/25	0745	SWSG19-08	SW	G	10	3	1	2	1	1	—		1	1	
9/25	0745	SWSG19-08-F	SW	G	1						1				
9/25	0820	SWSG20-08	SW	G	10	3	1	2	1	1	—		1	1	
9/25	0820	SWSG20-08 F	SW	G	1						1				
9/25	0850	SWSG21-08	SW	G	10	3	1	2	1	1	—		1	1	
9/25	0850	SWSG21-08 F	SW	G	1						1				
9/25	0930	SWSG18-08	SW	G	10	3	1	2	1	1	—		1	1	
9/25	0930	SWSG18-08 F	SW	G	1						1				
9/25	1100	3MSP01-08	SP	G	10	3	1	2	1	1	—		1	1	
9/25	1100	3MSP01-08 F	SP	G	1						1				

1. RELINQUISHED BY SJ Conti	DATE 9/25/01	TIME 1600	1. RECEIVED BY FED EX.	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENT: 3 COOLERS (4 SW, SEEP & 38D)

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER NSB 092401-02 | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 816 2863	NSB NLON	CORY RICH 412 921 8984	CHEMTECH / KURT H
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: SJ CONTI 412 921 8422	ADDRESS
SJ Conti		CARRIER/WAYBILL NUMBER: FED EX AB# 826074027210	CITY, STATE: MOUNTAINSIDE, NJ.

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2001	TIME	SAMPLE ID (AREA "A" ROUND 8)	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TCL VOCs (40ml)	TCL SVOCs	TCL PEST/PCB	TCL PAH	TAL METALS (TOT) + HARDNESS	TAL METALS (DISS)	COD/TOC	ALK, CHLORIDE TDS, SULFATE	COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	G	G	P	P	P	P	
PRESERVATIVE USED						HCL	–	–	–	HNO3	HNO3	H2SO4	–	
9/24	1230	TB-092401-02	AQ	G	2	2								
9/24	1300	2WGW44DS-08	GW	"	10	3	1	2	1	1	[redacted]	1	1	
9/24	1300	2WGW44DS-08 F	GW	"	1						1			
9/24	1400	2WGW45DS-08	GW	"	10	3	1	2	1	1	—	1	1	
9/24	1400	2WGW45DS-08 F	GW	"	1						1			
9/24	1350	2WGW43DS-08	GW	"	10	3	1	2	1	1	—	1	1	
9/24	1350	2WGW43DS-08 F	GW	"	1						1			
9/24	1245	2WGW42DS-08	GW	"	10	3	1	2	1	1	—	1	1	
9/24	1245	2WGW42DS-08 F	GW	"	1						1			

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: SJ Conti	9/24/01	1600	1. RECEIVED BY: FED EX.		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS: 3 COOLERS (2 AREA A, 1 BRMO)

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99

TETRA TECH NUS, INC. (FRI) CHAIN OF CUSTODY | NUMBER NSB 092101-2 | PAGE 1 OF 1

PROJECT NO: CTO 816 2863	SITE NAME: NSB NLON
PROJECT MANAGER AND PHONE NUMBER: CORY RICH 412 921 8984	LABORATORY NAME AND CONTACT: CHEM TECH / KURT H.
FIELD OPERATIONS LEADER AND PHONE NUMBER: SJ CONTI 412 921 8422.	ADDRESS:
CARRIER/WAYBILL NUMBER: FED EX AB # 828074027183	CITY, STATE: MOUNTAINSIDE, NJ
SAMPLERS (SIGNATURE): SJ Conti	

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2001	TIME	SAMPLE ID (AREA A ROUND 8)	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TCL VOCs (40ml)	TCL SVOCs	TCL PEST/PCB	TCL PAH	TAL METALS (TOT) + HARDNESS	TAL METALS (DISS)	~~TOC~~ SSC	COD/TOC	ALK, CHLORIDE, TDS, SULFATE	COMMENTS
		CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	G	G	G	P	P	G/P	P		
		PRESERVATIVE USED				HCl	–	–	–	HNO3	HNO3	~~HCl~~ H2SO4	–		
9/21	1300	TB-092101-02	AQ	G	2	2									
9/21	1510	~~2W~~ 2L GW20S-08	GW	G	30	9	3	6	3	3	–		3	3	DO MS/MSD
9/21	1510	2LGW20S-08-F	GW	G	3						3				DO MS/MSD

1. RELINQUISHED BY: SJ Conti	DATE 9/21/01	TIME 1830	1. RECEIVED BY: FED EX.	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENT

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TINUS-001

TETRA TECH NUS, INC. THURS

CHAIN OF CUSTODY | NUMBER NSB 092001-1 | PAGE 1 OF 1

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 816 2863	NSB NLON	CORY RICH 412 921 8984	CHEMTECH / KURT
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: SJ CONTI 412 921 8422	ADDRESS
SJ Conti		CARRIER/WAYBILL NUMBER: FED EX AB# 828074027253	CITY, STATE: MOUNTAINSIDE, NJ

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

AREA A
ROUND 8

DATE YEAR 2001	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TCL VOC (40ml)	TCL SVOC	TCL PEST/PCB	TCL PAH	TAL METALS (TOT) + HARDNESS	TAL METALS (DISS)	~~TOC/COD~~	~~COD~~ TOC/COD	ALK, CHLORIDE TDS, SULFATE	COMMENTS
		CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	G	G	G	P	P	G	P	P	
		PRESERVATIVE USED				HCl	–	–	–	HNO3	HNO3	~~HCL~~	H_2SO_4	–	
9/20	0730	TB-092001-01	AG	G	2	2									
"	0800	2W-GW46DS-08	GW	G	10	3	1	2	1	1	–	–	1	1	
"	"	2W-GW46DS-08-F	GW	G	1						1				
"	0800	2W-GW47DS-08	GW	G	10	3	1	2	1	1	–	–	1	1	
"	"	2W-GW47DS-08-F	GW	G	1						1				
"	1040	4-GW01S-08	GW	G	10	3	1	2	1	1	–	–	1	1	
"	"	4-GW01S-08-F	GW	G	1						1				
"	0000	GWFD-092001-01	GW	G	10	3	1	2	1	1	–	–	1	1	DUP OF GW01S
"	"	GWFD-092001-01F	GW	G	1						1				" " "

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY SJ Conti	9/20/01	1400	1. RECEIVED BY FED EX		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99

TETRA TECH NUS, INC. WED

CHAIN OF CUSTODY | NUMBER NSB 091901-1 | PAGE 1 OF 1

PROJECT NO: CTO 816 2863	SITE NAME: NSB NLON	PROJECT MANAGER AND PHONE NUMBER: CORY RICH 412 921 8984	LABORATORY NAME AND CONTACT: CHEM TECH / KURT H.
SAMPLERS (SIGNATURE): SJ Conti		FIELD OPERATIONS LEADER AND PHONE NUMBER: SJ CONTI 412 921 8422	ADDRESS: 205 CAMPUS PLAZA 1
		CARRIER/WAYBILL NUMBER: AB # 828074027172	CITY, STATE: EDISON, NJ. 08837

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

AREA A
ROUND 8

DATE YEAR 2001	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TCL VOC (40ml)	TCL SVOC	TCL PEST/PCB	TCL PAH	TAL METALS (TOT) + HARDNESS	TAL METALS (DISS)	TOC	COD	ALK. CHLORIDE TDS, SULFATE	COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	G	G	P	P	P	P		
PRESERVATIVE USED						HCL	–	–	–	HNO3	HNO3	H2SO4	–		
9/19	1030	TB-0919-01-01	AQ	G	2	2									
9/19	1125	2W-GW21S-08	GW	G	8 10	3	1	2	1	1	–	1	1		
9/19	1125	2W-GW21S-08-F	GW	G	1						1				
9/19	0000	GWFD-091901-01	GW	G	8 10	3	1	2	1	1	–	1	1	DUP OF GW21S	
9/19	0000	GWFD-091901-01-F	GW	G	1						1			" " " "	

1. RELINQUISHED BY SJ Conti	DATE 9/19/01	TIME 1600±	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

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FORM NO. TINUS 001

APPENDIX F

ROUND 8 DATA VALIDATION LETTERS AND LABORATORY DATA SHEETS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**C. RICH**	**DATE:**	**NOVEMBER 15, 2001**
FROM:	**ERIN M. FAUST**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – TAL METALS AND MISCELLANEOUS PARAMETERS**
CTO-816 NSB NEW LONDON
SAMPLE DELIVERY GROUP (SDG) – 5932

SAMPLES: 9/Aqueous/

2W-GW21S-08	2W-GW46DS-08	DRMO-6MW6D-GW-13
2W-GW47DS-08	4-GW01S-08	DRMO-6MW6S-GW-13
GWFD-091901-01	GWFD-092001-01	GWFD-092001-02

Overview

The sample set for CTO 816, NSB New London, SDG 5932, consists of nine (9) aqueous environmental samples. Five (5) field duplicate pairs (GWFD-091901-01 / 2W-GW21S-08, GWFD-091901-01-F / 2W-GW21S08-F, GWFD-092001-01 / 4-GW01S-08, GWFD-092001-01-F / 4-GW01S-08-F and GWFD-092001-02 / DRMO-6MW6S-GW-13) are included within this SDG.

All samples were analyzed for hardness, total organic carbon (TOC), chemical oxygen demand (COD), alkalinity, chloride, sulfate, total dissolved solids (TDS) and total and dissolved target analyte list (TAL) metals, with the exception of samples DRMO-6MW6D-GW-13 and DRMO-6MW6S-GW-13, which are analyzed for total TAL metals only. Samples designated –F were analyzed for dissolved metals. The samples were collected by TetraTech NUS on September 19 and 20, 2001 and analyzed by Chemtech Consulting Group under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Metals analyses, with the exception of mercury, were conducted using Contract Laboratory Program (CLP) method ILM04.1. Mercury analyses were conducted using EPA method 245.1. Results for hardness were calculated using Standard Methods 18th ed. Method 2340B. Analyses for COD were conducted using the Hach 8000 Method. Analyses for TOC, alkalinity, chloride, sulfate and TDS were conducted using EPA methods 415.1, 310.1, 325.3, 375.4 and 160.1, respectively.

Metals analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using Cold Vapor Atomic Absorption (CVAA).

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Calibration Recoveries
• Laboratory Blank Analyses
* • Laboratory Control Sample Results
• ICP Interference Check Sample Results
• Matrix Spike Results
• Laboratory Duplicate Results

- ICP Serial Dilution Results
- Field Duplicate Results
- Sample Quantitation
- * Detection Limits

* - All quality control criteria were met for this parameter.

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Action Level
Aluminum	45.7 µg/L	228.5 µg/L
Antimony	5.9 µg/L	29.5 µg/L
Cadmium	0.50 µg/L	2.5 µg/L
Calcium	55.6 µg/L	278 µg/L
Iron	34.0 µg/L	170 µg/L
Magnesium	48.7 µg/L	243.5 µg/L
Mercury	0.20 µg/L	1.0 µg/L
Sodium	300.4 µg/L	1502 µg/L
Thallium	4.3 µg/L	21.5 µg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level reported for aluminum, antimony, iron and mercury were qualified "U" as a result of laboratory blank contamination.

ICP Interference Check Sample Results

The interfering analyte magnesium was present in samples 2W-GW21S-08, 2W-GW21S-08-F, 2W-GW46DS-08 and GWFD-091901-01-F at concentrations that were comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely antimony, cadmium and thallium were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for antimony, cadmium and thallium in the affected samples. The nondetected results reported for these analytes were qualified as estimated, "UJ".

The interfering analyte magnesium was present in samples 2W-GW46DS-08-F and GWFD-091901-01 at concentrations that were comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely antimony, cadmium and thallium were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for cadmium and thallium in the affected samples. The nondetected results reported for these analytes were qualified as estimated, "UJ".

Laboratory Duplicate Results

Laboratory duplicate imprecision (RPD>20%) was noted for sulfate. Positive results reported for sulfate were qualified as estimated, "J".

Laboratory duplicate imprecision (difference > CRDL) was noted for lead, affecting the dissolved metals matrix. Positive results reported for lead in the affected samples were qualified as estimated, "J".

ICP Serial Dilution Results

The ICP serial dilution percent differences for potassium and sodium were > 15% quality control limit, affecting the total metals matrix. Positive results reported for potassium and sodium in the affected samples were qualified as estimated, "J". A direction of bias could not be determined.

Field Duplicate Results

Field duplicate imprecision (RPD>30%) was noted for COD in the GWFD-091901-01 / 2WGW21S-08 sample pair. Positive results reported for COD in this sample pair only were qualified as estimated, "J".

Field duplicate imprecision (difference > CRDL) was noted for iron in the GWFD-091901-01-F / 2WGW21S-08-F sample pair. Positive results reported for iron in this sample pair only were qualified as estimated, "J".

Field duplicate imprecision (difference > CRDL) was noted for lead in the GWFD-092001-01 / 4-GW01S-08, GWFD-092001-01-F / 4-GW01S-08-F and GWFD-092001-02 / DRMO-6MW6S-GW-13 sample pairs. Positive and nondetected results reported for lead in these sample pairs only were qualified as estimated, "J" and "UJ", respectively.

Sample Quantitation

Due to uncertainty near the IDL, positive results less than two times the IDL reported for arsenic, chromium, cobalt, copper, lead, vanadium and zinc were qualified as estimated, "J".

Notes

The contract required detection limit (CRDL) percent recovery for thallium was >120% quality control limit, affecting the total metals matrix with the exception of sample GWFD-092001-02. No validation action was necessary because all of the results for thallium in the affected samples were reported by the laboratory as nondetected.

Hardness results for samples 4-GW01S-08 and 2W-GW47DS-08 were reported incorrectly by the laboratory. The data reviewer corrected the results to be entered into the database.

The Matrix Spike (MS) percent recovery for mercury was >125% quality control limit, affecting both the total and dissolved metals matrices. No validation action was necessary because all results for mercury were either reported as nondetected by the laboratory or were qualified "U" as a result of laboratory blank contamination.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method blanks. Laboratory duplicate imprecision was noted for sulfate and lead. The laboratory reported incorrect results for hardness in two samples.

Other Factors Affecting Data Quality: Potassium and sodium qualified due to ICP serial dilution noncompliance, affecting the total metals matrix. Arsenic, chromium, cobalt, copper, lead, vanadium and zinc were qualified due to uncertainty near the IDL. The interfering analyte magnesium was present in several samples. Field duplicate imprecision was noted for COD, iron and lead.

TO: C. RICH – PAGE 4
DATE: NOVEMBER 15, 2001

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1989 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Erin M. Faust
Environmental Scientist

TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
N01 = Internal Standard Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

CTO81 NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	2WGW21S-08			2WGW21S-08-F			2WGW46DS-08			2WGW46DS-08-F		
SAMPLE DATE:	09/19/01			09/19/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-02			N5932-03			N5932-07			N5932-08		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	46.3	U	A	30.0	U		30.0	U		30.0	U	
ANTIMONY	5.0	UJ	K	5.0	UJ	K	5.0	UJ	K	5.6	U	A
ARSENIC	5.5	J	P	4.0	U		10.1			29.8		
BARIUM	37.0			42.5			83.1			94.8		
BERYLLIUM	1.0	U		1.0	U		1.0	U		1.0	U	
CADMIUM	0.30	UJ	K	0.30	UJ	K	0.30	UJ	K	0.30	UJ	K
CALCIUM	119000			135000			232000			233000		
CHROMIUM	5.8			6.1			5.1			6.0		
COBALT	5.0	U		5.0	U		5.0	U		5.0	U	
COPPER	3.0	U		3.0	U		3.0	U		3.0	U	
IRON	9300			548	J	G	900			12.0	U	
LEAD	3.0	U		3.0	U		3.0	U		3.0	U	
MAGNESIUM	370000			423000			798000			804000		
MANGANESE	280			295			106			56.3		
MERCURY	0.08	U		0.08	U		0.08	U		0.16	U	A
NICKEL	10.0	U		10.0	U		10.0	U		10.0	U	
POTASSIUM	208000	J	I	234000			387000	J	I	398000		
SELENIUM	5.0	U		5.0	U		5.0	U		5.0	U	
SILVER	1.0	U		1.0	U		1.0	U		1.0	U	
SODIUM	4890000	J	I	5500000			9400000	J	I	9600000		
THALLIUM	2.0	UJ	K	2.0	UJ	K	2.0	UJ	K	2.0	UJ	K
VANADIUM	7.4	U		7.4	U		7.4	U		7.4	U	
ZINC	10.4			14.2			15.8			6.2	J	P

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	2WGW47DS-08			2WGW47DS-08-F			4GW01S-08			4GW01S-08-F		
SAMPLE DATE:	09/20/01			09/20/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-09			N5932-10			N5932-11			N5932-12		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	235			30.5	U	A	63.7	U	A	81.2	U	A
ANTIMONY	5.0	U		5.3	U	A	5.0	U		5.0	U	
ARSENIC	10.7			11.0			4.0	U		4.0	U	
BARIUM	182			330			48.8			49.0		
BERYLLIUM	1.0	U		1.0	U		1.0	U		1.0	U	
CADMIUM	0.30	U		0.30	U		0.30	U		0.30	U	
CALCIUM	42500			42200			22400			22200		
CHROMIUM	2.9			1.6	J	P	1.1	J	P	1.1	J	P
COBALT	7.0	J	P	8.4	J	P	5.0	U		5.0	U	
COPPER	4.6	J	P	4.1	J	P	4.5	J	P	3.8	J	P
IRON	38200			46500			40.5	U	A	20.3	U	A
LEAD	3.0	U		3.7	J	FP	4.5	J	GP	3.0	UJ	G
MAGNESIUM	62800			55200			3100			3080		
MANGANESE	3460			4200			6.8			6.8		
MERCURY	0.09	U	A	0.08	U		0.08	U		0.17	U	A
NICKEL	10.0	U		10.0	U		10.0	U		10.0	U	
POTASSIUM	92100	J	I	83700			2970	J	I	3000		
SELENIUM	5.0	U		5.0	U		5.0	U		5.0	U	
SILVER	1.0	U		1.0	U		1.0	U		1.0	U	
SODIUM	1330000	J	I	1230000			31900	J	I	32100		
THALLIUM	2.0	U		2.0	U		2.0	U		2.0	U	
VANADIUM	7.4	U		7.4	U		7.4	U		7.4	U	
ZINC	26.8			35.0			39.2			40.1		

CTO8 . .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	DRMO-6MW6D-GW13			DRMO-6MW6S-GW13			GWFD-091901-01			GWFD-091901-01-F		
SAMPLE DATE:	09/20/01			09/20/01			09/19/01			09/19/01		
LABORATORY ID:	N5932-17			N5932-16			N5932-04			N5932-05		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:							2WGW21S-08			2WGW21S-08-F		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	30.0	U		481			57.3	U	A	30.0	U	
ANTIMONY	5.0	U		5.0	U		5.4	U	A	5.0	UJ	K
ARSENIC	4.0	U		4.0	U		6.9	J	P	7.5	J	P
BARIUM	45.1			42.3			44.0			42.3		
BERYLLIUM	1.0	U		1.0	U		1.0	U		1.0	U	
CADMIUM	0.30	U		0.30	U		0.30	UJ	K	0.30	UJ	K
CALCIUM	66000			16300			141000			134000		
CHROMIUM	1.1	J	P	1.6	J	P	6.7			5.6		
COBALT	5.0	U		5.0	U		5.0	U		5.0	U	
COPPER	3.2	J	P	4.8	J	P	3.0	U		3.0	U	
IRON	3800			661			10200			175	J	G
LEAD	3.0	U		3.0	UJ	G	3.0	U		3.0	U	
MAGNESIUM	54200			3490			442000			420000		
MANGANESE	2530			12.7			325			290		
MERCURY	0.20	U	A	0.08	U	A	0.08	U		0.16	U	A
NICKEL	10.0	U		10.0	U		10.0	U		10.0	U	
POTASSIUM	32000	J	I	2910	J	I	254000	J	I	231000		
SELENIUM	5.0	U		5.0	U		5.0	U		5.0	U	
SILVER	1.0	U		1.0	U		1.0	U		1.0	U	
SODIUM	703000	J	I	40300	J	I	5950000	J	I	5400000		
THALLIUM	2.0	U		2.0	U		2.0	UJ	K	2.0	UJ	K
VANADIUM	7.4	U		7.4	U		8.1	J	P	7.4	U	
ZINC	33.7			28.1			13.6			19.1		

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	GWFD-092001-01	GWFD-092001-01-F	GWFD-092001-02	
SAMPLE DATE:	09/20/01	09/20/01	09/20/01	/ /
LABORATORY ID:	N5932-13	N5932-14	N5932-20	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:	4GW01S-08	4GW01S-08-F	DRMO-6MW6S-GW13	

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	59.1	U	A	63.1	U	A	411					
ANTIMONY	5.9	U	A	5.0	U		5.0	U				
ARSENIC	4.0	U		4.0	U		4.0	U				
BARIUM	47.7			49.0			41.5					
BERYLLIUM	1.0	U		1.0	U		1.0	U				
CADMIUM	0.30	U		0.30	U		0.30	U				
CALCIUM	21800			22100			16000					
CHROMIUM	6.5			1.1	J	P	1.9	J	P			
COBALT	5.0	U		5.0	U		5.0	U				
COPPER	4.4	J	P	5.6	J	P	4.0	J	P			
IRON	46.0	U	A	39.6	U	A	580					
LEAD	10.6	J	G	4.1	J	FGP	4.7	J	GP			
MAGNESIUM	3010			3070			3420					
MANGANESE	6.7			6.6			12.4					
MERCURY	0.08	U	A	0.14	U	A	0.18	U	A			
NICKEL	10.0	U		10.0	U		10.0	U				
POTASSIUM	2850	J	I	3040			2900	J	I			
SELENIUM	5.0	U		5.0	U		5.0	U				
SILVER	1.0	U		1.0	U		1.0	U				
SODIUM	30500	J	I	32100			40300	J	I			
THALLIUM	2.0	U		2.0	U		2.0	U				
VANADIUM	7.4	U		7.4	U		7.4	U				
ZINC	37.5			41.4			27.8					

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	2WGW21S-08			GWFD-091901-01			2WGW46DS-08			2WGW47DS-08		
SAMPLE DATE:	09/19/01			09/19/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-02			N5932-04			N5932-07			N5932-09		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
FIELD DUPLICATE OF:				2WGW21S-08								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
ALKALINITY(MG/L)	1400			1500			1900			320		
CHEMICAL OXYGEN DEMAND(MG/L)	620	J	G	410	J	G	1400			43		
CHLORIDE(MG/L)	8800			8200			26000			1800		
HARDNESS(MG/L)	1800			2200			3900			360		
SULFATE(MG/L)	55	J	F	52	J	F	840	J	F	6	J	F
TOTAL DISSOLVED SOLIDS(MG/L)	15000			14000			30000			3000		
TOTAL ORGANIC CARBON(MG/L)	98			74			26			12		

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	4GW01S-08	GWFD-092001-01		
SAMPLE DATE:	09/20/01	09/20/01	/ /	/ /
LABORATORY ID:	N5932-11	N5932-13		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
FIELD DUPLICATE OF:		4GW01S-08		

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
ALKALINITY(MG/L)	25			25								
CHEMICAL OXYGEN DEMAND(MG/L)	5.0	U		5.0	U							
CHLORIDE(MG/L)	34			36								
HARDNESS(MG/L)	69			67								
SULFATE(MG/L)	44	J	F	41	J	F						
TOTAL DISSOLVED SOLIDS(MG/L)	180			190								
TOTAL ORGANIC CARBON(MG/L)	3.9			4.3								

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**C. RICH**	**DATE:**	**NOVEMBER 14, 2001**
FROM:	**ERIN M. FAUST**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – TAL METALS AND MISCELLANEOUS PARAMETERS**
CTO-816 NSB NEW LONDON
SAMPLE DELIVERY GROUP (SDG) – 5965

SAMPLES: 11/Aqueous/

2LGW20S-08
2W-GW40DS-08
3GW37S-08
DRMO-6MW10S-GW13
DRMO-6MW11S-GW13
DRMO-6MW2S-GW13
2W-GW39DS-08
2W-GW41DS-08
DRMO-6MW10D-GW13
DRMO-6MW11D-GW13
DRMO-6MW2D-GW13

Overview

The sample set for CTO 816, NSB New London, SDG 5965, consists of eleven (11) aqueous environmental samples.

All samples were analyzed for hardness, total organic carbon (TOC), chemical oxygen demand (COD), alkalinity, chloride, sulfate, total dissolved solids (TDS) and total and dissolved target analyte list (TAL) metals, with the exception of samples DRMO-6MW10D-GW13, DRMO-6MW10S-GW13, DRMO-6MW11D-GW13, DRMO-6MW11S-GW13, DRMO-6MW2D-GW13 and DRMO-6MW2S-GW13, which are analyzed for total TAL metals only. Samples designated –F were analyzed for dissolved metals. The samples were collected by TetraTech NUS from September 21-23, 2001 and analyzed by Chemtech Consulting Group under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Metals analyses, with the exception of mercury, were conducted using Contract Laboratory Program (CLP) method ILM04.1. Mercury analyses were conducted using EPA method 245.1. Results for hardness were calculated using Standard Methods 18th ed. Method 2340B. Analyses for COD were conducted using the Hach 8000 Method. Analyses for TOC, alkalinity, chloride, sulfate and TDS were conducted using EPA methods 415.1, 310.1, 325.3, 375.4 and 160.1, respectively.

Metals analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using Cold Vapor Atomic Absorption (CVAA).

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Calibration Recoveries
• Laboratory Blank Analyses
* • Laboratory Control Sample Results
• ICP Interference Check Sample Results

- Matrix Spike Results
- * Laboratory Duplicate Results
- ICP Serial Dilution Results
- Sample Quantitation
- * Detection Limits

* - All quality control criteria were met for this parameter.

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Action Level
Aluminum	-47.1 µg/L	235.5 µg/L
Arsenic	4.5 µg/L	22.5 µg/L
Iron	17.6 µg/L	88.0 µg/L
Mercury	0.20 µg/L	1.0 µg/L
Thallium	5.5 µg/L	27.5 µg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level reported for arsenic, iron, mercury and thallium were qualified "U" as a result of laboratory blank contamination.

Negative results greater than two times the IDL were reported in laboratory method blanks for aluminum. Positive results less than the action level and nondetected results reported for aluminum were qualified as estimated, "J" and "UJ", respectively, and may be biased low.

ICP Interference Check Sample Results

The interfering analyte magnesium was present in samples 2W-GW40DS-08, 2W-GW40DS-08-F, 2W-GW41DS-08-F, DRMO-6MW10S-GW13, DRMO-6MW2D-GW13 and DRMO-6MW2S-GW13 at concentrations that were comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely cadmium, silver and thallium were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for cadmium in the affected samples. The nondetected results reported for cadmium were qualified as estimated, "UJ".

The interfering analyte magnesium was present in samples 2W-GW41DS-08 and DRMO-6MW11D-GW13 at concentrations that were comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely cadmium, silver and thallium were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for cadmium and silver in the affected samples. The nondetected results reported for cadmium were qualified as estimated, "UJ". The positive results reported for silver were qualified as estimated, "J".

The interfering analyte magnesium was present in sample DRMO-6MW11S-GW13 at a concentration that was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely cadmium, silver and thallium were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). Interference affects exist for cadmium in the affected sample. The positive result reported for cadmium was qualified as estimated, "J".

Matrix Spike Results

The Matrix Spike (MS) percent recovery for silver was < 30% quality control limit, affecting the total metals matrix. Positive results reported for silver in the affected samples were qualified as estimated, "J". Nondetected results reported for silver in the affected samples were qualified as unusable, "UR".

ICP Serial Dilution Results

The ICP serial dilution percent differences for potassium and sodium were > 15% quality control limit, affecting the both the total and dissolved metals matrices. Positive results reported for potassium and sodium in the affected samples were qualified as estimated, "J". A direction of bias could not be determined.

Sample Quantitation

Due to uncertainty near the IDL, positive results less than two times the IDL reported for cadmium, chromium, cobalt, copper, lead, silver, vanadium and zinc were qualified as estimated, "J".

Notes

The contract required detection limit (CRDL) percent recovery for selenium was >120% quality control limit, affecting the dissolved metals matrix with the exception of sample 2LGW20S-08-F. No validation action was necessary because all of the results for selenium in the affected samples were reported by the laboratory as nondetected.

Results for samples RW-092201-01 and RW-092201-01-F were reported in this SDG. These samples did not require validation and were removed from this SDG as per the project manager.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method blanks.

Other Factors Affecting Data Quality: Potassium and sodium qualified due to ICP serial dilution noncompliance, affecting both the total and dissolved metals matrices. Silver was qualified due to MS noncompliance, affecting the total metals matrix. Cadmium, chromium, cobalt, copper, lead, silver, vanadium and zinc were qualified due to uncertainty near the IDL. The interfering analyte magnesium was present in several samples.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1989 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Erin M Faust

Tetra Tech NUS
Erin M. Faust
Environmental Scientist

TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A	=	Lab Blank Contamination
B	=	Field Blank Contamination
C	=	Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D	=	MS/MSD Noncompliance
E	=	LCS/LCSD Noncompliance
F	=	Lab Duplicate Imprecision
G	=	Field Duplicate Imprecision
H	=	Holding Time Exceedance
I	=	ICP Serial Dilution Noncompliance
J	=	GFAA PDS - GFAA MSA's $r < 0.995$
K	=	ICP Interference - include ICSAB % R's
L	=	Instrument Calibration Range Exceedance
M	=	Sample Preservation
N	=	Internal Standard Noncompliance
N01	=	Internal Standard Noncompliance Dioxins
N02	=	Recovery Standard Noncompliance Dioxins
N03	=	Clean-up Standard Noncompliance Dioxins
O	=	Poor Instrument Performance (i.e., base-time drifting)
P	=	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q	=	Other problems (can encompass a number of issues)
R	=	Surrogates Recovery Noncompliance
S	=	Pesticide/PCB Resolution
T	=	% Breakdown Noncompliance for DDT and Endrin
U	=	Pest/PCD% between columns for positive results
V	=	Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W	=	EMPC result
X	=	Signal to noise response drop
Y	=	Percent solids <30%
Z	=	Uncertainty at 2 sigma deviation is less than sample activity

CTO8 . .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	2LGW20S-08			2LGW20S-08-F			2WGW39DS-08			2WGW39DS-08-F		
SAMPLE DATE:	09/21/01			09/21/01			09/22/01			09/22/01		
LABORATORY ID:	N5965-05			N5965-08			N5965-14			N5965-15		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	63.1	J	A	30.0	UJ	A	30.0	UJ	A	30.0	UJ	A
ANTIMONY	5.0	U		5.0	U		5.0	U		5.0	U	
ARSENIC	8.9	U	A	6.4	U	A	5.0	U	A	4.7	U	A
BARIUM	51.6			54.4			85.5			139		
BERYLLIUM	1.0	U		1.0	U		1.0	U		1.0	U	
CADMIUM	0.30	U		0.30	U		0.30	U		0.30	U	
CALCIUM	22000			23000			41300			40800		
CHROMIUM	1.0	U		1.1	J	P	1.2	J	P	1.0	U	
COBALT	5.0	U		5.0	U		5.0	U		5.0	U	
COPPER	4.4	J	P	3.0	U		3.6	J	P	3.0	U	
IRON	10200			9800			8290			10800		
LEAD	3.0	U		3.0	U		5.0	J	P	3.0	U	
MAGNESIUM	4500			4870			8210			7260		
MANGANESE	625			638			877			959		
MERCURY	0.15	U	A	0.15	U	A	0.21	U	A	0.17	U	A
NICKEL	10.0	U		10.0	U		10.0	U		10.0	U	
POTASSIUM	4630	J	I	5840	J	I	13800	J	I	13900	J	I
SELENIUM	5.0	U		5.0	U		5.0	U		5.0	U	
SILVER	1.0	UR	D	1.0	U		1.0	UR	D	1.0	U	
SODIUM	48700	J	I	62300	J	I	284000	J	I	322000	J	I
THALLIUM	2.0	U		2.0	U		2.0	U		3.7	U	A
VANADIUM	7.4	U		7.4	U		7.4	U		7.4	U	
ZINC	41.1			33.0			27.8			33.0		

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	2WGW40DS-08			2WGW40DS-08-F			2WGW41DS-08			2WGW41DS-08-F		
SAMPLE DATE:	09/23/01			09/23/01			09/23/01			09/23/01		
LABORATORY ID:	N5965-18			N5965-19			N5965-20			N5965-21		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	30.0	UJ	A	30.0	UJ	A	203	J	A	30.0	UJ	A
ANTIMONY	5.0	U		5.0	U		5.0	U		5.0	U	
ARSENIC	15.1	U	A	8.5	U	A	11.3	U	A	13.1	U	A
BARIUM	68.7			69.8			38.9			56.3		
BERYLLIUM	1.0	U		1.0	U		1.0	U		1.0	U	
CADMIUM	0.30	UJ	K	0.30	UJ	K	0.30	UJ	K	0.30	UJ	K
CALCIUM	175000			169000			143000			173000		
CHROMIUM	3.5			2.2			6.7			16.2		
COBALT	5.0	U		5.0	U		5.0	U		5.0	U	
COPPER	3.0	U		3.0	U		3.0	U		3.0	U	
IRON	387			60.3	U	A	14000			142		
LEAD	3.0	U		3.0	U		3.0	U		3.0	U	
MAGNESIUM	622000			586000			475000			587000		
MANGANESE	103			125			333			190		
MERCURY	0.41	U	A	0.26	U	A	0.31	U	A	0.18	U	A
NICKEL	10.0	U		10.0	U		10.0	U		10.0	U	
POTASSIUM	363000	J	I	366000	J	I	289000	J	I	391000	J	I
SELENIUM	5.0	U		5.0	U		5.0	U		5.0	U	
SILVER	1.0	UR	D	1.0	U		1.4	J	DKP	1.0	U	
SODIUM	8360000	J	I	8200000	J	I	6540000	J	I	8730000	J	I
THALLIUM	2.1	U	A	2.7	U	A	6.0	U	A	2.0	UJ	K
VANADIUM	7.4	U		7.4	U		8.0	J	P	10.5	J	P
ZINC	4.8	J	P	4.0	U		9.3			4.0	U	

CTO8 NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	3GW37S-08			3GW37S-08-F			DRMO-6MW10D-GW13			DRMO-6MW10S-GW13		
SAMPLE DATE:	09/22/01			09/22/01			09/21/01			09/21/01		
LABORATORY ID:	N5965-12			N5965-13			N5965-03			N5965-02		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	30.0	UJ	A	30.0	UJ	A	30.0	UJ	A	30.0	UJ	A
ANTIMONY	5.0	U		5.0	U		5.0	U		5.0	U	
ARSENIC	4.0	U		5.2	U	A	4.0	U		4.0	U	
BARIUM	117			117			2.1			149		
BERYLLIUM	1.0	U		1.0	U		1.0	U		1.0	U	
CADMIUM	0.30	U		0.30	U		0.30	U		0.30	UJ	K
CALCIUM	39700			35400			825			123000		
CHROMIUM	1.5	J	P	1.0	U		1.0	U		5.6		
COBALT	8.6	J	P	7.6	J	P	5.0	U		5.0	U	
COPPER	3.9	J	P	3.0	U		5.5	J	P	3.3	J	P
IRON	1140			1030			150			1580		
LEAD	3.0	U		3.0	U		3.3	J	P	3.0	U	
MAGNESIUM	15100			13700			960			257000		
MANGANESE	2390			2120			11.5			581		
MERCURY	0.20	U	A	0.19	U	A	0.17	U	A	0.18	U	A
NICKEL	10.0	U		10.0	U		10.0	U		10.0	U	
POTASSIUM	9330	J	I	10200	J	I	1080	J	I	155000	J	I
SELENIUM	5.0	U		5.0	U		5.0	U		5.0	U	
SILVER	1.0	UR	D	1.2	J	P	1.0	UR	D	1.0	UR	D
SODIUM	190000	J	I	206000	J	I	11200	J	I	3390000	J	I
THALLIUM	2.6	U	A	3.8	U	A	2.0	U		3.1	U	A
VANADIUM	7.4	U		7.4	U		10.6	J	P	15.8		
ZINC	29.3			18.3			278			20.5		

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	DRMO-6MW11D-GW13			DRMO-6MW11S-GW13			DRMO-6MW2D-GW13			DRMO-6MW2S-GW13		
SAMPLE DATE:	09/22/01			09/22/01			09/23/01			09/23/01		
LABORATORY ID:	N5965-24			N5965-23			N5965-25			N5965-26		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	107	J	A	30.0	UJ	A	175	J	A	30.0	UJ	A
ANTIMONY	5.0	U		5.0	U		5.0	U		5.0	U	
ARSENIC	11.4	U	A	4.0	U		4.0	U		4.0	U	
BARIUM	205			142			144			28.7		
BERYLLIUM	1.0	U		1.0	U		1.0	U		1.0	U	
CADMIUM	0.30	UJ	K	0.38	J	KP	0.30	UJ	K	0.30	UJ	K
CALCIUM	203000			130000			211000			197000		
CHROMIUM	1.0	U		1.0	U		7.9			1.0	U	
COBALT	5.0	U		5.0	U		5.0	U		5.0	U	
COPPER	9.5			5.4	J	P	3.0	U		3.0	U	
IRON	5600			219			2360			166		
LEAD	5.0	J	P	3.0	U		3.0	U		3.0	U	
MAGNESIUM	566000			329000			649000			656000		
MANGANESE	1110			347			567			63.3		
MERCURY	0.33	U	A	0.25	U	A	0.32	U	A	0.17	U	A
NICKEL	10.0	U		10.0	U		10.0	U		10.0	U	
POTASSIUM	306000	J	I	191000	J	I	369000	J	I	378000	J	I
SELENIUM	5.0	U		5.0	U		5.0	U		5.0	U	
SILVER	2.5	J	DK	1.0	UR	D	1.0	UR	D	1.0	UR	D
SODIUM	7380000	J	I	4370000	J	I	8540000	J	I	8870000	J	I
THALLIUM	4.6	U	A	2.3	U	A	2.1	U	A	2.4	U	A
VANADIUM	7.4	U		20.0			7.4	U		7.4	U	
ZINC	15.4			81.2			4.0	U		4.5	J	P

CTO8 . .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	2LGW20S-08			2WGW39DS-08			2WGW40DS-08			2WGW41DS-08		
SAMPLE DATE:	09/21/01			09/22/01			09/23/01			09/23/01		
LABORATORY ID:	N5965-05			N5965-14			N5965-18			N5965-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
ALKALINITY(MG/L)	70			160			1200			2000		
CHEMICAL OXYGEN DEMAND(MG/L)	5.0	U		5.0	U		660			540		
CHLORIDE(MG/L)	83			300			19000			15000		
HARDNESS(MG/L)	74			140			3000			2300		
SULFATE(MG/L)	2.0			1.0	U		980			230		
TOTAL DISSOLVED SOLIDS(MG/L)	240			690			22000			20000		
TOTAL ORGANIC CARBON(MG/L)	10			9.9			42			41		

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	3GW37S-08			
SAMPLE DATE:	09/22/01	/ /	/ /	/ /
LABORATORY ID:	N5965-12			
QC_TYPE:	NORMAL			
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
ALKALINITY(MG/L)	130											
CHEMICAL OXYGEN DEMAND(MG/L)	5.0	U										
CHLORIDE(MG/L)	300											
HARDNESS(MG/L)	160											
SULFATE(MG/L)	17											
TOTAL DISSOLVED SOLIDS(MG/L)	520											
TOTAL ORGANIC CARBON(MG/L)	9.9											

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**C. RICH**	**DATE:**	**NOVEMBER 12, 2001**
FROM:	**ERIN M. FAUST**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – TAL METALS AND MISCELLANEOUS PARAMETERS**
CTO-816 NSB NEW LONDON
SAMPLE DELIVERY GROUP (SDG) – 5986

SAMPLES: 12/Aqueous/

2WGW44DS-08	2WGW38DS-08	2WGW42DS-08
2WGW43DS-08	2WGW45DS-08	DRMO-6MW1S-GW13
3MSP01-08	SWSG18-08	DRMO-6MW9S-GW13
SWSG19-08	SWSG20-08	SWSG21-08

Overview

The sample set for CTO 816, NSB New London, SDG 5986, consists of twelve (12) aqueous environmental samples.

All samples were analyzed for hardness, total organic carbon (TOC), chemical oxygen demand (COD), alkalinity, chloride, sulfate, total dissolved solids (TDS) and total and dissolved target analyte list (TAL) metals, with the exception of samples DRMO-6MW9S-GW13 and DRMO-6MW1S-GW13, which are analyzed for total TAL metals only. Samples designated –F were analyzed for dissolved metals. The samples were collected by TetraTech NUS on September 24 and 25, 2001 and analyzed by Chemtech Consulting Group under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Metals analyses, with the exception of mercury, were conducted using Contract Laboratory Program (CLP) method ILM04.1. Mercury analyses were conducted using EPA method 245.1. Results for hardness were calculated using Standard Methods 18th ed. Method 2340B. Analyses for COD were conducted using the Hach 8000 Method. Analyses for TOC, alkalinity, chloride, sulfate and TDS were conducted using EPA methods 415.1, 310.1, 325.3, 375.4 and 160.1, respectively.

Metals analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using Cold Vapor Atomic Absorption (CVAA).

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
• Calibration Recoveries
• Laboratory Blank Analyses
* • Laboratory Control Sample Results
• ICP Interference Check Sample Results
* • Matrix Spike Results
• Laboratory Duplicate Results
• ICP Serial Dilution Results

- Sample Quantitation
* • Detection Limits

* - All quality control criteria were met for this parameter.

Calibration Recoveries

The contract required detection limit (CRDL) percent recovery for zinc was >120% quality control limit, affecting all samples except SWSG21-08-F, SWSG18-08-F and 3MSP01-08-F. Positive results less than three times the CRDL reported for zinc in the affected samples were qualified as estimated, "J".

The CRDL percent recoveries for selenium and vanadium were < 80% quality control limit, affecting all dissolved metals samples and samples SWSG21-08, SWSG18-08 and 3MSP01-08. Positive results less than three times the CRDL reported for vanadium in the affected samples were qualified as estimated, "J". Nondetected results reported for selenium and vanadium in the affected samples were qualified as estimated, "UJ".

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Action Level
Aluminum	52.4 µg/L	262 µg/L
Barium[1]	5.035 µg/L	25.175 µg/L
Beryllium	2.1 µg/L	10.5 µg/L
Calcium	37.0 µg/L	185 µg/L
Iron	-30.0 µg/L	150 µg/L
Magnesium	38.5 µg/L	192.5 µg/L
Manganese	-1.2 µg/L	6.0 µg/L
Potassium	-466 µg/L	2330 µg/L
Zinc	-4.2 µg/L	21.0 µg/L

[1] Maximum concentration present in an aqueous preparation blank, affecting the dissolved metals matrix.

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level reported for aluminum, barium and beryllium were qualified "U" as a result of laboratory blank contamination.

Negative results greater than two times the IDL were reported in laboratory method blanks for iron, manganese, potassium and zinc. Positive results less than the action level reported for iron, potassium and zinc were qualified as estimated, "J" and may be biased low. Nondetected results reported for iron and manganese were qualified as estimated, "UJ" and may be biased low.

ICP Interference Check Sample Results

The interfering analyte magnesium was present in samples 2WGW43DS-08 and 2WGW43DS-08-F at concentrations that were comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely beryllium, manganese, potassium and zinc were present in the ICS solution at concentrations that exceeded 2X the absolute value of the

Instrument Detection Limit (IDL). Interference affects exist for zinc in the affected samples. The positive results reported for zinc were qualified as estimated, "J".

Laboratory Duplicate Results

Laboratory duplicate imprecision (difference > CRDL) was noted for lead, affecting the total metals matrix. Positive results reported for lead in the affected samples were qualified as estimated, "J".

ICP Serial Dilution Results

The ICP serial dilution percent difference for potassium was > 15% quality control limit, affecting the dissolved metals matrix. Positive results reported for potassium in the affected samples were qualified as estimated, "J". A direction of bias could not be determined.

Sample Quantitation

Due to uncertainty near the IDL, positive results less than two times the IDL reported for arsenic, cobalt, copper, iron, lead, nickel, thallium and vanadium were qualified as estimated, "J".

Notes

The interfering analyte magnesium was present in sample DRMO-6MW1S-GW13 at a concentration that was comparable to the level of magnesium in the Interference Check Sample (ICS) solution. Several analytes namely beryllium, manganese, potassium and zinc were present in the ICS solution at concentrations that exceeded 2X the absolute value of the Instrument Detection Limit (IDL). No validation action was necessary because no interference affects exist in this sample.

Executive Summary

Laboratory Performance: Several analytes were present in the laboratory method/preparation blanks. Selenium, vanadium and zinc were qualified due to calibration noncompliance. Laboratory duplicate imprecision was noted for lead, affecting the total metals matrix.

Other Factors Affecting Data Quality: Potassium was qualified due to ICP serial dilution noncompliance, affecting the dissolved metals matrix. Arsenic, cobalt, copper, iron, lead, nickel, thallium and vanadium were qualified due to uncertainty near the IDL. The interfering analyte magnesium was present in several samples.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1989 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Erin M Faust

Tetra Tech NUS
Erin M. Faust
Environmental Scientist

TetraTech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
N01 = Internal Standard Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW38DS-08	2WGW38DS-08-F	2WGW42DS-08	2WGW42DS-08-F
SAMPLE DATE:	09/25/01	09/25/01	09/24/01	09/24/01
LABORATORY ID:	N5986-14	N5986-15	N5986-08	N5986-09
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	131	U	A	41.1	U	A	4890			10.7	U	
ANTIMONY	9.2	U		9.2	U		9.2	U		9.2	U	
ARSENIC	5.0	U		5.0	U		16.4			5.0	U	
BARIUM	12.9			8.7	U	A	77.3			54.9		
BERYLLIUM	1.3	U	A	0.41	U	A	1.4	U	A	0.30	U	A
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	48100			46000			106000			92000		
CHROMIUM	5.0	U		5.0	U		24.7			5.0	U	
COBALT	5.0	U		5.0	U		5.2	J	P	5.0	U	
COPPER	10.1			9.8			10.7			2.4	U	
IRON	420			8.8	J	AP	38300			3220		
LEAD	3.0	U		3.0	U		12.4	J	F	3.0	U	
MAGNESIUM	18500			17700			164000			142000		
MANGANESE	19.8			15.1			742			569		
MERCURY	0.20	U		0.20	U		0.20	U		0.20	U	
NICKEL	4.0	U		4.0	U		4.0	J	P	4.0	U	
POTASSIUM	22300			20400	J	I	114000			99000	J	I
SELENIUM	5.0	U		5.0	UJ	C	5.0	U		5.0	UJ	C
SILVER	5.0	U		5.0	U		5.0	U		5.0	U	
SODIUM	215000			200000			2020000			1860000		
THALLIUM	7.2	U		7.2	U		7.2	U		7.2	U	
VANADIUM	10.4			8.4	J	C	26.5			2.6	UJ	C
ZINC	39.5	J	C	47.2	J	C	369			17.7	J	AC

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW43DS-08			2WGW43DS-08-F			2WGW44DS-08			2WGW44DS-08-F		
SAMPLE DATE:	09/24/01			09/24/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-06			N5986-07			N5986-02			N5986-03		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	10.7	U		10.7	U		82.4	U	A	44.2	U	A
ANTIMONY	9.2	U		9.2	U		9.2	U		9.2	U	
ARSENIC	8.1	J	P	6.8	J	P	5.0	U		5.0	U	
BARIUM	89.5			82.6			22.0			31.5		
BERYLLIUM	0.57	U	A	0.10	U		1.1	U	A	0.24	U	A
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	210000			202000			78800			77300		
CHROMIUM	5.0	U		5.0	U		5.0	U		5.0	U	
COBALT	5.0	U		5.0	U		5.0	U		5.0	U	
COPPER	2.4	U		2.4	U		4.1	J	P	7.9		
IRON	6190			1170			5150			12300		
LEAD	3.0	U		3.0	U		3.0	U		3.6	J	P
MAGNESIUM	706000			668000			134000			98700		
MANGANESE	182			216			369			528		
MERCURY	0.20	U		0.20	U		0.20	U		0.20	U	
NICKEL	4.0	U		4.0	U		4.0	U		4.0	U	
POTASSIUM	390000			371000	J	I	90300			64800	J	I
SELENIUM	5.0	U		5.0	UJ	C	5.0	U		5.0	UJ	C
SILVER	5.0	U		5.0	U		5.0	U		5.0	U	
SODIUM	7310000			8400000			1630000			1180000		
THALLIUM	7.2	U		7.2	U		7.2	U		7.2	U	
VANADIUM	14.3			8.5	J	C	3.7	J	P	2.9	J	CP
ZINC	17.4	J	ACK	19.0	J	ACK	31.9	J	C	41.2	J	C

CTO8 NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW45DS-08			2WGW45DS-08-F			3MSP01-08			3MSP01-08-F		
SAMPLE DATE:	09/24/01			09/24/01			09/25/01			09/25/01		
LABORATORY ID:	N5986-04			N5986-05			N5986-24			N5986-25		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	54.5	U	A	48.9	U	A	99.0	U	A	25.8	U	A
ANTIMONY	9.2	U		9.2	U		9.2	U		9.2	U	
ARSENIC	14.7			10.7			6.1	J	P	5.0	U	
BARIUM	11.9			9.8	U	A	67.9			69.0		
BERYLLIUM	1.2	U	A	0.14	U	A	0.17	U	A	1.3	U	A
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	45400			50600			25200			25500		
CHROMIUM	5.0	U		5.0	U		5.0	U		5.0	U	
COBALT	5.0	U		5.0	U		5.0	U		5.0	U	
COPPER	4.1	J	P	2.7	J	P	6.3			2.4	U	
IRON	32100			34300			11000			9370		
LEAD	3.4	J	FP	3.0	U		3.0	U		3.0	U	
MAGNESIUM	95600			108000			8920			9060		
MANGANESE	300			327			873			884		
MERCURY	0.20	U		0.20	U		0.20	U		0.20	U	
NICKEL	4.0	U		4.0	U		4.0	U		4.0	U	
POTASSIUM	74400			78900	J	I	5910			10600	J	I
SELENIUM	5.0	U		5.0	UJ	C	5.0	UJ	C	5.0	UJ	C
SILVER	5.0	U		5.0	U		5.0	U		5.0	U	
SODIUM	1300000			1430000			115000			119000		
THALLIUM	7.6	J	P	7.2	U		7.2	U		7.2	U	
VANADIUM	7.5			2.8	J	CP	2.6	UJ	C	2.6	UJ	C
ZINC	29.0	J	C	40.9	J	C	66.4			61.8		

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	DRMO-6MW1S-GW13			DRMO-6MW9S-GW13			SWSG18-08			SWSG18-08-F		
SAMPLE DATE:	09/24/01			09/24/01			09/25/01			09/25/01		
LABORATORY ID:	N5986-12			N5986-11			N5986-22			N5986-23		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	10.7	U		191	U	A	2180			46.5	U	A
ANTIMONY	9.2	U		9.2	U		9.2	U		9.2	U	
ARSENIC	5.0	U		5.0	U		7.7			5.0	U	
BARIUM	9.1	J	P	18.5			82.6			66.9		
BERYLLIUM	0.10	U		1.3	U	A	0.38	U	A	1.3	U	A
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	89600			3090			19100			20000		
CHROMIUM	5.0	U		5.0	U		5.0	U		5.0	U	
COBALT	5.0	U		5.0	U		5.0	U		5.0	U	
COPPER	9.8			7.7			17.2			4.6	J	P
IRON	7.0	UJ	A	32.7	J	A	20700			12300		
LEAD	3.0	U		3.3	J	FP	8.2	J	F	3.0	U	
MAGNESIUM	276000			982			3740			3410		
MANGANESE	0.50	UJ	A	203			566			561		
MERCURY	0.20	U		0.20	U		0.20	U		0.20	U	
NICKEL	4.0	U		4.0	U		4.3	J	P	4.0	U	
POTASSIUM	13800			635	J	A	2070	J	A	7720	J	I
SELENIUM	5.0	U		5.0	U		5.0	UJ	C	5.0	UJ	C
SILVER	5.0	U		5.0	U		5.0	U		5.0	U	
SODIUM	2950000			5560			37800			41500		
THALLIUM	7.2	U		7.2	U		7.2	U		7.2	U	
VANADIUM	2.6	U		2.6	U		19.7	J	C	2.6	UJ	C
ZINC	48.0	J	C	133			263			102		

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	SWSG19-08			SWSG19-08-F			SWSG20-08			SWSG20-08-F		
SAMPLE DATE:	09/25/01			09/25/01			09/25/01			09/25/01		
LABORATORY ID:	N5986-16			N5986-17			N5986-18			N5986-19		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	163	U	A	65.3	U	A	437			78.1	U	A
ANTIMONY	9.2	U		9.2	U		9.2	U		9.2	U	
ARSENIC	9.1	J	P	5.0	U		7.2	J	P	5.6	J	P
BARIUM	63.9			70.4			26.7			19.0	U	A
BERYLLIUM	0.10	U		0.42	U	A	0.10	U		0.46	U	A
CADMIUM	3.0	U		3.0	U		3.0	U		3.0	U	
CALCIUM	28000			27900			11200			9230		
CHROMIUM	5.0	U		5.0	U		5.0	U		5.0	U	
COBALT	5.0	U		5.0	U		5.0	U		5.0	U	
COPPER	16.0			4.7	J	P	18.4			2.4	U	
IRON	25200			17500			5610			2020		
LEAD	3.0	U		3.0	U		3.8	J	FP	3.0	U	
MAGNESIUM	4890			4510			3230			2710		
MANGANESE	518			473			263			204		
MERCURY	0.20	U		0.20	U		0.20	U		0.20	U	
NICKEL	4.0	U		4.0	U		4.0	U		4.0	U	
POTASSIUM	4020			4070	J	I	2470			1810	J	AI
SELENIUM	5.0	U		5.0	UJ	C	5.0	U		5.0	UJ	C
SILVER	5.0	U		5.0	U		5.0	U		5.0	U	
SODIUM	60600			62800			38800			35700		
THALLIUM	7.2	U		7.2	U		7.2	U		7.2	U	
VANADIUM	14.2			6.2	J	C	5.1	J	P	2.6	UJ	C
ZINC	109			86.1			121			51.2	J	C

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	SWSG21-08	SWSG21-08-F		
SAMPLE DATE:	09/25/01	09/25/01	/ /	/ /
LABORATORY ID:	N5986-20	N5986-21		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	78.0	U	A	31.4	U	A						
ANTIMONY	9.2	U		9.2	U							
ARSENIC	5.0	U		5.0	U							
BARIUM	38.2			37.8								
BERYLLIUM	0.13	U	A	1.3	U	A						
CADMIUM	3.0	U		3.0	U							
CALCIUM	17500			17700								
CHROMIUM	5.0	U		5.0	U							
COBALT	5.0	U		5.0	U							
COPPER	5.7			3.2	J	P						
IRON	7330			3180								
LEAD	3.0	U		3.0	U							
MAGNESIUM	4750			4870								
MANGANESE	315			320								
MERCURY	0.20	U		0.20	U							
NICKEL	4.0	U		4.0	U							
POTASSIUM	4530			5900	J	I						
SELENIUM	5.0	UJ	C	5.0	UJ	C						
SILVER	5.0	U		5.0	U							
SODIUM	51100			52700								
THALLIUM	7.2	U		7.2	U							
VANADIUM	2.6	UJ	C	2.6	UJ	C						
ZINC	55.3	J	C	50.1								

CTO8[illegible] NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW38DS-08			2WGW42DS-08			2WGW43DS-08			2WGW44DS-08		
SAMPLE DATE:	09/24/01			09/24/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-14			N5986-08			N5986-06			N5986-02		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
ALKALINITY(MG/L)				640			2100			650		
CHEMICAL OXYGEN DEMAND(MG/L)				92			920			46		
CHLORIDE(MG/L)				2700			19000			2800		
HARDNESS(MG/L)	200			940			3400			750		
SULFATE(MG/L)				83			530			36		
TOTAL DISSOLVED SOLIDS(MG/L)				5800			24000			4900		
TOTAL ORGANIC CARBON(MG/L)				20			33			8		

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW45DS-08			3MSP01-08			SWSG18-08			SWSG19-08		
SAMPLE DATE:	09/24/01			09/25/01			09/25/01			09/25/01		
LABORATORY ID:	N5986-04			N5986-24			N5986-22			N5986-16		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
ALKALINITY(MG/L)	460			80			55			85		
CHEMICAL OXYGEN DEMAND(MG/L)	56			9			100			43		
CHLORIDE(MG/L)	2500			180			70			100		
HARDNESS(MG/L)	510			99			63			90		
SULFATE(MG/L)	49			8			1	U		1	U	
TOTAL DISSOLVED SOLIDS(MG/L)	4400			460			430			320		
TOTAL ORGANIC CARBON(MG/L)	20			6.4			16			15		

CTO81 NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	SWSG20-08	SWSG21-08		
SAMPLE DATE:	09/25/01	09/25/01	/ /	/ /
LABORATORY ID:	N5986-18	N5986-20		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
ALKALINITY(MG/L)	25			57								
CHEMICAL OXYGEN DEMAND(MG/L)	75			23								
CHLORIDE(MG/L)	70			90								
HARDNESS(MG/L)	41			63								
SULFATE(MG/L)	1	U		2								
TOTAL DISSOLVED SOLIDS(MG/L)	280			250								
TOTAL ORGANIC CARBON(MG/L)	14			10								

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **COREY RICH** **DATE: NOVEMBER 30, 2001**

FROM: **DOUGLAS SCHLOER** **COPIES: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: VOA / SVOA / PAH / PEST / PCB**
CTO: 816, NSB NEW LONDON
SDG: 5932

SAMPLES: 3 / Aqueous / VOA

TB-091901-01 TB-092001-01 TB-092001-02

9 / Aqueous / VOA / SVOA / PAH / PEST / PCB

2W-GW21S-08	2WGW46DS-08	2WGW47DS-08
4-GW01S-08	DRMO-6MW6D-GW-13	DRMO-6MW6S-GW-13
GWFD-091901-01	GWFD-092001-01	GWFD-092001-02

Overview

The sample set for the CTO 816, NSB New London, SDG 5932 consists of nine (9) groundwater environmental samples and three (3) aqueous field quality control samples. The field quality control samples were analyzed for TCL volatile organic compounds (VOC) only. All environmental samples were analyzed for volatile, semivolatile (SVOC), polynuclear aromatic hydrocarbons (PAHs), pesticides (PEST), and polychlorinated biphenyl (PCB) organic compounds. Three field duplicate pairs were included in this SDG: 2W-GW21S-08 and GWFD-091901-01; 4-GW01S-08 and GWFD-092001-01; DRMO-6MW6S-GW-13 and GWFD-092001-02.

The samples were collected by TetraTech NUS on September 19th and 20th, 2001 and were analyzed by Chemtech Analytical Services. Analyses were conducted using the Contract Laboratory Program (CLP) Statement of Work (SOW) OLC02.1 (volatile, semivolatile, pesticide and PCB), and the U.S. EPA Test Methods for Evaluating Solid Wastes (SW-846) Methods 8310 analytical and reporting protocols.

The data were evaluated based on the following parameters:

- Data Completeness
- * Holding Times
- * GC/MS Tuning
- Calibration
- Blanks
- * Surrogate Spike Recoveries
- * Blank Spike Recoveries
- Matrix Spike/Matrix Spike Duplicate Recoveries
- * Internal Standards Performance
- * Instrument Performance
- Field Duplicate Precision
- * Compound Identification
- Compound Quantitation
- Tentatively Identified Compounds (TICs)

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report. The attached Table I summarizes the validation qualifications which were based on the following information:

HOLDING TIMES

Sample extraction for the semivolatile fraction was conducted one and two days beyond the seven-day holding time requirement. Positive and nondetected results for all semivolatile compounds were qualified as estimated (J) and (UJ), respectively, in all samples.

Sample extraction for the PCB fraction was conducted one day beyond the seven-day holding time requirement. Only nondetected results were reported for all PCBs and these were qualified as estimated (UJ) in all samples.

CALIBRATIONS

The following tables (by analytical fraction) summarize calibration non-compliances and corresponding actions:

Compound	IC 10/3/01	CC 10/3/01;17:37
Acetone	R	R
2-Butanone	R	R
2-Hexanone	RD	R
4-Methyl-2-pentanone	R	R
Chloroethane		RX
Methylene chloride		X
1,2-dichloropropane		X
1,2-Dibromo-3-chloropropane	R	RX
1,1,2,2-tetrachloroethane		X
Associated Samples:	All	2W-GW46DS-08
		2W-GW47DS-08
		4-GW01S-08
		DRMO-6MW6D-GW-13
		DRMO-6MW6S-GW-13
		GWFD-092001-01
		GWFD-092001-02
		TB-092001-01
		TB-092001-02

Compound	CC 10/4/01;17:15
2,2'-oxybis(1-chloropropane)	X
3&4-Methylphenol	X
4-Chloroaniline	X
2-Nitroaniline	X
3-Nitroaniline	X
4-Nitrophenol	X
4-Nitroaniline	X
Carbazole	X
3,3'-Dichlrobenzidine	X
Associated Samples:	GWFD-090901-01 GWFD-092001-02 2W-GW21S-08 2W-GW46DS-08 2W-GW47DS-08 DRMO-6MW6D-GW-13

Compound	ICAL 10/2/01	CC 10/5/01;18:11	CC 10/6/01;10:47	CC 10/9/01;10:55	CC 10/9/01;16:51
Acenaphthene	D	X			
Fluorene		X	X	X	X
Phenanthrene		X			X
2-Methylnaphthalene		X			X
Fluoranthene			X	X	
Benzo(a)anthracene			X		
Chrysene			X		X
Pyrene					X
Associated Samples:	All	2WGW21S-08 2WGW46DS-08 2WGW47DS-08 4GW01S-08 DRMO-6MW6D-GW-13 DRMO-6MW6S-GW-13 GWFD-091901-01 GWFD-092001-01	2WGW21S-08 2WGW46DS-08 2WGW47DS-08 4GW01S-08 DRMO-6MW6D-GW-13 DRMO-6MW6S-GW-13 GWFD-091901-01 GWFD-092001-01	GWFD-092001-02	GWFD-092001-02

Calibration Actions:

D - Percent Relative Standard Deviation (%RSD) > 30%, Estimate positive and nondetected results (J) and (UJ), respectively.

X - Percent Difference (%D) > 25%; Estimate positive and nondetected results (J) and (UJ), respectively.

R - Relative Response Factors (RRF) < 0.05; Reject nondetected results (UR) and estimate positive results (J).

BLANKS

The following compounds were detected in the trip blanks as indicated below:

Compound	Maximum Concentration	Action Level
Methylene chloride	0.9 µg/L	9 µg/L

Samples Affected: All
Blank Actions:

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < action level; report value followed by a U.
- Value > CRQL and > action level; report value unqualified.

An action level of 10X the blank concentration was used to evaluate contamination for methylene chloride. Dilution factors and sample aliquots were taken into consideration prior to the application of all action levels. Field quality control blanks were not qualified due to method blank contamination or contamination in other field quality control blanks. Only nondetected results were reported for methylene chloride and these did not require qualification based on this noncompliance.

SURROGATE RECOVERY

Recovery of the base/neutral and acid surrogates nitrobenzene-d5, 2-fluorobiphenyl, phenol-d5, 2-fluorophenol, terphenyl-d14 and 2,4,6-tribromophenol fell below quality control limits (and were < 10%) for the analysis of sample DRMO-6MW6D-GW-13. Positive results were qualified as estimated (J) and nondetected results were rejected (R) for all base/neutral and acid fraction compounds.

Recovery of the base/neutral and acid surrogates nitrobenzene-d5, 2-fluorobiphenyl, phenol-d5, 2-fluorophenol, terphenyl-d14 and 2,4,6-tribromophenol fell below quality control limits (and were < 10%) for the MS analysis of sample DRMO-6MW6D-GW-13. No action was taken for the MS sample.

Recovery of the acid fraction surrogates phenol-d5, 2-fluorophenol and 2,4,6-tribromophenol fell below quality control limits (and were < 10%) for the MSD analysis of sample DRMO-6MW6D-GW-13. No action was taken for the MSD sample.

Recovery of the PAH surrogate Decachlorobiphenyl (DCB) exceeded the 10%-150% quality control limit for the analysis of sample 2WGW46DS-08. Positive and nondetected results were qualified as estimated (J) and (UJ), respectively.

Recovery of the pesticide surrogate Tetrachloro-m-xylene (TCX) exceeded the 60%-150% quality control limit on one analytical column (RTX-50) for the analysis of sample 2W-GW21S-08. However, since a 10X dilution was required for the analysis of this sample, no action was taken based on this noncompliance.

Recovery of the pesticide surrogate TCX exceeded the 60%-150% quality control limit on one analytical column (RTX-1701) for the analysis of sample 2S-GW46DS-08. No action was taken since the TCX recovery was complaint on the RTX-50 analytical column.

Recovery of the pesticide surrogate TCX exceeded the 60%-150% quality control limit on both analytical columns for the analysis of sample 2W-GW47DS-08. Only nondetected results were reported for all pesticide compounds and these were qualified as estimated (UJ).

Recovery of the pesticide surrogate TCX exceeded the 60%-150% quality control limit on both analytical columns for the analysis of sample GWFD-091901-01. Recovery of DCB also exceeded the 60%-150% quality control limit on one analytical column (RTX-1701). No action was taken since this sample required a 10X dilution for analysis.

Recovery of the pesticide surrogates TCX and/or Decachlorobiphenyl (DCB) exceeded the 60%-150% quality control limit on one or both analytical columns for the MS/MSD analysis of sample DRMO-6MW6D-GW-13. No action was taken based on this noncompliance.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

The Relative Percent Difference (RPD) for trichloroethene exceeded the 14% quality control limit for the Matrix Spike / Matrix Spike Duplicate (MS/MSD) analysis of sample DRMO-6MW6D-GW-13. A positive result was reported for trichloroethene and this was qualified as estimated (J) in the unspiked sample DRMO-6MW6D-GW-13 only.

Recovery of phenol, 4-chloro-3-methylphenol, 4-nitrophenol and pentachlorophenol fell below quality control limits (and were < 10%) for the MS/MSD analysis of sample DRMO-6MW6D-GW-13. Recovery of 2-chlorophenol fell below quality control limits for the MS/MSD analysis of sample DRMO-6MW6D-GW-13. All matrix spike acid fraction compounds fell below quality control limits and/or 10%. In the professional judgement of the data reviewer, sample matrix interference has affected the recovery of the acid fraction compounds. Therefore, nondetected results for all acid fraction compounds were rejected in the unspiked sample DRMO-6MW6D-GW-13.

Recovery of fluorene fell below the 50%-150% quality control limit for the MS analysis of sample DRMO-6MW6D-GW-13. Only nondetected results were reported for fluorene and this was qualified as estimated (UJ) in the unspiked sample only.

The RPD for phenanthrene exceeded the 20% quality control limit for the MS/MSD analysis of sample DRMO-6MW6D-GW-13. Only nondetected results were reported for phenanthrene and this was qualified as estimated (UJ) in the unspiked sample only.

Recovery of the pesticide target compound Endosulfan Sulfate fell below the 50%-120% quality control limit for the MS/MSD analysis of sample DRMO-6MW6D-GW-13. Only nondetected results were reported for Endosulfan Sulfate and these were qualified as estimated (UJ) in the unspiked sample only.

FIELD DUPLICATE PRECISION

Field duplicate precision was evaluated for the duplicate pairs: 2W-GW21S-08 and GWFD-091901-01; 4-GW01S-08 and GWFD-092001-01; DRMO-6MW6S-GW-13 and GWFD-092001-02, by evaluating the RPD between positive results. The RPD exceeded the 20% quality control limit for positive results reported for carbon disulfide and these were qualified as estimated (J), the field duplicate pair 2W-GW21S-08 and GWFD-091901-01, due to field duplicate imprecision.

The RPD exceeded the 20% quality control limit for positive results reported for trichloroethene and these were qualified as estimated (J) in the field duplicate pair DRMO-6MW6S-GW-13 and GWFD-092001-02 due to field duplicate imprecision.

The RPD exceeded the 20% quality control limit for positive results reported for bis(2-ethylhexyl)phthalate and these were qualified as estimated (J) in the field duplicate pair 4-GW01S-08 and GWFD-092001-01, due to field duplicate imprecision.

COMPOUND QUANTITATION

Due to the presence of acenaphthene, pyrene and 2-methylnaphthalene at concentrations that exceeded the linear range of the instrument calibration, sample 2WGW46DS-08 was re-analyzed at a 1000X dilution. Positive results for the aforementioned compounds were transposed onto the Electronic Data Deliverable (EDD) from the 1000X dilution and the remaining compounds were reported from the undiluted sample analysis.

The pesticide fraction of samples 2W-GW21S-08 and GWFD-091901-01 were analyzed and reported at a 10X dilution. The laboratory did not analyze the samples undiluted. This account for the elevated reporting limits for these samples.

The percent Difference (%D) between analytical columns exceeded 25% for positive results reported in the samples outlined in the table that follows. Positive results were qualified as estimated (UJ) for %Ds that exceeded 25% and were rejected (R) if %Ds exceeded 100%.

Sample	Compound	%D	Qual
2W-GW47DS-08	4,4'-DDD	154.5	R
GWFD-091901-01	4,4'-DDE	109.3	R

TENTATIVELY INDENTIFIED COMPOUNDS

Sulfur dioxide and several unknown compounds were tentatively identified in the volatile fraction samples.

Numerous TICs were identified in the semivolatile fraction of all samples (see Table 2).

ADDITIONAL COMMENTS

Positive results reported at concentrations below the CRQL were qualified as estimated, (J).

The text of this report has been formulated to address only those problem areas affecting data quality.

The OLC02.1 volatile compounds 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene and 1,4-dichlorobenzene were reported in the semivolatile fraction of this SDG. Since these compounds are on the CLP OLC02.1 volatile target compound list, they were removed from the semivolatile database.

Nondetected results for the PAH and pesticide fractions were reported by the laboratory at the method detection limit "MDL". However, after correspondence with laboratory chemists at Chemtech Inc., it was determined that the value reported on the sample Form Is is actually the sample reporting limit (RL). The reviewer requested that the laboratory resubmit corrected sample Form Is.

Transcription errors were observed for sample identifications between the EDDs and Form Is. Several data completeness issues were noted.

OVERALL ASSESSMENT

Laboratory Performance: Initial and continuing calibration of several volatile, semivolatile and PAH compounds failed to meet quality control criteria, resulting in the qualification of analytical data. Transcription errors were observed for sample identifications between EDDs and Form Is. Several data completeness issues were noted. The %D between analytical columns exceeded the quality control criteria for several positive pesticide results, resulting in the rejection of analytical data.

Other Factors Affecting Data Quality: Noncompliances (% recoveries and %RPDs) were observed for the MS/MSD analysis of sample DRMO-6MW6D-GW-13, resulting in the qualification of analytical data.

The data for these analyses were reviewed with reference to the Region I EPA "Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

TetraTech NUS

Douglas S. Schloer
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

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SDG 5986

TABLE I. Summary of Tentatively Identified Volatile Compounds

TIC	2W-GW21S-08	2W-GW46DS-08	2W-GW47DS-08	4-GW01S-08	DRMO-6MW6D-GW-13	DRMO-6MW6S-GW-13
Unknown				X	X	
Sulfur dioxide	X	X	X			X
	GWFD-091901-01	GWFD-092001-01				
Unknown						
Sulfur dioxide	X	X				
Methane, chlorofluoro						

NEW LONDON NSB

SDG 5986

TABLE II. Summary of Tentatively Identified Semivolatile Compounds

TIC	2W-GW21S-08	2W-GW46DS-08	2W-GW47DS-08	4-GW01S-08	DRMO-6MW6D-GW-13	DRMO-6MW6S-GW-13
Lenthionine		X				
Hexthiepane		X				
1,4-Cyclohexanedione					X	
Unknown			X		X	
Sulfur,mol(S8)		X	X			
(3H,6H)Thieno[3,4-c]isoxaol					X	
Sulfur	X	X	X			
4-Fluoro-3-nitrophenol					X	
2-Norbornanone					X	
Tetradecanoic acid				X	X	
3-Hexadecanol						X
3-Hexadecanol					X	X
Decanoic acid						X

TIC	GWFD-091901-01	GWFD-092001-01	GWFD-092001-02
Propane,1,1-dimethoxy-2-meth		X	
1,2-Benzenedicarboxylic acid		X	
3-Hexadecanol			X
Unknown	X		X
Tetratetracontane			X
N,N'-bis(pentamethylene)thiu	X		
Sulfur	X		
ACP		X	X
Nonadecane			X
Tetradecanoic acid		X	X
Hexadecane			X
Butyl hexadecanoate			X

Decanoic acid		X			X
Carotene,7,7',8					
3-Tetradecanol					
Lenthionine					
Cyclopentadecanone,2-hydrox	X				
14-Pentadecanoic acid			X		
Hexadecanamide					
Dodecanamide					
Tetradecane					
4-Nonylphenol					
Glycine,N-methyl-n-(1-oxodo					
1,2-Benzenedicarboxylic acid					
3-Eicosane					
1-Octadecanol					X
Ethane,1,1,2,2-tetrachloro	X	X	X		
Benzaldehyde	X	X			
Methane,dibromodichloro	X				
Hexadecanoic acid,bis(2-ethy	X				
Methyl(Z)-5,11,14,17-eicosa		X		X	
10-Methylnonadecane			X		
9-Octadedenamide	X				

NSB NEW LONDON-CTO816
FIELD DUPLICATE EVALUATION

SDG		5932	5932		5932	5932	
FRACTION	COMPOUND	2W-GW21S-08 RESULT ug/L	GWFD-091901-01 RESULT ug/L	RPD	4-GW-01S-08 RESULT ug/L	GWFD-092001-01 RESULT ug/L	RPD
VOA							
	Carbon Disulfide	4.7	1.7	93.8	ND	ND	NC
	Trichloroethene	1.3	ND	NC	ND	0.9	NC
	Cis-1,2-dichloroethene	ND	ND	NC	ND	ND	NC
SVOA							
	Bis-(2-ethylhexyl)phthalate	2.1 J	ND	NC	3 J	7.9	89.9
PAH							
	Anthracene	ND	ND	NC	0.13	ND	NC
	Fluoranthene	ND	ND	NC	0.19	ND	NC
	Acenaphthylene	ND	ND	NC	ND	ND	NC
	Fluoranthene	ND	ND	NC	ND	ND	NC
PEST/PCB							
	4,4'-DDD	2.7	2.4	11.8	ND	ND	NC

ND = Compound not detected.
NC = RPD not calculated.
J = amount is estimated.
Shading indicates that the RPD exceeded the 20% quality control limit.

NSB NEW LONDON-CTO816
FIELD DUPLICATE EVALUATION

SDG		5932	5932	
FRACTION	COMPOUND	DRMO-6MW6S-GW-13 RESULT ug/L	GWFD-092001-02 RESULT ug/L	RPD
VOA				
	Carbon Disulfide	0.8 J	0.7 J	NC
	Trichloroethene	7.2	0.6 J	169.2
	Cis-1,2-dichloroethene	4.7	ND	NC
SVOA				
	Bis-(2-ethylhexyl)phthalate	5.9	ND	NC
PAH				
	Anthracene	ND	ND	NC
	Fluoranthene	ND	ND	NC
	Acenaphthylene	0.02	ND	NC
	Fluoranthene	0.13	0.14	7.4
PEST/PCB				
	4,4'-DDD	ND	ND	NC

ND = Compound not detected.
NC = RPD not calculated.
J = amount is estimated.
Shading indicates that the RPD exceeded the 20%

APPENDIX A

QUALIFIED LABORATORY RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
N01 = Internal Standard Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

CTO8 JSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	2WGW21S-08			2WGW46DS-08			2WGW47DS-08			4GW01S-08		
SAMPLE DATE:	09/19/01			09/20/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-02			N5932-07			N5932-09			N5932-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	UJ	C	1	UJ	C	1	UJ	C
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C	1	UR	C
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	UJ	C	1	UJ	C	1	UJ	C
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
4-METHYL-2-PENTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
ACETONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	4.7	J	G	2.5			1			1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	UR	C	1	UR	C	1	UR	C
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLBENZENE	1	U		1	U		1	U		1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	2WGW21S-08			2WGW46DS-08			2WGW47DS-08			4GW01S-08		
SAMPLE DATE:	09/19/01			09/20/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-02			N5932-07			N5932-09			N5932-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U		2	UJ	C	2	UJ	C	2	UJ	C
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1.3			1	U		1	U		1	U	
VINYL CHLORIDE	1	U		1	U		1	U		1	U	

CTO8 ISB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	DRMO-6MW6D-GW13			DRMO-6MW6S-GW13			GWFD-091901-01			GWFD-092001-01		
SAMPLE DATE:	09/20/01			09/20/01			09/19/01			09/20/01		
LABORATORY ID:	N5932-17			N5932-16			N5932-04			N5932-13		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:							2W-GW21S-08			4-GW21S-08		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	UJ	C	1	UJ	C	1	U		1	UJ	C
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR		1	UR	C
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	UJ	C	1	UJ	C	1	U		1	UJ	C
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
4-METHYL-2-PENTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
ACETONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	0.8	J	P	0.7	J	P	1.7	J	G	1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	UR	C	1	UR	C	1	U		1	UR	C
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	4.7			1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLBENZENE	1	U		1	U		1	U		1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	DRMO-6MW6D-GW13			DRMO-6MW6S-GW13			GWFD-091901-01			GWFD-092001-01		
SAMPLE DATE:	09/20/01			09/20/01			09/19/01			09/20/01		
LABORATORY ID:	N5932-17			N5932-16			N5932-04			N5932-13		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:							2W-GW21S-08			4-GW21S-08		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	UJ	C	2	UJ	C	2	U		2	UJ	C
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	7.2	J	DG	1	U		1	U		0.9	J	P
VINYL CHLORIDE	1	U		1	U		1	U		1	U	

SAMPLE NUMBER:	GWFD-092001-02			TB-091901-01			TB-092001-01			TB-092001-02		
SAMPLE DATE:	09/20/01			09/19/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-20			N5932-01			N5932-06			N5932-15		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:	DRMO-6MW6S-GW13											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	UJ	C	1	U		1	UJ	C	1	UJ	C
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C	1	UR	C
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	UJ	C	1	U		1	UJ	C	1	UJ	C
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
4-METHYL-2-PENTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
ACETONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	0.7	J	P	1	U		1	U		1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	UR	C	1	U		1	UR	C	1	UR	C
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLBENZENE	1	U		1	U		1	U		1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	GWFD-092001-02			TB-091901-01			TB-092001-01			TB-092001-02		
SAMPLE DATE:	09/20/01			09/19/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-20			N5932-01			N5932-06			N5932-15		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:	DRMO-6MW6S-GW13											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	UJ	C	2	U		0.9	J	CP	2	UJ	C
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	0.6	J	GP	1	U		1	U		1	U	
VINYL CHLORIDE	1	U		1	U		1	U		1	U	

CTO81. .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	2WGW21S-08			2WGW46DS-08			2WGW47DS-08			4GW01S-08		
SAMPLE DATE:	09/19/01			09/20/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-02			N5932-07			N5932-09			N5932-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	CH	5.1	UJ	CH	5	UJ	CH	5	UJ	H
2,4,5-TRICHLOROPHENOL	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
2,4,6-TRICHLOROPHENOL	20	UJ	H	20	UJ	H	20	UJ	H	20	UJ	H
2,4-DICHLOROPHENOL	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
2,4-DIMETHYLPHENOL	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
2,4-DINITROPHENOL	20	UJ	H	20	UJ	H	20	UJ	H	20	UJ	H
2,4-DINITROTOLUENE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
2,6-DINITROTOLUENE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
2-CHLORONAPHTHALENE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
2-CHLOROPHENOL	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
2-METHYLPHENOL	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
2-NITROANILINE	20	UJ	CH	20	UJ	CH	20	UJ	CH	20	UJ	H
2-NITROPHENOL	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
3&4-METHYLPHENOL	5	UJ	CH	5.1	UJ	CH	5	UJ	CH	5	UJ	H
3,3'-DICHLOROBENZIDINE	5	UJ	CH	5.1	UJ	CH	5	UJ	CH	5	UJ	H
3-NITROANILINE	20	UJ	CH	20	UJ	CH	20	UJ	CH	20	UJ	H
4,6-DINITRO-2-METHYLPHENOL	20	UJ	H	20	UJ	H	20	UJ	H	20	UJ	H
4-BROMOPHENYL PHENYL ETHER	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
4-CHLORO-3-METHYLPHENOL	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
4-CHLOROANILINE	5	UJ	CH	5.1	UJ	CH	5	UJ	CH	5	UJ	H
4-CHLOROPHENYL PHENYL ETHER	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
4-NITROANILINE	20	UJ	CH	20	UJ	CH	20	UJ	CH	20	UJ	H
4-NITROPHENOL	20	UJ	CH	20	UJ	CH	20	UJ	CH	20	UJ	H
BENZOIC ACID	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
BIS(2-CHLOROETHOXY)METHANE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
BIS(2-CHLOROETHYL)ETHER	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
BIS(2-ETHYLHEXYL)PHTHALATE	2.1	J	HP	5.1	UJ	H	6.3	J	H	3	J	GHP
BUTYL BENZYL PHTHALATE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
CARBAZOLE	5	UJ	CH	5.1	UJ	CH	5	UJ	CH	5	UJ	H
DI-N-BUTYL PHTHALATE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
DI-N-OCTYL PHTHALATE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
DIBENZOFURAN	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	2WGW21S-08			2WGW46DS-08			2WGW47DS-08			4GW01S-08		
SAMPLE DATE:	09/19/01			09/20/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-02			N5932-07			N5932-09			N5932-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIETHYL PHTHALATE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
DIMETHYL PHTHALATE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
HEXACHLOROBENZENE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
HEXACHLOROBUTADIENE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
HEXACHLOROCYCLOPENTADIENE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
HEXACHLOROETHANE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
ISOPHORONE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
N-NITROSODIPHENYLAMINE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
NITROBENZENE	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H
PENTACHLOROPHENOL	20	UJ	H	20	UJ	H	20	UJ	H	20	UJ	H
PHENOL	5	UJ	H	5.1	UJ	H	5	UJ	H	5	UJ	H

CTO8 . JSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	DRMO-6MW6D-GW13			DRMO-6MW6S-GW13			GWFD-091901-01			GWFD-092001-01		
SAMPLE DATE:	09/20/01			09/20/01			09/19/01			09/20/01		
LABORATORY ID:	N5932-17			N5932-16			N5932-04			N5932-13		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:							2W-GW21S-08			4-GW21S-08		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UR	R	5	UJ	H	5	UJ	CH	5	UJ	H
2,4,5-TRICHLOROPHENOL	5	UR	DR	5	UJ	H	5	UJ	H	5	UJ	H
2,4,6-TRICHLOROPHENOL	20	UR	DR	20	UJ	H	20	UJ	H	20	UJ	H
2,4-DICHLOROPHENOL	5	UR	DR	5	UJ	H	5	UJ	H	5	UJ	H
2,4-DIMETHYLPHENOL	5	UR	DR	5	UJ	H	5	UJ	H	5	UJ	H
2,4-DINITROPHENOL	20	UR	DR	20	UJ	H	20	UJ	H	20	UJ	H
2,4-DINITROTOLUENE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
2,6-DINITROTOLUENE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
2-CHLORONAPHTHALENE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
2-CHLOROPHENOL	5	UR	DR	5	UJ	H	5	UJ	H	5	UJ	H
2-METHYLPHENOL	5	UR	DR	5	UJ	H	5	UJ	H	5	UJ	H
2-NITROANILINE	20	UR	R	20	UJ	H	20	UJ	CH	20	UJ	H
2-NITROPHENOL	5	UR	DR	5	UJ	H	5	UJ	H	5	UJ	H
3&4-METHYLPHENOL	5	UR	R	5	UJ	H	5	UJ	CH	5	UJ	H
3,3'-DICHLOROBENZIDINE	5	UR	R	5	UJ	H	5	UJ	CH	5	UJ	H
3-NITROANILINE	20	UR	R	20	UJ	H	20	UJ	CH	20	UJ	H
4,6-DINITRO-2-METHYLPHENOL	20	UR	DR	20	UJ	H	20	UJ	H	20	UJ	H
4-BROMOPHENYL PHENYL ETHER	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
4-CHLORO-3-METHYLPHENOL	5	UR	DR	5	UJ	H	5	UJ	H	5	UJ	H
4-CHLOROANILINE	5	UR	R	5	UJ	H	5	UJ	CH	5	UJ	H
4-CHLOROPHENYL PHENYL ETHER	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
4-NITROANILINE	20	UR	DR	20	UJ	H	20	UJ	CH	20	UJ	H
4-NITROPHENOL	20	UR	R	20	UJ	H	20	UJ	CH	20	UJ	H
BENZOIC ACID	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
BIS(2-CHLOROETHOXY)METHANE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
BIS(2-CHLOROETHYL)ETHER	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
BIS(2-ETHYLHEXYL)PHTHALATE	5.9	J	R	5	UJ	H	5	UJ	H	7.9	J	GH
BUTYL BENZYL PHTHALATE	5	UR	H	5	UJ	H	5	UJ	H	5	UJ	H
CARBAZOLE	5	UR	R	5	UJ	H	5	UJ	CH	5	UJ	H
DI-N-BUTYL PHTHALATE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
DI-N-OCTYL PHTHALATE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
DIBENZOFURAN	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H

SAMPLE NUMBER:	DRMO-6MW6D-GW13			DRMO-6MW6S-GW13			GWFD-091901-01			GWFD-092001-01		
SAMPLE DATE:	09/20/01			09/20/01			09/19/01			09/20/01		
LABORATORY ID:	N5932-17			N5932-16			N5932-04			N5932-13		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:							2W-GW21S-08			4-GW21S-08		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIETHYL PHTHALATE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
DIMETHYL PHTHALATE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
HEXACHLOROBENZENE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
HEXACHLOROBUTADIENE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
HEXACHLOROCYCLOPENTADIENE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
HEXACHLOROETHANE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
ISOPHORONE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
N-NITROSO-DI-N-PROPYLAMINE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
N-NITROSODIPHENYLAMINE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
NITROBENZENE	5	UR	R	5	UJ	H	5	UJ	H	5	UJ	H
PENTACHLOROPHENOL	20	UR	DR	20	UJ	H	20	UJ	H	20	UJ	H
PHENOL	5	UR	DR	5	UJ	H	5	UJ	H	5	UJ	H

CTO8 ISB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	GWFD-092001-02											
SAMPLE DATE:	09/20/01			/ /			/ /			/ /		
LABORATORY ID:	N5932-20											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:	DRMO-6MW6S-GW13											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	CH									
2,4,5-TRICHLOROPHENOL	5	UJ	H									
2,4,6-TRICHLOROPHENOL	20	UJ	H									
2,4-DICHLOROPHENOL	5	UJ	H									
2,4-DIMETHYLPHENOL	5	UJ	H									
2,4-DINITROPHENOL	20	UJ	H									
2,4-DINITROTOLUENE	5	UJ	H									
2,6-DINITROTOLUENE	5	UJ	H									
2-CHLORONAPHTHALENE	5	UJ	H									
2-CHLOROPHENOL	5	UJ	H									
2-METHYLPHENOL	5	UJ	H									
2-NITROANILINE	20	UJ	CH									
2-NITROPHENOL	5	UJ	H									
3&4-METHYLPHENOL	5	UJ	CH									
3,3'-DICHLOROBENZIDINE	5	UJ	CH									
3-NITROANILINE	20	UJ	CH									
4,6-DINITRO-2-METHYLPHENOL	20	UJ	H									
4-BROMOPHENYL PHENYL ETHER	5	UJ	H									
4-CHLORO-3-METHYLPHENOL	5	UJ	H									
4-CHLOROANILINE	5	UJ	CH									
4-CHLOROPHENYL PHENYL ETHER	5	UJ	H									
4-NITROANILINE	20	UJ	CH									
4-NITROPHENOL	20	UJ	CH									
BENZOIC ACID	5	UJ	H									
BIS(2-CHLOROETHOXY)METHANE	5	UJ	H									
BIS(2-CHLOROETHYL)ETHER	5	UJ	H									
BIS(2-ETHYLHEXYL)PHTHALATE	5	UJ	H									
BUTYL BENZYL PHTHALATE	5	UJ	H									
CARBAZOLE	5	UJ	CH									
DI-N-BUTYL PHTHALATE	5	UJ	H									
DI-N-OCTYL PHTHALATE	5	UJ	H									
DIBENZOFURAN	5	UJ	H									

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	GWFD-092001-02			
SAMPLE DATE:	09/20/01	/ /	/ /	/ /
LABORATORY ID:	N5932-20			
QC_TYPE:	NORMAL			
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L			
FIELD DUPLICATE OF:	DRMO-6MW6S-GW13			

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIETHYL PHTHALATE	5	UJ	H									
DIMETHYL PHTHALATE	5	UJ	H									
HEXACHLOROBENZENE	5	UJ	H									
HEXACHLOROBUTADIENE	5	UJ	H									
HEXACHLOROCYCLOPENTADIENE	5	UJ	H									
HEXACHLOROETHANE	5	UJ	H									
ISOPHORONE	5	UJ	H									
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	H									
N-NITROSODIPHENYLAMINE	5	UJ	H									
NITROBENZENE	5	UJ	H									
PENTACHLOROPHENOL	20	UJ	H									
PHENOL	5	UJ	H									

CTO8 ISB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	2WGW21S-08			2WGW46DS-08			2WGW47DS-08			4GW01S-08		
SAMPLE DATE:	09/19/01			09/20/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-02			N5932-07			N5932-09			N5932-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.5	U		0.5	UJ	R	0.5	U		0.5	U	
2-METHYLNAPHTHALENE	0.5	UJ	C	180	J	CR	0.5	UJ	C	0.5	UJ	C
ACENAPHTHENE	0.016	UJ	C	82	J	CR	0.016	UJ	C	0.016	UJ	C
ACENAPHTHYLENE	0.013	U		2.7	J	R	0.013	U		0.013	U	
ANTHRACENE	0.03	U		0.03	UJ	R	0.03	U		0.13		
BENZO(A)ANTHRACENE	0.012	UJ	C	0.012	UJ	CR	0.012	UJ	C	0.012	UJ	C
BENZO(A)PYRENE	0.021	U		0.021	UJ	R	0.021	U		0.021	U	
BENZO(B)FLUORANTHENE	0.02	U		0.02	UJ	R	0.02	U		0.02	U	
BENZO(G,H,I)PERYLENE	0.009	U		0.009	UJ	R	0.009	U		0.009	U	
BENZO(K)FLUORANTHENE	0.02	U		0.02	UJ	R	0.02	U		0.02	U	
CHRYSENE	0.012	UJ	C	0.012	UJ	CR	0.012	UJ	C	0.012	UJ	C
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	UJ	R	0.014	U		0.014	U	
FLUORANTHENE	0.009	UJ	C	0.009	UJ	CR	0.009	UJ	C	0.19	J	C
FLUORENE	0.007	UJ	C	0.007	UJ	CR	0.007	UJ	C	0.007	UJ	C
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	UJ	R	0.008	U		0.008	U	
NAPHTHALENE	0.008	U		0.008	UJ	R	0.008	U		0.008	U	
PHENANTHRENE	0.004	UJ	C	0.004	UJ	CR	0.004	UJ	C	0.004	UJ	C
PYRENE	0.008	U		400	J	R	0.008	U		0.008	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	DRMO-6MW6D-GW13			DRMO-6MW6S-GW13			GWFD-091901-01			GWFD-092001-01		
SAMPLE DATE:	09/20/01			09/20/01			09/19/01			09/20/01		
LABORATORY ID:	N5932-17			N5932-16			N5932-04			N5932-13		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:							2W-GW21S-08			4-GW21S-08		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U		0.5	U	
2-METHYLNAPHTHALENE	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
ACENAPHTHENE	0.016	UJ	C	0.016	UJ	C	0.016	U		0.016	U	
ACENAPHTHYLENE	0.02			0.013	U		0.013	U		0.013	U	
ANTHRACENE	0.03	U		0.03	U		0.03	U		0.14		
BENZO(A)ANTHRACENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C
BENZO(A)PYRENE	0.021	U		0.021	U		0.021	U		0.021	U	
BENZO(B)FLUORANTHENE	0.02	U		0.02	U		0.02	U		0.02	U	
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U		0.009	U		0.009	U	
BENZO(K)FLUORANTHENE	0.02	U		0.02	U		0.02	U		0.02	U	
CHRYSENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U		0.014	U		0.014	U	
FLUORANTHENE	0.13	J	C	0.15	J	C	0.009	UJ	C	0.009	UJ	C
FLUORENE	0.007	UJ	CD	0.007	UJ	CD	0.007	UJ	C	0.007	UJ	C
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U		0.008	U		0.008	U	
NAPHTHALENE	0.008	U		0.008	U		0.008	U		0.008	U	
PHENANTHRENE	0.004	UJ	CD	0.004	UJ	CD	0.004	UJ	C	0.004	UJ	C
PYRENE	0.008	U		0.008	U		0.008	U		0.008	U	

CTO8. ISB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	GWFD-092001-02			
SAMPLE DATE:	09/20/01	/ /	/ /	/ /
LABORATORY ID:	N5932-20			
QC_TYPE:	NORMAL			
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L			
FIELD DUPLICATE OF:	DRMO-6MW6S-GW13			

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.5	U										
2-METHYLNAPHTHALENE	0.5	UJ	C									
ACENAPHTHENE	0.016	U										
ACENAPHTHYLENE	0.013	U										
ANTHRACENE	0.03	U										
BENZO(A)ANTHRACENE	0.012	UJ	C									
BENZO(A)PYRENE	0.021	U										
BENZO(B)FLUORANTHENE	0.02	U										
BENZO(G,H,I)PERYLENE	0.009	U										
BENZO(K)FLUORANTHENE	0.02	U										
CHRYSENE	0.012	UJ	C									
DIBENZO(A,H)ANTHRACENE	0.014	U										
FLUORANTHENE	0.14	J	C									
FLUORENE	0.007	UJ	C									
INDENO(1,2,3-CD)PYRENE	0.008	U										
NAPHTHALENE	0.008	U										
PHENANTHRENE	0.004	UJ	C									
PYRENE	0.008	UJ	C									

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	2WGW21S-08			2WGW46DS-08			2WGW47DS-08			4GW01S-08		
SAMPLE DATE:	09/19/01			09/20/01			09/20/01			09/20/01		
LABORATORY ID:	N5932-02			N5932-07			N5932-09			N5932-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	2.7			0.020	U		0.011	R	U	0.020	U	
4,4'-DDE	0.20	U		0.020	U		0.020	UJ	R	0.020	U	
4,4'-DDT	0.20	U		0.020	U		0.020	UJ	R	0.020	U	
ALDRIN	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
ALPHA-BHC	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
ALPHA-CHLORDANE	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
AROCLOR-1016	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1221	0.40	UJ	H	0.40	UJ	H	0.40	UJ	H	0.40	UJ	H
AROCLOR-1232	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1242	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1248	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1254	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1260	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
BETA-BHC	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
DELTA-BHC	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
DIELDRIN	0.20	U		0.020	U		0.020	UJ	R	0.020	U	
ENDOSULFAN I	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
ENDOSULFAN II	0.20	U		0.020	U		0.020	UJ	R	0.020	U	
ENDOSULFAN SULFATE	0.20	U		0.020	U		0.020	UJ	R	0.020	U	
ENDRIN	0.20	U		0.020	U		0.020	UJ	R	0.020	U	
ENDRIN ALDEHYDE	0.20	U		0.020	U		0.020	UJ	R	0.020	U	
ENDRIN KETONE	0.20	U		0.020	U		0.020	UJ	R	0.020	U	
GAMMA-BHC (LINDANE)	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
GAMMA-CHLORDANE	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
HEPTACHLOR	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
HEPTACHLOR EPOXIDE	0.10	U		0.010	U		0.010	UJ	R	0.010	U	
METHOXYCHLOR	0.10	U		0.10	U		0.10	UJ	R	0.10	U	
TOXAPHENE	10	U		1.0	U		1.0	UJ	R	1.0	U	

CTO8 ISB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	DRMO-6MW6D-GW13			DRMO-6MW6S-GW13			GWFD-091901-01			GWFD-092001-01		
SAMPLE DATE:	09/20/01			09/20/01			09/19/01			09/20/01		
LABORATORY ID:	N5932-17			N5932-16			N5932-04			N5932-13		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:							2W-GW21S-08			4-GW21S-08		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.020	U		0.020	U		2.4			0.020	U	
4,4'-DDE	0.020	U		0.020	U		0.043	R	U	0.020	U	
4,4'-DDT	0.020	U		0.020	U		0.20	U		0.020	U	
ALDRIN	0.010	U		0.010	U		0.10	U		0.010	U	
ALPHA-BHC	0.010	U		0.010	U		0.10	U		0.010	U	
ALPHA-CHLORDANE	0.010	U		0.010	U		0.10	U		0.010	U	
AROCLOR-1016	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1221	0.40	UJ	H	0.40	UJ	H	0.40	UJ	H	0.40	UJ	H
AROCLOR-1232	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1242	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1248	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1254	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1260	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
BETA-BHC	0.010	U		0.010	U		0.10	U		0.010	U	
DELTA-BHC	0.010	U		0.010	U		0.10	U		0.010	U	
DIELDRIN	0.020	U		0.020	U		0.20	U		0.020	U	
ENDOSULFAN I	0.010	U		0.010	U		0.10	U		0.010	U	
ENDOSULFAN II	0.020	U		0.020	U		0.20	U		0.020	U	
ENDOSULFAN SULFATE	0.020	U		0.020	U		0.20	U		0.020	U	
ENDRIN	0.020	U		0.020	U		0.20	U		0.020	U	
ENDRIN ALDEHYDE	0.020	U		0.020	U		0.20	U		0.020	U	
ENDRIN KETONE	0.020	U		0.020	U		0.20	U		0.020	U	
GAMMA-BHC (LINDANE)	0.010	U		0.010	U		0.10	U		0.010	U	
GAMMA-CHLORDANE	0.010	U		0.010	U		0.10	U		0.010	U	
HEPTACHLOR	0.010	U		0.010	U		0.10	U		0.010	U	
HEPTACHLOR EPOXIDE	0.010	U		0.010	U		0.10	U		0.010	U	
METHOXYCHLOR	0.10	U		0.10	U		0.10	U		0.10	U	
TOXAPHENE	1.0	U		1.0	U		10	U		1.0	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5932

SAMPLE NUMBER:	GWFD-092001-02											
SAMPLE DATE:	09/20/01			/ /			/ /			/ /		
LABORATORY ID:	N5932-20											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:	DRMO-6MW6S-GW13											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.020	U										
4,4'-DDE	0.020	U										
4,4'-DDT	0.020	U										
ALDRIN	0.010	U										
ALPHA-BHC	0.010	U										
ALPHA-CHLORDANE	0.010	U										
AROCLOR-1016	0.20	UJ	H									
AROCLOR-1221	0.40	UJ	H									
AROCLOR-1232	0.20	UJ	H									
AROCLOR-1242	0.20	UJ	H									
AROCLOR-1248	0.20	UJ	H									
AROCLOR-1254	0.20	UJ	H									
AROCLOR-1260	0.20	UJ	H									
BETA-BHC	0.010	U										
DELTA-BHC	0.010	U										
DIELDRIN	0.020	U										
ENDOSULFAN I	0.010	U										
ENDOSULFAN II	0.020	U										
ENDOSULFAN SULFATE	0.020	U										
ENDRIN	0.020	U										
ENDRIN ALDEHYDE	0.020	U										
ENDRIN KETONE	0.020	U										
GAMMA-BHC (LINDANE)	0.010	U										
GAMMA-CHLORDANE	0.010	U										
HEPTACHLOR	0.010	U										
HEPTACHLOR EPOXIDE	0.010	U										
METHOXYCHLOR	0.10	U										
TOXAPHENE	1.0	U										

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **COREY RICH** **DATE: NOVEMBER 26, 2001**

FROM: **DOUGLAS SCHLOER** **COPIES: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: VOA / SVOA / PAH / PEST / PCB**
CTO: 816, NSB NEW LONDON
SDG: 5965

SAMPLES: 4 / Aqueous / VOA

TB-092101-01 TB-092101-02 TB-092201-01 TB092202-02

11 / Aqueous / VOA / SVOA / PAH / PEST / PCB

2LGW20S-08	2W-GW39DS-08	2W-GW40DS-08
2W-GW41DS-08	3GW37S-08	DRMO-6MW10D-GW13
DRMO-6MW10S-GW13	DRMO-6MW11D-GW13	DRMO-6MW11S-GW13
DRMO-6MW2D-GW13	DRMO-6MW2S-GW13	

Overview

The sample set for the CTO 816, NSB New London, SDG 5965 consists of eleven (11) groundwater environmental samples and four (4) aqueous field quality control samples. The aqueous field quality control samples were analyzed for TCL volatile organic compounds (VOC) only. All environmental samples were analyzed for volatile, semivolatile (SVOC), polynuclear aromatic hydrocarbons (PAHs), pesticides (PEST), and polychlorinated biphenyl (PCB) organic compounds. One field duplicate pair was included in this SDG: GWFD-092001 and

The samples were collected by TetraTech NUS on September 21st through 23rd, 2001 and were analyzed by Chemtech Analytical Services. Analyses were conducted using the Contract Laboratory Program (CLP) Statement of Work (SOW) OLC02.1 (volatile, semivolatile, pesticide and PCB), and the U.S. EPA Test Methods for Evaluating Solid Wastes (SW-846) Method 8310 analytical and reporting protocols.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times
- * GC/MS Tuning
- Calibration
- Blanks
- Surrogate Spike Recoveries
- * Blank Spike Recoveries
- Matrix Spike/Matrix Spike Duplicate Recoveries
- * Field Duplicate Precision
- * Internal Standards Performance
- * Instrument Performance
- * Compound Identification
- Compound Quantitation
- Tentatively Identified Compounds (TICs)

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report. The attached Table I summarizes the validation qualifications which were based on the following information:

HOLDING TIMES

Extraction of the PAH fraction samples occurred one to six days beyond the seven day holding time. All nondetected results reported for the Aroclors were qualified as estimated (UJ) in all aqueous environmental samples.

CALIBRATIONS

The following tables (by analytical fraction) summarize calibration non-compliances and corresponding actions:

Compound	IC 10/3/01	CC 10/5/01;12:50	CC 10/6/01;08:16
Acetone	R	R	R
2-Butanone	R	R	RX
2-Hexanone	RD	RX	R
4-Methyl-2-pentanone	R	R	D
1,2-Dibromo-3-chloropropane	R	RX	R
Benzene			D
1,2-Dichloroethane			D
1,2-Dichlorobenzene			D
1,3-Dichlorobenzene			D
Associated Samples:	All	TB-092101-01	TB-0922-01
		TB-092102-02	DRMO-6MW11S-GW13
		TB-092201-02	DRMO-6MW11D-GW13
		DRMO-6MW10S-GW13	DRMO-6MW2D-GW13
		DRMO-6MW10D-GW13	DRMO-6MW2S-GW13
		2LGW20S-08	
		3GW37S-08	
		2W-GW39DS-08	
		2W-GW40DS-08	
		2W-GW41DS-08	

Compound	CC 10/5/01;14:46	CC 10/6/01;02:59
Bis(2-chloroethyl)ether	X	X
Associated Samples:	DRMO-6MW10S-GW13	DRMO-6MW10D-GW13
	DRMO-6MW2S-GW13	DRMO-6MW11D-GW13
	2LGW20S-08	2W-GW41DS-08

Compound	IC 10/2/01	CC 10/9/01;16:51	CC 10/10/01;04:43	CC 10/10/01;16:35
Acenaphthene	D			
Fluorene		X	X	X
Phenanthrene		X	X	X
Pyrene		X	X	
Chrysene		X	X	X
Fluoranthene			X	
Benzo(a)anthracene			X	X
Benzo(b)fluoranthene			X	
Benzo(k)fluoranthene			X	
Associated Samples:	All	2WGW39DS-08 3GW37S-08 DRMO-6MW10D-GW13 DRMO-6MW10S-GW13 2LGW20S-08	All	2W-GW40DS-08 2W-GW41DS-08 DRMO-6MW11D-GW13 DRMO-6MW11S-GW13 DRMO-6MW2D-GW13 DRMO-6MW2S-GW13

Calibration Actions:

D - Percent Relative Standard Deviation (%RSD) > 30%, Estimate positive and nondetected results (J) and (UJ), respectively.

X - Percent Difference (%D) > 25%; Estimate positive and nondetected results (J) and (UJ), respectively.

R - Relative Response Factors (RRF) < 0.05; Reject nondetected results (UR) and estimate positive results (J).

BLANKS

The following compounds were detected in the trip blanks as indicated below:

Compound	Maximum Concentration	Action Level
Methylene chloride	0.8 µg/L	8 µg/L

Samples Affected: All
Blank Actions:

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < action level; report value followed by a U.
- Value > CRQL and > action level; report value unqualified.

An action level of 10X the blank concentration was used to evaluate contamination for methylene chloride. Dilution factors and sample aliquots were taken into consideration prior to the application of all action levels. Positive results for methylene chloride were qualified due to blank contamination. Field quality control blanks were not qualified due to method blank contamination or contamination in other field quality control blanks.

SURROGATE RECOVERY

The laboratory failed to report recoveries for the PAH surrogate decafluorobiphenyl in sample DRMO-6MW2D-GW13. The reviewer contacted the laboratory and requested the surrogate recovery for the aforementioned sample.

Recovery of the pesticide surrogate tetrachloro-m-xylene (TCX) exceeded the 50%-150% quality control limit and recovery of decachlorobiphenyl (DCB) fell below the 50%-150% quality control limit on one analytical column only for the analysis of sample 2W-GW40DS-08. No action was taken based on this noncompliance.

Recovery of the pesticide surrogate TCX exceeded the 50%-150% quality control limit on both analytical columns for the analysis of sample 2W-GW41DS-08. Only nondetected results were reported and these were not qualified based on this noncompliance.

Recovery of the pesticide surrogate TCX exceeded the 50%-150% quality control limit on one analytical column for the analysis of samples DRMO-6MW11S-GW-13 and DRMO-6MW2S-GW13. No action was taken based on these noncompliances.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Relative Percent Differences (RPDs) exceeded quality control limits for the following compounds: 1,1-dichloroethene, benzene and trichloroethene. Only nondetected results were reported for the aforementioned compounds and these were qualified as estimated (UJ) in the native sample, 2LGW205-08 only.

MS recovery of naphthalene fell below the 50%-150% quality control limit and MSD recovery of naphthalene fell below 10% for the analysis of sample 2LGW20S-08. In addition, the RPD for naphthalene exceeded the 20% quality control limit. The nondetected result reported for naphthalene was rejected (R) in the native sample only.

MS recovery of phenanthrene and fluoranthene fell below the 50%-150% quality control limit for the analysis of sample 2LGW20S-08. In addition, the RPD for phenanthrene exceeded the 20% quality control limit. The nondetected results reported in for phenanthrene and fluoranthene were qualified as estimated (UJ) in the native sample only.

The RPD for Aroclor-1260 exceeded the 20% quality control limit for the MS/MSD analysis of sample 2LGW20S-08. The nondetected result reported for Aroclor-1260 was qualified as estimated (UJ) in the native sample 2LGW20S-08 only.

COMPOUND QUANTITATION

Poor chromatography was observed for the analysis of sample 2W-GW40DS-08. Review of sample chromatography reveal evidence of extraneous non-target compound peaks and/or sample matrix interference on both analytical columns between the chromatographic retention times of approximately 3.39 minutes to approximately 15.75 minutes. It should also be noted that there were surrogate recovery noncompliances for the analysis of this sample. The laboratory did not re-analyze the sample to confirm sample matrix interference. Several target compounds elute within the above retention time range and in the professional judgement of the reviewer, data quality is compromised. Therefore, the nondetected results reported for Alpha-BHC, Beta-BHC, Gamma-BHC, Delta-BHC, Aldrin, and Heptachlor were qualified as estimated (UJ) due to chromatographic interference.

TENTATIVELY INDENTIFIED COMPOUNDS

1,2-Dichloro-1,1,2trifluoroethane, 1,1,2-trichloro-1,2-difluoroethane, dimethyl ether, sulfur dioxide and several unknown compounds were tentatively identified in the volatile fraction samples.

Numerous TICs were identified in the semivolatile fraction of all samples (see Table 2).

ADDITIONAL COMMENTS

Positive results reported at concentrations below the CRQL were qualified as estimated, (J).

The text of this report has been formulated to address only those problem areas affecting data quality.

The OLC02.1 volatile compounds 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene and 1,4-dichlorobenzene were reported in the semivolatile fraction of this SDG. Since these compounds are on the CLP OLC02.1 volatile target compound list, they were removed from the semivolatile database.

The Form I for sample 2LGW40S-08 was incorrectly identified by the laboratory as DRMO-6MW10D-GW13. The reviewer manually updated the sample Form I to reflect the correct identification (2LGW40S-08).

Nondetected results for the PAH and pesticide fractions were reported by the laboratory at the method detection limit "MDL". However, the value reported on the sample Form Is is actually the sample reporting limit (RL). The reviewer contacted the laboratory and requested that sample Form Is be corrected and re-submitted accordingly

OVERALL ASSESSMENT

Laboratory Performance: Several compounds were detected in the laboratory blank and/or field quality control blanks. The laboratory was unable to obtain acceptable percent differences between initial and continuing calibration response factors for several volatile, semivolatile and PAH compounds. The laboratory was unable to obtain acceptable relative response factors for several volatile compounds. Several transcription errors were observed between results reported on the EDD and sample Form Is.

Other Factors Affecting Data Quality: Several recovery and RPD noncompliances were observed for the MS/MSD analysis of sample 2LGW20S-08. Nondetected results for the PAH and pesticide fractions were reported by the laboratory at the method detection limit "MDL". However, the value reported on the sample Form Is is actually the sample reporting limit (RL).

The data for these analyses were reviewed with reference to the Region I EPA "Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

TetraTech NUS

Douglas S. Schloer
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

NEW LONDON NSB

SDG 5965

TABLE I. Summary of Tentatively Identified Volatile Compounds

TIC	TB-092101-01	TB-092201-01	2W-GW39DS-08	2W-GW40DS-08	2W-GW41DS-08	
1,2-Dichloro-1,1,2t ethane						
1,1,2-trichloro-1,2-ethane						
dimethyl ether	X					
sulfur dioxide		X		X	X	
Unknown			X			
	DRMO-6MW10D-GW13	DRMO-6MW10S-GW13	DRMO-6MW11D-GW13	DRMO-6MW11S-GW13	DRMO-6MW2D-GW13	DRMO-6MW2S-GW13
1,2-Dichloro-1,1,2t ethane						
1,1,2-trichloro-1,2-ethane	X		X			
dimethyl ether	X					
sulfur dioxide						
Unknown				X	X	X
		X				

NEW LONDON NSB

SDG 200621

TABLE II. Summary of Tentatively Identified Semivolatile Compounds

TIC	2LGW20S-08	2W-GW39DS-08	2W-GW40DS-08	2W-GW41DS-08	3GW37S-08	DRMO-6MW10D-GW13
Oleic acid	X		X			
Hexadecanoic acid	X		X			X
cyclohexane	X					
9-Octadecenamide(z)	X					
ACP		X			X	
Unknown		X	X			
Pentanoic acid,2-methyl		X				
Hexanoic acid		X				
2-Butene,1chloro-3-methyl		X				
Benzenepropanoic acid		X				
Diethyltoluamide		X				
Glycine,N-methyl-N-(1oxodo)			X			
Eicosane			X			
Tetradecanoic acid			X			
Phenol,5-methyl-2-(1-methyl)			X			
Isopropyl myristate			X			
9-Hexadecanoic acid			X			
Cyclopentanecarboxylic acid			X			
Octadecanoic acid			X			
Butyl hexadecanoate			X			
Butyl tetradecanoate			X			
3-Hexadecanol			X			
Dodecanamide			X			
2,6,10-dodecatrien-1-ol,3,7			X			
Sulfur,mol(S8)				X		
Heptanamide,4-ethyl-5-methyl				X		X

	DRMO-6MW10S-GW13	DRMO-6MW11D-GW13	DRMO-6MW11S-GW13	DRMO-6MW2D-GW13	DRMO-6MW2S-GW13
Hexadecanoic acid	X				X
9-Octadecenamide(z)	X	X			X
2,6,10-dodecatrien-1-ol,3,7	X				
Pentadecanoic acid		X			
Propylhexadrine		X			
Unknown		X	X	X	
1-Hexadecanol,2-methyl		X			
1-Octadecanthiol		X			
1-Heptacosanol		X			
1-Octadecene		X			
ACP			X		
Sulfur				X	
Sulfur,Mol(S8)				X	
Butyl hexadecanoate					X
Butyl tetradecanoate					X
Cyclohexane					X
Eicosane					X
4-Pentene,2-ol,2-methyl					X
Hexatriacontane					X
Tetradecane					X
Pentacosane					X
tetratetracontane					X
Pentatriacontane					X
3,7,11=Tridecatrienenitrile					X

APPENDIX A

QUALIFIED LABORATORY RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
N01 = Internal Standard Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	2LGW20S-08			2WGW39DS-08			2WGW40DS-08			2WGW41DS-08		
SAMPLE DATE:	09/21/01			09/22/01			09/23/01			09/23/01		
LABORATORY ID:	N5965-05			N5965-14			N5965-18			N5965-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	UJ	D	1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C	1	UR	C
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
4-METHYL-2-PENTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
ACETONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
BENZENE	1	UJ	D	1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	U		1	U		4			1.6		
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLBI[illegible]NE	1	U		1	U		1	U		1	U	

CTO8. .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	2LGW20S-08			2WGW39DS-08			2WGW40DS-08			2WGW41DS-08		
SAMPLE DATE:	09/21/01			09/22/01			09/23/01			09/23/01		
LABORATORY ID:	N5965-05			N5965-14			N5965-18			N5965-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U		2	U		2	U		2	U	
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	UJ	D	1.2			1	U		1	U	
VINYL CHLORIDE	1	U		1	U		1	U		1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	3GW37S-08			DRMO-6MW10D-GW13			DRMO-6MW10S-GW13			DRMO-6MW11D-GW13		
SAMPLE DATE:	09/22/01			09/21/01			09/21/01			09/22/01		
LABORATORY ID:	N5965-12			N5965-03			N5965-02			N5965-24		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		0.9	J	P	1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C	1	UR	C
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	U		1	U		1	U		1	UJ	C
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	UJ	C
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	UJ	C
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
4-METHYL-2-PENTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
ACETONE	5	UR	C	5	UR	C	26	J	C	5	UR	C
BENZENE	1	U		1	U		1	U		1	UJ	C
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	2.2			1	U		1	U		1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		5.7			1.6			1.8		
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLB NE	1	U		1	U		1	U		1	U	

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	3GW37S-08			DRMO-6MW10D-GW13			DRMO-6MW10S-GW13			DRMO-6MW11D-GW13		
SAMPLE DATE:	09/22/01			09/21/01			09/21/01			09/22/01		
LABORATORY ID:	N5965-12			N5965-03			N5965-02			N5965-24		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U	B	2	U		2	U		2	U	
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1.1			1.4			1	U		1	U	
VINYL CHLORIDE	1	U		1	U		0.6	J	P	1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	DRMO-6MW11S-GW13			DRMO-6MW2D-GW13			DRMO-6MW2S-GW13			TB-092101-01		
SAMPLE DATE:	09/22/01			09/23/01			09/23/01			09/21/01		
LABORATORY ID:	N5965-23			N5965-25			N5965-26			N5965-01		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	0.6	J	P	1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C	1	UR	C
1,2-DIBROMOETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROBENZENE	1	UJ	C	1	UJ	C	1	UJ	C	1	U	
1,2-DICHLOROETHANE	1	UJ	C	1	UJ	C	1	UJ	C	1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	UJ	C	1	UJ	C	1	UJ	C	1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
4-METHYL-2-PENTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
ACETONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
BENZENE	1	UJ	C	1	UJ	C	1	UJ	C	1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	U		1	U		2.5			1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1.3			1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLBENZENE	1	U		1	U		1	U		1	U	

CTO8 . .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	DRMO-6MW11S-GW13			DRMO-6MW2D-GW13			DRMO-6MW2S-GW13			TB-092101-01		
SAMPLE DATE:	09/22/01			09/23/01			09/23/01			09/21/01		
LABORATORY ID:	N5965-23			N5965-25			N5965-26			N5965-01		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U		2	U		2	U		2	U	
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	0.7	J	P	1	U		1	U		1	U	
VINYL CHLORIDE	0.8	J	P	1	U		1	U		1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	TB-092101-02			TB-092201-01			TB-092201-02					
SAMPLE DATE:	09/21/01			09/22/01			09/22/01			/ /		
LABORATORY ID:	N5965-04			N5965-22			N5965-11					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U				
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U				
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHENE	1	U		1	U		1	U				
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U				
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C			
1,2-DIBROMOETHANE	1	U		1	U		1	U				
1,2-DICHLOROBENZENE	1	U		1	UJ	C	1	U				
1,2-DICHLOROETHANE	1	U		1	UJ	C	1	U				
1,2-DICHLOROPROPANE	1	U		1	U		1	U				
1,3-DICHLOROBENZENE	1	U		1	UJ	C	1	U				
1,4-DICHLOROBENZENE	1	U		1	U		1	U				
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C			
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C			
4-METHYL-2-PENTANONE	5	UR	C	5	UR	C	5	UR	C			
ACETONE	5	UR	C	5	UR	C	5	UR	C			
BENZENE	1	U		1	UJ	C	1	U				
BROMOCHLOROMETHANE	1	U		1	U		1	U				
BROMODICHLOROMETHANE	1	U		1	U		1	U				
BROMOFORM	1	U		1	U		1	U				
BROMOMETHANE	1	U		1	U		1	U				
CARBON DISULFIDE	1	U		1	U		1	U				
CARBON TETRACHLORIDE	1	U		1	U		1	U				
CHLOROBENZENE	1	U		1	U		1	U				
CHLORODIBROMOMETHANE	1	U		1	U		1	U				
CHLOROETHANE	1	U		1	U		1	U				
CHLOROFORM	1	U		1	U		1	U				
CHLOROMETHANE	1	U		1	U		1	U				
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
ETHYLBENZENE	1	U		1	U		1	U				

CTO8 NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	TB-092101-02			TB-092201-01			TB-092201-02					
SAMPLE DATE:	09/21/01			09/22/01			09/22/01			/ /		
LABORATORY ID:	N5965-04			N5965-22			N5965-11					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U				
METHYLENE CHLORIDE	2	U		0.8	J	P	2	U				
O-XYLENE	1	U		1	U		1	U				
STYRENE	1	U		1	U		1	U				
TETRACHLOROETHENE	1	U		1	U		1	U				
TOLUENE	1	U		1	U		1	U				
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
TRICHLOROETHENE	1	U		1	U		1	U				
VINYL CHLORIDE	1	U		1	U		1	U				

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	2LGW20S-08			2WGW39DS-08			2WGW40DS-08			2WGW41DS-08		
SAMPLE DATE:	09/21/01			09/22/01			09/23/01			09/23/01		
LABORATORY ID:	N5965-05			N5965-14			N5965-18			N5965-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
2,2'-OXYBIS(1-CHLOROPROPANE)	5.2	U		5.2	U		5.1	U		5	U	
2,4,5-TRICHLOROPHENOL	5.2	U		5.2	U		5.1	U		5	U	
2,4,6-TRICHLOROPHENOL	21	U		21	U		20	U		20	U	
2,4-DICHLOROPHENOL	5.2	U		5.2	U		5.1	U		5	U	
2,4-DIMETHYLPHENOL	5.2	U		5.2	U		5.1	U		5	U	
2,4-DINITROPHENOL	21	U		21	U		20	U		20	U	
2,4-DINITROTOLUENE	5.2	U		5.2	U		5.1	U		5	U	
2,6-DINITROTOLUENE	5.2	U		5.2	U		5.1	U		5	U	
2-CHLORONAPHTHALENE	5.2	U		5.2	U		5.1	U		5	U	
2-CHLOROPHENOL	5.2	U		5.2	U		5.1	U		5	U	
2-METHYLPHENOL	5.2	U		5.2	U		5.1	U		5	U	
2-NITROANILINE	21	U		21	U		20	U		20	U	
2-NITROPHENOL	5.2	U		5.2	U		5.1	U		5	U	
3&4-METHYLPHENOL	5.2	U		1.7	J	P	5.1	U		5	U	
3,3'-DICHLOROBENZIDINE	5.2	U		5.2	U		5.1	U		5	U	
3-NITROANILINE	21	U		21	U		20	U		20	U	
4,6-DINITRO-2-METHYLPHENOL	21	U		21	U		20	U		20	U	
4-BROMOPHENYL PHENYL ETHER	5.2	U		5.2	U		5.1	U		5	U	
4-CHLORO-3-METHYLPHENOL	5.2	U		5.2	U		5.1	U		5	U	
4-CHLOROANILINE	5.2	U		5.2	U		5.1	U		5	U	
4-CHLOROPHENYL PHENYL ETHER	5.2	U		5.2	U		5.1	U		5	U	
4-NITROANILINE	21	U		21	U		20	U		20	U	
4-NITROPHENOL	21	U		21	U		20	U		20	U	
BENZOIC ACID	5.2	U		5.2	U		5.1	U		5	U	
BIS(2-CHLOROETHOXY)METHANE	5.2	UJ	C	5.2	U		5.1	U		5	U	
BIS(2-CHLOROETHYL)ETHER	5.2	U		5.2	U		5.1	UJ	C	5	UJ	C
BIS(2-ETHYLHEXYL)PHTHALATE	15			3.3	J	P	1.9	J	P	2.5	J	P
BUTYL BENZYL PHTHALATE	5.2	U		5.2	U		5.1	U		5	U	
CARBAZOLE	5.2	U		5.2	U		5.1	U		5	U	
DI-N-BUTYL PHTHALATE	5.2	U		5.2	U		1.5	J	P	5	U	
DI-N-OCTY[illegible] PHTHALATE	5.2	U		5.2	U		5.1	U		5	U	
DIBENZ[illegible]AN	5.2	U		5	U		5.1	U		5	U	

CTO8 . NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	2LGW20S-08			2WGW39DS-08			2WGW40DS-08			2WGW41DS-08		
SAMPLE DATE:	09/21/01			09/22/01			09/23/01			09/23/01		
LABORATORY ID:	N5965-05			N5965-14			N5965-18			N5965-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIETHYL PHTHALATE	5.2	U		5.2	U		5.1	U		5	U	
DIMETHYL PHTHALATE	5.2	U		5.2	U		5.1	U		5	U	
HEXACHLOROBENZENE	5.2	U		5.2	U		5.1	U		5	U	
HEXACHLOROBUTADIENE	5.2	U		5.2	U		5.1	U		5	U	
HEXACHLOROCYCLOPENTADIENE	5.2	U		5.2	U		5.1	U		5	U	
HEXACHLOROETHANE	5.2	U		5.2	U		5.1	U		5	U	
ISOPHORONE	5.2	U		5.2	U		5.1	U		5	U	
N-NITROSO-DI-N-PROPYLAMINE	5.2	U		5.2	U		5.1	U		5	U	
N-NITROSODIPHENYLAMINE	5.2	U		5.2	U		5.1	U		5	U	
NITROBENZENE	5.2	U		5.2	U		5.1	U		5	U	
PENTACHLOROPHENOL	21	U		21	U		20	U		20	U	
PHENOL	5.2	U		5.2	U		5.1	U		5	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	3GW37S-08			DRMO-6MW10D-GW13			DRMO-6MW10S-GW13			DRMO-6MW11D-GW13		
SAMPLE DATE:	09/22/01			09/21/01			09/21/01			09/22/01		
LABORATORY ID:	N5965-12			N5965-03			N5965-02			N5965-24		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
2,2'-OXYBIS(1-CHLOROPROPANE)	5.2	U		5.1	U		5	U		5	U	
2,4,5-TRICHLOROPHENOL	5.2	U		5.1	U		5	U		5	U	
2,4,6-TRICHLOROPHENOL	21	U		20	U		20	U		20	U	
2,4-DICHLOROPHENOL	5.2	U		5.1	U		5	U		5	U	
2,4-DIMETHYLPHENOL	5.2	U		5.1	U		5	U		5	U	
2,4-DINITROPHENOL	21	U		20	U		20	U		20	U	
2,4-DINITROTOLUENE	5.2	U		5.1	U		5	U		5	U	
2,6-DINITROTOLUENE	5.2	U		5.1	U		5	U		5	U	
2-CHLORONAPHTHALENE	5.2	U		5.1	U		5	U		5	U	
2-CHLOROPHENOL	5.2	U		5.1	U		5	U		5	U	
2-METHYLPHENOL	5.2	U		5.1	U		5	U		5	U	
2-NITROANILINE	21	U		20	U		20	U		20	U	
2-NITROPHENOL	5.2	U		5.1	U		5	U		5	U	
3&4-METHYLPHENOL	5.2	U		5.1	U		5	U		5	U	
3,3'-DICHLOROBENZIDINE	5.2	U		5.1	U		5	U		5	U	
3-NITROANILINE	21	U		20	U		20	U		20	U	
4,6-DINITRO-2-METHYLPHENOL	21	U		20	U		20	U		20	U	
4-BROMOPHENYL PHENYL ETHER	5.2	U		5.1	U		5	U		5	U	
4-CHLORO-3-METHYLPHENOL	5.2	U		5.1	U		5	U		5	U	
4-CHLOROANILINE	5.2	U		5.1	U		5	U		5	U	
4-CHLOROPHENYL PHENYL ETHER	5.2	U		5.1	U		5	U		5	U	
4-NITROANILINE	21	U		20	U		20	U		20	U	
4-NITROPHENOL	21	U		20	U		20	U		20	U	
BENZOIC ACID	5.2	U		5.1	U		5	U		5	U	
BIS(2-CHLOROETHOXY)METHANE	5.2	U		5.1	U		5	U		5	U	
BIS(2-CHLOROETHYL)ETHER	5.2	U		5.1	UJ	C	5	UJ	C	5	UJ	C
BIS(2-ETHYLHEXYL)PHTHALATE	5.2	U		45			2.9	J	P	76		
BUTYL BENZYL PHTHALATE	5.2	U		5.1	U		5	U		5	U	
CARBAZOLE	5.2	U		5.1	U		5	U		5	U	
DI-N-BUTYL PHTHALATE	5.2	U		5.1	U		5	U		5	U	
DI-N-OCTYL PHTHALATE	5.2	U		5.1	U		5	U		5	U	
DIBENZ AN	5.2	U		5	U		5	U		5	U	

CTO8 . .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	3GW37S-08			DRMO-6MW10D-GW13			DRMO-6MW10S-GW13			DRMO-6MW11D-GW13		
SAMPLE DATE:	09/22/01			09/21/01			09/21/01			09/22/01		
LABORATORY ID:	N5965-12			N5965-03			N5965-02			N5965-24		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIETHYL PHTHALATE	5.2	U		5.1	U		5	U		5	U	
DIMETHYL PHTHALATE	5.2	U		5.1	U		5	U		5	U	
HEXACHLOROBENZENE	5.2	U		5.1	U		5	U		5	U	
HEXACHLOROBUTADIENE	5.2	U		5.1	U		5	U		5	U	
HEXACHLOROCYCLOPENTADIENE	5.2	U		5.1	U		5	U		5	U	
HEXACHLOROETHANE	5.2	U		5.1	U		5	U		5	U	
ISOPHORONE	5.2	U		5.1	U		5	U		5	U	
N-NITROSO-DI-N-PROPYLAMINE	5.2	U		5.1	U		5	U		5	U	
N-NITROSODIPHENYLAMINE	5.2	U		5.1	U		5	U		5	U	
NITROBENZENE	5.2	U		5.1	U		5	U		5	U	
PENTACHLOROPHENOL	21	U		20	U		20	U		20	U	
PHENOL	5.2	U		5.1	U		5	U		5	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	DRMO-6MW11S-GW13			DRMO-6MW2D-GW13			DRMO-6MW2S-GW13					
SAMPLE DATE:	09/22/01			09/23/01			09/23/01			/ /		
LABORATORY ID:	N5965-23			N5965-25			N5965-26					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
2,2'-OXYBIS(1-CHLOROPROPANE)	5	U		5	U		5.1	U				
2,4,5-TRICHLOROPHENOL	5	U		5	U		5.1	U				
2,4,6-TRICHLOROPHENOL	20	U		20	U		20	U				
2,4-DICHLOROPHENOL	5	U		5	U		5.1	U				
2,4-DIMETHYLPHENOL	5	U		5	U		5.1	U				
2,4-DINITROPHENOL	20	U		20	U		20	U				
2,4-DINITROTOLUENE	5	U		5	U		5.1	U				
2,6-DINITROTOLUENE	5	U		5	U		5.1	U				
2-CHLORONAPHTHALENE	5	U		5	U		5.1	U				
2-CHLOROPHENOL	5	U		5	U		5.1	U				
2-METHYLPHENOL	5	U		5	U		5.1	U				
2-NITROANILINE	20	U		20	U		20	U				
2-NITROPHENOL	5	U		5	U		5.1	U				
3&4-METHYLPHENOL	5	U		5	U		5.1	U				
3,3'-DICHLOROBENZIDINE	5	U		5	U		5.1	U				
3-NITROANILINE	20	U		20	U		20	U				
4,6-DINITRO-2-METHYLPHENOL	20	U		20	U		20	U				
4-BROMOPHENYL PHENYL ETHER	5	U		5	U		5.1	U				
4-CHLORO-3-METHYLPHENOL	5	U		5	U		5.1	U				
4-CHLOROANILINE	5	U		5	U		5.1	U				
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U		5.1	U				
4-NITROANILINE	20	U		20	U		20	U				
4-NITROPHENOL	20	U		20	U		20	U				
BENZOIC ACID	5	U		5	U		5.1	U				
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U		5.1	U				
BIS(2-CHLOROETHYL)ETHER	5	U		5	UJ	C	5.1	U				
BIS(2-ETHYLHEXYL)PHTHALATE	66			53			21					
BUTYL BENZYL PHTHALATE	5	U		5	U		5.1	U				
CARBAZOLE	5	U		5	U		5.1	U				
DI-N-BUTYL PHTHALATE	5	U		5	U		5.1	U				
DI-N-OCTYL PHTHALATE	5	U		5	U		5.1	U				
DIBENZ AN	5	U		5	U		5.1	U				

CTO8 . .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	DRMO-6MW11S-GW13	DRMO-6MW2D-GW13	DRMO-6MW2S-GW13	
SAMPLE DATE:	09/22/01	09/23/01	09/23/01	/ /
LABORATORY ID:	N5965-23	N5965-25	N5965-26	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIETHYL PHTHALATE	5	U		5	U		5.1	U				
DIMETHYL PHTHALATE	5	U		5	U		5.1	U				
HEXACHLOROBENZENE	5	U		5	U		5.1	U				
HEXACHLOROBUTADIENE	5	U		5	U		5.1	U				
HEXACHLOROCYCLOPENTADIENE	5	U		5	U		5.1	U				
HEXACHLOROETHANE	5	U		5	U		5.1	U				
ISOPHORONE	5	U		5	U		5.1	U				
N-NITROSO-DI-N-PROPYLAMINE	5	U		5	U		5.1	U				
N-NITROSODIPHENYLAMINE	5	U		5	U		5.1	U				
NITROBENZENE	5	U		5	U		5.1	U				
PENTACHLOROPHENOL	20	U		20	U		20	U				
PHENOL	5	U		5	U		5.1	U				

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	2LGW20S-08			2WGW39DS-08			2WGW40DS-08			2WGW41DS-08		
SAMPLE DATE:	09/21/01			09/22/01			09/23/01			09/23/01		
LABORATORY ID:	N5965-05			N5965-14			N5965-18			N5965-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.020	U		0.020	U		0.020	U		0.020	U	
4,4'-DDE	0.020	U		0.020	U		0.020	U		0.020	U	
4,4'-DDT	0.020	U		0.020	U		0.020	U		0.020	U	
ALDRIN	0.010	U		0.010	U		0.010	UJ	Q	0.010	U	
ALPHA-BHC	0.010	U		0.010	U		0.010	UJ	Q	0.010	U	
ALPHA-CHLORDANE	0.010	U		0.010	U		0.010	U		0.010	U	
AROCLOR-1016	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1221	0.40	UJ	H	0.40	UJ	H	0.40	UJ	H	0.40	UJ	H
AROCLOR-1232	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1242	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1248	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1254	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1260	0.20	UJ	DH	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
BETA-BHC	0.010	U		0.010	U		0.010	UJ	Q	0.010	U	
DELTA-BHC	0.010	U		0.010	U		0.010	UJ	Q	0.010	U	
DIELDRIN	0.020	U		0.020	U		0.020	U		0.020	U	
ENDOSULFAN I	0.010	U		0.010	U		0.010	U		0.010	U	
ENDOSULFAN II	0.020	U		0.020	U		0.020	U		0.020	U	
ENDOSULFAN SULFATE	0.020	U		0.020	U		0.020	U		0.020	U	
ENDRIN	0.020	U		0.020	U		0.020	U		0.020	U	
ENDRIN ALDEHYDE	0.020	U		0.020	U		0.020	U		0.020	U	
ENDRIN KETONE	0.020	U		0.020	U		0.020	U		0.020	U	
GAMMA-BHC (LINDANE)	0.010	U		0.010	U		0.010	UJ	Q	0.010	U	
GAMMA-CHLORDANE	0.010	U		0.010	U		0.010	U		0.010	U	
HEPTACHLOR	0.010	U		0.010	U		0.010	UJ	Q	0.010	U	
HEPTACHLOR EPOXIDE	0.010	U		0.010	U		0.010	U		0.010	U	
METHOXYCHLOR	0.10	U		0.10	U		0.10	U		0.10	U	
TOXAPHENE	1.0	U		1.0	U		1.0	U		1.0	U	

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	3GW37S-08			DRMO-6MW10D-GW13			DRMO-6MW10S-GW13			DRMO-6MW11D-GW13		
SAMPLE DATE:	09/22/01			09/21/01			09/21/01			09/22/01		
LABORATORY ID:	N5965-12			N5965-03			N5965-02			N5965-24		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.020	U		0.020	U		0.020	U		0.020	U	
4,4'-DDE	0.020	U		0.020	U		0.020	U		0.020	U	
4,4'-DDT	0.020	U		0.020	U		0.020	U		0.020	U	
ALDRIN	0.010	U		0.010	U		0.010	U		0.010	U	
ALPHA-BHC	0.010	U		0.010	U		0.010	U		0.010	U	
ALPHA-CHLORDANE	0.010	U		0.010	U		0.010	U		0.010	U	
AROCLOR-1016	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1221	0.40	UJ	H	0.40	UJ	H	0.40	UJ	H	0.40	UJ	H
AROCLOR-1232	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1242	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1248	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1254	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
AROCLOR-1260	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H
BETA-BHC	0.010	U		0.010	U		0.010	U		0.010	U	
DELTA-BHC	0.010	U		0.010	U		0.010	U		0.010	U	
DIELDRIN	0.020	U		0.020	U		0.020	U		0.020	U	
ENDOSULFAN I	0.010	U		0.010	U		0.010	U		0.010	U	
ENDOSULFAN II	0.020	U		0.020	U		0.020	U		0.020	U	
ENDOSULFAN SULFATE	0.020	U		0.020	U		0.020	U		0.020	U	
ENDRIN	0.020	U		0.020	U		0.020	U		0.020	U	
ENDRIN ALDEHYDE	0.020	U		0.020	U		0.020	U		0.020	U	
ENDRIN KETONE	0.020	U		0.020	U		0.020	U		0.020	U	
GAMMA-BHC (LINDANE)	0.010	U		0.010	U		0.010	U		0.010	U	
GAMMA-CHLORDANE	0.010	U		0.010	U		0.010	U		0.010	U	
HEPTACHLOR	0.010	U		0.010	U		0.010	U		0.010	U	
HEPTACHLOR EPOXIDE	0.010	U		0.010	U		0.010	U		0.010	U	
METHOXYCHLOR	0.10	U		0.10	U		0.10	U		0.10	U	
TOXAPHENE	1.0	U		1.0	U		1.0	U		1.0	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	DRMO-6MW11S-GW13			DRMO-6MW2D-GW13			DRMO-6MW2S-GW13					
SAMPLE DATE:	09/22/01			09/23/01			09/23/01			/ /		
LABORATORY ID:	N5965-23			N5965-25			N5965-26					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.020	U		0.020	U		0.020	U				
4,4'-DDE	0.020	U		0.020	U		0.020	U				
4,4'-DDT	0.020	U		0.020	U		0.020	U				
ALDRIN	0.010	U		0.010	U		0.010	U				
ALPHA-BHC	0.010	U		0.010	U		0.010	U				
ALPHA-CHLORDANE	0.010	U		0.010	U		0.010	U				
AROCLOR-1016	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H			
AROCLOR-1221	0.40	UJ	H	0.40	UJ	H	0.40	UJ	H			
AROCLOR-1232	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H			
AROCLOR-1242	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H			
AROCLOR-1248	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H			
AROCLOR-1254	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H			
AROCLOR-1260	0.20	UJ	H	0.20	UJ	H	0.20	UJ	H			
BETA-BHC	0.010	U		0.010	U		0.010	U				
DELTA-BHC	0.010	U		0.010	U		0.010	U				
DIELDRIN	0.020	U		0.020	U		0.020	U				
ENDOSULFAN I	0.010	U		0.010	U		0.010	U				
ENDOSULFAN II	0.020	U		0.020	U		0.020	U				
ENDOSULFAN SULFATE	0.020	U		0.020	U		0.020	U				
ENDRIN	0.020	U		0.020	U		0.020	U				
ENDRIN ALDEHYDE	0.020	U		0.020	U		0.020	U				
ENDRIN KETONE	0.020	U		0.020	U		0.020	U				
GAMMA-BHC (LINDANE)	0.010	U		0.010	U		0.010	U				
GAMMA-CHLORDANE	0.010	U		0.010	U		0.010	U				
HEPTACHLOR	0.010	U		0.010	U		0.010	U				
HEPTACHLOR EPOXIDE	0.010	U		0.010	U		0.010	U				
METHOXYCHLOR	0.10	U		0.10	U		0.10	U				
TOXAPHENE	1.0	U		1.0	U		1.0	U				

CTO8 NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	2LGW20S-08			2WGW39DS-08			2WGW40DS-08			2WGW41DS-08		
SAMPLE DATE:	09/21/01			09/22/01			09/23/01			09/23/01		
LABORATORY ID:	N5965-05			N5965-14			N5965-18			N5965-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U		0.5	U	
2-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U		0.5	U	
ACENAPHTHENE	0.016	UJ	C	0.016	UJ	C	0.016	UJ	C	0.56	J	C
ACENAPHTHYLENE	0.013	U		0.013	U		0.013	U		0.013	U	
ANTHRACENE	0.35			0.03	U		0.03	U		0.07		
BENZO(A)ANTHRACENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C
BENZO(A)PYRENE	0.021	U		0.021	U		0.021	U		0.021	U	
BENZO(B)FLUORANTHENE	0.02	UJ	C	0.02	UJ	C	0.02	UJ	C	0.02	UJ	C
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U		0.009	U		0.009	U	
BENZO(K)FLUORANTHENE	0.02	U		0.02	U		0.02	U		0.02	U	
CHRYSENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C	0.6	J	C
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U		0.014	U		0.014	U	
FLUORANTHENE	0.009	UJ	CD	0.009	UJ	C	0.009	UJ	C	0.06	J	C
FLUORENE	0.007	UJ	C	0.007	UJ	C	0.007	UJ	C	0.007	UJ	C
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U		0.008	U		0.008	U	
NAPHTHALENE	0.008	UR	D	0.008	U		0.008	U		0.008	U	
PHENANTHRENE	0.004	UJ	CD	0.004	UJ	C	0.004	UJ	C	0.004	UJ	C
PYRENE	0.008	UJ	C	0.008	UJ	C	0.008	UJ	C	0.21	J	C

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	3GW37S-08			DRMO-6MW10D-GW13			DRMO-6MW10S-GW13			DRMO-6MW11D-GW13		
SAMPLE DATE:	09/22/01			09/21/01			09/21/01			09/22/01		
LABORATORY ID:	N5965-12			N5965-03			N5965-02			N5965-24		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U		0.5	U	
2-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U		0.5	U	
ACENAPHTHENE	0.016	UJ	C	0.016	UJ	C	0.016	UJ	C	0.016	UJ	C
ACENAPHTHYLENE	0.013	U		0.013	U		0.013	U		0.013	U	
ANTHRACENE	0.03	U		0.03	U		0.03	U		0.03	U	
BENZO(A)ANTHRACENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C
BENZO(A)PYRENE	0.021	U		0.021	U		0.021	U		0.021	U	
BENZO(B)FLUORANTHENE	0.020	UJ	C	0.02	UJ	C	0.02	UJ	C	0.02	UJ	C
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U		0.009	U		0.009	U	
BENZO(K)FLUORANTHENE	0.020	U		0.02	U		0.02	U		0.02	U	
CHRYSENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U		0.014	U		0.014	U	
FLUORANTHENE	0.009	UJ	C	0.009	UJ	C	0.009	UJ	C	0.009	UJ	C
FLUORENE	0.007	UJ	C	0.007	UJ	C	0.007	UJ	C	0.007	UJ	C
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U		0.008	U		0.008	U	
NAPHTHALENE	0.008	U		0.008	U		0.008	U		0.008	U	
PHENANTHRENE	0.004	UJ	C	0.004	UJ	C	0.004	UJ	C	0.004	UJ	C
PYRENE	0.008	UJ	C	0.008	UJ	C	0.008	UJ	C	0.008	UJ	C

CTO8 ISB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5965

SAMPLE NUMBER:	DRMO-6MW11S-GW13	DRMO-6MW2D-GW13	DRMO-6MW2S-GW13	
SAMPLE DATE:	09/22/01	09/23/01	09/23/01	/ /
LABORATORY ID:	N5965-23	N5965-25	N5965-26	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U				
2-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U				
ACENAPHTHENE	0.016	UJ	C	0.016	UJ	C	0.016	UJ	C			
ACENAPHTHYLENE	0.013	U		0.013	U		0.013	U				
ANTHRACENE	0.03	U		0.03	U		0.03	U				
BENZO(A)ANTHRACENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C			
BENZO(A)PYRENE	0.021	U		0.021	U		0.021	U				
BENZO(B)FLUORANTHENE	0.02	UJ	C	0.02	UJ	C	0.02	UJ	C			
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U		0.009	U				
BENZO(K)FLUORANTHENE	0.02	U		0.02	U		0.02	U				
CHRYSENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C			
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U		0.014	U				
FLUORANTHENE	0.009	UJ	C	0.009	UJ	C	0.009	UJ	C			
FLUORENE	0.007	UJ	C	0.007	UJ	C	0.007	UJ	C			
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U		0.008	U				
NAPHTHALENE	0.008	U		0.008	U		0.008	U				
PHENANTHRENE	0.004	UJ	C	0.004	UJ	C	0.004	UJ	C			
PYRENE	0.008	UJ	C	0.008	UJ	C	0.008	UJ	C			

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **COREY RICH** **DATE: NOVEMBER 28, 2001 rev.2/15/02**

FROM: **DOUGLAS SCHLOER** **COPIES: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: VOA / SVOA / PAH / PEST / PCB**
CTO: 816, NSB NEW LONDON
SDG: 5986

SAMPLES: 3 / Aqueous / VOA

TB-092401-01 TB-092401-02 TB-092501-01

1 / Aqueous / VOA / SVOA / PAH

2WGW38DS-08

11 / Aqueous / VOA / SVOA / PAH / PEST / PCB

2WGW44DS-08	2WGW42DS-08	2WGW43DS-08
2WGW45DS-08	3MSP01-08	DRMO-6MW1S-GW13
DRMO-6MW9S-GW13	SWSG18-08	SWSG19-08
SWSG20-08	SWSG21-08	

Overview

The sample set for the CTO 816, NSB New London, SDG 5986 consists of twelve (12) groundwater environmental samples and three (3) aqueous field quality control samples. The aqueous field quality control samples were analyzed for TCL volatile organic compounds (VOC) only. All environmental samples were analyzed for volatile, semivolatile (SVOC), polynuclear aromatic hydrocarbons (PAHs), pesticides (PEST), and polychlorinated biphenyl (PCB) organic compounds. No field duplicate pairs were included in this SDG.

The samples were collected by TetraTech NUS on September 24th and 25th, 2001 and were analyzed by Chemtech Analytical Services. Analyses were conducted using the Contract Laboratory Program (CLP) Statement of Work (SOW) OLC02.1, and the U.S. EPA Test Methods for Evaluating Solid Wastes (SW-846) Methods 8270B, 8310 and 8082 analytical and reporting protocols.

The data were evaluated based on the following parameters:

- Data Completeness
- * Holding Times
- * GC/MS Tuning
- Calibration
- Blanks
- * Surrogate Spike Recoveries
- * Blank Spike Recoveries
- * Matrix Spike/Matrix Spike Duplicate Recoveries
- * Internal Standards Performance
- * Instrument Performance
- * Compound Identification
- Compound Quantitation
- Tentatively Identified Compounds (TICs).

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the documentation to support the findings as discussed in this data validation report. The attached Table I summarizes the validation qualifications which were based on the following information:

CALIBRATIONS

The following tables (by analytical fraction) summarize calibration non-compliances and corresponding actions:

Compound	IC 10/7/01	CC 10/7/01;20:19
Acetone	RD	R
2-Butanone	RD	R
2-Hexanone	RD	R
1,2-dibromoethane	D	RX
1,2-Dibromo-3-chloropropane	R	RX
Vinyl chloride		X
1,2-Dichloroethane		X

Associated Samples:	All	2WGW45DS-08
		2WGW43DS-08
		2WGW28DS-08
		SWSG20-08
		SWSG21-08
		SWSG19-08
		SWSG18-08
		2WGW42DS-08

Compound	CC 10/12/01;13:07	CC 10/3/01;00:16
2,2'-oxybis(1-chloropropane)		
N-nitroso-di-n-propylamine		
4-chloroaniline		
2-nitroaniline		
3-nitroaniline		
4-nitrophenol		
4-nitroaniline		
Carbazole		
3,3'-dichlorobenzidine		
2,4-dinitrophenol		
Hexachlorocyclopentadiene		

Associated Samples:

DRMO-6MW1S-GW13
2WGW45DS-08
3MSP01-08
2WGW38DS-08
DRMO-6MW9S-GW13
SWSG19-08
2WG44DS-08
2WGW43DS-08
2WGW42DS-08
SWSG20-08
SWSG18-08
SWSG21-08

Compound	CC 10/14/01;15:42	CC 10/15/01;07:07	CC 10/15/01;14:14
Fluoranthene	X		
Benzo(a)anthracene	X	X	X
2-Methylnaphthalene	X	X	X
Chrysene			X
Associated Samples:	2WG44DS-08 2WGW38DS-08 2WGW42DS-08 2WGW43DS-08 2WGW45DS-08 DRMO-6MW1S-GW13 DRMO-6MW9S-GW13 SWSG19-08	All	3MSP01-08 SWSG18-08 SWSG20-08 SWSG21-08

Calibration Actions:

D - Percent Relative Standard Deviation (%RSD) > 30%, Estimate positive and nondetected results (J) and (UJ), respectively.

X - Percent Difference (%D) > 25%; Estimate positive and nondetected results (J) and (UJ), respectively.

R - Relative Response Factors (RRF) < 0.05; Reject nondetected results (UR) and estimate positive results (J).

BLANKS

The following compounds were detected in the trip blanks as indicated below:

Compound	Maximum Concentration	Action Level
Methylene chloride	1 µg/L	10 µg/L

Samples Affected: All
Blank Actions:

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < action level; report value followed by a U.
- Value > CRQL and > action level; report value unqualified.

An action level of 10X the blank concentration was used to evaluate contamination for methylene chloride. Dilution factors and sample aliquots were taken into consideration prior to the application of all action levels. Field quality control blanks were not qualified due to method blank contamination or contamination in other field quality control blanks.

SURROGATE RECOVERY

Recovery of the semivolatile acid fraction surrogate 2-fluorophenol fell below the 21%-100% quality control limit for the analysis of samples DRMO-6MW1S-GW13 and 3MSP01-08. No action was taken based on this noncompliance.

Recovery of the semivolatile acid fraction surrogate 2,4,6-tribromophenol exceeded the 10%-123% quality control limit for the analysis of sample 2WGW42DS-08. No action was taken based on this noncompliance.

Recovery of the semivolatile base/neutral fraction surrogate 2-fluorobiphenyl fell below the 43%-126% quality control limit for the analysis of sample 2WGW43DS-08. No action was taken based on this noncompliance.

Recovery of the pesticide surrogate tetrachloro-m-xylene (TCX) exceeded the 60%-150% quality control limit on both analytical columns for the analysis of samples 2WGW44DS-08 and 2WGW42DS-08. In addition, review of sample chromatography shows evidence of significant matrix interference. In the professional judgement of the reviewer, this interference resulted in the noncompliant surrogate recoveries. Therefore, nondetected results for all pesticides were qualified as estimated (UJ) in samples 2WGW44DS-08 and 2WGW42DS-08.

Recovery of the pesticide surrogate TCX exceeded the 60%-150% quality control limit one analytical column (RTX-1701) for the analysis of sample 2WGW43DS-08. Surrogate recovery was compliant on the other analytical column (RTX-50). No action was taken based on this noncompliance.

COMPOUND QUANTITATION

Poor chromatography was observed for the pesticide analysis of samples 2WGW44DS-08 and 2WGW43DS-08. Review of sample chromatography shows evidence of sample matrix interference on both analytical columns, resulting in retention time shifting for TCX on the RTX-1701 analytical column. TCX retention times did not shift on the RTX-50 analytical column. It should also be noted that there were surrogate recovery noncompliances for the analysis of these samples. The laboratory did not re-analyze the sample to confirm sample matrix interference. Therefore, nondetected results for all pesticide compounds were qualified as estimated (UJ) due to chromatographic interference.

TENTATIVELY INDENTIFIED COMPOUNDS

Chlorofluoro methane, sulfur dioxide and several unknown compounds were tentatively identified in the volatile fraction samples.

Numerous TICs were identified in the semivolatile fraction of all samples (see Table 2).

ADDITIONAL COMMENTS

Positive results reported at concentrations below the CRQL were qualified as estimated, (J).

The text of this report has been formulated to address only those problem areas affecting data quality.

The compound 1,2,4-trichlorobenzene was reported in the volatile and semivolatile fractions of this SDG. However, as per the Statement Of Work (SOW), 1,2,4-trichlorobenzene was requested to be reported in the semivolatile fraction of this SDG. The reviewer removed this compound from the volatile fraction database since it was not part of the volatile target compound list.

Nondetected results for the PAH and pesticide fractions were reported by the laboratory at the method detection limit "MDL". However, after correspondence with laboratory chemists at Chemtech Inc., it was determined that the value reported on the sample Form Is is actually the sample reporting limit (RL). The reviewer requested that the laboratory resubmit corrected sample Form Is.

The laboratory incorrectly identified sample DRMO-6MW1S-GW13 as DRMO-6MW9S-GW13. The reviewer corrected the Form I to reflect the correct sample identification.

Results for sample 2WGW42DS-08 were not reported on a Form I in the hardcopy data package deliverable. The reviewer contacted the laboratory and requested a Form I for the aforementioned sample.

OVERALL ASSESSMENT

Laboratory Performance: Initial and continuing calibration of several volatile, semivolatile and PAH compounds failed to meet quality control criteria, resulting in the qualification of analytical data. Transcription errors were observed for sample identifications on Form Is and reporting limits for several semivolatile compounds. Data completeness issues were noted.

Other Factors Affecting Data Quality: Poor chromatography was observed for the pesticide analysis of several samples, resulting in the qualification of analytical data.

The data for these analyses were reviewed with reference to the Region I EPA "Data Validation Functional Guidelines - Part II" (12/96).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

TetraTech NUS

Douglas S. Schloer
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Regional Worksheets
4. Appendix D - Support Documentation

NEW LONDON NSB

SDG 5986

TABLE I. Summary of Tentatively Identified Volatile Compounds

TIC	2WG44DS-08	SWSG20-08	2WGW38DS-08	2WGW42DS-08	2WGW43DS-08	2WGW45DS-08
Unknown	X					
Sulfur dioxide	X	X	X	X	X	X

	SWSG18-08	SWGW19-08	SWSG21-08
Unknown		X	
Sulfur dioxide			X
Methane, chlorofluoro	X	X	X

NEW LONDON NSB

SDG 5986

TABLE II. Summary of Tentatively Identified Semivolatile Compounds

TIC	2WG44DS-08	2WGW38DS-08	2WGW42DS-08	2WGW43DS-08	2WGW45DS-08	3MSP01-08	DRMO-6MW1S-GW13
1,2,4-Trithiolane	X		X	X			
1,2,4,5-tetrathiane	X		X				
Lenthionine	X						
Unknown	X	X	X	X	X	X	X
Sulfur,mol(S8)	X		X	X			
Hexthiepane	X						
Sulfur	X		X				
ACP					X		x
Phenol,4-(1,1,3,3-tetrameth		X			X	X	X
Cyclododecanemethanol		X					
Tetradecanoic acid		X		X	X	X	
Heptadecanoic acid		X					
9-Octadenamide,(Z)-		X					
.Carotene,7,7',8		X			X	X	
3-Tetradecanol		X				X	
Lenthionine			X	X			
Cyclopentadecanone,2-hydrox					X	X	
14-Pentadecanoic acid					X		
Hexadecanamide					X		
Dodecanamide						X	
Tetradecane							X
4-Nonylphenol							X
Glycine,N-methyl-n-(1-oxodo							X
1,2-Benzenedicarboxylic acid							X
3-Eicosane							X
9-Octadedenamide							X

TIC	SWSG18-08	SWSG19-08	SWSG20-08	SWSG21-08	DRMO-6MW9S-GW13
Phosphonic acid,dioctadecyl				X	
Pentadecanoic acid				X	
Lenthionine					
Unknown	X	X	X		
Sulfur,mol(S8)					
Hexthiepane					
Sulfur					
ACP	X	X	X	X	X
Phenol,4-(1,1,3,3-tetrameth					
Cyclododecanemethanol					
Tetradecanoic acid	X	X	X		X
Heptadecanoic acid		X	X		
9-Octadenamide,(Z)-		X			X
Carotene,7,7',8					
3-Tetradecanol					
Lenthionine					
Cyclopentadecanone,2-hydrox	X				
14-Pentadecanoic acid			X		
Hexadecanamide					
Dodecanamide					
Tetradecane					
4-Nonylphenol					
Glycine,N-methyl-n-(1-oxodo					
1,2-Benzenedicarboxylic acid					
3-Eicosane					
1-Octadecanol					X
Ethane,1,1,2,2-tetrachloro	X	X	X		
Benzaldehyde	X	X			
Methane,dibromodichloro	X				
Hexadecanoic acid,bis(2-ethy	X				
Methyl(Z)-5,11,14,17-eicosa		X		X	
10-Methylnonadecane			X		
9-Octadedenamide	X				

APPENDIX A

QUALIFIED LABORATORY RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
N01 = Internal Standard Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW38DS-08			2WGW42DS-08			2WGW43DS-08			2WGW44DS-08		
SAMPLE DATE:	09/25/01			09/24/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-14			N5986-08			N5986-06			N5986-02		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C	1	UR	C
1,2-DIBROMOETHANE	1	UJ	C	1	UJ	C	1	UJ	C	1	UJ	C
1,2-DICHLOROBENZENE	1	UJ	C	1	UJ	C	1	UJ	C	1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
4-METHYL-2-PENTANONE	5	U		5	U		5	U		5	U	
ACETONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	U		3.5			1.7			6.3		
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLBENZENE	1	U		1	U		1	U		1	U	

CTO8 . .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW38DS-08			2WGW42DS-08			2WGW43DS-08			2WGW44DS-08		
SAMPLE DATE:	09/25/01			09/24/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-14			N5986-08			N5986-06			N5986-02		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U		2	U		2	U		2	U	
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	U		1	U		1	U		1	U	
VINYL CHLORIDE	1	UJ	C	1	UJ	C	1	UJ	C	1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW45DS-08			3MSP01-08			DRMO-6MW1S-GW13			DRMO-6MW9S-GW13		
SAMPLE DATE:	09/24/01			09/25/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-04			N5986-24			N5986-12			N5986-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C	1	UR	C
1,2-DIBROMOETHANE	1	UJ	C	1	UJ	C	1	UJ	C	1	UJ	C
1,2-DICHLOROBENZENE	1	UJ	C	1	U		1	U		1	U	
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
4-METHYL-2-PENTANONE	5	U		5	U		5	U		5	U	
ACETONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	2.6			1	U		1	U		1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLB[illegible]NE	1	U		1	U		1	U		1	U	

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW45DS-08			3MSP01-08			DRMO-6MW1S-GW13			DRMO-6MW9S-GW13		
SAMPLE DATE:	09/24/01			09/25/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-04			N5986-24			N5986-12			N5986-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U		2	U		2	U		2	U	
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1	U		1	U		1	U		1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	U		1	U		1	U		1	U	
VINYL CHLORIDE	1	UJ	C	1	U		1	U		1	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	SWSG18-08			SWSG19-08			SWSG20-08			SWSG21-08		
SAMPLE DATE:	09/25/01			09/25/01			09/25/01			09/25/01		
LABORATORY ID:	N5986-22			N5986-16			N5986-18			N5986-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U		1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,1-DICHLOROETHENE	1	U		1	U		1	U		1	U	
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C	1	UR	C
1,2-DIBROMOETHANE	1	UJ	C	1	UJ	C	1	UJ	C	1	UJ	C
1,2-DICHLOROBENZENE	1	UJ	C	1	UJ	C	1	UJ	C	1	UJ	C
1,2-DICHLOROETHANE	1	U		1	U		1	U		1	U	
1,2-DICHLOROPROPANE	1	U		1	U		1	U		1	U	
1,3-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
1,4-DICHLOROBENZENE	1	U		1	U		1	U		1	U	
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
4-METHYL-2-PENTANONE	5	U		5	U		5	U		5	U	
ACETONE	5	UR	C	5	UR	C	5	UR	C	5	UR	C
BENZENE	1	U		1	U		1	U		1	U	
BROMOCHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMODICHLOROMETHANE	1	U		1	U		1	U		1	U	
BROMOFORM	1	U		1	U		1	U		1	U	
BROMOMETHANE	1	U		1	U		1	U		1	U	
CARBON DISULFIDE	1	U		1	U		1	U		1	U	
CARBON TETRACHLORIDE	1	U		1	U		1	U		1	U	
CHLOROBENZENE	1	U		1	U		1	U		1	U	
CHLORODIBROMOMETHANE	1	U		1	U		1	U		1	U	
CHLOROETHANE	1	U		1	U		1	U		1	U	
CHLOROFORM	1	U		1	U		1	U		1	U	
CHLOROMETHANE	1	U		1	U		1	U		1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
ETHYLBI NE	1	U		1	U		1	U		1	U	

CTO8 NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	SWSG18-08			SWSG19-08			SWSG20-08			SWSG21-08		
SAMPLE DATE:	09/25/01			09/25/01			09/25/01			09/25/01		
LABORATORY ID:	N5986-22			N5986-16			N5986-18			N5986-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYLENE CHLORIDE	2	U		2	U		2	U		2	U	
O-XYLENE	1	U		1	U		1	U		1	U	
STYRENE	1	U		1	U		1	U		1	U	
TETRACHLOROETHENE	1	U		1	U		1	U		1	U	
TOLUENE	1.3			0.9	J	P	0.9	J	P	0.7	J	P
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U		1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U		1	U	
TRICHLOROETHENE	1	U		1	U		1	U		1	U	
VINYL CHLORIDE	1	UJ	C	1	UJ	C	1	UJ	C	1	UJ	C

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	TB-092401-01			TB-092401-02			TB-092501-01			/ /		
SAMPLE DATE:	09/24/01			09/24/01			09/25/01					
LABORATORY ID:	N5986-10			N5986-01			N5986-13					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U		1	U				
1,1,2,2-TETRACHLOROETHANE	1	U		1	U		1	U				
1,1,2-TRICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHANE	1	U		1	U		1	U				
1,1-DICHLOROETHENE	1	U		1	U		1	U				
1,2,4-TRICHLOROBENZENE	1	U		1	U		1	U				
1,2-DIBROMO-3-CHLOROPROPANE	1	UR	C	1	UR	C	1	UR	C			
1,2-DIBROMOETHANE	1	UJ	C	1	UJ	C	1	UJ	C			
1,2-DICHLOROBENZENE	1	U		1	U		1	U				
1,2-DICHLOROETHANE	1	U		1	U		1	U				
1,2-DICHLOROPROPANE	1	U		1	U		1	U				
1,3-DICHLOROBENZENE	1	U		1	U		1	U				
1,4-DICHLOROBENZENE	1	U		1	U		1	U				
2-BUTANONE	5	UR	C	5	UR	C	5	UR	C			
2-HEXANONE	5	UR	C	5	UR	C	5	UR	C			
4-METHYL-2-PENTANONE	5	U		5	U		5	U				
ACETONE	5	UR	C	5	UR	C	5	UR	C			
BENZENE	1	U		1	U		1	U				
BROMOCHLOROMETHANE	1	U		1	U		1	U				
BROMODICHLOROMETHANE	1	U		1	U		1	U				
BROMOFORM	1	U		1	U		1	U				
BROMOMETHANE	1	U		1	U		1	U				
CARBON DISULFIDE	1	U		1	U		1	U				
CARBON TETRACHLORIDE	1	U		1	U		1	U				
CHLOROBENZENE	1	U		1	U		1	U				
CHLORODIBROMOMETHANE	1	U		1	U		1	U				
CHLOROETHANE	1	U		1	U		1	U				
CHLOROFORM	1	U		1	U		1	U				
CHLOROMETHANE	1	U		1	U		1	U				
CIS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
CIS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
ETHYLB[illegible]NE	1	U		1	U		1	U				

CTO8 NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	TB-092401-01	TB-092401-02	TB-092501-01	
SAMPLE DATE:	09/24/01	09/24/01	09/25/01	/ /
LABORATORY ID:	N5986-10	N5986-01	N5986-13	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
M+P-XYLENES	1	U		1	U		1	U				
METHYLENE CHLORIDE	0.9	J	P	2	U		1	J	P			
O-XYLENE	1	U		1	U		1	U				
STYRENE	1	U		1	U		1	U				
TETRACHLOROETHENE	1	U		1	U		1	U				
TOLUENE	1	U		1	U		1	U				
TRANS-1,2-DICHLOROETHENE	1	U		1	U		1	U				
TRANS-1,3-DICHLOROPROPENE	1	U		1	U		1	U				
TRICHLOROETHENE	1	U		1	U		1	U				
VINYL CHLORIDE	1	U		1	U		1	U				

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW38DS-08			2WGW42DS-08			2WGW43DS-08			2WGW44DS-08		
SAMPLE DATE:	09/25/01			09/24/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-14			N5986-08			N5986-06			N5986-02		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
2,4,5-TRICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4,6-TRICHLOROPHENOL	20	U		20	U		20	U		20	U	
2,4-DICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4-DIMETHYLPHENOL	5	U		5	U		5	U		5	U	
2,4-DINITROPHENOL	20	U		20	UJ	C	20	U		20	UJ	C
2,4-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2,6-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2-CHLORONAPHTHALENE	5	U		5	U		5	U		5	U	
2-CHLOROPHENOL	5	U		5	U		5	U		5	U	
2-METHYLPHENOL	5	U		5	U		5	U		5	U	
2-NITROANILINE	20	UJ	C	20	UJ	C	20	UJ	C	20	UJ	C
2-NITROPHENOL	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
3&4-METHYLPHENOL	5	U		5	U		5	U		5	U	
3,3'-DICHLOROBENZIDINE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
3-NITROANILINE	20	UJ	C	20	UJ	C	20	UJ	C	20	UJ	C
4,6-DINITRO-2-METHYLPHENOL	20	U		20	U		20	U		20	U	
4-BROMOPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-CHLORO-3-METHYLPHENOL	5	U		5	U		5	U		5	U	
4-CHLOROANILINE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-NITROANILINE	20	UJ	C	20	UJ	C	20	UJ	C	20	UJ	C
4-NITROPHENOL	20	U		20	U		20	U		20	U	
BENZOIC ACID	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHYL)ETHER	5	U		5	U		5	U		5	U	
BIS(2-ETHYLHEXYL)PHTHALATE	6.9			27			40			1.2	J	P
BUTYL BENZYL PHTHALATE	5	U		5	U		5	U		5	U	
CARBAZOLE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
DI-N-BUTYL PHTHALATE	5	U		5	U		5	U		5	U	
DI-N-OCTYL PHTHALATE	5	U		5	U		5	U		5	U	
DIBENZC AN	5	U		5	U		5	U		5	U	

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW38DS-08			2WGW42DS-08			2WGW43DS-08			2WGW44DS-08		
SAMPLE DATE:	09/25/01			09/24/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-14			N5986-08			N5986-06			N5986-02		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIETHYL PHTHALATE	5	U		5	U		5	U		5	U	
DIMETHYL PHTHALATE	5	U		5	U		5	U		5	U	
HEXACHLOROBENZENE	5	U		5	U		5	U		5	U	
HEXACHLOROBUTADIENE	5	U		5	U		5	U		5	U	
HEXACHLOROCYCLOPENTADIENE	5	U		5	UJ	C	5	U		5	U	
HEXACHLOROETHANE	5	U		5	U		5	U		5	U	
ISOPHORONE	5	U		5	U		5	U		5	U	
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
N-NITROSODIPHENYLAMINE	5	U		5	U		5	U		5	U	
NITROBENZENE	5	U		5	U		5	U		5	U	
PENTACHLOROPHENOL	20	U		20	U		20	U		20	U	
PHENOL	5	U		5	U		5	U		5	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW45DS-08			3MSP01-08			DRMO-6MW1S-GW13			DRMO-6MW9S-GW13		
SAMPLE DATE:	09/24/01			09/25/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-04			N5986-24			N5986-12			N5986-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
2,4,5-TRICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4,6-TRICHLOROPHENOL	20	U		20	U		20	U		20	U	
2,4-DICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4-DIMETHYLPHENOL	5	U		5	U		5	U		5	U	
2,4-DINITROPHENOL	20	U		20	U		20	U		20	U	
2,4-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2,6-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2-CHLORONAPHTHALENE	5	U		5	U		5	U		5	U	
2-CHLOROPHENOL	5	U		5	U		5	U		5	U	
2-METHYLPHENOL	5	U		5	U		5	U		5	U	
2-NITROANILINE	20	UJ	C	20	UJ	C	20	UJ	C	20	UJ	C
2-NITROPHENOL	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
3&4-METHYLPHENOL	5	U		5	U		5	U		5	U	
3,3'-DICHLOROBENZIDINE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
3-NITROANILINE	20	UJ	C	20	UJ	C	20	UJ	C	20	UJ	C
4,6-DINITRO-2-METHYLPHENOL	20	U		20	U		20	U		20	U	
4-BROMOPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-CHLORO-3-METHYLPHENOL	5	U		5	U		5	U		5	U	
4-CHLOROANILINE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-NITROANILINE	20	UJ	C	20	UJ	C	20	UJ	C	20	UJ	C
4-NITROPHENOL	20	U		20	U		20	U		20	U	
BENZOIC ACID	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHYL)ETHER	5	U		5	U		5	U		5	U	
BIS(2-ETHYLHEXYL)PHTHALATE	1.1	J	P	5.4			130			1.3	J	P
BUTYL BENZYL PHTHALATE	5	U		5	U		5	U		5	U	
CARBAZOLE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
DI-N-BUTYL PHTHALATE	5	U		5	U		5	U		5	U	
DI-N-OCT[illegible] PHTHALATE	5	U		5	U		5	U		5	U	
DIBENZ[illegible]AN	5	U		5	U		5	U		5	U	

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW45DS-08	3MSP01-08	DRMO-6MW1S-GW13	DRMO-6MW9S-GW13
SAMPLE DATE:	09/24/01	09/25/01	09/24/01	09/24/01
LABORATORY ID:	N5986-04	N5986-24	N5986-12	N5986-11
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIETHYL PHTHALATE	5	U		5	U		5	U		5	U	
DIMETHYL PHTHALATE	5	U		5	U		5	U		5	U	
HEXACHLOROBENZENE	5	U		5	U		5	U		5	U	
HEXACHLOROBUTADIENE	5	U		5	U		5	U		5	U	
HEXACHLOROCYCLOPENTADIENE	5	U		5	U		5	U		5	U	
HEXACHLOROETHANE	5	U		5	U		5	U		5	U	
ISOPHORONE	5	U		5	U		5	U		5	U	
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
N-NITROSODIPHENYLAMINE	5	U		5	U		5	U		5	U	
NITROBENZENE	5	U		5	U		5	U		5	U	
PENTACHLOROPHENOL	20	U		20	U		20	U		20	U	
PHENOL	5	U		5	U		5	U		5	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	SWSG18-08			SWSG19-08			SWSG20-08			SWSG21-08		
SAMPLE DATE:	09/25/01			09/25/01			09/25/01			09/25/01		
LABORATORY ID:	N5986-22			N5986-16			N5986-18			N5986-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
2,2'-OXYBIS(1-CHLOROPROPANE)	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
2,4,5-TRICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4,6-TRICHLOROPHENOL	20	U		20	U		20	U		20	U	
2,4-DICHLOROPHENOL	5	U		5	U		5	U		5	U	
2,4-DIMETHYLPHENOL	5	U		5	U		5	U		5	U	
2,4-DINITROPHENOL	20	UJ	C	20	U		20	UJ	C	20	UJ	C
2,4-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2,6-DINITROTOLUENE	5	U		5	U		5	U		5	U	
2-CHLORONAPHTHALENE	5	U		5	U		5	U		5	U	
2-CHLOROPHENOL	5	U		5	U		5	U		5	U	
2-METHYLPHENOL	5	U		5	U		5	U		5	U	
2-NITROANILINE	20	UJ	C	20	UJ	C	20	UJ	C	20	UJ	C
2-NITROPHENOL	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
3&4-METHYLPHENOL	5	U		5	U		5	U		5	U	
3,3'-DICHLOROBENZIDINE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
3-NITROANILINE	20	UJ	C	20	UJ	C	20	UJ	C	20	UJ	C
4,6-DINITRO-2-METHYLPHENOL	20	U		20	U		20	U		20	U	
4-BROMOPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-CHLORO-3-METHYLPHENOL	5	U		5	U		5	U		5	U	
4-CHLOROANILINE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U		5	U		5	U	
4-NITROANILINE	20	UJ	C	20	UJ	C	20	UJ	C	20	UJ	C
4-NITROPHENOL	20	U		20	U		20	U		20	U	
BENZOIC ACID	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U		5	U		5	U	
BIS(2-CHLOROETHYL)ETHER	5	U		5	U		5	U		5	U	
BIS(2-ETHYLHEXYL)PHTHALATE	5	U		1.3	J	P	5	U		4.1	J	P
BUTYL BENZYL PHTHALATE	5	U		5	U		5	U		5	U	
CARBAZOLE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
DI-N-BUTYL PHTHALATE	5	U		5	U		5	U		5	U	
DI-N-OCTY' PHTHALATE	5	U		5	U		5	U		2.3	J	P
DIBENZ AN	5	U		5	U		5	U		5	U	

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	SWSG18-08			SWSG19-08			SWSG20-08			SWSG21-08		
SAMPLE DATE:	09/25/01			09/25/01			09/25/01			09/25/01		
LABORATORY ID:	N5986-22			N5986-16			N5986-18			N5986-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DIETHYL PHTHALATE	5	U		5	U		5	U		5	U	
DIMETHYL PHTHALATE	5	U		5	U		5	U		5	U	
HEXACHLOROBENZENE	5	U		5	U		5	U		5	U	
HEXACHLOROBUTADIENE	5	U		5	U		5	U		5	U	
HEXACHLOROCYCLOPENTADIENE	5	UJ	C	5	U		5	UJ	C	5	UJ	C
HEXACHLOROETHANE	5	U		5	U		5	U		5	U	
ISOPHORONE	5	U		5	U		5	U		5	U	
N-NITROSO-DI-N-PROPYLAMINE	5	UJ	C	5	UJ	C	5	UJ	C	5	UJ	C
N-NITROSODIPHENYLAMINE	5	U		5	U		5	U		5	U	
NITROBENZENE	5	U		5	U		5	U		5	U	
PENTACHLOROPHENOL	20	U		20	U		20	U		20	U	
PHENOL	5	U		5	U		5	U		5	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW38DS-08			2WGW42DS-08			2WGW43DS-08			2WGW44DS-08		
SAMPLE DATE:	09/25/01			09/24/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-14			N5986-08			N5986-06			N5986-02		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U		0.5	U	
2-METHYLNAPHTHALENE	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
ACENAPHTHENE	0.016	U		0.016	U		0.016	U		0.016	U	
ACENAPHTHYLENE	0.013	U		0.013	U		0.013	U		0.013	U	
ANTHRACENE	0.03	U		0.03	U		0.03	U		0.03	U	
BENZO(A)ANTHRACENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C
BENZO(A)PYRENE	0.021	U		0.021	U		1.2			0.021	U	
BENZO(B)FLUORANTHENE	0.02	U		0.02	U		0.02	U		0.02	U	
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U		0.009	U		0.009	U	
BENZO(K)FLUORANTHENE	0.02	U		0.02	U		0.02	U		0.02	U	
CHRYSENE	0.012	U		0.012	U		0.012	U		0.012	UJ	C
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U		0.014	U		0.014	U	
FLUORANTHENE	0.009	UJ	C	0.009	UJ	C	0.009	UJ	C	0.009	UJ	C
FLUORENE	0.007	U		0.53			0.007	U		0.007	U	
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U		0.008	U		0.008	U	
NAPHTHALENE	0.008	U		0.008	U		0.008	U		0.008	U	
PHENANTHRENE	0.004	U		0.004	U		0.5			0.004	U	
PYRENE	0.18			0.008	U		0.3			0.008	U	

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW45DS-08			3MSP01-08			DRMO-6MW1S-GW13			DRMO-6MW9S-GW13		
SAMPLE DATE:	09/24/01			09/25/01			09/24/01			09/24/01		
LABORATORY ID:	N5986-04			N5986-24			N5986-12			N5986-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U		0.5	U	
2-METHYLNAPHTHALENE	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C
ACENAPHTHENE	0.016	U		0.016	U		0.016	U		0.016	U	
ACENAPHTHYLENE	0.013	U		0.3			0.013	U		0.013	U	
ANTHRACENE	0.03	U		0.03	U		0.03	U		0.03	U	
BENZO(A)ANTHRACENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C
BENZO(A)PYRENE	0.021	U		0.021	U		0.021	U		0.021	U	
BENZO(B)FLUORANTHENE	0.02	U		0.02	U		0.02	U		0.02	U	
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U		0.009	U		0.009	U	
BENZO(K)FLUORANTHENE	0.02	U		0.02	U		0.02	U		0.02	U	
CHRYSENE	0.012	U		0.012	UJ	C	0.012	U		0.012	U	
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U		0.014	U		0.014	U	
FLUORANTHENE	0.009	UJ	C	0.009	U		0.009	UJ	C	0.009	UJ	C
FLUORENE	0.007	U		0.13			0.007	U		0.007	U	
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U		0.008	U		0.008	U	
NAPHTHALENE	0.008	U		0.008	U		0.008	U		0.008	U	
PHENANTHRENE	0.004	U		0.004	U		0.19			0.004	U	
PYRENE	0.008	U		0.008	U		0.55			0.008	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	SWSG18-08			SWSG19-08			SWSG20-08			SWSG21-08		
SAMPLE DATE:	09/25/01			09/25/01			09/25/01			09/25/01		
LABORATORY ID:	N5986-22			N5986-16			N5986-18			N5986-20		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.5	U		0.5	U		0.5	U		0.5	U	
2-METHYLNAPHTHALENE	0.5	UJ	C	0.5	UJ	C	0.5	UJ	C	0.06	J	C
ACENAPHTHENE	0.016	U		0.016	U		0.016	U		0.016	U	
ACENAPHTHYLENE	0.013	U		0.013	U		0.013	U		0.2		
ANTHRACENE	0.03	U		0.03	U		0.03	U		0.03	U	
BENZO(A)ANTHRACENE	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C	0.012	UJ	C
BENZO(A)PYRENE	0.021	U		0.021	U		0.021	U		0.021	U	
BENZO(B)FLUORANTHENE	0.02	U		0.02	U		0.02	U		0.02	U	
BENZO(G,H,I)PERYLENE	0.009	U		0.009	U		0.009	U		0.009	U	
BENZO(K)FLUORANTHENE	0.02	U		0.02	U		0.02	U		0.02	U	
CHRYSENE	0.012	UJ	C	0.012	U		0.012	UJ	C	0.012	UJ	C
DIBENZO(A,H)ANTHRACENE	0.014	U		0.014	U		0.014	U		0.014	U	
FLUORANTHENE	0.009	U		0.009	UJ	C	0.009	U		0.009	U	
FLUORENE	0.007	U		0.25			0.007	U		0.36		
INDENO(1,2,3-CD)PYRENE	0.008	U		0.008	U		0.008	U		0.008	U	
NAPHTHALENE	0.008	U		0.008	U		0.008	U		0.008	U	
PHENANTHRENE	0.004	U		0.004	U		0.004	U		0.004	U	
PYRENE	0.008	U		0.23			0.19			0.008	U	

CTO8 .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	2WGW42DS-08	2WGW43DS-08	2WGW44DS-08	2WGW45DS-08
SAMPLE DATE:	09/24/01	09/24/01	09/24/01	09/24/01
LABORATORY ID:	N5986-08	N5986-06	N5986-02	N5986-04
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.020	UJ	QR	0.020	U		0.020	UJ	QR	0.020	U	
4,4'-DDE	0.020	UJ	QR	0.020	U		0.020	UJ	QR	0.020	U	
4,4'-DDT	0.020	UJ	QR	0.020	U		0.020	UJ	QR	0.020	U	
ALDRIN	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
ALPHA-BHC	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
ALPHA-CHLORDANE	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
AROCLOR-1016	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1221	0.40	U		0.40	U		0.40	U		0.40	U	
AROCLOR-1232	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1242	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1248	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1254	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1260	0.20	U		0.20	U		0.20	U		0.20	U	
BETA-BHC	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
DELTA-BHC	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
DIELDRIN	0.020	UJ	QR	0.020	U		0.020	UJ	QR	0.020	U	
ENDOSULFAN I	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
ENDOSULFAN II	0.020	UJ	QR	0.020	U		0.020	UJ	QR	0.020	U	
ENDOSULFAN SULFATE	0.020	UJ	QR	0.020	U		0.020	UJ	QR	0.020	U	
ENDRIN	0.020	UJ	QR	0.020	U		0.020	UJ	QR	0.020	U	
ENDRIN ALDEHYDE	0.020	UJ	QR	0.020	U		0.020	UJ	QR	0.020	U	
ENDRIN KETONE	0.020	UJ	QR	0.020	U		0.020	UJ	QR	0.020	U	
GAMMA-BHC (LINDANE)	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
GAMMA-CHLORDANE	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
HEPTACHLOR	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
HEPTACHLOR EPOXIDE	0.010	UJ	QR	0.010	U		0.010	UJ	QR	0.010	U	
METHOXYCHLOR	0.10	UJ	QR	0.10	U		0.10	UJ	QR	0.10	U	
TOXAPHENE	1.0	UJ	QR	1.0	U		1.0	UJ	QR	1.0	U	

CTO816-NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	3MSP01-08			DRMO-6MW1S-GW13			DRMO-6MW9S-GW13			SWSG18-08		
SAMPLE DATE:	09/25/01			09/24/01			09/24/01			09/25/01		
LABORATORY ID:	N5986-24			N5986-12			N5986-11			N5986-22		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.020	U		0.020	U		0.020	U		0.020	U	
4,4'-DDE	0.020	U		0.020	U		0.020	U		0.020	U	
4,4'-DDT	0.020	U		0.020	U		0.020	U		0.020	U	
ALDRIN	0.010	U		0.010	U		0.010	U		0.010	U	
ALPHA-BHC	0.010	U		0.010	U		0.010	U		0.010	U	
ALPHA-CHLORDANE	0.010	U		0.010	U		0.010	U		0.010	U	
AROCLOR-1016	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1221	0.40	U		0.40	U		0.40	U		0.40	U	
AROCLOR-1232	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1242	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1248	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1254	0.20	U		0.20	U		0.20	U		0.20	U	
AROCLOR-1260	0.20	U		0.20	U		0.20	U		0.20	U	
BETA-BHC	0.010	U		0.010	U		0.010	U		0.010	U	
DELTA-BHC	0.010	U		0.010	U		0.010	U		0.010	U	
DIELDRIN	0.020	U		0.020	U		0.020	U		0.020	U	
ENDOSULFAN I	0.010	U		0.010	U		0.010	U		0.010	U	
ENDOSULFAN II	0.020	U		0.020	U		0.020	U		0.020	U	
ENDOSULFAN SULFATE	0.020	U		0.020	U		0.020	U		0.020	U	
ENDRIN	0.020	U		0.020	U		0.020	U		0.020	U	
ENDRIN ALDEHYDE	0.020	U		0.020	U		0.020	U		0.020	U	
ENDRIN KETONE	0.020	U		0.020	U		0.020	U		0.020	U	
GAMMA-BHC (LINDANE)	0.010	U		0.010	U		0.010	U		0.010	U	
GAMMA-CHLORDANE	0.010	U		0.010	U		0.010	U		0.010	U	
HEPTACHLOR	0.010	U		0.010	U		0.010	U		0.010	U	
HEPTACHLOR EPOXIDE	0.010	U		0.010	U		0.010	U		0.010	U	
METHOXYCHLOR	0.10	U		0.10	U		0.10	U		0.10	U	
TOXAPHENE	1.0	U		1.0	U		1.0	U		1.0	U	

CTO8 . .NSB NEW LONDON
WATER DATA
CHEMTECH CONSULTING GROUP
SDG: 5986

SAMPLE NUMBER:	SWSG19-08	SWSG20-08	SWSG21-08	
SAMPLE DATE:	09/25/01	09/25/01	09/25/01	/ /
LABORATORY ID:	N5986-16	N5986-18	N5986-20	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.020	U		0.020	U		0.020	U				
4,4'-DDE	0.020	U		0.020	U		0.020	U				
4,4'-DDT	0.020	U		0.020	U		0.020	U				
ALDRIN	0.010	U		0.010	U		0.010	U				
ALPHA-BHC	0.010	U		0.010	U		0.010	U				
ALPHA-CHLORDANE	0.010	U		0.010	U		0.010	U				
AROCLOR-1016	0.20	U		0.20	U		0.20	U				
AROCLOR-1221	0.40	U		0.40	U		0.40	U				
AROCLOR-1232	0.20	U		0.20	U		0.20	U				
AROCLOR-1242	0.20	U		0.20	U		0.20	U				
AROCLOR-1248	0.20	U		0.20	U		0.20	U				
AROCLOR-1254	0.20	U		0.20	U		0.20	U				
AROCLOR-1260	0.20	U		0.20	U		0.20	U				
BETA-BHC	0.010	U		0.010	U		0.010	U				
DELTA-BHC	0.010	U		0.010	U		0.010	U				
DIELDRIN	0.020	U		0.020	U		0.020	U				
ENDOSULFAN I	0.010	U		0.010	U		0.010	U				
ENDOSULFAN II	0.020	U		0.020	U		0.020	U				
ENDOSULFAN SULFATE	0.020	U		0.020	U		0.020	U				
ENDRIN	0.020	U		0.020	U		0.020	U				
ENDRIN ALDEHYDE	0.020	U		0.020	U		0.020	U				
ENDRIN KETONE	0.020	U		0.020	U		0.020	U				
GAMMA-BHC (LINDANE)	0.010	U		0.010	U		0.010	U				
GAMMA-CHLORDANE	0.010	U		0.010	U		0.010	U				
HEPTACHLOR	0.010	U		0.010	U		0.010	U				
HEPTACHLOR EPOXIDE	0.010	U		0.010	U		0.010	U				
METHOXYCHLOR	0.10	U		0.10	U		0.10	U				
TOXAPHENE	1.0	U		1.0	U		1.0	U				

APPENDIX G

SUMMARY OF MONITORING PROGRAM ANALYTICAL DATA
YEARS 1 AND 2

Table	**Description**
Table G-1	Upgradient Monitoring Well Frequency of Detection for Years 1 and 2
Table G-2	Reference Monitoring Well Frequency of Detection for Years 1 and 2
Table G-3	Downgradient Monitoring Wells in Area A Downstream Frequency of Detection for Years 1 and 2
Table G-4	Downgradient Monitoring Wells in Area A Wetland Frequency of Detection for Years 1 and 2
Table G-5	Downgradient Seep Location Frequency of Detection for Years 1 and 2
Table G-6	Downgradient Staff Gauges Frequency of Detection for Years 1 and 2
Table G-7	Downgradient Soil Samples Frequency of Detection for Round 1

Column Name	**Description**
CAS	Chemical Abstract Service Number
Parameter	Chemical or Analyte Name
Detection Frequency	*Detection's/number analyzed, a duplicate pair is counted as one. Rejected values are excluded.*
Minimum Conc	Minimum detection
Minimum Qualifier	Qualifier of minimum detection
Maximum Conc	Maximum detection
Maximum Qualifier	Qualifier of maximum detection
Detection Range	Range of detections
Minimum Non-Detect	Minimum non-detected quantitation limit
Maximum Non-Detect	Maximum non-detected quantitation limit
Range of Non-Detects	Range of non-detected quantitation limits
Sample Containing Maximum Concentration	Name of sample with maximum detection
Location of Maximum Concentration	Name of location with maximum detection
Average of Positive Detects	*Arithmetic Average of positive results*
Average of All Detects	*Arithmetic Average of all results. Uses ½ non-detected quantitation limits for non-detects and excludes rejected values.*

Italicized columns use the average of the duplicate pair. All else use the duplicate pair.

TABLE G-1

SUMMARY OF FREQUENCY OF DETECTION INFORMATION
FOR UPGRADIENT MONITORING WELLS
AREA A LANDFILL, NSB-NLON, GROTON, CT

CAS	PARAMETER	DETECTION FREQUENCY	MINIMUM CONC	MINIMUM QUALIFIER	MAXIMUM CONC	MAXIMUM QUALIFIER	DETECTION RANGE	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	RANGE OF NON-DETECTS	SAMPLE CONTAINING MAXIMUM CONCENTRATION	LOCATION OF MAXIMUM CONCENTRATION	AVERAGE OF POSITIVE DETECTS	AVERAGE OF ALL RESULTS
	Volatile Organics (ug/L)													
75-35-4	1,1-DICHLOROETHENE	1/15	1	J	1	J	1	1	1	1	2LGW20S-03	2LMW20S	1	0.53333
67-66-3	CHLOROFORM	1/15	1		1		1	1	3	1 - 3	4GW01S-02	4MW1S	1	0.6
127-18-4	TETRACHLOROETHENE	1/15	0.11	J	0.11	J	0.11	1	1	1	4GW01S-05	4MW1S	0.11	0.474
79-01-6	TRICHLOROETHENE	1/15	0.9	J	0.9	J	0.9	1	1	1	4GW01S-08-D	4MW1S	0.9	0.52667
	Semivolatile Organics (ug/L)													
120-12-7	ANTHRACENE	3/15	0.13		0.35		0.13 - 0.35	0.2	2.2	0.2 - 2.2	2LGW20S-08	2LMW20S	0.22833	0.42733
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	5/15	0.87	J	15		0.87 - 15	2	10	2 - 10	2LGW20S-08	2LMW20S	5.644	3.368
84-74-2	DI-N-BUTYL PHTHALATE	1/15	1.5	J	1.5	J	1.5	2	10	2 - 10	2L-GW20S-07	2LMW20S	1.5	2.32667
206-44-0	FLUORANTHENE	1/15	0.19	J	0.19	J	0.19	0.009	2.2	0.009 - 2.2	4GW01S-08	4MW1S	0.09725	0.38875
	Pesticides/PCBs (ug/L)													
7421-93-4	ENDRIN ALDEHYDE	1/15	0.016	J	0.016	J	0.016	0.02	0.021	0.02 - 0.021	4GW01S-05	4MW1S	0.016	0.01053
	Inorganics (ug/L)													
7429-90-5	ALUMINUM	2/16	63.1	J	472		63.1 - 472	12.9	196	12.9 - 196	2LGW20S-01	2LMW20S	267.55	66.83906
7440-38-2	ARSENIC	1/16	2.4	J	2.4	J	2.4	2.2	8.9	2.2 - 8.9	4GW01S-05	4MW1S	2.4	1.88438
7440-39-3	BARIUM	16/16	33.7		98.7		33.7 - 98.7	0	0	0	4GW01S-06	4MW1S	55.69063	55.69063
7440-70-2	CALCIUM	16/16	17300		53700		17300 - 53700	0	0	0	2LGW20S-06	2LMW20S	27900	27900
7440-47-3	CHROMIUM	1/16	1.1	J	6.5		1.1 - 6.5	0.51	5	0.51 - 5	4GW01S-08-D	4MW1S	3.8	1.11625
7440-50-8	COPPER	2/16	4.4	J	4.5	J	4.4 - 4.5	0.8	6.1	0.8 - 6.1	4GW01S-08	4MW1S	4.425	1.45594
7439-89-6	IRON	8/16	680		10200		680 - 10200	8.6	105	8.6 - 105	2LGW20S-08	2LMW20S	5033.75	2525.19844
7439-92-1	LEAD	1/16	4.5	J	10.6	J	4.5 - 10.6	1	3	1 - 3	4GW01S-08-D	4MW1S	7.55	1.41875
7439-95-4	MAGNESIUM	16/16	2480		7420		2480 - 7420	0	0	0	2LGW20S-05	2LMW20S	4442.1875	4442.1875
7439-96-5	MANGANESE	14/16	6.7		781		6.7 - 781	3.6	9.8	3.6 - 9.8	2LGW20S-05	2LMW20S	314.79286	275.9125
7439-97-6	MERCURY	3/16	0.21	J	0.27	J	0.21 - 0.27	0.08	0.2	0.08 - 0.2	2LGW20S-01	2LMW20S	0.18833	0.08313
7440-02-0	NICKEL	3/16	3	J	9.2		3 - 9.2	1.4	10	1.4 - 10	2LGW20S-05	2LMW20S	6.39167	3.26719
7440-09-7	POTASSIUM	15/16	2300		6330	J	2300 - 6330	4040	4220	4040 - 4220	2L-GW20S-07	2LMW20S	4007	3885.625
7440-23-5	SODIUM	16/16	21000		79900		21000 - 79900	0	0	0	2LGW20S-01	2LMW20S	44450	44450
7440-28-0	THALLIUM	1/16	7	J	7	J	7	2	10	2 - 10	2L-GW20S-07	2LMW20S	7	2.77188
7440-62-2	VANADIUM	1/16	1.7	J	1.7	J	1.7	0.5	7.4	0.5 - 7.4	2LGW20S-01	2LMW20S	1.7	1.6425
7440-66-6	ZINC	11/16	7	J	84.6		7 - 84.6	5.5	42.8	5.5 - 42.8	2LGW20S-03	2LMW20S	37.28636	28.50625
	Filtered Inorganics (ug/L)													
7440-38-2	ARSENIC, FILTERED	1/16	2.3	J	2.3	J	2.3	2.2	6.4	2.2 - 6.4	4GW01S-05-F	4MW1S	2.3	1.725
7440-39-3	BARIUM, FILTERED	16/16	30.9		103		30.9 - 103	0	0	0	4GW01S-06-F-D	4MW1S	57.39688	57.39688
7440-70-2	CALCIUM, FILTERED	16/16	17000		53200		17000 - 53200	0	0	0	2LGW20S-06-F	2LMW20S	28640.625	28640.625
7440-47-3	CHROMIUM, FILTERED	5/16	1.1	J	4.7		1.1 - 4.7	0.5	5	0.5 - 5	4GW01S-01-F	4MW1S	1.67	1.24063
7440-48-4	COBALT, FILTERED	1/16	3.2	J	3.2	J	3.2	0.67	5	0.67 - 5	2LGW20S-01-F	2LMW20S	3.2	1.30797
7440-50-8	COPPER, FILTERED	1/16	3.8	J	5.6	J	3.8 - 5.6	0.87	4.6	0.87 - 4.6	4GW01S-08-F-D	4MW1S	4.7	1.10906
7439-89-6	IRON, FILTERED	8/16	559		9800		559 - 9800	3.8	52.2	3.8 - 52.2	2LGW20S-08-F	2LMW20S	4873.5	2442.98125
7439-92-1	LEAD, FILTERED	1/16	4.1	J	4.1	J	4.1	1	3	1 - 3	4GW01S-08-F-D	4MW1S	2.8	1.1125
7439-95-4	MAGNESIUM, FILTERED	16/16	2630		7440		2630 - 7440	0	0	0	2LGW20S-05-F	2LMW20S	4549.375	4549.375
7439-96-5	MANGANESE, FILTERED	14/16	6.6		874		6.6 - 874	3.4	7.9	3.4 - 7.9	2LGW20S-01-F	2LMW20S	338.64286	296.67344
7439-97-6	MERCURY, FILTERED	1/16	0.2		0.2		0.2	0.08	0.2	0.08 - 0.2	4GW01S-03-F	4MW1S	0.2	0.06984
7440-02-0	NICKEL, FILTERED	4/16	5	J	9.1		5 - 9.1	1.8	10	1.8 - 10	2LGW20S-01-F	2LMW20S	7.825	4.05938
7440-09-7	POTASSIUM, FILTERED	15/16	2230		6270	J	2230 - 6270	3880	4230	3880 - 4230	2LGW20S-01-F	2LMW20S	4107.66667	3977.65625
7440-22-4	SILVER, FILTERED	1/16	1.4	J	1.4	J	1.4	0.9	5	0.9 - 5	4GW01S-01-F	4MW1S	1.025	0.86094
7440-23-5	SODIUM, FILTERED	16/16	19900		80400	J	19900 - 80400	0	0	0	2L-GW20S-07-F	2LMW20S	44700	44700
7440-28-0	THALLIUM, FILTERED	2/16	6.4	J	7.3	J	6.4 - 7.3	2	7.1	2 - 7.1	2L-GW20S-07-F	2LMW20S	6.85	2.91563
7440-66-6	ZINC, FILTERED	11/16	5.1	J	80.4		5.1 - 80.4	5.2	24.4	5.2 - 24.4	2LGW20S-03-F	2LMW20S	35.70682	26.94531
	Miscellaneous Parameters (mg/L)													
TTNUS008	ALKALINITY	14/14	15.6		152		15.6 - 152	0	0	0	2LGW20S-03, 2LGW20S-06	2LMW20S	64.46786	64.46786
TTNUS013	CARBONATE ALKALINITY	1/1	80		80		80	0	0	0	2L-GW20S-07	2LMW20S	80	80
TTNUS017	CHEMICAL OXYGEN DEMAND	1/15	13.8		18.3		13.8 - 18.3	5	20	5 - 20	4GW01S-06-D	4MW1S	16.05	7.90333
16887-00-6	CHLORIDE	15/15	18.1		149		18.1 - 149	0	0	0	4GW01S-06-D	4MW1S	78.12667	78.12667
TTNUS022	HARDNESS	15/15	57.3		160		57.3 - 160	0	0	0	2LGW20S-06	2LMW20S	93.00667	93.00667
14808-79-8	SULFATE	12/15	2		57.7		2 - 57.7	20	20	20	4GW01S-01	4MW1S	27.55417	24.04333
TTNUS040	TOTAL DISSOLVED SOLIDS	15/15	105		341		105 - 341	0	0	0	2LGW20S-05	2LMW20S	239.43333	239.43333
TTNUS003	TOTAL ORGANIC CARBON	10/15	1.3		10		1.3 - 10	0.73	1.9	0.73 - 1.9	2LGW20S-08	2LMW20S	2.995	2.22433

Associated Samples

2L-GW20S-07	4GW01S-01
2L-GW20S-07-F	4GW01S-01-AVG
2LGW20S-01	4GW01S-01-D
2LGW20S-01-F	4GW01S-01-F
2LGW20S-02	4GW01S-01-F-AVG
2LGW20S-02-AVG	4GW01S-01-F-D
2LGW20S-02-D	4GW01S-02
2LGW20S-02-F	4GW01S-02-F
2LGW20S-02-F-AVG	4GW01S-03
2LGW20S-02-F-D	4GW01S-03-F
2LGW20S-03	4GW01S-04
2LGW20S-03-F	4GW01S-04-F
2LGW20S-04	4GW01S-05
2LGW20S-04-F	4GW01S-05-F
2LGW20S-05	4GW01S-06
2LGW20S-05-F	4GW01S-06-AVG
2LGW20S-06	4GW01S-06-D
2LGW20S-06-F	4GW01S-06-F
2LGW20S-08	4GW01S-06-F-AVG
2LGW20S-08-F	4GW01S-06-F-D
4-GW01S-07	4GW01S-08
4-GW01S-07-AVG	4GW01S-08-AVG
4-GW01S-07-D	4GW01S-08-D
4-GW01S-07-F	4GW01S-08-F
4-GW01S-07-F-AVG	4GW01S-08-F-AVG
4-GW01S-07-F-D	4GW01S-08-F-D

TABLE G-2

SUMMARY OF FREQUENCY OF DETECTION INFORMATION
FOR REFERENCE MONITORING WELL
AREA A LANDFILL, NSB-NLON, GROTON, CT

CAS	PARAMETER	DETECTION FREQUENCY	MINIMUM CONC	MINIMUM QUALIFIER	MAXIMUM CONC	MAXIMUM QUALIFIER	DETECTION RANGE	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	RANGE OF NON-DETECTS	SAMPLE CONTAINING MAXIMUM CONCENTRATION	LOCATION OF MAXIMUM CONCENTRATION	AVERAGE OF POSITIVE DETECTS	AVERAGE OF ALL RESULTS
	Volatile Organics (ug/L)													
78-93-3	2-BUTANONE	1/5	3.6	J	3.6	J	3.6	5	25	5 - 25	2WGW21S-05	2WMW21S	3.6	4.72
75-15-0	CARBON DISULFIDE	3/8	1		4.7	J	1 - 4.7	1	5	1 - 5	2WGW21S-08	2WMW21S	2.06667	1.3375
108-88-3	TOLUENE	1/8	0.22	J	0.22	J	0.22	1	5	1 - 5	2WGW21S-05	2WMW21S	0.22	0.715
79-01-6	TRICHLOROETHENE	1/8	1.3		1.3		1.3	1	5	1 - 5	2WGW21S-08	2WMW21S	0.9	0.8
	Semivolatile Organics (ug/L)													
208-96-8	ACENAPHTHYLENE	1/8	0.08	J	0.08	J	0.08	0.013	2.2	0.013 - 2.2	2WGW21S-05	2WMW21S	0.08	0.40538
120-12-7	ANTHRACENE	1/8	0.21		0.21		0.21	0.03	2.2	0.03 - 2.2	2W-GW21S-07	2WMW21S	0.21	0.38438
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	3/8	1.3	J	2.1	J	1.3 - 2.1	2	10	2 - 10	2WGW21S-08	2WMW21S	1.6	2.24375
84-74-2	DI-N-BUTYL PHTHALATE	1/8	0.7	J	0.7	J	0.7	2	10	2 - 10	2W-GW21S-07	2WMW21S	1.6	2.28125
206-44-0	FLUORANTHENE	1/8	0.029	J	0.029	J	0.029	0.009	2.2	0.009 - 2.2	2WGW21S-06-D	2WMW21S	0.029	0.3485
86-73-7	FLUORENE	1/8	0.007		0.007		0.007	0.007	2.2	0.007 - 2.2	2W-GW21S-07-D	2WMW21S	0.0053	0.35735
85-01-8	PHENANTHRENE	2/8	0.06	J	0.71	J	0.06 - 0.71	0.004	2.2	0.004 - 2.2	2W-GW21S-07-D	2WMW21S	0.241	0.40425
	Pesticides/PCBs (ug/L)													
72-54-8	4,4'-DDD	8/8	2.4		52		2.4 - 52	0	0	0	2WGW21S-03	2WMW21S	10.925	10.925
72-55-9	4,4'-DDE	4/8	0.045		0.082	J	0.045 - 0.082	0.02	0.2	0.02 - 0.2	2WGW21S-06	2WMW21S	0.05975	0.06113
	Inorganics (ug/L)													
7429-90-5	ALUMINUM	2/8	74.9	J	1500		74.9 - 1500	34	82	34 - 82	2WGW21S-02	2WMW21S	787.45	216.77188
7440-38-2	ARSENIC	5/8	3	J	8.8		3 - 8.8	2.6	5	2.6 - 5	2WGW21S-01	2WMW21S	4.86	3.775
7440-39-3	BARIUM	8/8	19.5		111		19.5 - 111	0	0	0	2WGW21S-05	2WMW21S	68.4875	68.4875
7440-70-2	CALCIUM	8/8	32600		287000		32600 - 287000	0	0	0	2WGW21S-05	2WMW21S	169043.75	169043.75
7440-47-3	CHROMIUM	6/8	5.8		9.3	J	5.8 - 9.3	1	2.7	1 - 2.7	2W-GW21S-07	2WMW21S	7.33333	5.73125
7440-48-4	COBALT	1/8	2	J	2.4	J	2 - 2.4	0.9	5.3	0.9 - 5.3	2W-GW21S-07	2WMW21S	2.2	1.37125
7439-89-6	IRON	8/8	8600	J	44000		8600 - 44000	0	0	0	2WGW21S-06	2WMW21S	20600	20600
7439-95-4	MAGNESIUM	8/8	79400		888000		79400 - 888000	0	0	0	2WGW21S-05	2WMW21S	542762.5	542762.5
7439-96-5	MANGANESE	8/8	175		449		175 - 449	0	0	0	2WGW21S-06	2WMW21S	248.6875	248.6875
7440-09-7	POTASSIUM	8/8	27400		391000	J	27400 - 391000	0	0	0	2WGW21S-05	2WMW21S	231425	231425
7782-49-2	SELENIUM	1/8	4.8	J	4.8	J	4.8	2.9	5	2.9 - 5	2WGW21S-03	2WMW21S	4.8	2.3375
7440-23-5	SODIUM	8/8	740000	J	9750000		740000 - 9750000	0	0	0	2W-GW21S-07	2WMW21S	4936812.5	4936812.5
7440-28-0	THALLIUM	2/8	4.3	J	9.2	J	4.3 - 9.2	2	20.5	2 - 20.5	2W-GW21S-07	2WMW21S	5.95	4.06875
7440-62-2	VANADIUM	5/8	7	J	10	J	7 - 10	3.6	13.5	3.6 - 13.5	2W-GW21S-07-D	2WMW21S	7.94	6.4125
7440-66-6	ZINC	3/8	7.6	J	20.4		7.6 - 20.4	1.3	8.5	1.3 - 8.5	2W-GW21S-07	2WMW21S	11.96667	5.6625
	Filtered Inorganics (ug/L)													
7440-38-2	ARSENIC, FILTERED	4/8	3.8	J	7.5	J	3.8 - 7.5	2.6	5	2.6 - 5	2WGW21S-08-F-D	2WMW21S	5.0375	3.33125
7440-39-3	BARIUM, FILTERED	8/8	19.5		109		19.5 - 109	0	0	0	2WGW21S-05-F	2WMW21S	68.075	68.075
7440-70-2	CALCIUM, FILTERED	8/8	34200		293000		34200 - 293000	0	0	0	2WGW21S-05-F	2WMW21S	174356.25	174356.25
7440-47-3	CHROMIUM, FILTERED	6/8	5.2	J	12.8		5.2 - 12.8	2.6	5.6	2.6 - 5.6	2W-GW21S-07-F-D	2WMW21S	7.2	5.92188
7439-89-6	IRON, FILTERED	8/8	175	J	42800		175 - 42800	0	0	0	2WGW21S-06-F	2WMW21S	8665.8125	8665.8125
7439-92-1	LEAD, FILTERED	1/8	3.4	J	3.4	J	3.4	1	3	1 - 3	2WGW21S-03-F	2WMW21S	3.4	1.325
7439-95-4	MAGNESIUM, FILTERED	8/8	84300		937000		84300 - 937000	0	0	0	2WGW21S-05-F	2WMW21S	551962.5	551962.5
7439-96-5	MANGANESE, FILTERED	8/8	155		445		155 - 445	0	0	0	2WGW21S-06-F	2WMW21S	251.6875	251.6875
7440-02-0	NICKEL, FILTERED	1/8	9.2		9.2		9.2	1.2	10	1.2 - 10	2W-GW21S-07-F-D	2WMW21S	5.6	2.6375
7440-09-7	POTASSIUM, FILTERED	8/8	28200		407000	J	28200 - 407000	0	0	0	2WGW21S-05-F	2WMW21S	236731.25	236731.25
7782-49-2	SELENIUM, FILTERED	1/8	5.3	J	5.3	J	5.3	2.9	5	2.9 - 5	2WGW21S-03-F	2WMW21S	5.3	2.4
7440-23-5	SODIUM, FILTERED	8/8	670000	J	7620000		670000 - 7620000	0	0	0	2WGW21S-05-F	2WMW21S	4921562.5	4921562.5
7440-28-0	THALLIUM, FILTERED	2/8	4.3	J	10	J	4.3 - 10	2	18.4	2 - 18.4	2W-GW21S-07-F-D	2WMW21S	7.1	4.29375
7440-62-2	VANADIUM, FILTERED	5/8	5.7	J	11.2	J	5.7 - 11.2	4.9	7.4	4.9 - 7.4	2W-GW21S-07-F	2WMW21S	7.51	5.9375
7440-66-6	ZINC, FILTERED	3/8	4.9	J	37.4		4.9 - 37.4	2	8.5	2 - 8.5	2W-GW21S-07-F-D	2WMW21S	14.125	6.76563
	Miscellaneous Parameters (mg/L)													
TTNUS008	ALKALINITY	7/7	283		2220		283 - 2220	0	0	0	2WGW21S-05	2WMW21S	1230.35714	1230.35714
TTNUS013	CARBONATE ALKALINITY	1/1	1300		1300		1300	0	0	0	2W-GW21S-07, 2W-GW21S-07-D	2WMW21S	1300	1300
TTNUS017	CHEMICAL OXYGEN DEMAND	8/8	152		1670		152 - 1670	0	0	0	2WGW21S-06	2WMW21S	674.375	674.375
16887-00-6	CHLORIDE	8/8	1360		12200		1360 - 12200	0	0	0	2WGW21S-05	2WMW21S	8203.75	8203.75
TTNUS022	HARDNESS	8/8	317		4370		317 - 4370	0	0	0	2WGW21S-05	2WMW21S	2348.375	2348.375
14808-79-8	SULFATE	5/8	17.3		246		17.3 - 246	1	200	1 - 200	2WGW21S-02	2WMW21S	86.06	67.6
TTNUS040	TOTAL DISSOLVED SOLIDS	8/8	2290		20400		2290 - 20400	0	0	0	2WGW21S-05	2WMW21S	12480	12480
TTNUS003	TOTAL ORGANIC CARBON	8/8	14.8	J	98		14.8 - 98	0	0	0	2WGW21S-08	2WMW21S	36.81875	36.81875
TTNUS044	TOTAL SUSPENDED SOLIDS	1/1	20	J	20	J	20	0	0	0	2WGW21S-04	2WMW21S	20	20

Associated Samples:

2W-GW21S-07	2WGW21S-05
2W-GW21S-07-AVG	2WGW21S-05-F
2W-GW21S-07-D	2WGW21S-06
2W-GW21S-07-F	2WGW21S-06-AVG
2W-GW21S-07-F-AVG	2WGW21S-06-D
2W-GW21S-07-F-D	2WGW21S-06-F
2WGW21S-01	2WGW21S-06-F-AVG
2WGW21S-01-F	2WGW21S-06-F-D
2WGW21S-02	2WGW21S-08
2WGW21S-02-F	2WGW21S-08-AVG
2WGW21S-03	2WGW21S-08-D
2WGW21S-03-F	2WGW21S-08-F
2WGW21S-04	2WGW21S-08-F-AVG
2WGW21S-04-F	2WGW21S-08-F-D

TABLE G-3

SUMMARY OF FREQUENCY OF DETECTION INFORMATION
FOR DOWNGRADIENT MONITORING WELLS IN AREA A DOWNSTREAM
AREA A LANDFILL, NSB-NLON, GROTON, CT

CAS	PARAMETER	DETECTION FREQUENCY	MINIMUM CONC	MINIMUM QUALIFIER	MAXIMUM CONC	MAXIMUM QUALIFIER	DETECTION RANGE	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	RANGE OF NON-DETECTS	SAMPLE CONTAINING MAXIMUM CONCENTRATION	LOCATION OF MAXIMUM CONCENTRATION	AVERAGE OF POSITIVE DETECTS	AVERAGE OF ALL RESULTS
	Volatile Organics (ug/L)													
75-15-0	CARBON DISULFIDE	2/15	0.2	J	2.2		0.2 - 2.2	1	1	1	3GW37S-08	3MW37S	1.2	0.59333
156-59-2	CIS-1,2-DICHLOROETHENE	4/15	0.14	J	0.4	J	0.14 - 0.4	1	1	1	3GW37S-03	3MW37S	0.2275	0.42733
108-88-3	TOLUENE	1/15	0.1	J	0.1	J	0.1	1	1	1	3GW12S-03	3MW12S	0.1	0.47333
156-60-5	TRANS-1,2-DICHLOROETHENE	1/15	0.2	J	0.2	J	0.2	1	1	1	3GW37S-03	3MW37S	0.2	0.48
79-01-6	TRICHLOROETHENE	8/15	0.58	J	2		0.58 - 2	1	1	1	3GW37S-03	3MW37S	1.02	0.77733
	Semivolatile Organics (ug/L)													
120-12-7	ANTHRACENE	2/15	0.034	J	0.52		0.034 - 0.52	0.2	30	0.2 - 30	3-GW37S-07	3MW37S	0.277	1.43027
56-55-3	BENZO(A)ANTHRACENE	1/15	0.051	J	0.051	J	0.051	0.012	12	0.012 - 12	3-GW37S-05	3MW37S	0.051	0.4688
50-32-8	BENZO(A)PYRENE	1/15	0.039	J	0.039	J	0.039	0.021	21	0.021 - 21	3-GW37S-05	3MW37S	0.039	0.7583
205-99-2	BENZO(B)FLUORANTHENE	1/15	0.044	J	0.044	J	0.044	0.02	20	0.02 - 20	3-GW37S-05	3MW37S	0.044	0.73527
65-85-0	BENZOIC ACID	1/9	1.8	J	1.8	J	1.8	5	50	5 - 50	3GW37S-02	3MW37S	1.8	10.82222
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/15	1.7	J	1.7	J	1.7	2	10	2 - 10	3-GW37S-07	3MW37S	1.7	1.69667
218-01-9	CHRYSENE	1/15	0.037	J	0.037	J	0.037	0.012	12	0.012 - 12	3-GW37S-05	3MW37S	0.037	0.46787
84-74-2	DI-N-BUTYL PHTHALATE	1/15	1.6	J	1.6	J	1.6	2	10	2 - 10	3-GW37S-07	3MW37S	1.6	1.69
206-44-0	FLUORANTHENE	1/15	0.12	J	0.12	J	0.12	0.009	9	0.009 - 9	3-GW37S-05	3MW37S	0.12	0.70163
85-01-8	PHENANTHRENE	1/15	0.11	J	0.11	J	0.11	0.004	4	0.004 - 4	3-GW37S-05	3MW37S	0.11	0.53413
129-00-0	PYRENE	1/15	0.096	J	0.096	J	0.096	0.008	8	0.008 - 8	3-GW37S-05	3MW37S	0.096	0.66667
	Inorganics (ug/L)													
7440-39-3	BARIUM	15/15	49.6		297		49.6 - 297	0	0	0	3GW37S-06	3MW37S	98.21333	98.21333
7440-70-2	CALCIUM	15/15	26300		77500		26300 - 77500	0	0	0	3GW12D-03-D	3MW12D	54896.66667	54896.66667
7440-47-3	CHROMIUM	4/15	1	J	36.2	J	1 - 36.2	0.5	5	0.5 - 5	3GW12S-02	3MW12S	5.525	2.28333
7440-48-4	COBALT	12/15	2.4	J	17.6		2.4 - 17.6	3.2	11.3	3.2 - 11.3	3GW12S-03-D	3MW12S	10.1125	8.85167
7440-50-8	COPPER	2/15	1.8	J	3.9	J	1.8 - 3.9	0.87	3.7	0.87 - 3.7	3GW37S-08	3MW37S	2.85	1.264
7439-89-6	IRON	15/15	188		69700		188 - 69700	0	0	0	3GW12D-03-D	3MW12D	14849.13333	14849.13333
7439-95-4	MAGNESIUM	15/15	5530		65400		5530 - 65400	0	0	0	3GW12S-03	3MW12S	33715.33333	33715.33333
7439-96-5	MANGANESE	15/15	269		7380		269 - 7380	0	0	0	3GW12S-02	3MW12S	4487.93333	4487.93333
7440-02-0	NICKEL	3/15	3.8	J	34.6	J	3.8 - 34.6	1.2	10	1.2 - 10	3GW12S-02	3MW12S	8.74167	3.31667
7440-09-7	POTASSIUM	15/15	4310		22100		4310 - 22100	0	0	0	3GW12S-03	3MW12S	13715.33333	13715.33333
7782-49-2	SELENIUM	2/15	4.5	J	4.9	J	4.5 - 4.9	2.9	5	2.9 - 5	3GW37S-03	3MW37S	4.05	2.22
7440-23-5	SODIUM	15/15	67000		582000		67000 - 582000	0	0	0	3GW12S-01	3MW12S	327786.6667	327786.6667
7440-28-0	THALLIUM	1/15	8.5	J	8.5	J	8.5	2.6	7.1	2.6 - 7.1	3-GW37S-07	3MW37S	8.5	2.715
7440-66-6	ZINC	10/15	6.1	J	29.3		6.1 - 29.3	2.4	16.8	2.4 - 16.8	3GW37S-08	3MW37S	16.0125	11.745
	Filtered Inorganics (ug/L)													
7440-39-3	BARIUM, FILTERED	15/15	51.7		269		51.7 - 269	0	0	0	3GW37S-06-F	3MW37S	96.06333	96.06333
7440-70-2	CALCIUM, FILTERED	15/15	25600		76900		25600 - 76900	0	0	0	3GW12D-03-F-D	3MW12D	53400	53400
7440-48-4	COBALT, FILTERED	12/15	2.6	J	18.7		2.6 - 18.7	3.6	9.1	3.6 - 9.1	3GW12S-03-F-D	3MW12S	9.39792	8.245
7440-50-8	COPPER, FILTERED	1/15	2.1		2.1		2.1	0.87	4.2	0.87 - 4.2	3-GW37S-05-F	3MW37S	2.1	0.95733
7439-89-6	IRON, FILTERED	15/15	219		64500		219 - 64500	0	0	0	3GW12D-03-F-D	3MW12D	13631.8	13631.8
7439-92-1	LEAD, FILTERED	1/15	3.3	J	3.3	J	3.3	1	3	1 - 3	3-GW37S-07-F	3MW37S	3.3	1.10667
7439-95-4	MAGNESIUM, FILTERED	15/15	5530		62700		5530 - 62700	0	0	0	3GW12S-03-F-D	3MW12S	33132.66667	33132.66667
7439-96-5	MANGANESE, FILTERED	15/15	264		7430		264 - 7430	0	0	0	3GW12S-02-F	3MW12S	4422.6	4422.6
7440-02-0	NICKEL, FILTERED	3/15	2.7	J	3.6	J	2.7 - 3.6	1.2	10	1.2 - 10	3GW12D-01-F	3MW12D	3.16667	2.26167
7440-02-0	NICKEL, FILTERED	3/15	2.7	J	3.6	J	2.7 - 3.6	1.2	10	1.2 - 10	3GW12S-02-F-D	3MW12S	3.16667	2.26167
7440-09-7	POTASSIUM, FILTERED	15/15	4620		21900		4620 - 21900	0	0	0	3GW12S-02-F-D	3MW12S	13168.66667	13168.66667
7440-22-4	SILVER, FILTERED	1/15	1.2	J	1.2	J	1.2	0.9	5	0.9 - 5	3GW37S-08-F	3MW37S	1.2	0.75
7440-23-5	SODIUM, FILTERED	15/15	67300		609000		67300 - 609000	0	0	0	3GW12S-01-F	3MW12S	314606.6667	314606.6667
7440-28-0	THALLIUM, FILTERED	1/15	7.6	J	7.6	J	7.6	3.8	7.1	3.8 - 7.1	3-GW37S-07-F	3MW37S	7.6	2.70333
7440-66-6	ZINC, FILTERED	10/15	6	J	172	J	6 - 172	1.9	16.7	1.9 - 16.7	3GW12D-01-F	3MW12D	22.97	16.47
	Miscellaneous Parameters (mg/L)													
TTNUS008	ALKALINITY	14/14	105		283		105 - 283	0	0	0	3GW12D-03	3MW12D	182.57143	182.57143
TTNUS013	CARBONATE ALKALINITY	1/1	140		140		140	0	0	0	3-GW37S-07	3MW37S	140	140
TTNUS017	CHEMICAL OXYGEN DEMAND	10/15	5		92.4		5 - 92.4	5	20	5 - 20	3GW37S-01	3MW37S	32.455	24.47
16887-00-6	CHLORIDE	15/15	91.9		1000		91.9 - 1000	0	0	0	3GW12S-02-D	3MW12S	581.76	581.76
TTNUS022	HARDNESS	15/15	116		536		116 - 536	0	0	0	3GW12D-01	3MW12D	296.4	296.4
14808-79-8	SULFATE	15/15	15.5		98.1		15.5 - 98.1	0	0	0	3GW12S-01	3MW12S	49.65333	49.65333
TTNUS040	TOTAL DISSOLVED SOLIDS	15/15	283		1950		283 - 1950	0	0	0	3GW12D-03	3MW12D	1157.33333	1157.33333
TTNUS003	TOTAL ORGANIC CARBON	14/15	2.4		36.3	J	2.4 - 36.3	2.7	2.7	2.7	3GW12S-02-D	3MW12S	5.375	5.10667
TTNUS044	TOTAL SUSPENDED SOLIDS	1/2	38		38		38	4	4	4	3GW12D-04	3MW12D	38	20

Associated Samples:

3-GW37S-05	3GW12S-02-AVG
3-GW37S-05-F	3GW12S-02-D
3-GW37S-07	3GW12S-02-F
3-GW37S-07-F	3GW12S-02-F-AVG
3GW12D-01	3GW12S-02-F-D
3GW12D-01-AVG	3GW12S-03
3GW12D-01-D	3GW12S-03-AVG
3GW12D-01-F	3GW12S-03-D
3GW12D-01-F-AVG	3GW12S-03-F
3GW12D-01-F-D	3GW12S-03-F-AVG
3GW12D-02	3GW12S-03-F-D
3GW12D-02-F	3GW37S-01
3GW12D-03	3GW37S-01-F
3GW12D-03-AVG	3GW37S-02
3GW12D-03-D	3GW37S-02-F
3GW12D-03-F	3GW37S-03
3GW12D-03-F-AVG	3GW37S-03-F
3GW12D-03-F-D	3GW37S-04
3GW12D-04	3GW37S-04-F
3GW12D-04-F	3GW37S-06
3GW12S-01	3GW37S-06-F
3GW12S-01-F	3GW37S-08
3GW12S-02	3GW37S-08-F

TABLE G-4

SUMMARY OF FREQUENCY OF DETECTION INFORMATION
FOR DOWNGRADIENT MONITORING WELLS IN AREA A WETLAND
AREA A LANDFILL, NSB-NLON, GROTON, CT

CAS	PARAMETER	DETECTION FREQUENCY	MINIMUM CONC	MINIMUM QUALIFIER	MAXIMUM CONC	MAXIMUM QUALIFIER	DETECTION RANGE	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	RANGE OF NON-DETECTS	SAMPLE CONTAINING MAXIMUM CONCENTRATION	LOCATION OF MAXIMUM CONCENTRATION	AVERAGE OF POSITIVE DETECTS	AVERAGE OF ALL RESULTS
	Volatile Organics (ug/L)													
78-93-3	2-BUTANONE	18/43	1	J	26		1 - 26	5	25	5 - 25	2WGW39DS-04	2WMW39DS	6.02222	5.36977
67-64-1	ACETONE	21/59	3	J	120		3 - 120	5	31	5 - 31	2WGW39DS-04	2WMW39DS	21	10.60593
75-15-0	CARBON DISULFIDE	48/79	0.27	J	7.6		0.27 - 7.6	1	5	1 - 5	2W-GW43DS-07	2WMW43DS	2.22833	1.77165
100-41-4	ETHYLBENZENE	1/79	0.3	J	0.3	J	0.3	1	5	1 - 5	2WGW39DS-04	2WMW39DS	0.3	0.64937
75-09-2	METHYLENE CHLORIDE	6/79	0.5	J	1.2	J	0.5 - 1.2	1	10	1 - 10	2W-GW39DS-07	2WMW39DS	0.85	1.28608
127-18-4	TETRACHLOROETHENE	1/79	1.4		1.4		1.4	1	5	1 - 5	2W-GW46DS-07	2WMW46DS	1.4	0.66329
108-88-3	TOLUENE	15/79	0.17	J	4		0.17 - 4	1	5	1 - 5	2WGW39DS-03	2WMW39DS	0.948	0.73696
79-01-6	TRICHLOROETHENE	2/79	1.2		1.4		1.2 - 1.4	1	5	1 - 5	2W-GW46DS-07	2WMW46DS	1.3	0.67215
	Semivolatile Organics (ug/L)													
91-57-6	2-METHYLNAPHTHALENE	1/59	180	J	180	J	180	0.5	6.1	0.5 - 6.1	2WGW46DS-08	2WMW46DS	180	3.95127
95-48-7	2-METHYLPHENOL	1/79	0.93	J	0.93	J	0.93	5	10	5 - 10	2WGW43DS-02	2WMW43DS	0.93	3.14437
TTNUS042	3&4-METHYLPHENOL	14/59	0.75	J	65.7		0.75 - 65.7	5	6.2	5 - 6.2	2WGW46DS-01	2WMW46DS	9.45071	4.18364
83-32-9	ACENAPHTHENE	2/79	0.56	J	82	J	0.56 - 82	0.016	6.1	0.016 - 6.1	2WGW46DS-08	2WMW46DS	41.28	1.4773
208-96-8	ACENAPHTHYLENE	7/79	0.093	J	2.7	J	0.093 - 2.7	0.013	6.1	0.013 - 6.1	2WGW46DS-08	2WMW46DS	0.71043	0.46944
120-12-7	ANTHRACENE	8/79	0.07		0.42		0.07 - 0.42	0.03	6.1	0.03 - 6.1	2W-GW46DS-07	2WMW46DS	0.2325	0.35497
50-32-8	BENZO(A)PYRENE	4/79	0.028	J	1.2		0.028 - 1.2	0.021	2	0.021 - 2	2WGW43DS-08	2WMW43DS	0.652	0.14296
205-99-2	BENZO(B)FLUORANTHENE	1/79	0.034	J	0.034	J	0.034	0.02	2	0.02 - 2	2WGW42DS-05	2WMW42DS	0.034	0.11065
65-85-0	BENZOIC ACID	7/58	0.77	J	14.5	J	0.77 - 14.5	5	50	5 - 50	2WGW39DS-02	2WMW39DS	5.72429	11.63397
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	26/79	0.75	J	40		0.75 - 40	2	10	2 - 10	2WGW43DS-08	2WMW43DS	4.81692	3.24703
85-68-7	BUTYL BENZYL PHTHALATE	1/79	0.6	J	0.6	J	0.6	2	10	2 - 10	2W-GW40DS-07	2WMW40DS	0.6	2.3807
218-01-9	CHRYSENE	2/79	0.061	J	0.6	J	0.061 - 0.6	0.012	2	0.012 - 2	2WGW41DS-08	2WMW41DS	0.3305	0.11755
84-74-2	DI-N-BUTYL PHTHALATE	9/79	0.6	J	2	J	0.6 - 2	2	10	2 - 10	2W-GW42DS-07	2WMW42DS	1.37778	2.27627
53-70-3	DIBENZO(A,H)ANTHRACENE	1/79	0.55		0.55		0.55	0.014	2	0.014 - 2	2WGW45DS-03	2WMW45DS	0.55	0.11665
84-66-2	DIETHYL PHTHALATE	1/79	0.6	J	0.6	J	0.6	2	10	2 - 10	2W-GW41DS-07	2WMW41DS	0.6	2.3807
206-44-0	FLUORANTHENE	4/79	0.029	J	0.17		0.029 - 0.17	0.009	6.1	0.009 - 6.1	2W-GW44DS-07	2WMW44DS	0.07225	0.3313
86-73-7	FLUORENE	1/79	0.53		0.53		0.53	0.007	6.1	0.007 - 6.1	2WGW42DS-08	2WMW42DS	0.53	0.3367
193-39-5	INDENO(1,2,3-CD)PYRENE	2/79	0.75		110		0.75 - 110	0.008	2	0.008 - 2	2W-GW45DS-07	2WMW45DS	55.375	1.51082
85-01-8	PHENANTHRENE	7/79	0.023	J	22		0.023 - 22	0.004	6.1	0.004 - 6.1	2W-GW42DS-07	2WMW42DS	4.34614	0.71334
108-95-2	PHENOL	10/79	1.1	J	35.8		1.1 - 35.8	5	10	5 - 10	2WGW46DS-01	2WMW46DS	10.77	4.20728
129-00-0	PYRENE	7/79	0.023	J	400	J	0.023 - 400	0.008	6.1	0.008 - 6.1	2WGW46DS-08	2WMW46DS	57.25857	5.40282
	Pesticides/PCBs (ug/L)													
72-54-8	4,4-DDD	7/77	0.016	J	0.058	J	0.016 - 0.058	0.02	0.029	0.02 - 0.029	2WGW47DS-04	2WMW47DS	0.029	0.0119
33213-65-9	ENDOSULFAN II	1/78	0.01	J	0.01	J	0.01	0.02	0.029	0.02 - 0.029	2WGW43DS-05	2WMW43DS	0.01	0.01018
7421-93-4	ENDRIN ALDEHYDE	1/78	0.02		0.02		0.02	0.02	0.029	0.02 - 0.029	2WGW47DS-06	2WMW47DS	0.02	0.01031
	Inorganics (ug/L)													
7429-90-5	ALUMINUM	21/78	171		4890		171 - 4890	10.7	894	10.7 - 894	2WGW42DS-08	2WMW42DS	952.42857	305.80641
7440-38-2	ARSENIC	55/78	2.6	J	36.3		2.6 - 36.3	2.2	16.8	2.2 - 16.8	2WGW40DS-01	2WMW40DS	13.43455	10.36474
7440-39-3	BARIUM	77/78	11.4		920		11.4 - 920	14.9	14.9	14.9	2WGW47DS-04	2WMW47DS	98.60779	97.4391
7440-41-7	BERYLLIUM	1/78	0.52	J	0.52	J	0.52	0.1	1.4	0.1 - 1.4	2WGW43DS-02	2WMW43DS	0.52	0.16904
7440-70-2	CALCIUM	78/78	14300		334000		14300 - 334000	0	0	0	2WGW46DS-04	2WMW46DS	136048.0769	136048.0769
7440-47-3	CHROMIUM	33/78	1.2	J	24.7		1.2 - 24.7	0.5	6	0.5 - 6	2WGW42DS-08	2WMW42DS	6.76061	3.65654
7440-48-4	COBALT	14/78	0.95	J	14.5		0.95 - 14.5	0.6	20	0.6 - 20	2W-GW47DS-07	2WMW47DS	6.98571	2.34564
7440-50-8	COPPER	8/78	3.6	J	10.7		3.6 - 10.7	0.8	11.6	0.8 - 11.6	2WGW42DS-08	2WMW42DS	6.275	1.71526
7439-89-6	IRON	76/78	380		234000		380 - 234000	112	279	112 - 279	2WGW47DS-04	2WMW47DS	22833.80263	22250.82692
7439-92-1	LEAD	5/78	3.4	J	12.4	J	3.4 - 12.4	1	3.8	1 - 3.8	2WGW42DS-08	2WMW42DS	5.86	1.31923
7439-95-4	MAGNESIUM	78/78	6990		1290000		6990 - 1290000	0	0	0	2W-GW46DS-07	2WMW46DS	387994.7436	387994.7436
7439-96-5	MANGANESE	78/78	19.8		8960		19.8 - 8960	0	0	0	2WGW47DS-04	2WMW47DS	1034.87436	1034.87436
7439-97-6	MERCURY	4/76	0.12	J	1.5		0.12 - 1.5	0.08	0.41	0.08 - 0.41	2WGW47DS-04-D	2WMW47DS	0.5125	0.09105
7440-02-0	NICKEL	21/78	2.1	J	12.3		2.1 - 12.3	1.2	11.8	1.2 - 11.8	2W-GW46DS-07	2WMW46DS	5.09048	3.22019
7440-09-7	POTASSIUM	78/78	8890	J	537000		8890 - 537000	0	0	0	2W-GW46DS-07	2WMW46DS	184284.4872	184284.4872
7782-49-2	SELENIUM	11/78	3.5	J	8.6	J	3.5 - 8.6	2.9	8.6	2.9 - 8.6	2WGW40DS-01, 2WGW46DS-01	2WMW40DS	6.19091	2.60962
7440-22-4	SILVER	3/76	0.8	J	8.7	J	0.8 - 8.7	0.5	5	0.5 - 5	2WGW43DS-03	2WMW43DS	3.63333	1.1102
7440-23-5	SODIUM	78/78	163000	J	10200000		163000 - 10200000	0	0	0	2WGW46DS-01	2WMW46DS	3470064.103	3470064.103
7440-28-0	THALLIUM	4/78	6.4	J	22.4	J	6.4 - 22.4	2	22	2 - 22	2W-GW46DS-07	2WMW46DS	10.8	3.62885
7440-62-2	VANADIUM	33/78	1.7	J	26.5		1.7 - 26.5	0.6	22	0.6 - 22	2WGW42DS-08	2WMW42DS	9.93939	5.93365
7440-66-6	ZINC	45/78	3.8	J	369		3.8 - 369	3	16.8	3 - 16.8	2WGW42DS-08	2WMW42DS	35.33667	22.10096
	Filtered Inorganics (ug/L)													
7429-90-5	ALUMINUM, FILTERED	1/77	294		294		294	10.7	142	10.7 - 142	2WGW43DS-06-F	2WMW43DS	294	29.05844
7440-36-0	ANTIMONY, FILTERED	4/77	3.4	J	23.6	J	3.4 - 23.6	1.8	9.2	1.8 - 9.2	2W-GW40DS-07-F	2WMW40DS	14.525	2.61688
7440-38-2	ARSENIC, FILTERED	43/77	3	J	36.2		3 - 36.2	2.2	31.6	2.2 - 31.6	2WGW40DS-05-F	2WMW40DS	14.37093	9.57403
7440-39-3	BARIUM, FILTERED	75/77	9.4	J	1070		9.4 - 1070	8.7	9.8	8.7 - 9.8	2WGW47DS-04-F	2WMW47DS	105.47333	102.8539
7440-41-7	BERYLLIUM, FILTERED	4/77	0.15	J	0.29		0.15 - 0.29	0.1	1.1	0.1 - 1.1	2W-GW40DS-07-F	2WMW40DS	0.21	0.12182
7440-70-2	CALCIUM, FILTERED	77/77	25600		348000		25600 - 348000	0	0	0	2WGW43DS-03-F	2WMW43DS	145480.5195	145480.5195
7440-47-3	CHROMIUM, FILTERED	29/77	1.6	J	16.2		1.6 - 16.2	0.5	5	0.5 - 5	2WGW41DS-06-F	2WMW41DS	5.86207	3.03636
7440-48-4	COBALT, FILTERED	16/77	0.99	J	14.5		0.99 - 14.5	0.62	19.6	0.62 - 19.6	2WGW47DS-04-F	2WMW47DS	5.6275	2.27903
7440-50-8	COPPER, FILTERED	9/77	2.7	J	11.2	J	2.7 - 11.2	0.87	13.6	0.87 - 13.6	2WGW43DS-03-F	2WMW43DS	6.64444	1.7114
7439-89-6	IRON, FILTERED	63/77	8.8	J	263000		8.8 - 263000	7	243	7 - 243	2WGW47DS-04-F	2WMW47DS	22057.41429	18052.8526
7439-92-1	LEAD, FILTERED	5/77	2.6	J	6.6	J	2.6 - 6.6	1	6.4	1 - 6.4	2W-GW46DS-07-F	2WMW46DS	4.48	1.31948
7439-95-4	MAGNESIUM, FILTERED	77/77	7260		1100000		7260 - 1100000	0	0	0	2WGW46DS-01-F	2WMW46DS	420662.2078	420662.2078
7439-96-5	MANGANESE, FILTERED	77/77	15.1		10100		15.1 - 10100	0	0	0	2WGW47DS-04-F	2WMW47DS	1060.64416	1060.64416
7439-97-6	MERCURY, FILTERED	4/76	0.083	J	1.3		0.083 - 1.3	0.08	10	0.08 - 10	2WGW47DS-04-F-D	2WMW47DS	0.38075	0.14761

TABLE G-4

SUMMARY OF FREQUENCY OF DETECTION INFORMATION
FOR DOWNGRADIENT MONITORING WELLS IN AREA A WETLAND
AREA A LANDFILL, NSB-NLON, GROTON, CT

CAS	PARAMETER	DETECTION FREQUENCY	MINIMUM CONC	MINIMUM QUALIFIER	MAXIMUM CONC	MAXIMUM QUALIFIER	DETECTION RANGE	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	RANGE OF NON-DETECTS	SAMPLE CONTAINING MAXIMUM CONCENTRATION	LOCATION OF MAXIMUM CONCENTRATION	AVERAGE OF POSITIVE DETECTS	AVERAGE OF ALL RESULTS
7440-02-0	NICKEL, FILTERED	24/77	2.1	J	21.2		2.1 - 21.2	1.3	10	1.3 - 10	2WGW46DS-01-F	2WMW46DS	5.00417	3.24123
7440-09-7	POTASSIUM, FILTERED	77/77	10000	J	543000	J	10000 - 543000	0	0	0	2WGW46DS-01-F	2WMW46DS	195701.9481	195701.9481
7782-49-2	SELENIUM, FILTERED	5/77	6.9	J	47.2		6.9 - 47.2	1.6	8.6	1.6 - 8.6	2W-GW44DS-07-F	2WMW44DS	18.14	3.1
7440-23-5	SODIUM, FILTERED	77/77	151000	J	9600000		151000 - 9600000	0	0	0	2WGW46DS-08-F	2WMW46DS	3724116.883	3724116.883
7440-28-0	THALLIUM, FILTERED	3/77	8.6	J	16.8	J	8.6 - 16.8	2	23.1	2 - 23.1	2W-GW46DS-07-F	2WMW46DS	11.6	3.54513
7440-62-2	VANADIUM, FILTERED	27/77	1.6	J	25.8		1.6 - 25.8	0.6	20.2	0.6 - 20.2	2WGW38DS-01-F	2WMW38DS	8.06296	4.33032
7440-66-6	ZINC, FILTERED	37/77	4.4	J	152	J	4.4 - 152	0.9	27.7	0.9 - 27.7	2WGW38DS-01-F	2WMW38DS	20.09054	11.79545
	Miscellaneous Parameters (mg/L)													
TTNUS008	ALKALINITY	76/76	129		2780		129 - 2780	0	0	0	2WGW46DS-03	2WMW46DS	1048.48684	1048.48684
TTNUS013	CARBONATE ALKALINITY	2/2	270		340		270 - 340	0	0	0	2W-GW47DS-07	2WMW47DS	305	305
TTNUS017	CHEMICAL OXYGEN DEMAND	74/77	22.6		2410		22.6 - 2410	5	20	5 - 20	2WGW46DS-04	2WMW46DS	525.0777	504.91234
16887-00-6	CHLORIDE	78/78	186		26000		186 - 26000	0	0	0	2WGW46DS-08	2WMW46DS	6839.44872	6839.44872
TTNUS022	HARDNESS	76/77	96		6100		96 - 6100	6.6	6.6	6.6	2W-GW46DS-07	2WMW46DS	1969.59868	1944.06234
14808-79-8	SULFATE	63/78	1.9		989		1.9 - 989	1	100	1 - 100	2WGW40DS-04	2WMW40DS	258.99524	211.13077
TTNUS040	TOTAL DISSOLVED SOLIDS	78/78	469		34400		469 - 34400	0	0	0	2W-GW46DS-07	2WMW46DS	11137.34615	11137.34615
TTNUS003	TOTAL ORGANIC CARBON	76/78	3.3		140		3.3 - 140	5.2	5.9	5.2 - 5.9	2W-GW46DS-07	2WMW46DS	26.23289	25.63141
TTNUS044	TOTAL SUSPENDED SOLIDS	9/10	22	J	181	J	22 - 181	4	4	4	2WGW47DS-04	2WMW47DS	71	64.1

Associated Samples:

2W-GW38DS-07	2WGW39DS-05-F	2WGW42DS-05	2WGW45DS-05-F
2W-GW38DS-07-F	2WGW39DS-06	2WGW42DS-05-F	2WGW45DS-06
2W-GW39DS-07	2WGW39DS-06-F	2WGW42DS-06	2WGW45DS-06-F
2W-GW39DS-07-F	2WGW39DS-08	2WGW42DS-06-F	2WGW45DS-08
2W-GW40DS-07	2WGW39DS-08-F	2WGW42DS-08	2WGW45DS-08-F
2W-GW40DS-07-F	2WGW40DS-01	2WGW42DS-08-F	2WGW46DS-01
2W-GW41DS-07	2WGW40DS-01-F	2WGW43DS-01	2WGW46DS-01-F
2W-GW41DS-07-F	2WGW40DS-02	2WGW43DS-01-F	2WGW46DS-02
2W-GW42DS-07	2WGW40DS-02-F	2WGW43DS-02	2WGW46DS-02-F
2W-GW42DS-07-F	2WGW40DS-03	2WGW43DS-02-F	2WGW46DS-03
2W-GW43DS-07	2WGW40DS-03-F	2WGW43DS-03	2WGW46DS-03-F
2W-GW43DS-07-F	2WGW40DS-04	2WGW43DS-03-F	2WGW46DS-04
2W-GW44DS-07	2WGW40DS-04-F	2WGW43DS-04	2WGW46DS-04-F
2W-GW44DS-07-F	2WGW40DS-05	2WGW43DS-04-F	2WGW46DS-05
2W-GW45DS-07	2WGW40DS-05-F	2WGW43DS-05	2WGW46DS-05-F
2W-GW45DS-07-F	2WGW40DS-06	2WGW43DS-05-F	2WGW46DS-06
2W-GW46DS-07	2WGW40DS-06-F	2WGW43DS-06	2WGW46DS-06-F
2W-GW46DS-07-F	2WGW40DS-08	2WGW43DS-06-F	2WGW46DS-08
2W-GW47DS-07	2WGW40DS-08-F	2WGW43DS-08	2WGW46DS-08-F
2W-GW47DS-07-F	2WGW41DS-01	2WGW43DS-08-F	2WGW47DS-01
2WGW38DS-01	2WGW41DS-01-F	2WGW44DS-01	2WGW47DS-01-F
2WGW38DS-01-F	2WGW41DS-02	2WGW44DS-01-F	2WGW47DS-02
2WGW38DS-02	2WGW41DS-02-F	2WGW44DS-03	2WGW47DS-02-F
2WGW38DS-02-F	2WGW41DS-03	2WGW44DS-03-F	2WGW47DS-03
2WGW38DS-03	2WGW41DS-03-F	2WGW44DS-04	2WGW47DS-03-F
2WGW38DS-03-F	2WGW41DS-04	2WGW44DS-04-F	2WGW47DS-04
2WGW38DS-04	2WGW41DS-04-F	2WGW44DS-05	2WGW47DS-04-AVG
2WGW38DS-05	2WGW41DS-05	2WGW44DS-05-F	2WGW47DS-04-D
2WGW38DS-06	2WGW41DS-05-F	2WGW44DS-06	2WGW47DS-04-F
2WGW38DS-06-F	2WGW41DS-06	2WGW44DS-06-F	2WGW47DS-04-F-AVG
2WGW38DS-08	2WGW41DS-06-F	2WGW44DS-08	2WGW47DS-04-F-D
2WGW38DS-08-F	2WGW41DS-08	2WGW44DS-08-F	2WGW47DS-05
2WGW39DS-01	2WGW41DS-08-F	2WGW45DS-01	2WGW47DS-05-AVG
2WGW39DS-01-F	2WGW42DS-01	2WGW45DS-01-F	2WGW47DS-05-D
2WGW39DS-02	2WGW42DS-01-F	2WGW45DS-02	2WGW47DS-05-F
2WGW39DS-02-F	2WGW42DS-02	2WGW45DS-02-F	2WGW47DS-05-F-AVG
2WGW39DS-03	2WGW42DS-02-F	2WGW45DS-03	2WGW47DS-05-F-D
2WGW39DS-03-F	2WGW42DS-03	2WGW45DS-03-F	2WGW47DS-06
2WGW39DS-04	2WGW42DS-03-F	2WGW45DS-04	2WGW47DS-06-F
2WGW39DS-04-F	2WGW42DS-04	2WGW45DS-04-F	2WGW47DS-08
2WGW39DS-05	2WGW42DS-04-F	2WGW45DS-05	2WGW47DS-08-F

TABLE G-5

SUMMARY OF FREQUENCY OF DETECTION INFORMATION
FOR DOWNGRADIENT SEEP LOCATION
AREA A LANDFILL, NSB-NLON, GROTON, CT

CAS	PARAMETER	DETECTION FREQUENCY	MINIMUM CONC	MINIMUM QUALIFIER	MAXIMUM CONC	MAXIMUM QUALIFIER	DETECTION RANGE	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	RANGE OF NON-DETECTS	SAMPLE CONTAINING MAXIMUM CONCENTRATION	LOCATION OF MAXIMUM CONCENTRATION	AVERAGE OF POSITIVE DETECTS	AVERAGE OF ALL RESULTS
	Semivolatile Organics (ug/L)													
208-96-8	ACENAPHTHYLENE	1/6	0.3		0.3		0.3	0.013	2.1	0.013 - 2.1	3MSP01-08	3MSP01	0.3	0.47608
120-12-7	ANTHRACENE	2/6	0.24		0.28		0.24 - 0.28	0.03	2.1	0.03 - 2.1	3MSP01-07	3MSP01	0.26	0.36417
56-55-3	BENZO(A)ANTHRACENE	1/6	0.82		0.82		0.82	0.012	2.1	0.012 - 2.1	3MSP01-06	3MSP01	0.82	0.34367
50-32-8	BENZO(A)PYRENE	1/6	0.9		0.9		0.9	0.021	2.1	0.021 - 2.1	3MSP01-06	3MSP01	0.9	0.3585
205-99-2	BENZO(B)FLUORANTHENE	1/6	0.83		0.83		0.83	0.02	2.1	0.02 - 2.1	3MSP01-06	3MSP01	0.83	0.34667
191-24-2	BENZO(G,H,I)PERYLENE	1/6	0.98	J	0.98	J	0.98	0.009	2.1	0.009 - 2.1	3MSP01-06	3MSP01	0.98	0.36983
207-08-9	BENZO(K)FLUORANTHENE	1/6	0.44		0.44		0.44	0.02	2.1	0.02 - 2.1	3MSP01-06	3MSP01	0.44	0.28167
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	3/6	2.1	J	5.4		2.1 - 5.4	2	10	2 - 10	3MSP01-08	3MSP01	3.66667	3.66667
218-01-9	CHRYSENE	1/6	0.77		0.77		0.77	0.012	2.1	0.012 - 2.1	3MSP01-06	3MSP01	0.77	0.33533
84-74-2	DI-N-BUTYL PHTHALATE	1/6	0.9	J	0.9	J	0.9	2	10	2 - 10	3MSP01-07	3MSP01	0.9	2.575
53-70-3	DIBENZO(A,H)ANTHRACENE	1/6	0.095	J	0.095	J	0.095	0.014	2.1	0.014 - 2.1	3MSP01-06	3MSP01	0.095	0.22317
206-44-0	FLUORANTHENE	2/6	0.1		2		0.1 - 2	0.009	2.1	0.009 - 2.1	3MSP01-06	3MSP01	1.05	0.62575
86-73-7	FLUORENE	3/6	0.07	J	0.13		0.07 - 0.13	0.007	2.1	0.007 - 2.1	3MSP01-08	3MSP01	0.10333	0.31058
193-39-5	INDENO(1,2,3-CD)PYRENE	1/6	0.49	J	0.49	J	0.49	0.008	2.1	0.008 - 2.1	3MSP01-06	3MSP01	0.49	0.288
91-20-3	NAPHTHALENE	1/6	0.18	J	0.18	J	0.18	0.008	2.1	0.008 - 2.1	3M-SP01-05	3MSP01	0.18	0.373
85-01-8	PHENANTHRENE	2/6	0.021	J	1.1		0.021 - 1.1	0.004	2.1	0.004 - 2.1	3MSP01-06	3MSP01	0.5605	0.44583
129-00-0	PYRENE	1/6	1.8		1.8		1.8	0.008	2.1	0.008 - 2.1	3MSP01-06	3MSP01	1.8	0.57633
	Pesticides/PCBs (ug/L)													
72-54-8	4,4'-DDD	2/6	0.0086	J	0.023		0.0086 - 0.023	0.02	0.02	0.02	3MSP01-06	3MSP01	0.0158	0.01193
72-55-9	4,4'-DDE	1/6	0.02		0.02		0.02	0.02	0.02	0.02	3MSP01-06	3MSP01	0.02	0.01167
50-29-3	4,4'-DDT	1/6	0.056		0.056		0.056	0.02	0.02	0.02	3MSP01-06	3MSP01	0.056	0.01767
	Inorganics (ug/L)													
7429-90-5	ALUMINUM	3/6	698		2090		698 - 2090	12.9	99	12.9 - 99	3MSP01-06	3MSP01	1194.33333	612.25
7440-36-0	ANTIMONY	1/6	5.5	J	5.5	J	5.5	2.6	9.2	2.6 - 9.2	3MSP01-06	3MSP01	5.5	2.7
7440-38-2	ARSENIC	3/6	2.7	J	6.1	J	2.7 - 6.1	2.7	5	2.7 - 5	3MSP01-08	3MSP01	4.23333	3.075
7440-39-3	BARIUM	6/6	27.3		80.6		27.3 - 80.6	0	0	0	3M-SP01-05	3MSP01	56.81667	56.81667
7440-41-7	BERYLLIUM	1/6	0.14	J	0.14	J	0.14	0.1	0.33	0.1 - 0.33	3MSP01-06	3MSP01	0.14	0.10667
7440-70-2	CALCIUM	6/6	25200		53000		25200 - 53000	0	0	0	3MSP01-07	3MSP01	36233.33333	36233.33333
7440-47-3	CHROMIUM	1/6	4.1	J	4.1	J	4.1	0.5	5	0.5 - 5	3MSP01-06	3MSP01	4.1	1.86667
7440-48-4	COBALT	1/6	2.1	J	2.1	J	2.1	0.82	5	0.82 - 5	3MSP01-07	3MSP01	2.1	1.43
7440-50-8	COPPER	1/6	6.3		6.3		6.3	0.87	8.1	0.87 - 8.1	3MSP01-08	3MSP01	6.3	2.63083
7439-89-6	IRON	6/6	1820		11000		1820 - 11000	0	0	0	3MSP01-04	3MSP01	6463.33333	6463.33333
7439-89-6	IRON	6/6	1820		11000		1820 - 11000	0	0	0	3MSP01-08	3MSP01	6463.33333	6463.33333
7439-92-1	LEAD	3/6	1.2	J	11.6	J	1.2 - 11.6	1.9	8.8	1.9 - 8.8	3MSP01-06	3MSP01	6.2	4.24167
7439-95-4	MAGNESIUM	6/6	3320		11500		3320 - 11500	0	0	0	3MSP01-04	3MSP01	7690	7690
7439-96-5	MANGANESE	6/6	63		1170		63 - 1170	0	0	0	3MSP01-04	3MSP01	614.33333	614.33333
7439-97-6	MERCURY	1/5	0.11	J	0.11	J	0.11	0.1	0.2	0.1 - 0.2	3MSP01-01	3MSP01	0.11	0.082
7440-09-7	POTASSIUM	6/6	3120		6570	J	3120 - 6570	0	0	0	3MSP01-04	3MSP01	5308.66667	5308.66667
7440-23-5	SODIUM	6/6	7400	J	137000		7400 - 137000	0	0	0	3MSP01-04	3MSP01	70766.66667	70766.66667
7440-62-2	VANADIUM	1/6	1.2	J	1.2	J	1.2	0.9	7.6	0.9 - 7.6	3MSP01-01	3MSP01	1.2	1.47083
7440-66-6	ZINC	4/6	10.3		116		10.3 - 116	28.1	45.3	28.1 - 45.3	3MSP01-06	3MSP01	65.3	49.65
	Filtered Inorganics (ug/L)													
7429-90-5	ALUMINUM, FILTERED	1/6	84.1		84.1		84.1	12.9	72.7	12.9 - 72.7	3MSP01-06-F	3MSP01	84.1	31.825
7440-38-2	ARSENIC, FILTERED	1/6	2.6	J	2.6	J	2.6	2.6	5	2.6 - 5	3M-SP01-05-F	3MSP01	2.6	2.025
7440-39-3	BARIUM, FILTERED	6/6	18.4		76		18.4 - 76	0	0	0	3M-SP01-05-F	3MSP01	51.78333	51.78333
7440-41-7	BERYLLIUM, FILTERED	1/6	0.15	J	0.15	J	0.15	0.1	1.3	0.1 - 1.3	3MSP01-06-F	3MSP01	0.15	0.18333
7440-70-2	CALCIUM, FILTERED	6/6	25500		52500		25500 - 52500	0	0	0	3MSP01-01-F	3MSP01	34433.33333	34433.33333
7439-89-6	IRON, FILTERED	6/6	85.8		9520		85.8 - 9520	0	0	0	3MSP01-04-F	3MSP01	4606.46667	4606.46667
7439-95-4	MAGNESIUM, FILTERED	6/6	2910		11100		2910 - 11100	0	0	0	3MSP01-04-F	3MSP01	7331.66667	7331.66667
7439-96-5	MANGANESE, FILTERED	6/6	16		1140		16 - 1140	0	0	0	3MSP01-04-F	3MSP01	594.66667	594.66667
7440-09-7	POTASSIUM, FILTERED	6/6	3070		10600	J	3070 - 10600	0	0	0	3MSP01-08-F	3MSP01	5993.33333	5993.33333
7440-23-5	SODIUM, FILTERED	6/6	7250	J	126000		7250 - 126000	0	0	0	3MSP01-04-F	3MSP01	69091.66667	69091.66667
7440-28-0	THALLIUM, FILTERED	1/6	6.6	J	6.6	J	6.6	4.3	7.2	4.3 - 7.2	3MSP01-06-F	3MSP01	6.6	3.54167
7440-66-6	ZINC, FILTERED	4/6	13.3		65.6		13.3 - 65.6	24.6	37.2	24.6 - 37.2	3MSP01-06-F	3MSP01	49.325	38.03333
	Miscellaneous Parameters (mg/L)													
TTNUS008	ALKALINITY	5/5	71.4		161		71.4 - 161	0	0	0	3MSP01-01	3MSP01	98.88	98.88
TTNUS013	CARBONATE ALKALINITY	1/1	110		110		110	0	0	0	3MSP01-07	3MSP01	110	110
TTNUS017	CHEMICAL OXYGEN DEMAND	5/6	9		34.3		9 - 34.3	20	20	20	3MSP01-01	3MSP01	20.24	18.53333
16887-00-6	CHLORIDE	6/6	10.1		239	J	10.1 - 239	0	0	0	3MSP01-04	3MSP01	112.2	112.2
TTNUS022	HARDNESS	6/6	85.3		160		85.3 - 160	0	0	0	3MSP01-07	3MSP01	120.05	120.05
14808-79-8	SULFATE	5/6	7.9		18.6		7.9 - 18.6	20	20	20	3MSP01-01	3MSP01	11.16	10.98667
TTNUS040	TOTAL DISSOLVED SOLIDS	6/6	121		522		121 - 522	0	0	0	3MSP01-04	3MSP01	333.16667	333.16667
TTNUS003	TOTAL ORGANIC CARBON	6/6	3.4		11		3.4 - 11	0	0	0	3MSP01-07	3MSP01	6.73333	6.73333

Associated Samples:

3M-SP01-05
3M-SP01-05-F
3MSP01-01
3MSP01-01-F
3MSP01-04
3MSP01-04-F
3MSP01-06
3MSP01-06-F
3MSP01-07
3MSP01-07-F
3MSP01-08
3MSP01-08-F

TABLE G-6

SUMMARY OF FREQUENCY OF DETECTION INFORMATION
FOR DOWNGRADIENT STAFF GAUGES
AREA A LANDFILL, NSB-NLON, GROTON, CT

CAS	PARAMETER	DETECTION FREQUENCY	MINIMUM CONC	MINIMUM QUALIFIER	MAXIMUM CONC	MAXIMUM QUALIFIER	DETECTION RANGE	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	RANGE OF NON-DETECTS	SAMPLE CONTAINING MAXIMUM CONCENTRATION	LOCATION OF MAXIMUM CONC	AVERAGE OF POSITIVE DETECTS	AVERAGE OF ALL RESULTS
7440-23-5	SODIUM, FILTERED	44/44	4800		191000		4800 - 191000	0	0	0	SWSG24-03-F	SG-24	50447.84091	50447.84091
7440-62-2	VANADIUM, FILTERED	2/44	1.8	J	6.2	J	1.8 - 6.2	0.6	3.7	0.6 - 3.7	SWSG19-06-F	SG-19	4	1.00136
7440-66-6	ZINC, FILTERED	40/44	6.4		342	J	6.4 - 342	4.1	34.5	4.1 - 34.5	SWSG23-06-F	SG-23	66.81063	62.01534
	Miscellaneous Parameters (mg/L)													
TTNUS008	ALKALINITY	39/41	6.4		144		6.4 - 144	5	5	5	SWSG19-04	SG-19	49.22051	46.94146
TTNUS013	CARBONATE ALKALINITY	1/1	29		29		29	0	0	0	SWSG21-07	SG-21	29	29
TTNUS017	CHEMICAL OXYGEN DEMAND	28/42	13.8		101		13.8 - 101	5	20	5 - 20	SWSG23-04	SG-23	36.63214	26.62381
16887-00-6	CHLORIDE	42/42	6.1		398	J	6.1 - 398	0	0	0	SWSG24-03	SG-24	89.9619	89.9619
TTNUS022	HARDNESS	40/42	10.1		172		10.1 - 172	1	6.5	1 - 6.5	SWSG23-01	SG-23	69.27625	66.06667
14808-79-8	SULFATE	26/42	1.8		45.5		1.8 - 45.5	1	20	1 - 20	SWSG23-04	SG-23	10.06154	8.88333
TTNUS040	TOTAL DISSOLVED SOLIDS	41/42	32		643		32 - 643	10	10	10	SWSG24-03	SG-24	235.10976	229.63095
TTNUS003	TOTAL ORGANIC CARBON	36/42	1.2		16		1.2 - 16	0.52	4.5	0.52 - 4.5	SWSG18-08	SG-18	7.19444	6.32405
TTNUS044	TOTAL SUSPENDED SOLIDS	5/5	24	J	141	J	24 - 141	0	0	0	SWSG19-04	SG-19	82.4	82.4

Associated Samples:

SWSG18-01	SWSG19-06-D	SWSG21-01-D	SWSG22-07-F-AVG
SWSG18-01-F	SWSG19-06-F	SWSG21-01-F	SWSG22-07-F-D
SWSG18-03	SWSG19-06-F-AVG	SWSG21-01-F-AVG	SWSG23-01
SWSG18-03-F	SWSG19-06-F-D	SWSG21-01-F-D	SWSG23-01-F
SWSG18-04	SWSG19-07	SWSG21-03	SWSG23-03
SWSG18-04-AVG	SWSG19-07-F	SWSG21-03-F	SWSG23-03-F
SWSG18-04-D	SWSG19-08	SWSG21-04	SWSG23-04
SWSG18-04-F	SWSG19-08-F	SWSG21-04-F	SWSG23-04-F
SWSG18-04-F-AVG	SWSG20-01	SWSG21-05	SWSG23-05
SWSG18-04-F-D	SWSG20-01-F	SWSG21-05-F	SWSG23-05-F
SWSG18-05	SWSG20-03	SWSG21-06	SWSG23-06
SWSG18-05-F	SWSG20-03-AVG	SWSG21-06-F	SWSG23-06-F
SWSG18-06	SWSG20-03-D	SWSG21-07	SWSG23-07
SWSG18-06-F	SWSG20-03-F	SWSG21-07-F	SWSG23-07-F
SWSG18-07	SWSG20-03-F-AVG	SWSG21-08	SWSG24-01
SWSG18-07-F	SWSG20-03-F-D	SWSG21-08-F	SWSG24-01-F
SWSG18-08	SWSG20-04	SWSG22-01	SWSG24-03
SWSG18-08-F	SWSG20-04-F	SWSG22-01-F	SWSG24-03-F
SWSG19-01	SWSG20-05	SWSG22-03	SWSG24-05
SWSG19-01-F	SWSG20-05-F	SWSG22-03-F	SWSG24-05-AVG
SWSG19-03	SWSG20-06	SWSG22-05	SWSG24-05-D
SWSG19-03-F	SWSG20-06-F	SWSG22-05-F	SWSG24-05-F
SWSG19-04	SWSG20-07	SWSG22-06	SWSG24-05-F-AVG
SWSG19-04-F	SWSG20-07-F	SWSG22-06-F	SWSG24-05-F-D
SWSG19-05	SWSG20-08	SWSG22-07	SWSG24-06
SWSG19-05-F	SWSG20-08-F	SWSG22-07-AVG	SWSG24-06-F
SWSG19-06	SWSG21-01	SWSG22-07-D	SWSG24-07
SWSG19-06-AVG	SWSG21-01-AVG	SWSG22-07-F	SWSG24-07-F

TABLE G-6

SUMMARY OF FREQUENCY OF DETECTION INFORMATION
FOR DOWNGRADIENT STAFF GAUGES
AREA A LANDFILL, NSB-NLON, GROTON, CT

CAS	PARAMETER	DETECTION FREQUENCY	MINIMUM CONC	MINIMUM QUALIFIER	MAXIMUM CONC	MAXIMUM QUALIFIER	DETECTION RANGE	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	RANGE OF NON-DETECTS	SAMPLE CONTAINING MAXIMUM CONCENTRATION	LOCATION OF MAXIMUM CONC	AVERAGE OF POSITIVE DETECTS	AVERAGE OF ALL RESULTS
	Volatile Organics (ug/L)													
78-93-3	2-BUTANONE	1/20	2	J	2	J	2	5	5	5	SWSG19-04	SG-19	2	2.475
67-64-1	ACETONE	8/33	3	J	15		3 - 15	5	5	5	SWSG21-04	SG-21	5.9375	3.33333
71-43-2	BENZENE	3/42	0.14	J	0.4	J	0.14 - 0.4	1	1	1	SWSG19-03	SG-19	0.31333	0.48667
71-43-2	BENZENE	3/42	0.14	J	0.4	J	0.14 - 0.4	1	1	1	SWSG19-04	SG-19	0.31333	0.48667
75-15-0	CARBON DISULFIDE	1/42	0.18	J	0.26	J	0.18 - 0.26	1	1	1	SWSG24-05	SG-24	0.22	0.49333
108-90-7	CHLOROBENZENE	2/42	0.17	J	0.3	J	0.17 - 0.3	1	1	1	SWSG19-03	SG-19	0.235	0.48738
100-41-4	ETHYLBENZENE	2/42	0.1	J	0.2	J	0.1 - 0.2	1	1	1	SWSG19-03	SG-19	0.15	0.48333
75-09-2	METHYLENE CHLORIDE	1/42	0.7	J	0.7	J	0.7	2	2	2	SWSG18-07	SG-18	0.7	0.99286
108-88-3	TOLUENE	18/42	0.1	J	20		0.1 - 20	1	1	1	SWSG19-04	SG-19	3.15	1.63571
1330-20-7	TOTAL XYLENES	2/38	0.21	J	0.57	J	0.21 - 0.57	1	1	1	SWSG19-04	SG-19	0.39	0.49421
	Semivolatile Organics (ug/L)													
90-12-0	1-METHYLNAPHTHALENE	1/18	1.4	J	1.4	J	1.4	0.5	1.1	0.5 - 1.1	SWSG19-03	SG-19	1.4	0.50139
91-57-6	2-METHYLNAPHTHALENE	2/28	0.06	J	0.89	J	0.06 - 0.89	0.5	5	0.5 - 5	SWSG19-04	SG-19	0.475	0.90625
83-32-9	ACENAPHTHENE	3/42	0.21	J	1.3	J	0.21 - 1.3	0.016	1.1	0.016 - 1.1	SWSG19-04	SG-19	0.87	0.386
208-96-8	ACENAPHTHYLENE	1/42	0.2		0.2		0.2	0.013	1.1	0.013 - 1.1	SWSG21-08	SG-21	0.2	0.35433
120-12-7	ANTHRACENE	5/42	0.037	J	0.35	J	0.037 - 0.35	0.03	1.1	0.03 - 1.1	SWSG19-07	SG-19	0.1954	0.23564
56-55-3	BENZO(A)ANTHRACENE	4/42	0.029	J	0.093	J	0.029 - 0.093	0.012	0.21	0.012 - 0.21	SWSG24-05	SG-24	0.055	0.06801
56-55-3	BENZO(A)ANTHRACENE	4/42	0.029	J	0.093	J	0.029 - 0.093	0.012	0.21	0.012 - 0.21	SWSG24-05-D	SG-24	0.055	0.06801
50-32-8	BENZO(A)PYRENE	6/42	0.022	J	0.11	J	0.022 - 0.11	0.021	0.21	0.021 - 0.21	SWSG18-06	SG-18	0.04842	0.06589
205-99-2	BENZO(B)FLUORANTHENE	2/42	0.037	J	0.069	J	0.037 - 0.069	0.02	0.21	0.02 - 0.21	SWSG24-05	SG-24	0.049	0.07073
191-24-2	BENZO(G,H,I)PERYLENE	6/42	0.023	J	0.2	J	0.023 - 0.2	0.009	0.21	0.009 - 0.21	SWSG18-06	SG-18	0.07017	0.06771
207-08-9	BENZO(K)FLUORANTHENE	3/42	0.026	J	0.083	J	0.026 - 0.083	0.02	0.21	0.02 - 0.21	SWSG18-06	SG-18	0.05333	0.06982
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	7/42	1.1	J	4.1	J	1.1 - 4.1	2	10	2 - 10	SWSG21-08	SG-21	2.01429	2.57738
218-01-9	CHRYSENE	6/42	0.022	J	0.16	J	0.022 - 0.16	0.012	0.21	0.012 - 0.21	SWSG18-06	SG-18	0.07433	0.06863
84-74-2	DI-N-BUTYL PHTHALATE	5/42	0.8	J	1.5	J	0.8 - 1.5	2	10	2 - 10	SWSG21-07	SG-21	1.12	2.49405
117-84-0	DI-N-OCTYL PHTHALATE	1/42	2.3	J	2.3	J	2.3	2	10	2 - 10	SWSG21-08	SG-21	2.3	2.65357
84-66-2	DIETHYL PHTHALATE	1/42	0.5	J	0.5	J	0.5	2	10	2 - 10	SWSG21-07	SG-21	0.5	2.61071
206-44-0	FLUORANTHENE	12/42	0.022	J	0.42		0.022 - 0.42	0.009	1.1	0.009 - 1.1	SWSG18-06	SG-18	0.12942	0.22437
86-73-7	FLUORENE	6/42	0.031	J	0.63	J	0.031 - 0.63	0.007	1.1	0.007 - 1.1	SWSG19-04	SG-19	0.32233	0.25211
193-39-5	INDENO(1,2,3-CD)PYRENE	4/42	0.022	J	0.091	J	0.022 - 0.091	0.008	0.21	0.008 - 0.21	SWSG18-06	SG-18	0.05075	0.06718
91-20-3	NAPHTHALENE	3/42	0.42	J	5	J	0.42 - 5	0.008	1.1	0.008 - 1.1	SWSG19-04	SG-19	3.00667	0.53776
85-01-8	PHENANTHRENE	12/42	0.024	J	0.39		0.024 - 0.39	0.004	1.1	0.004 - 1.1	SWSG19-05	SG-19	0.1125	0.219
129-00-0	PYRENE	10/42	0.022	J	0.3		0.022 - 0.3	0.008	1.1	0.008 - 1.1	SWSG18-06	SG-18	0.1372	0.22929
	Pesticides/PCBs (ug/L)													
72-54-8	4,4'-DDD	2/42	0.011	J	0.066		0.011 - 0.066	0.02	0.02	0.02	SWSG22-01	SG-22	0.0385	0.01136
	Inorganics (ug/L)													
7429-90-5	ALUMINUM	15/44	154		2180		154 - 2180	12.9	402	12.9 - 402	SWSG18-08	SG-18	654.74333	262.2983
7440-38-2	ARSENIC	14/44	2.7	J	9.1	J	2.7 - 9.1	2.2	5	2.2 - 5	SWSG19-08	SG-19	5.69643	2.83523
7440-39-3	BARIUM	41/44	12.7		184		12.7 - 184	7.2	9.8	7.2 - 9.8	SWSG24-03	SG-24	45.6061	42.78523
7440-41-7	BERYLLIUM	2/44	0.17	J	0.42		0.17 - 0.42	0.1	0.58	0.1 - 0.58	SWSG18-06	SG-18	0.295	0.10614
7440-43-9	CADMIUM	1/44	0.31		0.42		0.31 - 0.42	0.2	3	0.2 - 3	SWSG21-01	SG-21	0.365	0.67517
7440-70-2	CALCIUM	44/44	1630		45900		1630 - 45900	0	0	0	SWSG19-04	SG-19	17526.81818	17526.81818
7440-47-3	CHROMIUM	3/44	3.6	J	38.4	J	3.6 - 38.4	0.5	5	0.5 - 5	SWSG22-01	SG-22	15.43333	2.19659
7440-48-4	COBALT	10/44	1.9	J	19.2		1.9 - 19.2	0.6	5	0.6 - 5	SWSG24-03	SG-24	6.1125	2.27102
7440-50-8	COPPER	13/44	1.8	J	18.4		1.8 - 18.4	0.87	15.5	0.87 - 15.5	SWSG20-08	SG-20	8.22692	3.70761
7439-89-6	IRON	44/44	314		40300		314 - 40300	0	0	0	SWSG24-03	SG-24	9784.52273	9784.52273
7439-92-1	LEAD	9/44	2	J	9.5		2 - 9.5	1.3	6.6	1.3 - 6.6	SWSG20-07	SG-20	4.55833	1.91705
7439-95-4	MAGNESIUM	41/44	771		21900		771 - 21900	591	718	591 - 718	SWSG24-03	SG-24	4241.90244	3975.68182
7439-96-5	MANGANESE	44/44	44.9		3710		44.9 - 3710	0	0	0	SWSG24-03	SG-24	564.30568	564.30568
7439-97-6	MERCURY	3/42	0.18	J	0.38		0.18 - 0.38	0.08	0.2	0.08 - 0.2	SWSG19-04	SG-19	0.245	0.08167
7440-02-0	NICKEL	18/44	2.1	J	20.9		2.1 - 20.9	1.2	9.8	1.2 - 9.8	SWSG22-01	SG-22	6.15278	3.85284
7440-09-7	POTASSIUM	39/44	1070		21700	J	1070 - 21700	1040	3490	1040 - 3490	SWSG21-07	SG-21	3989.74359	3656.42045
7440-23-5	SODIUM	44/44	3730		178000		3730 - 178000	0	0	0	SWSG24-03	SG-24	48503.29545	48503.29545
7440-28-0	THALLIUM	2/44	6.1	J	6.4	J	6.1 - 6.4	4.1	7.2	4.1 - 7.2	SWSG21-07	SG-21	6.25	2.92614
7440-62-2	VANADIUM	10/44	1.6	J	19.7	J	1.6 - 19.7	0.6	7.2	0.6 - 7.2	SWSG18-08	SG-18	7.17	2.45886
7440-66-6	ZINC	43/44	11.3	J	334		11.3 - 334	15.8	26.2	15.8 - 26.2	SWSG23-06	SG-23	80.27907	78.63409
	Filtered Inorganics (ug/L)													
7440-38-2	ARSENIC, FILTERED	4/44	5.6	J	5.9	J	5.6 - 5.9	2.2	6.2	2.2 - 6.2	SWSG22-07-F	SG-22	5.85	1.98295
7440-39-3	BARIUM, FILTERED	41/44	12.9		178		12.9 - 178	7.6	19	7.6 - 19	SWSG24-03-F	SG-24	41.32805	38.90568
7440-41-7	BERYLLIUM, FILTERED	2/44	0.15	J	0.32		0.15 - 0.32	0.1	1.3	0.1 - 1.3	SWSG18-06-F	SG-18	0.235	0.12182
7440-70-2	CALCIUM, FILTERED	44/44	1570		49600		1570 - 49600	0	0	0	SWSG19-04-F	SG-19	17528.75	17528.75
7440-47-3	CHROMIUM, FILTERED	1/44	27.5		27.5		27.5	0.5	5	0.5 - 5	SWSG23-07-F	SG-23	27.5	1.73977
7440-48-4	COBALT, FILTERED	6/44	1.4	J	18.4		1.4 - 18.4	0.6	5	0.6 - 5	SWSG24-03-F	SG-24	8.01667	2.0867
7440-50-8	COPPER, FILTERED	6/44	1.5	J	11.4		1.5 - 11.4	0.87	6.4	0.87 - 6.4	SWSG24-01-F	SG-24	4.50833	1.4767
7439-89-6	IRON, FILTERED	40/44	152		33000		152 - 33000	110	236	110 - 236	SWSG19-04-F	SG-19	7445.875	6776.28977
7439-95-4	MAGNESIUM, FILTERED	41/44	892		23500		892 - 23500	553	770	553 - 770	SWSG24-03-F	SG-24	4233.96341	3968.72727
7439-96-5	MANGANESE, FILTERED	44/44	38.2		3590		38.2 - 3590	0	0	0	SWSG24-03-F	SG-24	540.11364	540.11364
7439-97-6	MERCURY, FILTERED	4/43	0.13	J	0.33		0.13 - 0.33	0.079	0.2	0.079 - 0.2	SWSG23-04-F	SG-23	0.2125	0.08278
7440-02-0	NICKEL, FILTERED	14/44	1.9	J	15.1		1.9 - 15.1	1.2	9.8	1.2 - 9.8	SWSG23-07-F	SG-23	5.15714	3.17102
7440-09-7	POTASSIUM, FILTERED	39/44	1170	J	9430		1170 - 9430	981	3320	981 - 3320	SWSG24-03-F	SG-24	3650.12821	3360.46591
7440-22-4	SILVER, FILTERED	2/44	1.4	J	3		1.4 - 3	0.9	5	0.9 - 5	SWSG23-01-F	SG-23	2.2	1.16364

TABLE G-7

SUMMARY OF FREQUENCY OF DETECTION INFORMATION
DOWNGRADIENT SOIL SAMPLES
AREA A LANDFILL, NSB-NLON, GROTON, CT

CAS	PARAMETER	DETECTION FREQUENCY	MINIMUM CONC	MINIMUM QUALIFIER	MAXIMUM CONC	MAXIMUM QUALIFIER	DETECTION RANGE	MINIMUM NON-DETECT	MAXIMUM NON-DETECT	RANGE OF NON-DETECTS	SAMPLE CONTAINING MAXIMUM CONCENTRATION	LOCATION OF MAXIMUM CONCENTRATION	AVERAGE OF POSITIVE DETECTS	AVERAGE OF ALL RESULTS
	Volatile Organics (ug/kg)													
67-64-1	ACETONE	11/11	22		280		22 - 280	0	0	0	2W-SU-43DSA-04-99	2WMW43DS	89	89
75-15-0	CARBON DISULFIDE	5/11	6	J	27	J	6 - 27	10	27	10 - 27	2W-SU-43DSA-04-99	2WMW43DS	12	10.13636
75-09-2	METHYLENE CHLORIDE	11/11	2		9		2 - 9	0	0	0	2W-SU-38DS-02-99	2WMW38DS,2WMW42DS	4.90909	4.90909
	Semivolatile Organics (ug/kg)													
83-32-9	ACENAPHTHENE	1/11	270		270		270	39	75	39 - 75	2W-SU-39DS-00-99	2WMW39DS	270	53.38636
56-55-3	BENZO(A)ANTHRACENE	6/11	30		260		30 - 260	5.9	11	5.9 - 11	2W-SU-39DS-00-99	2WMW39DS	72.5	41.62273
50-32-8	BENZO(A)PYRENE	7/11	31		310		31 - 310	5.9	11	5.9 - 11	2W-SU-39DS-00-99	2WMW39DS	96.28571	62.89545
205-99-2	BENZO(B)FLUORANTHENE	9/11	68		430		68 - 430	5.9	9	5.9 - 9	2W-SU-43DSA-04-99	2WMW43DS	236.27778	193.94091
191-24-2	BENZO(G,H,I)PERYLENE	4/11	49		260		49 - 260	7.9	15	7.9 - 15	2W-SU-39DS-00-99	2WMW39DS	109	43.60455
207-08-9	BENZO(K)FLUORANTHENE	3/11	51		180		51 - 180	5.9	11	5.9 - 11	2W-SU-39DS-00-99	2WMW39DS	113.66667	34.42273
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/11	51.4	J	51.4	J	51.4	180	350	180 - 350	2W-SU-39DS-00-99	2WMW39DS	51.4	141.94545
218-01-9	CHRYSENE	4/11	28		290		28 - 290	5.9	11	5.9 - 11	2W-SU-39DS-00-99	2WMW39DS	102	40.09091
53-70-3	DIBENZO(A,H)ANTHRACENE	2/11	15		32		15 - 32	9.7	19	9.7 - 19	2W-SU-39DS-00-99	2WMW39DS	23.5	10.80455
206-44-0	FLUORANTHENE	7/11	73		890		73 - 890	7.9	15	7.9 - 15	2W-SU-39DS-00-99	2WMW39DS	215.14286	139.05909
193-39-5	INDENO(1,2,3-CD)PYRENE	4/11	29		140		29 - 140	5.9	11	5.9 - 11	2W-SU-39DS-00-99	2WMW39DS	62.5	25.69545
85-01-8	PHENANTHRENE	1/11	300		300		300	5.9	91	5.9 - 91	2W-SU-39DS-00-99	2WMW39DS	300	33.51364
129-00-0	PYRENE	8/11	39		810		39 - 810	7.9	14	7.9 - 14	2W-SU-39DS-00-99	2WMW39DS	186.75	137.28636
	Pesticides/PCBs (ug/kg)													
72-54-8	4,4'-DDD	3/11	10		40		10 - 40	3.5	7.2	3.5 - 7.2	2W-SU-39DS-00-99	2WMW39DS,2WMW45DS	30	10.36136
72-55-9	4,4'-DDE	2/11	5.2		10		5.2 - 10	3.5	7.2	3.5 - 7.2	2W-SU-45DS-00-99	2WMW45DS	7.6	3.86591
50-29-3	4,4'-DDT	1/11	28		28		28	3.5	7.2	3.5 - 7.2	2W-SU-39DS-00-99	2WMW39DS	28	5.29318
5103-71-9	ALPHA-CHLORDANE	1/11	3		3		3	1.8	3.6	1.8 - 3.6	2W-SU-39DS-00-99	2WMW39DS	3	1.64773
11096-82-5	AROCLOR-1260	1/11	110		110		110	35	72	35 - 72	2W-SU-39DS-00-99	2WMW39DS	110	37.47727
5103-74-2	GAMMA-CHLORDANE	1/11	2.2		2.2		2.2	1.8	3.6	1.8 - 3.6	2W-SU-39DS-00-99	2WMW39DS	2.2	1.575
	Inorganics (mg/kg)													
7429-90-5	ALUMINUM	11/11	4860		19700		4860 - 19700	0	0	0	2W-SU-46DS-04-99	2WMW46DS	14120	14120
7440-38-2	ARSENIC	11/11	1.2		15.1		1.2 - 15.1	1.1	1.1	1.1	2W-SU-45DS-00-99	2WMW45DS	8.53864	8.53864
7440-39-3	BARIUM	11/11	28.3		71.5		28.3 - 71.5	0	0	0	3-SU-37S-02-99	3MW37S	49.37273	49.37273
7440-41-7	BERYLLIUM	11/11	0.28	B	1.3	B	0.28 - 1.3	0	0	0	2W-SU-38DS-02-99	2WMW38DS	0.92364	0.92364
7440-43-9	CADMIUM	6/11	0.16	B	0.67	B	0.16 - 0.67	0.11	0.2	0.11 - 0.2	2W-SU-46DS-04-99	2WMW46DS	0.40563	0.31568
7440-70-2	CALCIUM	11/11	1070		6790		1070 - 6790	0	0	0	2W-SU-44DS-04-99	2WMW44DS	3611.36364	3611.36364
7440-47-3	CHROMIUM	11/11	10		56.5		10 - 56.5	0	0	0	2W-SU-46DS-04-99	2WMW46DS	36.87273	36.87273
7440-48-4	COBALT	11/11	4.8	B	13.2	B	4.8 - 13.2	0	0	0	2W-SU-46DS-04-99	2WMW46DS	9.85455	9.85455
7440-50-8	COPPER	11/11	12.4		31.6		12.4 - 31.6	0	0	0	3-SU-37S-02-99	3MW37S	20.92273	20.92273
7439-89-6	IRON	11/11	8100		35000		8100 - 35000	0	0	0	2W-SU-38DS-02-99	2WMW38DS	23840.90909	23840.90909
7439-92-1	LEAD	11/11	2.5		85		2.5 - 85	0	0	0	2W-SU-43DSA-04-99	2WMW43DS	20.75909	20.75909
7439-95-4	MAGNESIUM	11/11	2170		9580		2170 - 9580	0	0	0	2W-SU-46DS-04-99	2WMW46DS	6439.54545	6439.54545
7439-96-5	MANGANESE	11/11	99.2		454		99.2 - 454	0	0	0	2W-SU-38DS-02-99	2WMW38DS	281.15455	281.15455
7439-97-6	MERCURY	1/11	0.11		0.11		0.11	0.05	0.1	0.05 - 0.1	2W-SU-43DSA-04-99	2WMW43DS	0.11	0.04523
7440-02-0	NICKEL	11/11	7.2		28.3		7.2 - 28.3	0	0	0	2W-SU-38DS-02-99	2WMW38DS	20.52727	20.52727
7440-09-7	POTASSIUM	11/11	1000		5400		1000 - 5400	0	0	0	2W-SU-46DS-04-99	2WMW46DS	3874.54545	3874.54545
7782-49-2	SELENIUM	7/11	1.8		3		1.8 - 3	0.97	1.7	0.97 - 1.7	2W-SU-38DS-02-99	2WMW38DS	2.31786	1.70545
7440-23-5	SODIUM	11/11	224		10700		224 - 10700	0	0	0	2W-SU-46DS-04-99	2WMW46DS	4435.77273	4435.77273
7440-62-2	VANADIUM	11/11	20.7		51.1		20.7 - 51.1	0	0	0	2W-SU-38DS-02-99	2WMW38DS	38.95455	38.95455
7440-66-6	ZINC	11/11	28.9		87.6		28.9 - 87.6	0	0	0	2W-SU-43DSA-04-99	2WMW43DS	63.28636	63.28636

Associated Samples:

2W-SU-38DS-02-99
2W-SU-39DS-00-99
2W-SU-40DS-06-99
2W-SU-41DS-04-99
2W-SU-42DS-7.5-99
2W-SU-43DSA-04-99
2W-SU-44DS-04-99
2W-SU-44DS-04-99-AVG
2W-SU-44DS-04-99-D
2W-SU-45DS-00-99
2W-SU-46DS-04-99
2W-SU-47DS-02-99
3-SU-37S-02-99
3-SU-37S-02-99-AVG
3-SU-37S-02-99-D

APPENDIX H

STATISTICAL TABLES AND TEMPORAL PLOTS

STATISTICAL TABLES

Table H-1
COEFFICIENTS A_i FOR W TEST OF NORMALITY FOR N=2 to 50

i/n	2	3	4	5	6	7	8	9	10
1	0.7071	0.7071	0.6872	0.6646	0.6431	0.6233	0.6052	0.5888	0.5739
2			0.1677	0.2413	0.2806	0.3031	0.3164	0.3244	0.3291
3					0.0875	0.1401	0.1743	0.1976	0.2141
4							0.0561	0.0947	0.1224
5									0.0399

i/n	11	12	13	14	15	16	17	18	19	20
1	0.5601	0.5475	0.5359	0.5251	0.5150	0.5056	0.4968	0.4886	0.4808	0.4734
2	0.3315	0.3325	0.3325	0.3318	0.3306	0.3290	0.3273	0.3253	0.3232	0.3211
3	0.2260	0.2347	0.2412	0.2460	0.2495	0.2521	0.2540	0.2553	0.2561	0.2565
4	0.1429	0.1586	0.1707	0.1802	0.1878	0.1939	0.1988	0.2027	0.2059	0.2085
5	0.0695	0.0922	0.1099	0.1240	0.1353	0.1447	0.1524	0.1587	0.1641	0.1686
6		0.0303	0.0539	0.0727	0.0880	0.1005	0.1109	0.1197	0.1271	0.1334
7				0.0240	0.0433	0.0593	0.0725	0.0837	0.0932	0.1013
8						0.0196	0.0359	0.0496	0.0612	0.0711
9								0.0163	0.0303	0.0422
10										0.0140

i/n	21	22	23	24	25	26	27	28	29	30
1	0.4643	0.4590	0.4542	0.4493	0.4450	0.4407	0.4366	0.4328	0.4291	0.4254
2	0.3185	0.3156	0.3126	0.3098	0.3069	0.3043	0.3018	0.2992	0.2968	0.2944
3	0.2578	0.2571	0.2563	0.2554	0.2543	0.2533	0.2522	0.2510	0.2499	0.2487
4	0.2119	0.2131	0.2139	0.2145	0.2148	0.2151	0.2152	0.2151	0.2150	0.2148
5	0.1736	0.1764	0.1787	0.1807	0.1822	0.1836	0.1848	0.1857	0.1864	0.1870
6	0.1399	0.1443	0.1480	0.1512	0.1539	0.1563	0.1584	0.1601	0.1616	0.1630
7	0.1092	0.1150	0.1201	0.1245	0.1283	0.1316	0.1346	0.1372	0.1395	0.1415
8	0.0804	0.0878	0.0941	0.0997	0.1046	0.1089	0.1128	0.1162	0.1192	0.1219
9	0.0530	0.0618	0.0696	0.0764	0.0823	0.0876	0.0923	0.0965	0.1002	0.1036
10	0.0263	0.0368	0.0459	0.0539	0.0610	0.0672	0.0728	0.0778	0.0822	0.0862
11		0.0122	0.0228	0.0321	0.0403	0.0476	0.0540	0.0598	0.0650	0.0697
12				0.0107	0.0200	0.0284	0.0358	0.0424	0.0483	0.0537
13						0.0094	0.0178	0.0253	0.0320	0.0381
14								0.0084	0.0159	0.0227
15										0.0076

i/n	31	32	33	34	35	36	37	38	39	40
1	0.4220	0.4188	0.4156	0.4127	0.4096	0.4068	0.4040	0.4015	0.9689	0.3964
2	0.2921	0.2898	0.2876	0.2854	0.2834	0.2813	0.2794	0.2774	0.2755	0.2737
3	0.2475	0.2463	0.2451	0.2439	0.2427	0.2415	0.2403	0.2391	0.2380	0.2368
4	0.2145	0.2141	0.2137	0.2132	0.2127	0.2121	0.2116	0.2110	0.2104	0.2098
5	0.1874	0.1878	0.1880	0.1882	0.1883	0.1883	0.1883	0.1881	0.1880	0.1878
6	0.1641	0.1651	0.1660	0.1667	0.1673	0.1678	0.1683	0.1686	0.1689	0.1691
7	0.1433	0.1449	0.1463	0.1475	0.1487	0.1496	0.1503	0.1513	0.1520	0.1526
8	0.1243	0.1265	0.1284	0.1301	0.1317	0.1331	0.1344	0.1356	0.1366	0.1376
9	0.1066	0.1093	0.1118	0.1140	0.1160	0.1179	0.1196	0.1211	0.1225	0.1237
10	0.0899	0.0931	0.0961	0.0988	0.1013	0.1036	0.1056	0.1075	0.1092	0.1108
11	0.0739	0.0777	0.0821	0.0844	0.0873	0.0900	0.0924	0.0947	0.0967	0.0986
12	0.0585	0.0629	0.0669	0.0706	0.0739	0.0770	0.0798	0.0824	0.0848	0.0870
13	0.0435	0.0485	0.0530	0.0572	0.0610	0.0645	0.0677	0.0706	0.0733	0.0759
14	0.0289	0.0344	0.0395	0.0441	0.0484	0.0523	0.0559	0.0592	0.0622	0.0651
15	0.0144	0.0206	0.0262	0.0314	0.0361	0.0404	0.0444	0.0481	0.0515	0.0546
16		0.0068	0.0131	0.0187	0.0239	0.0287	0.0331	0.0372	0.0409	0.0444
17				0.0062	0.0119	0.0172	0.0220	0.0264	0.0305	0.0343
18						0.0057	0.0110	0.0158	0.0203	0.0244
19								0.0053	0.0101	0.0146
20										0.0049

i/n	41	42	43	44	45	46	47	48	49	50
1	0.3940	0.3917	0.3894	0.3872	0.3850	0.3830	0.3808	0.3789	0.3770	0.3751
2	0.2719	0.2701	0.2684	0.2667	0.2651	0.2635	0.2620	0.2604	0.2589	0.2574
3	0.2357	0.2345	0.2334	0.2323	0.2313	0.2302	0.2291	0.2281	0.2271	0.2260
4	0.2091	0.2085	0.2078	0.2072	0.2065	0.2058	0.2052	0.2045	0.2038	0.2032
5	0.1876	0.1874	0.1871	0.1868	0.1865	0.1862	0.1859	0.1855	0.1851	0.1847
6	0.1693	0.1694	0.1695	0.1695	0.1695	0.1695	0.1695	0.1693	0.1692	0.1691
7	0.1531	0.1535	0.1539	0.1542	0.1545	0.1548	0.1550	0.1551	0.1553	0.1554
8	0.1384	0.1392	0.1398	0.1405	0.1410	0.1415	0.1420	0.1423	0.1427	0.1430
9	0.1249	0.1259	0.1269	0.1278	0.1286	0.1293	0.1300	0.1306	0.1312	0.1317
10	0.1123	0.1136	0.1149	0.1160	0.1170	0.1180	0.1189	0.1197	0.1205	0.1212
11	0.1004	0.1020	0.1035	0.1049	0.1062	0.1073	0.1085	0.1095	0.1105	0.1113
12	0.0891	0.0909	0.0927	0.0943	0.0959	0.0972	0.0986	0.0998	0.1010	0.1020
13	0.0782	0.0804	0.0824	0.0842	0.0860	0.0876	0.0892	0.0906	0.0919	0.0932
14	0.0677	0.0701	0.0724	0.0745	0.0775	0.0785	0.0801	0.0817	0.0832	0.0846
15	0.0575	0.0602	0.0628	0.0651	0.0673	0.0694	0.0713	0.0731	0.0748	0.0764
16	0.0476	0.0506	0.0534	0.0560	0.0584	0.0607	0.0628	0.0648	0.0667	0.0685
17	0.0379	0.0411	0.0442	0.0471	0.0497	0.0522	0.0546	0.0568	0.0588	0.0608
18	0.0283	0.0318	0.0352	0.0383	0.0412	0.0439	0.0465	0.0489	0.0511	0.0532
19	0.0188	0.0227	0.0263	0.0296	0.0328	0.0357	0.0385	0.0411	0.0436	0.0459
20	0.0094	0.0136	0.0175	0.0211	0.0245	0.0277	0.0307	0.0335	0.0361	0.0386
21		0.0045	0.0087	0.0126	0.0163	0.0197	0.0229	0.0259	0.0288	0.0314
22				0.0042	0.0081	0.0188	0.0153	0.0185	0.0215	0.0244
23						0.0039	0.0076	0.0111	0.0143	0.0174
24								0.0037	0.0071	0.0104
25										0.0350

Table H-2
PERCENTAGE POINTS OF THE W TEST FOR N=3 to 50

n	0.01	0.05
3	0.753	0.767
4	0.687	0.748
5	0.686	0.762
6	0.713	0.788
7	0.730	0.803
8	0.749	0.818
9	0.764	0.829
10	0.781	0.842
11	0.792	0.850
12	0.805	0.859
13	0.814	0.866
14	0.825	0.874
15	0.835	0.881
16	0.844	0.887
17	0.851	0.892
18	0.858	0.897
19	0.863	0.901
20	0.868	0.905
21	0.873	0.908
22	0.878	0.911
23	0.881	0.914
24	0.884	0.916
25	0.888	0.918
26	0.891	0.920
27	0.894	0.923
28	0.896	0.924
29	0.898	0.926
30	0.900	0.927

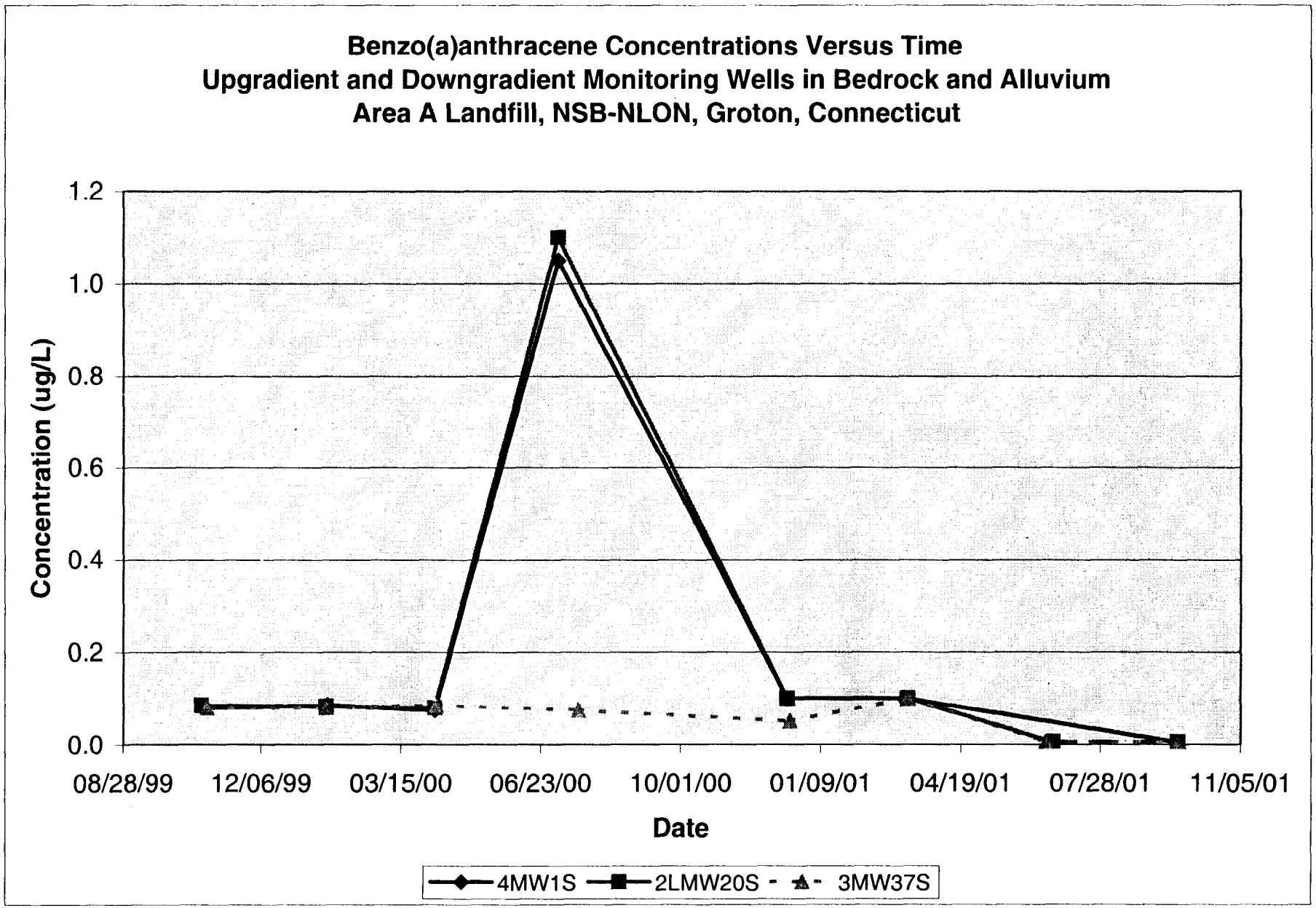
n	0.01	0.05
31	0.902	0.929
32	0.904	0.930
33	0.906	0.931
34	0.908	0.933
35	0.910	0.934
36	0.912	0.935
37	0.914	0.936
38	0.916	0.938
39	0.917	0.939
40	0.919	0.940
41	0.920	0.941
42	0.922	0.942
43	0.923	0.943
44	0.924	0.944
45	0.926	0.945
46	0.927	0.945
47	0.928	0.946
48	0.929	0.947
49	0.929	0.947
50	0.930	0.947

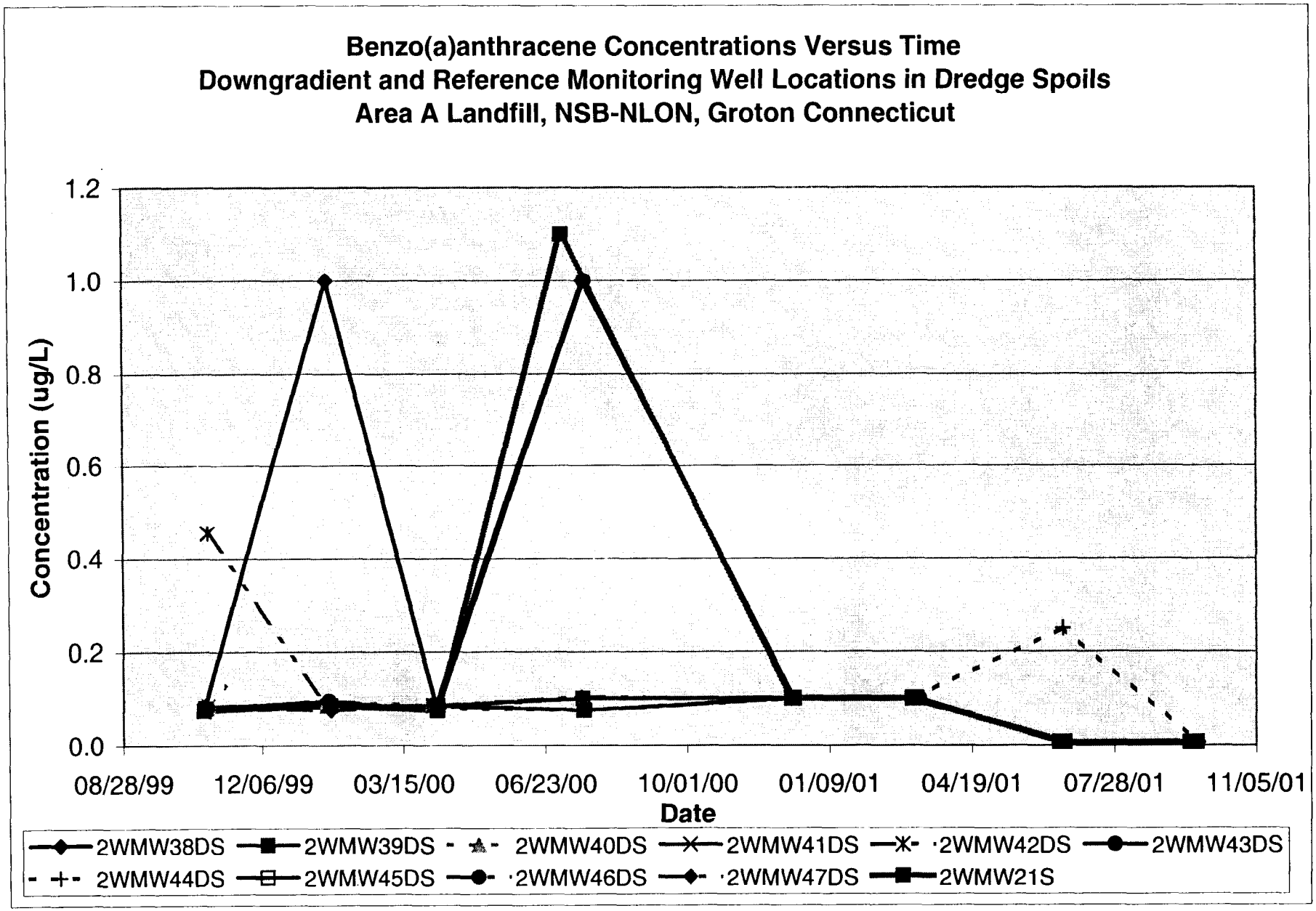
Table H-3
95th PERCENTILES OF F-DISTRIBUTION WITH v_1 and v_2 DEGREES OF FREEDOM

v_1/v_2	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120
1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5	241.9	243.9	245.9	248.0	249.1	250.1	251.1	252.2	253.3
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.72
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47
120	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96	1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35

NOTE: v_1: Degrees of Freedom for numerator
v_2: Degrees of freedom for denominator

TEMPORAL PLOTS


Benzo(a)anthracene Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Bedrock and Alluvium
Area A Landfill, NSB-NLON, Groton, Connecticut
Concentration (ug/L)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Benzo(a)anthracene Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
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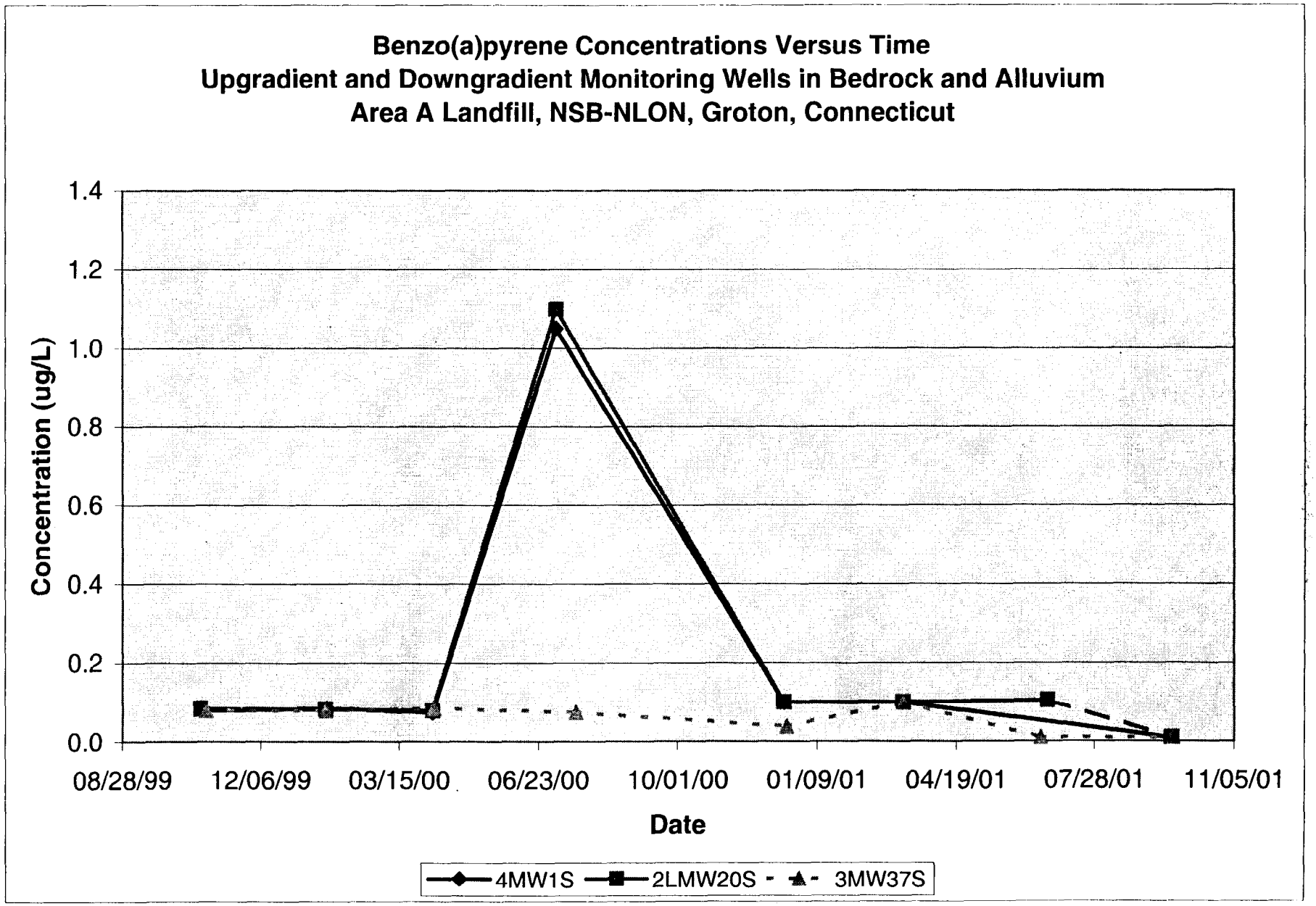
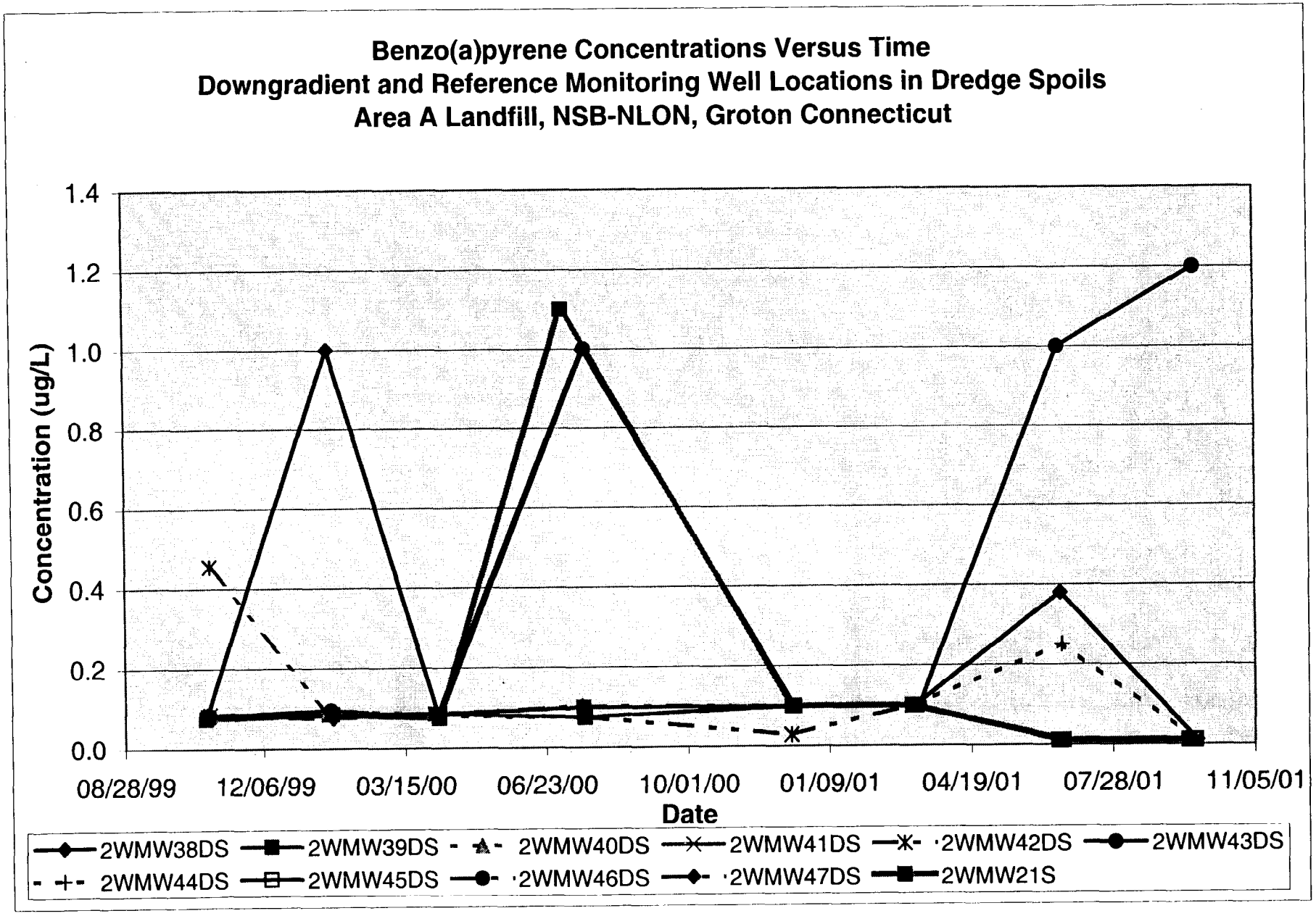
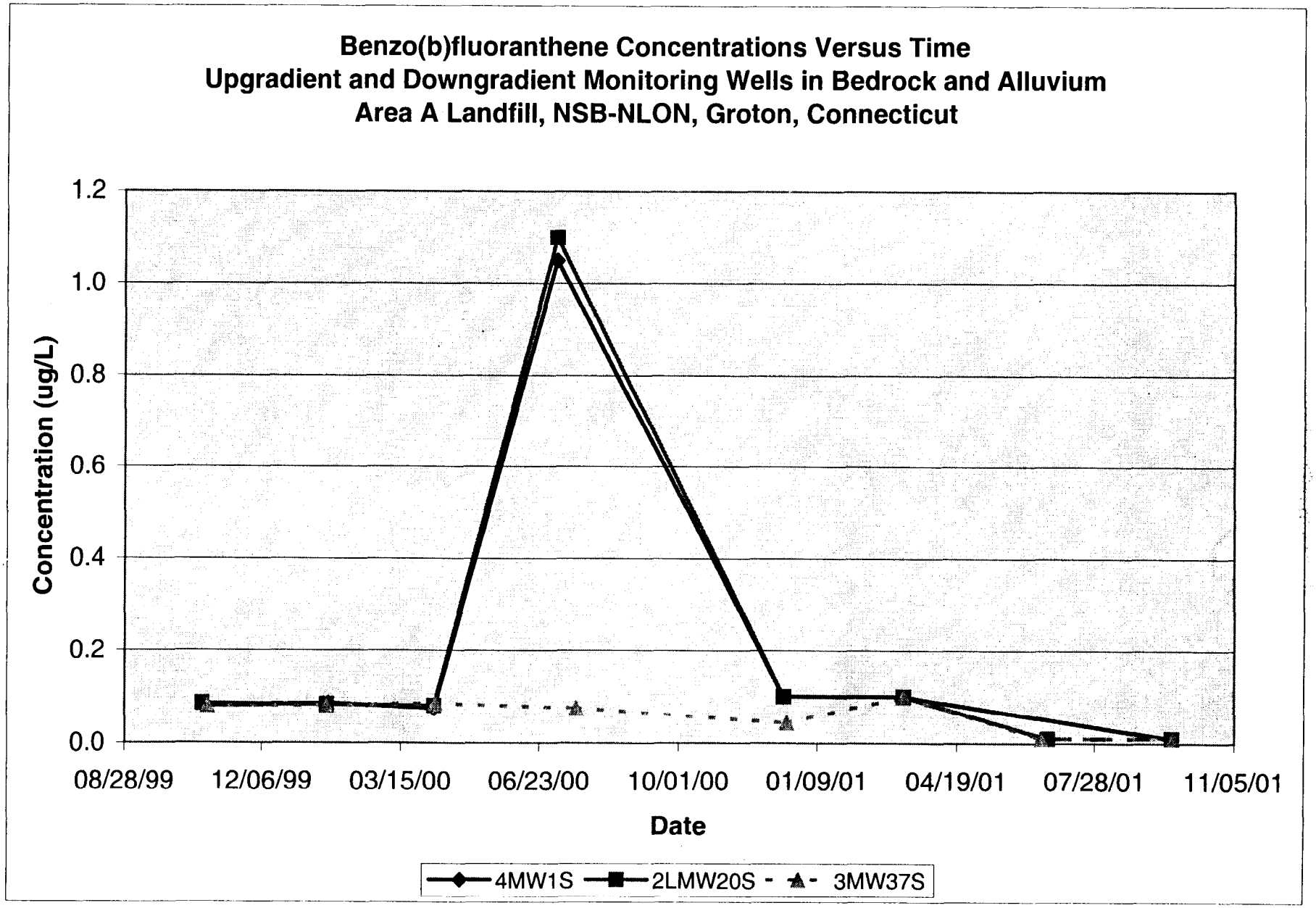
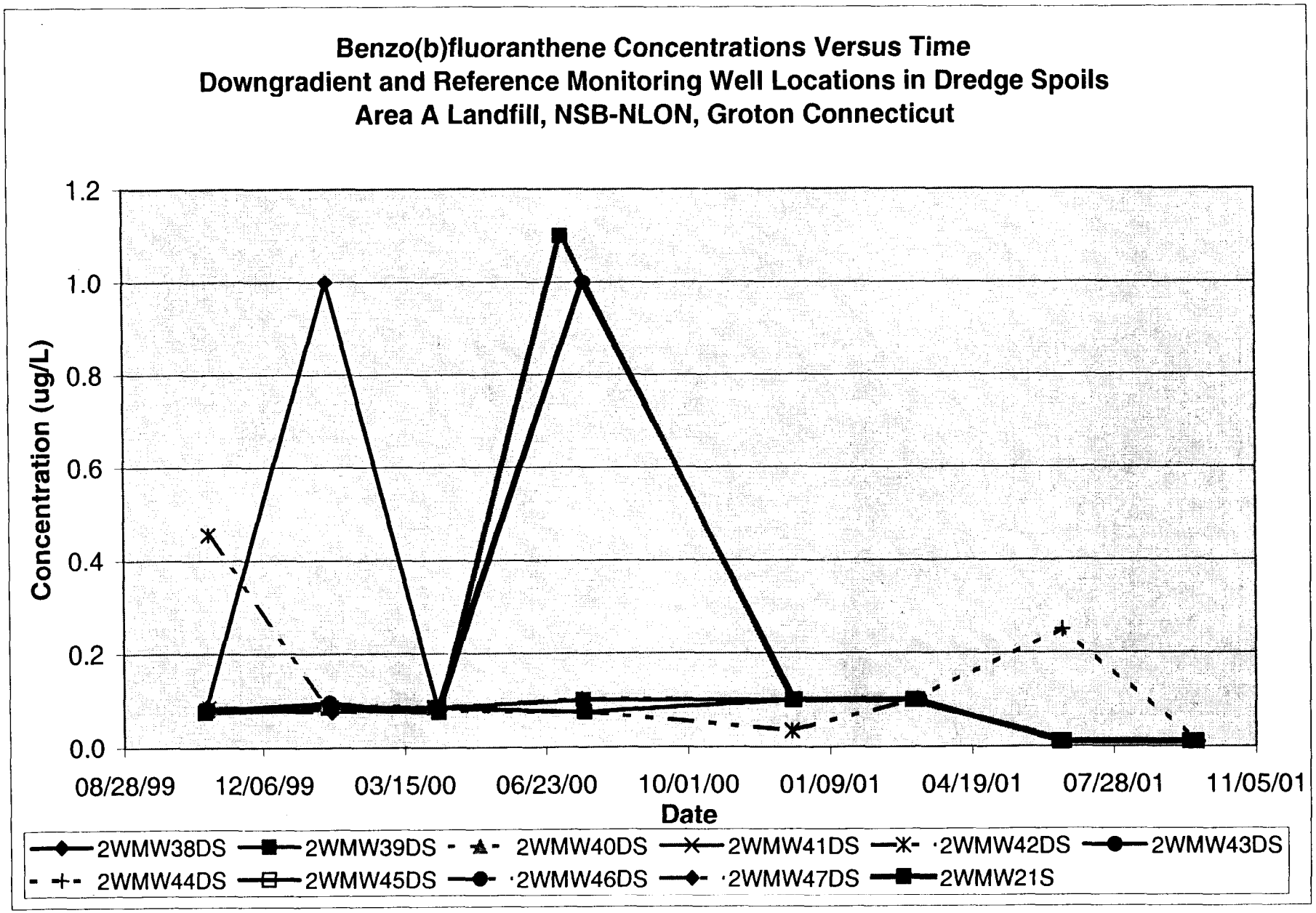
2WMW47DS
2WMW21S


Benzo(a)pyrene Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Bedrock and Alluvium
Area A Landfill, NSB-NLON, Groton, Connecticut
Concentration (ug/L)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Benzo(a)pyrene Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
2WMW41DS
2WMW42DS
2WMW43DS
2WMW44DS
2WMW45DS
2WMW46DS
2WMW47DS
2WMW21S


Benzo(b)fluoranthene Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Bedrock and Alluvium
Area A Landfill, NSB-NLON, Groton, Connecticut
Concentration (ug/L)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Benzo(b)fluoranthene Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
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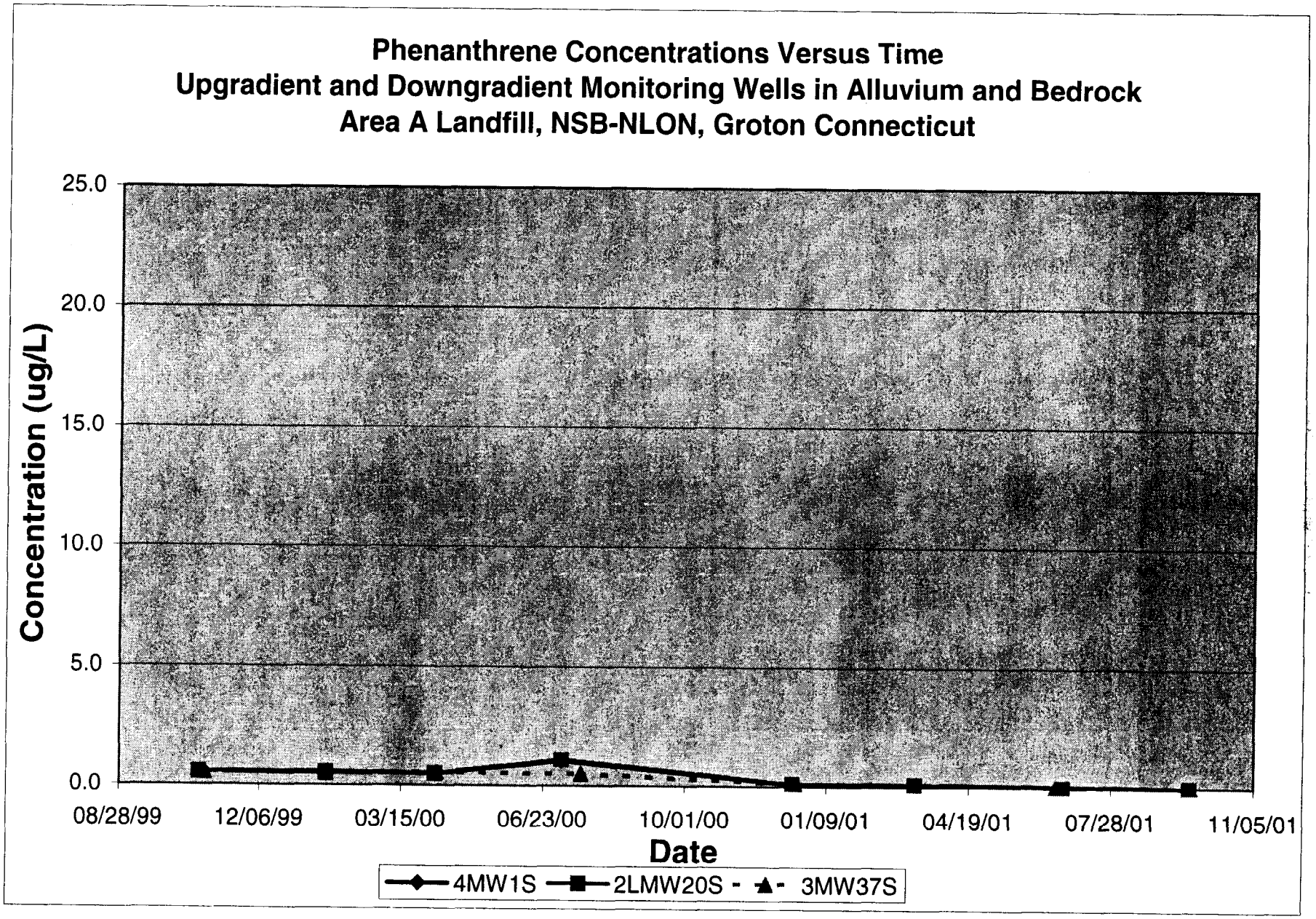
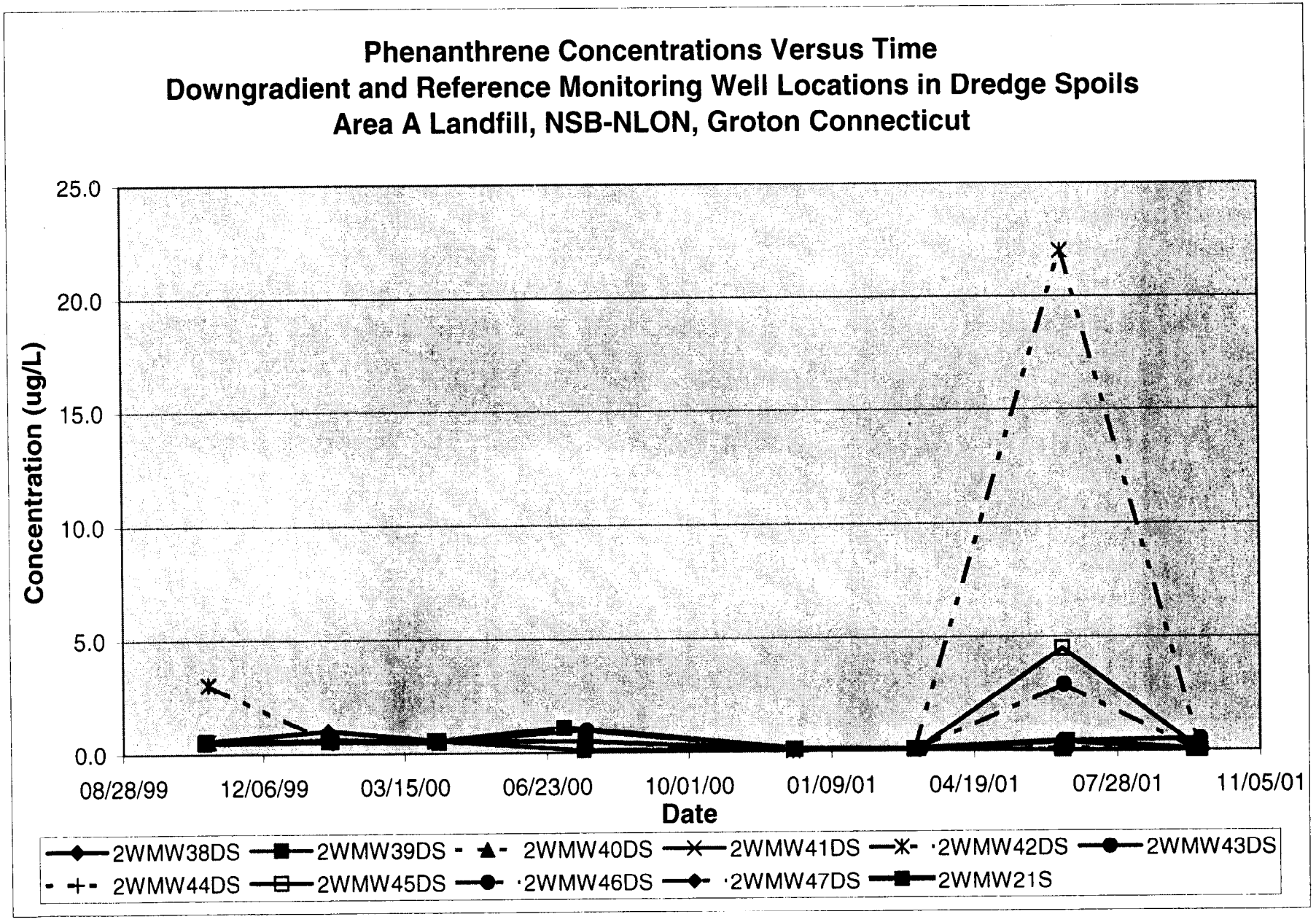
2WMW46DS
2WMW47DS
2WMW21S


Phenanthrene Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Alluvium and Bedrock
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
25.0
20.0
15.0
10.0
5.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Phenanthrene Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
25.0
20.0
15.0
10.0
5.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
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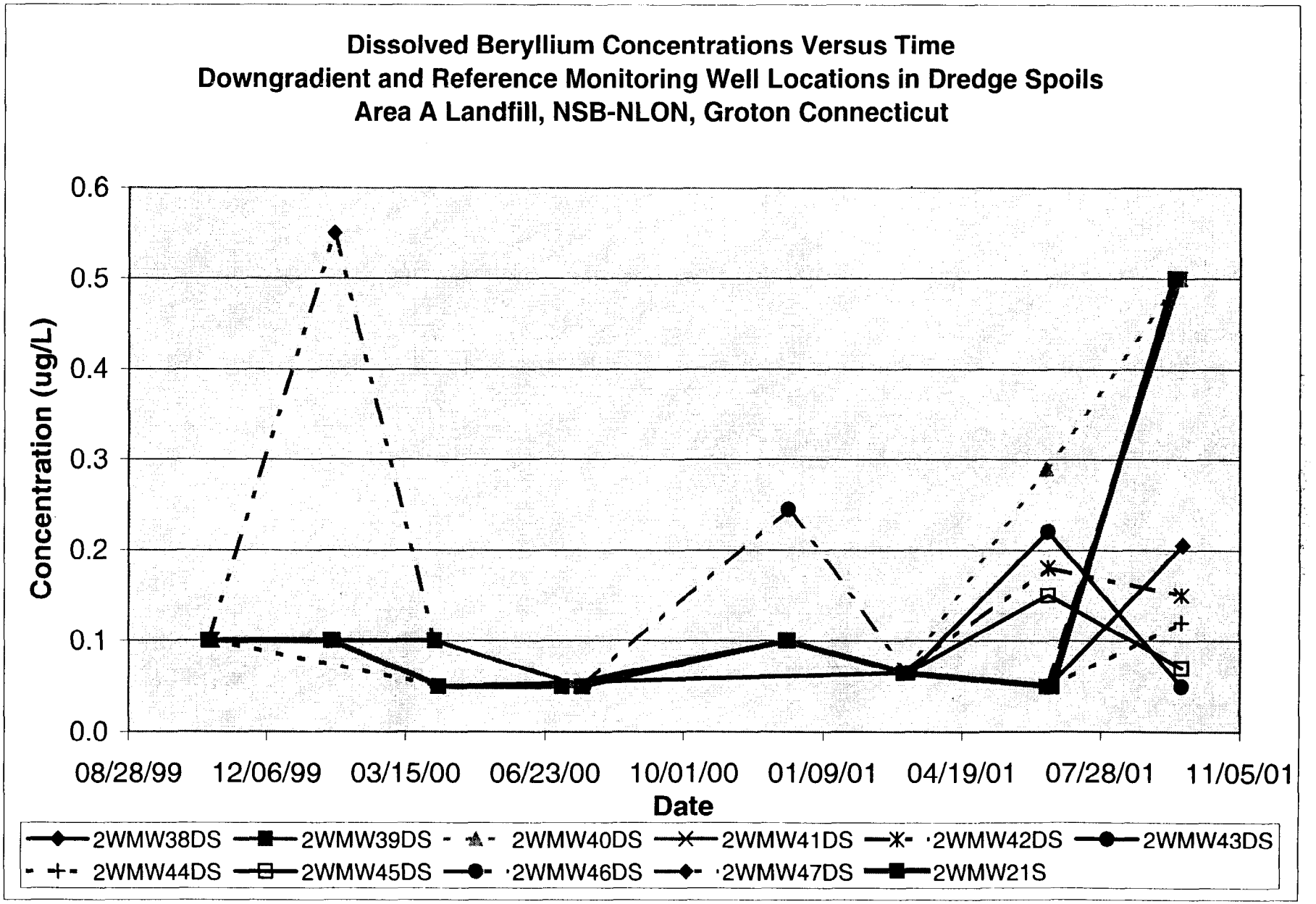
2WMW47DS
2WMW21S


Dissolved Beryllium Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
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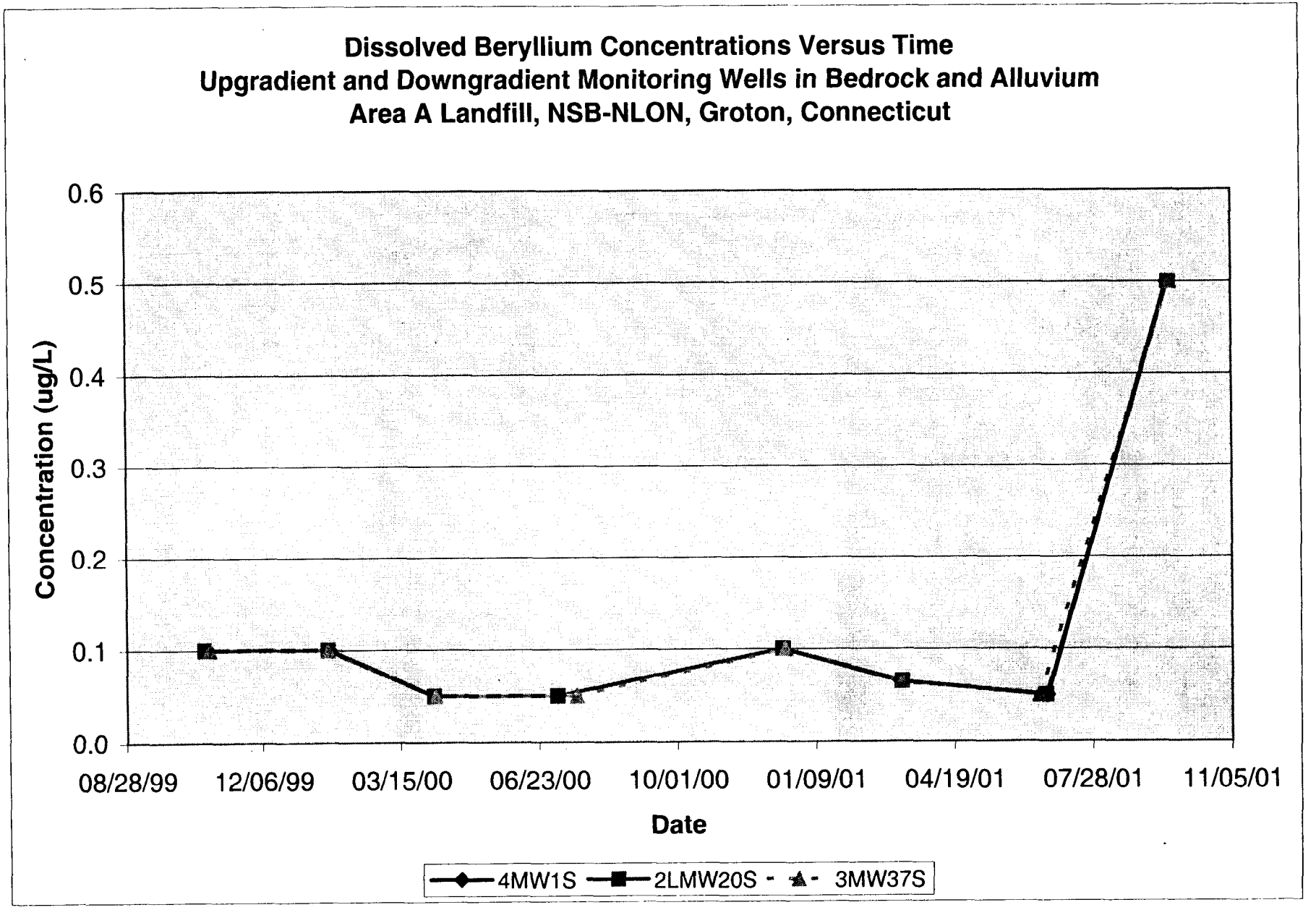
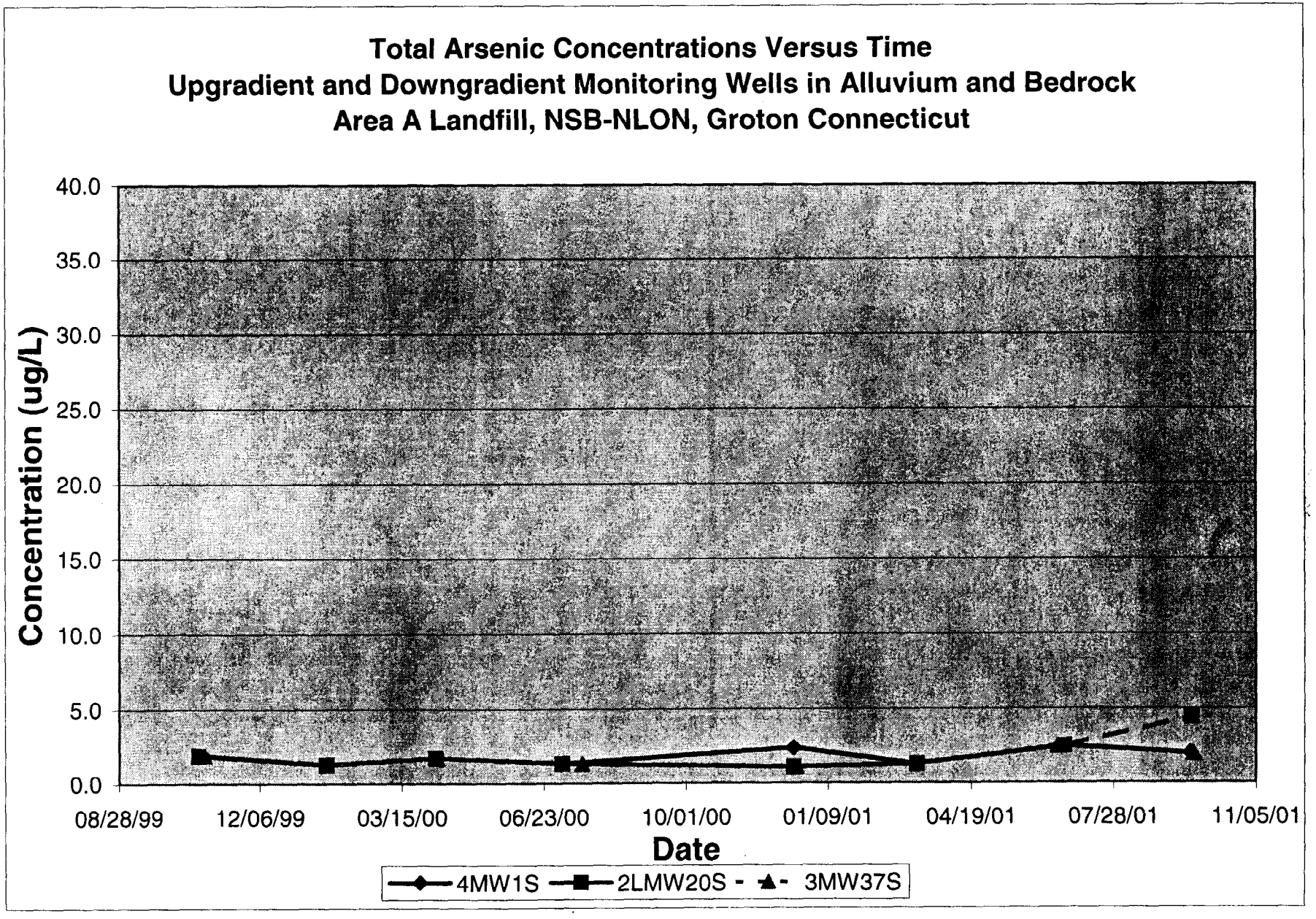
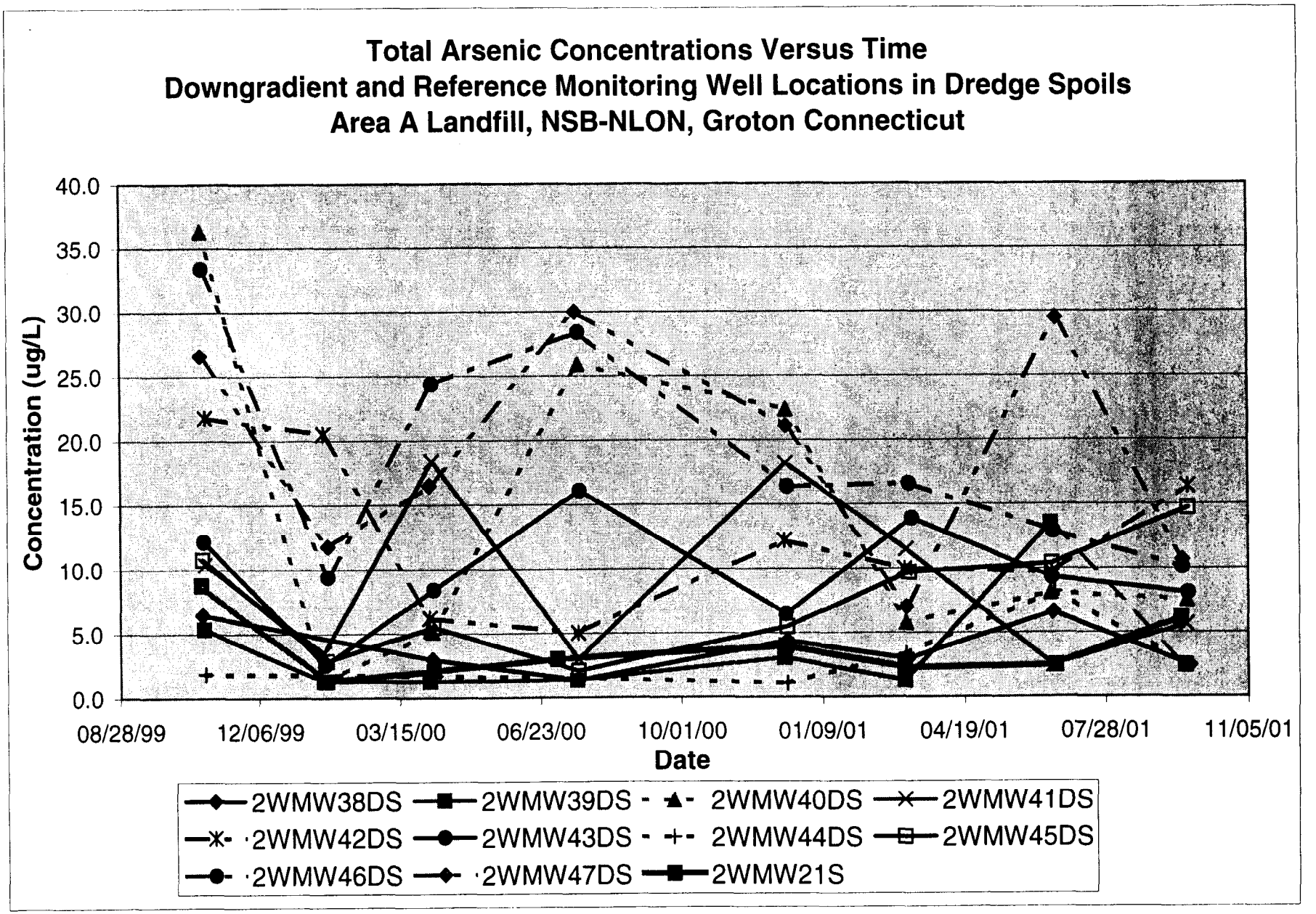
2WMW47DS
2WMW21S


Dissolved Beryllium Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Bedrock and Alluvium
Area A Landfill, NSB-NLON, Groton, Connecticut
Concentration (ug/L)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Total Arsenic Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Alluvium and Bedrock
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Total Arsenic Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
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2WMW44DS
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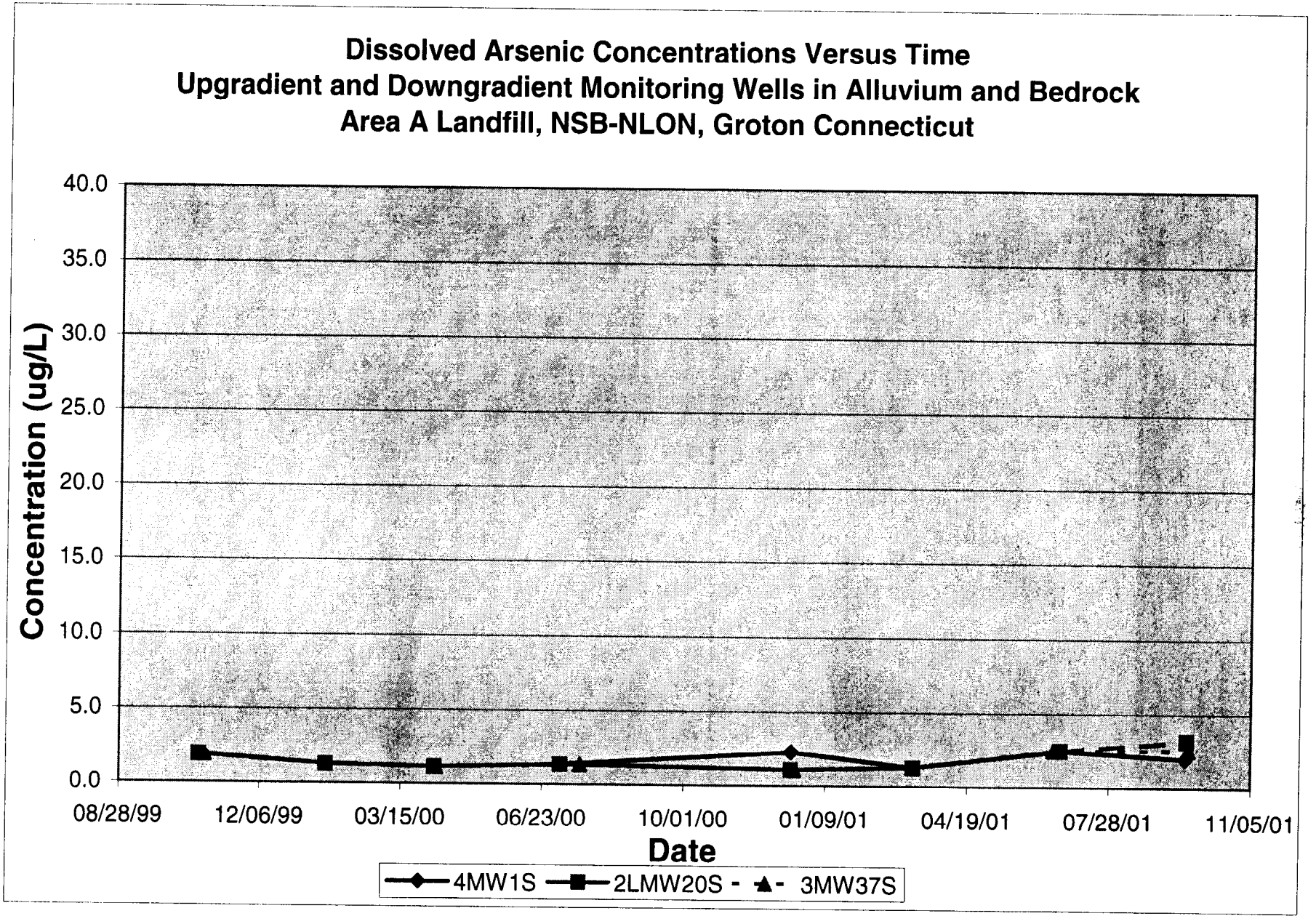
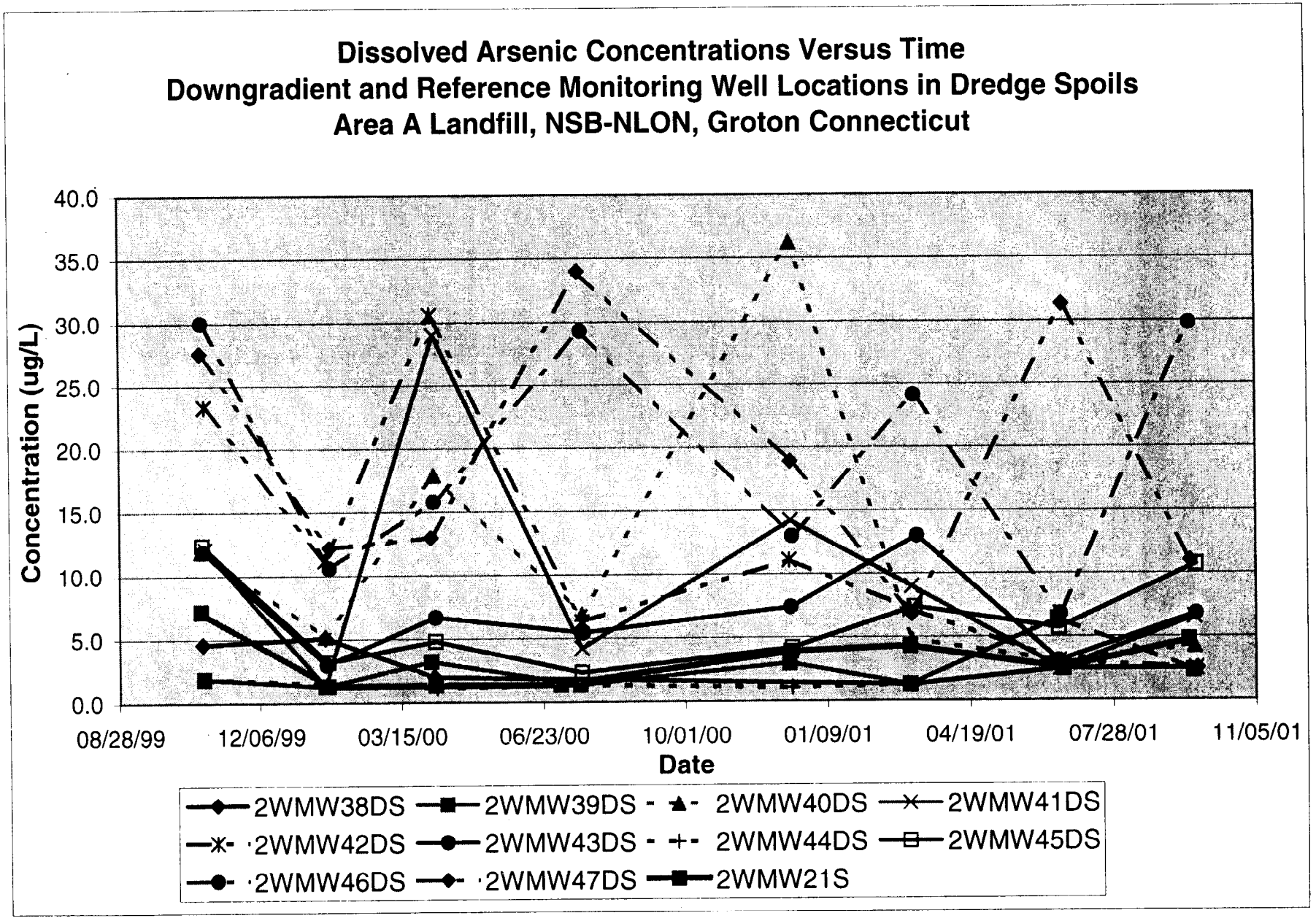
2WMW46DS
2WMW47DS
2WMW21S


Dissolved Arsenic Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Alluvium and Bedrock
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Dissolved Arsenic Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
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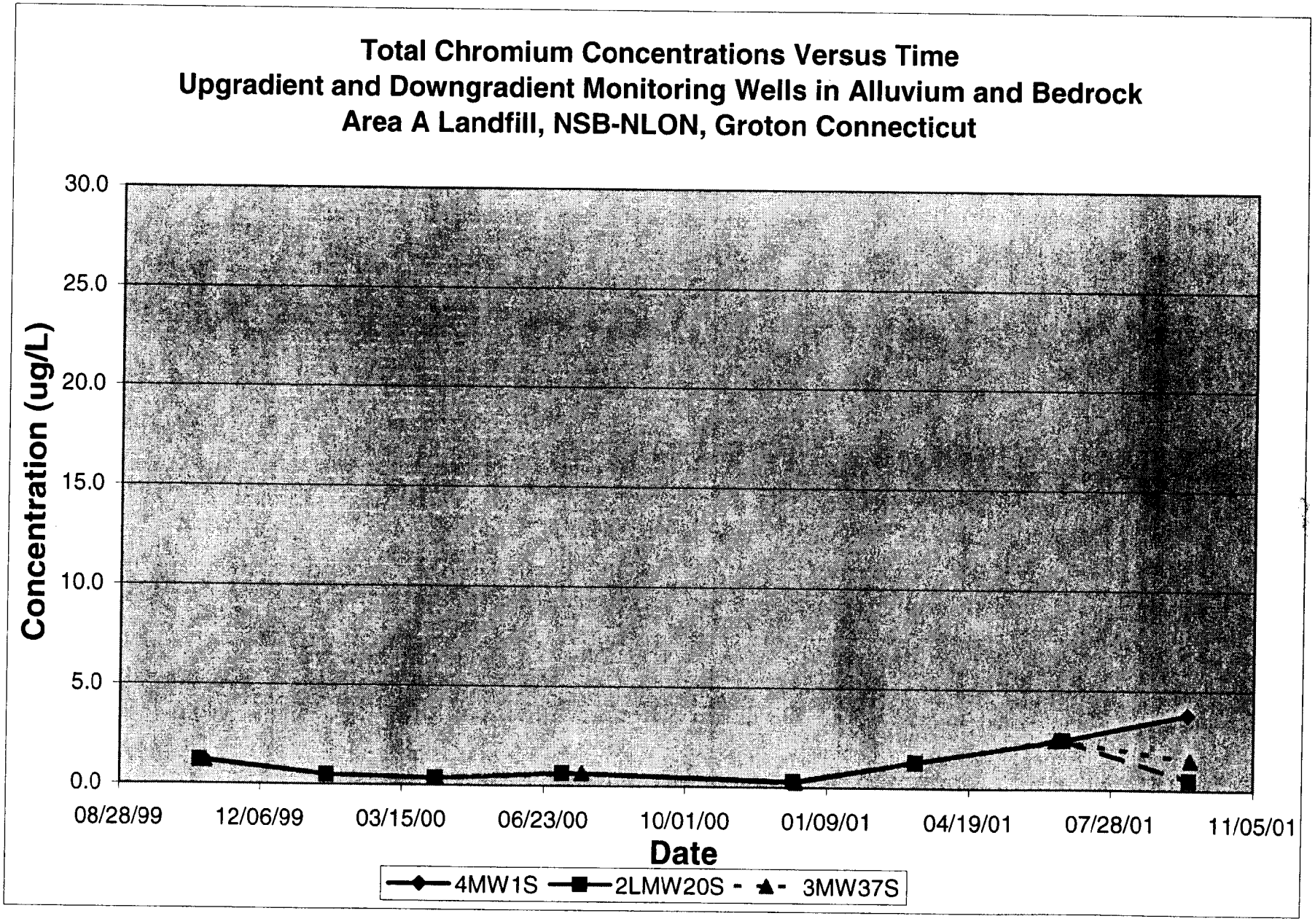
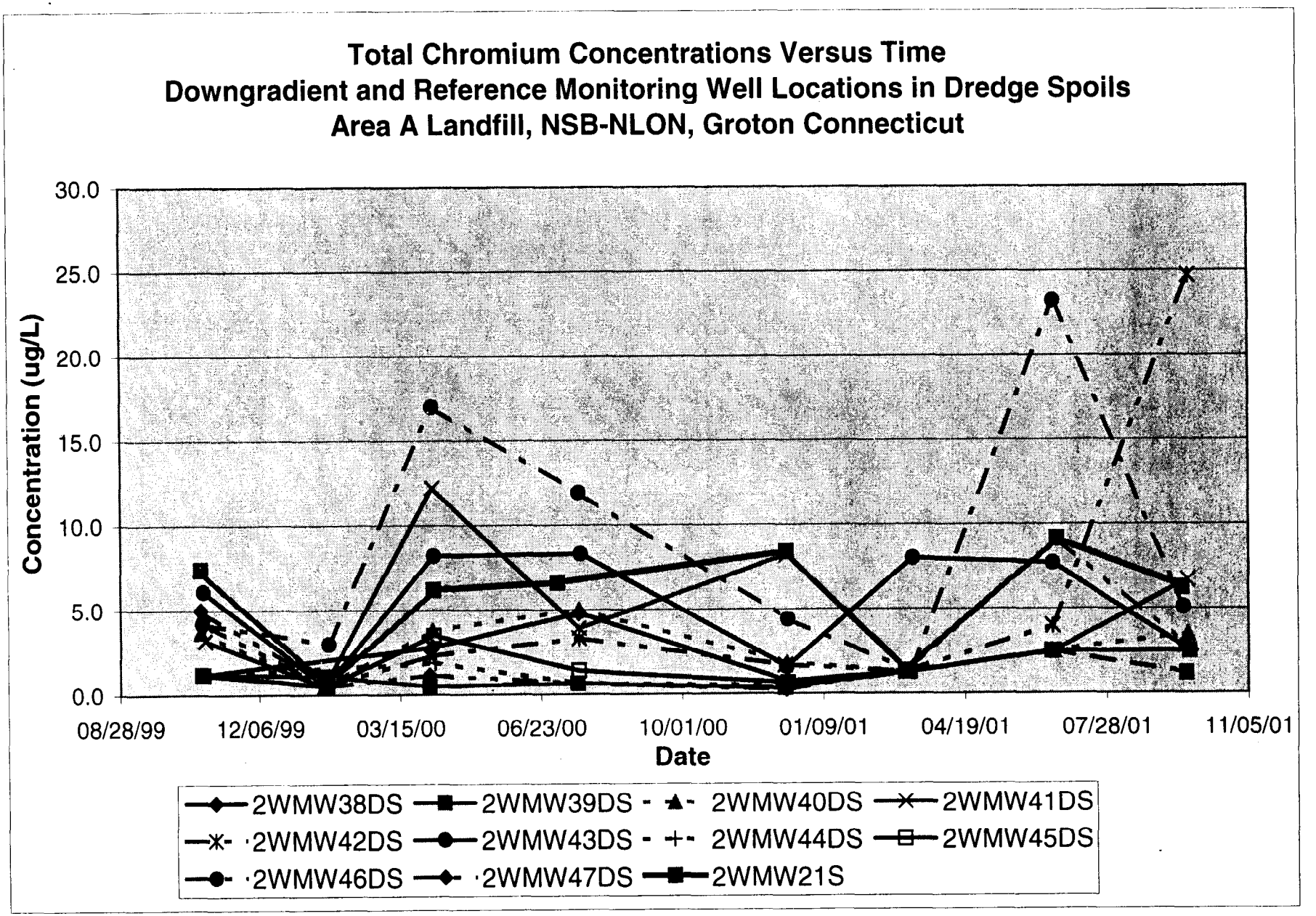
2WMW47DS
2WMW21S


Total Chromium Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Alluvium and Bedrock
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Total Chromium Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
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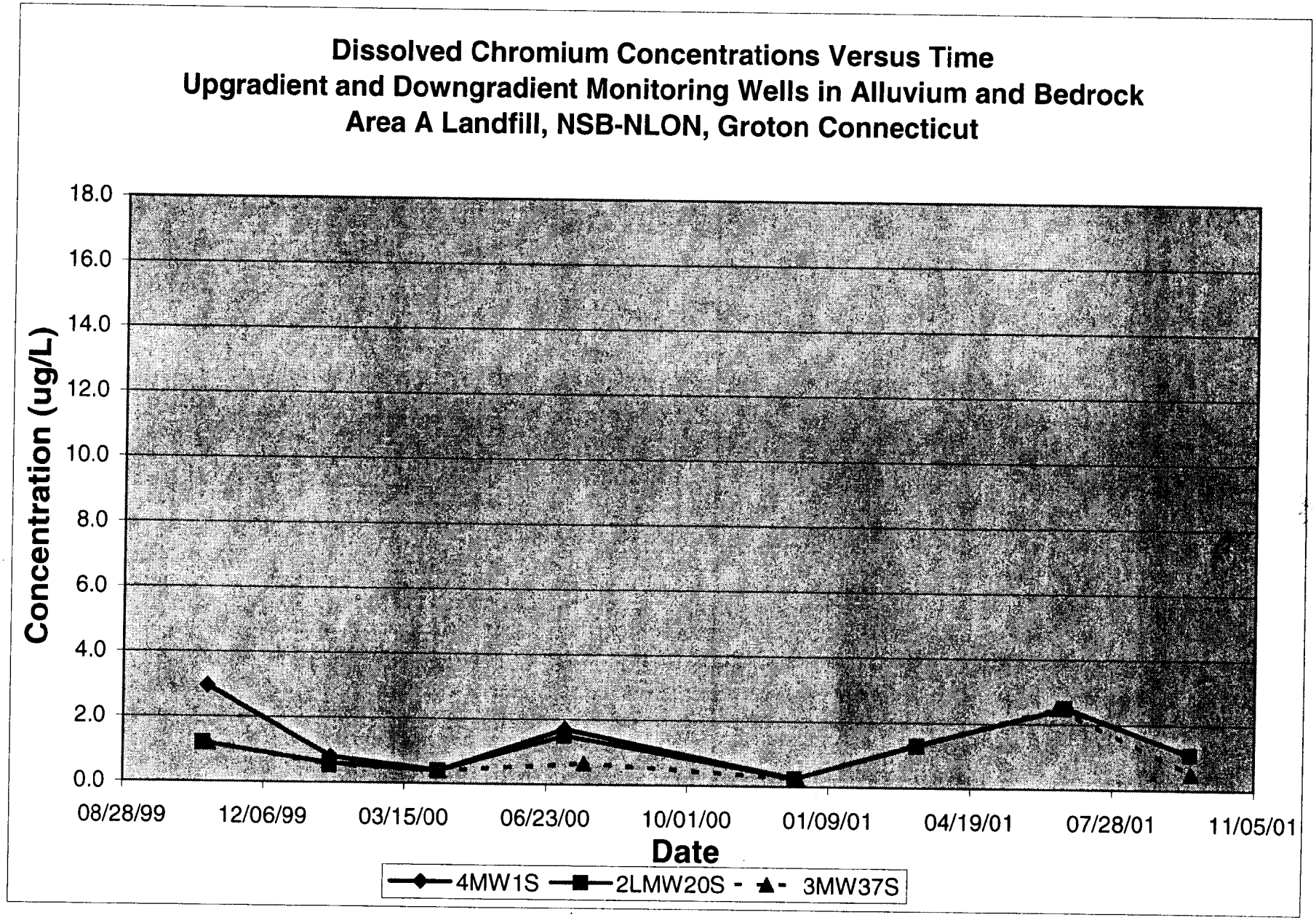
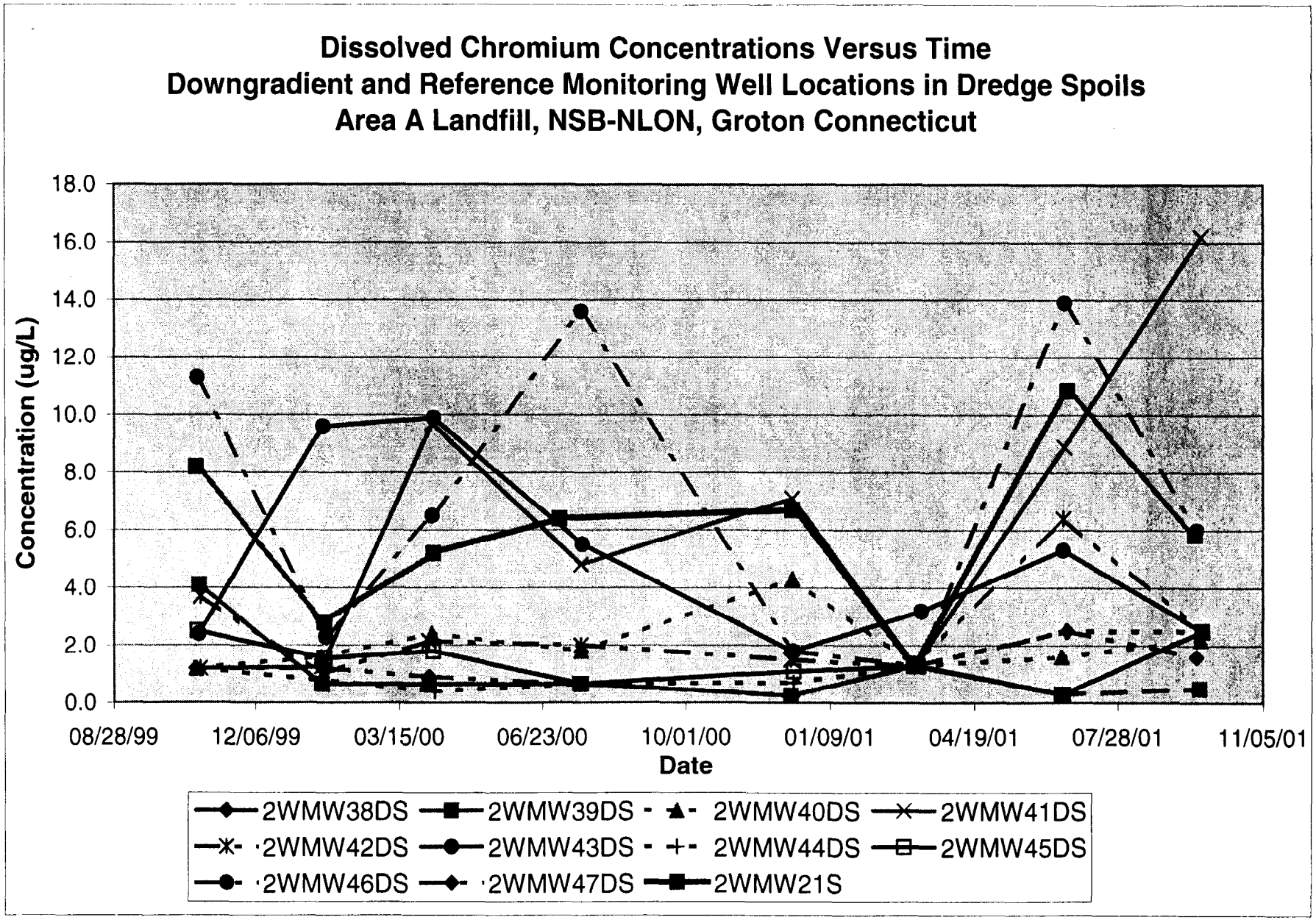
2WMW47DS
2WMW21S


Dissolved Chromium Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Alluvium and Bedrock
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Dissolved Chromium Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
2WMW41DS
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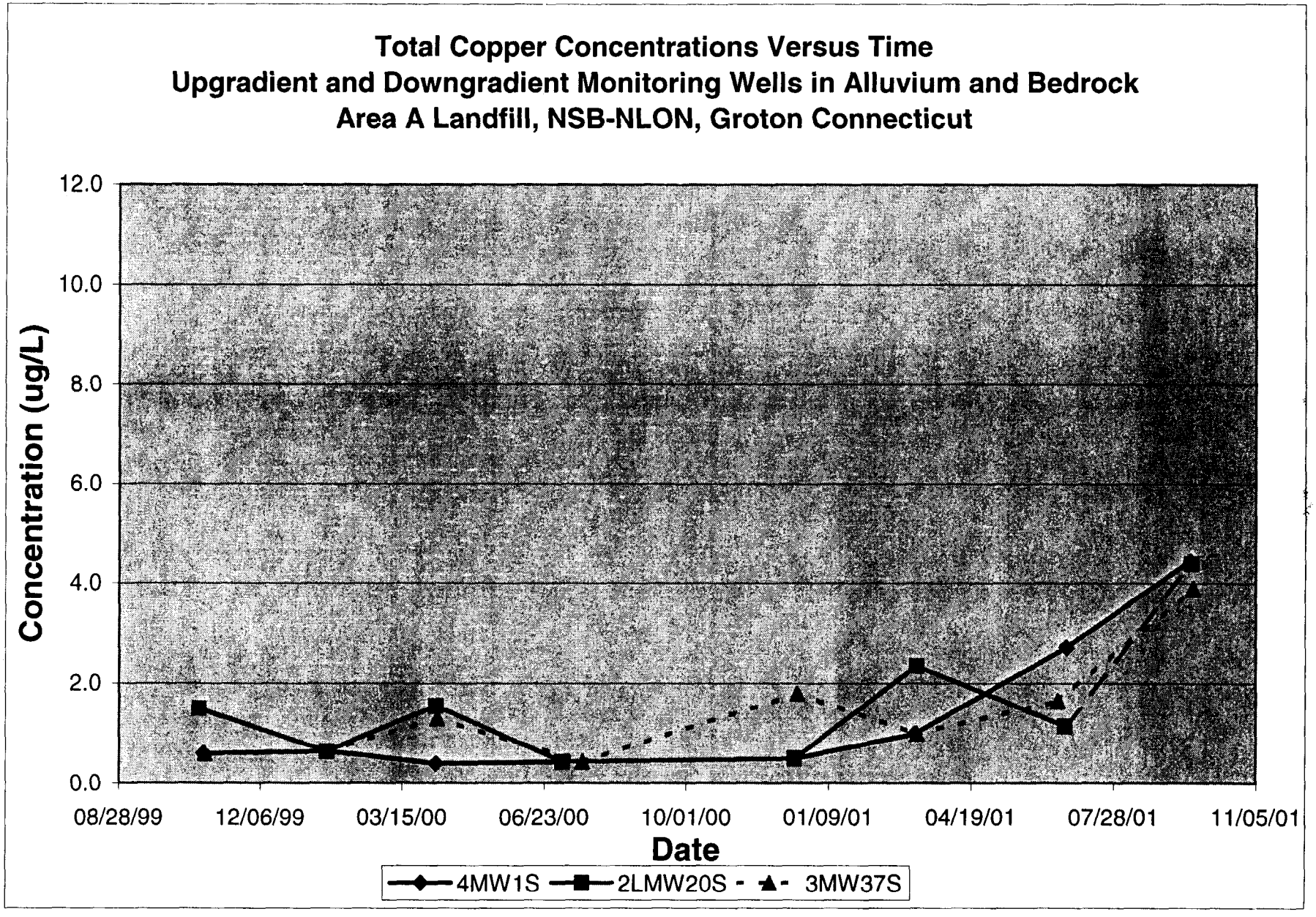
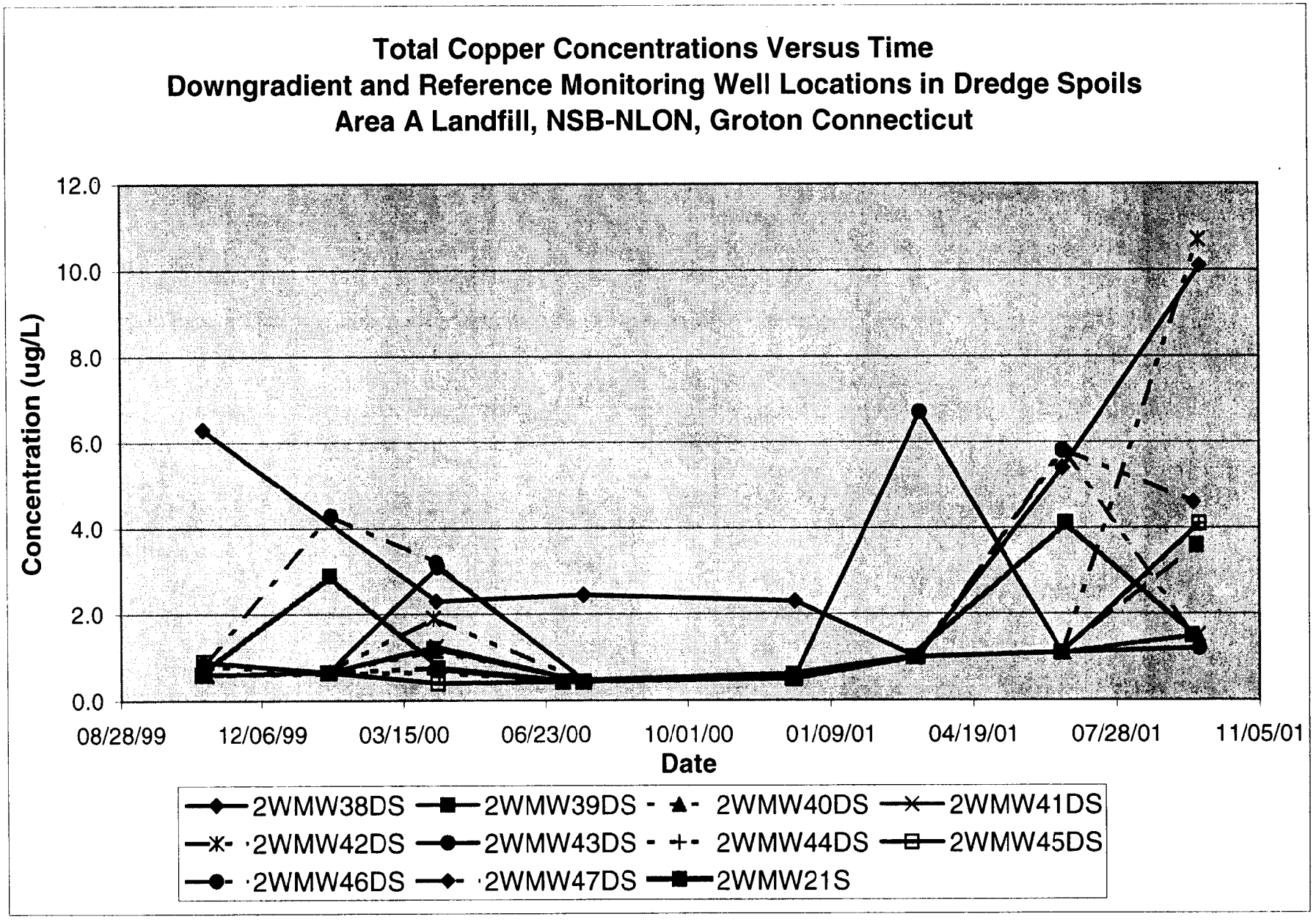
2WMW45DS
2WMW46DS
2WMW47DS
2WMW21S


Total Copper Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Alluvium and Bedrock
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Total Copper Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
2WMW41DS
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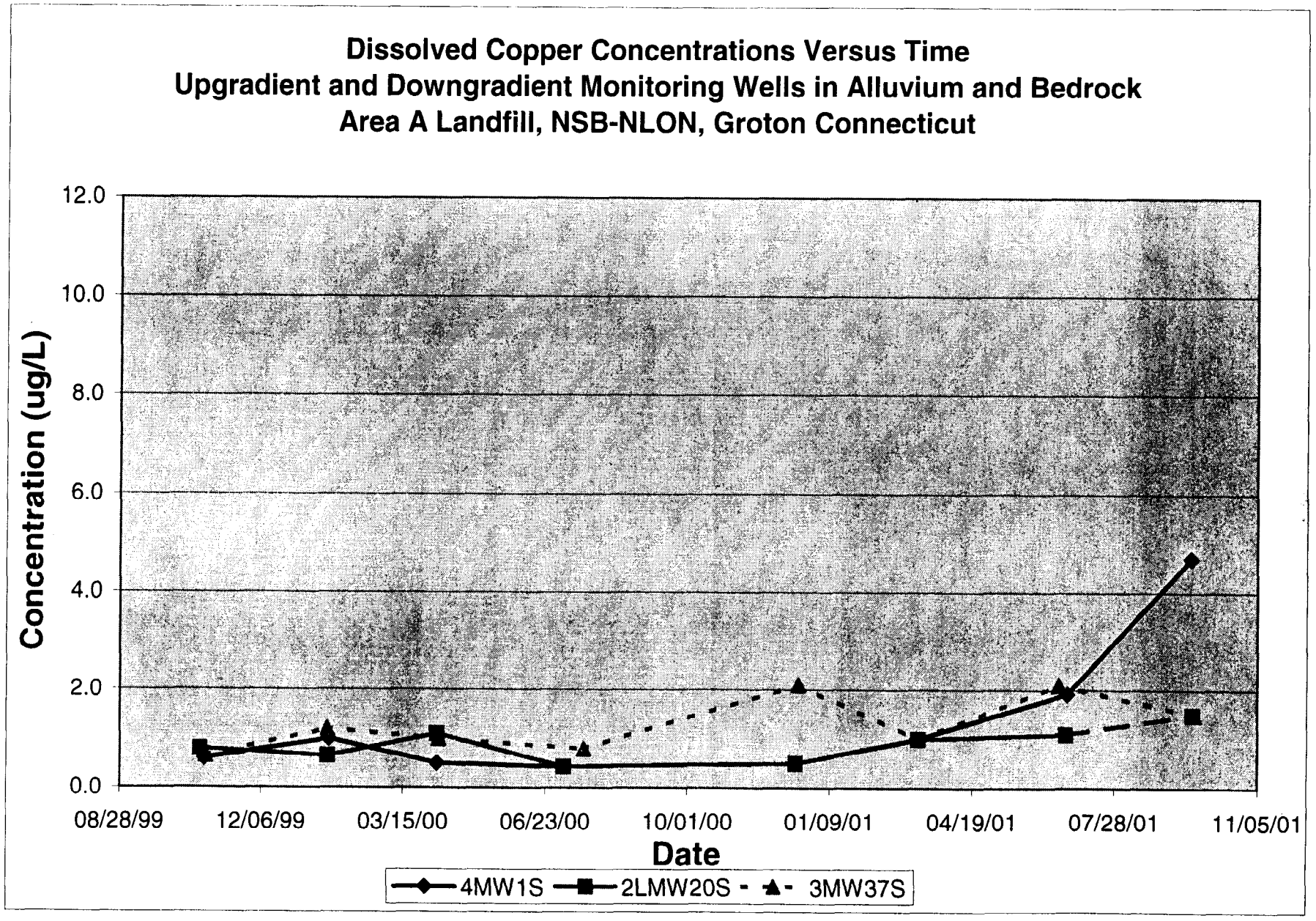
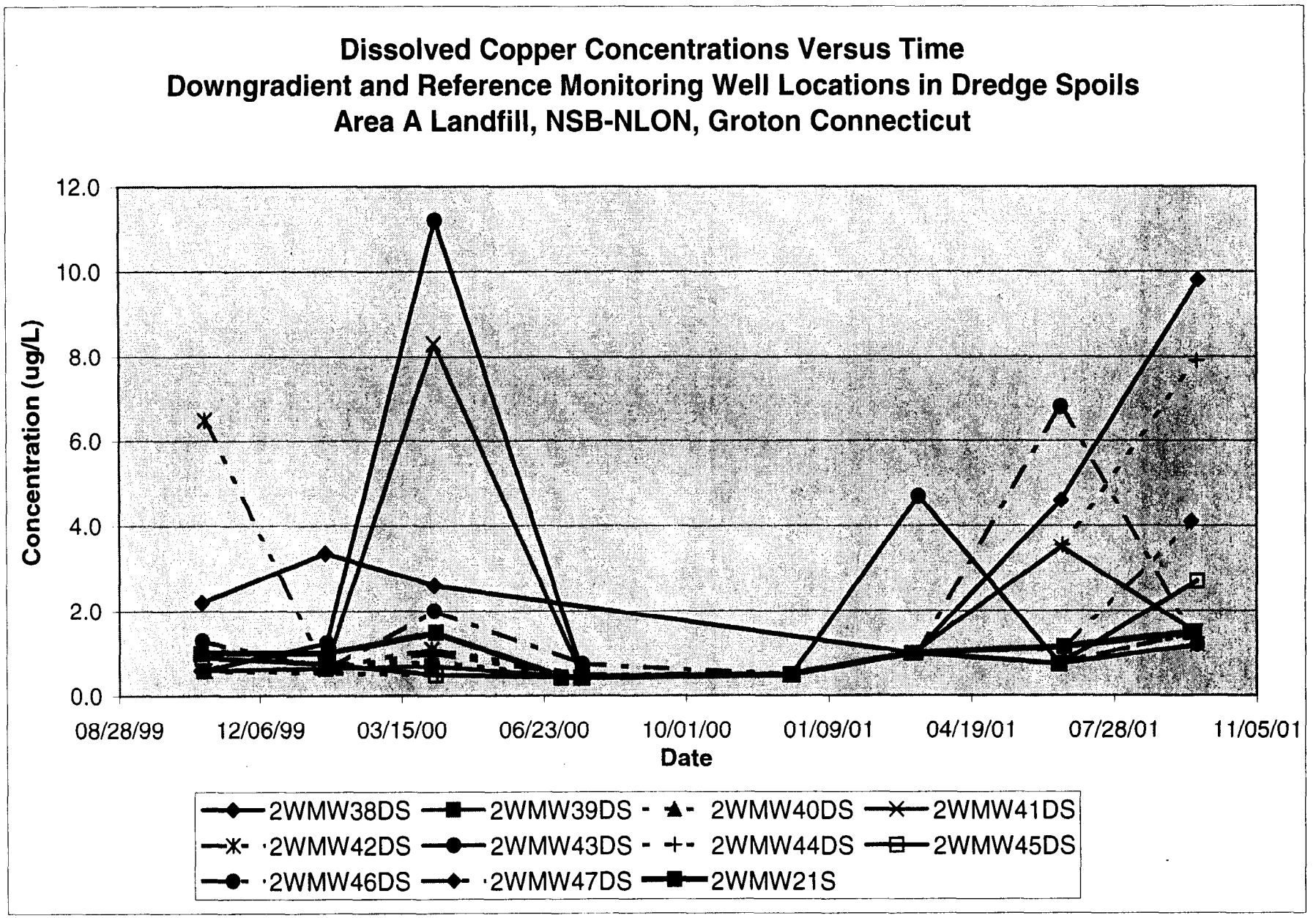
2WMW45DS
2WMW46DS
2WMW47DS
2WMW21S


Dissolved Copper Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Alluvium and Bedrock
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Dissolved Copper Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
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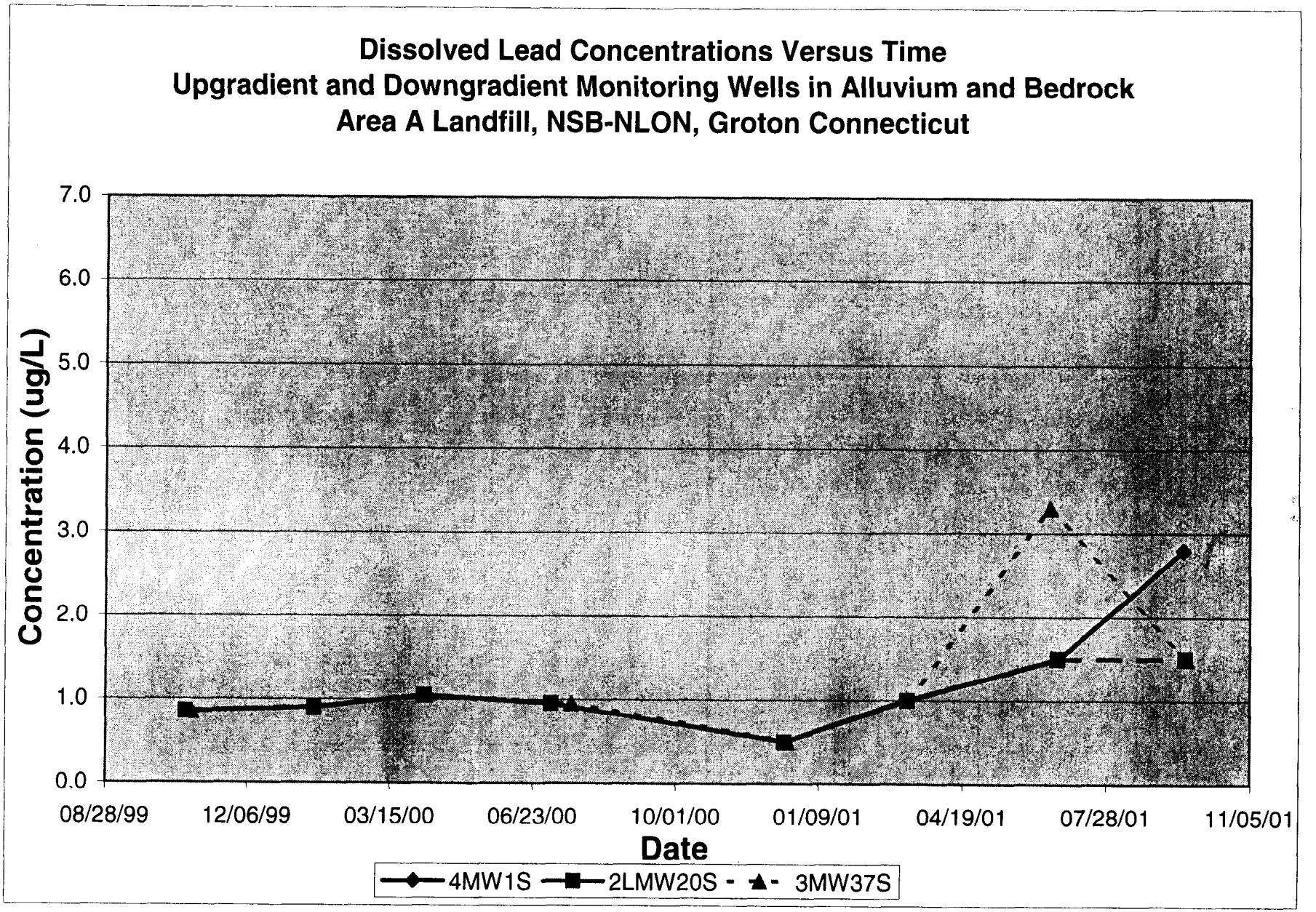
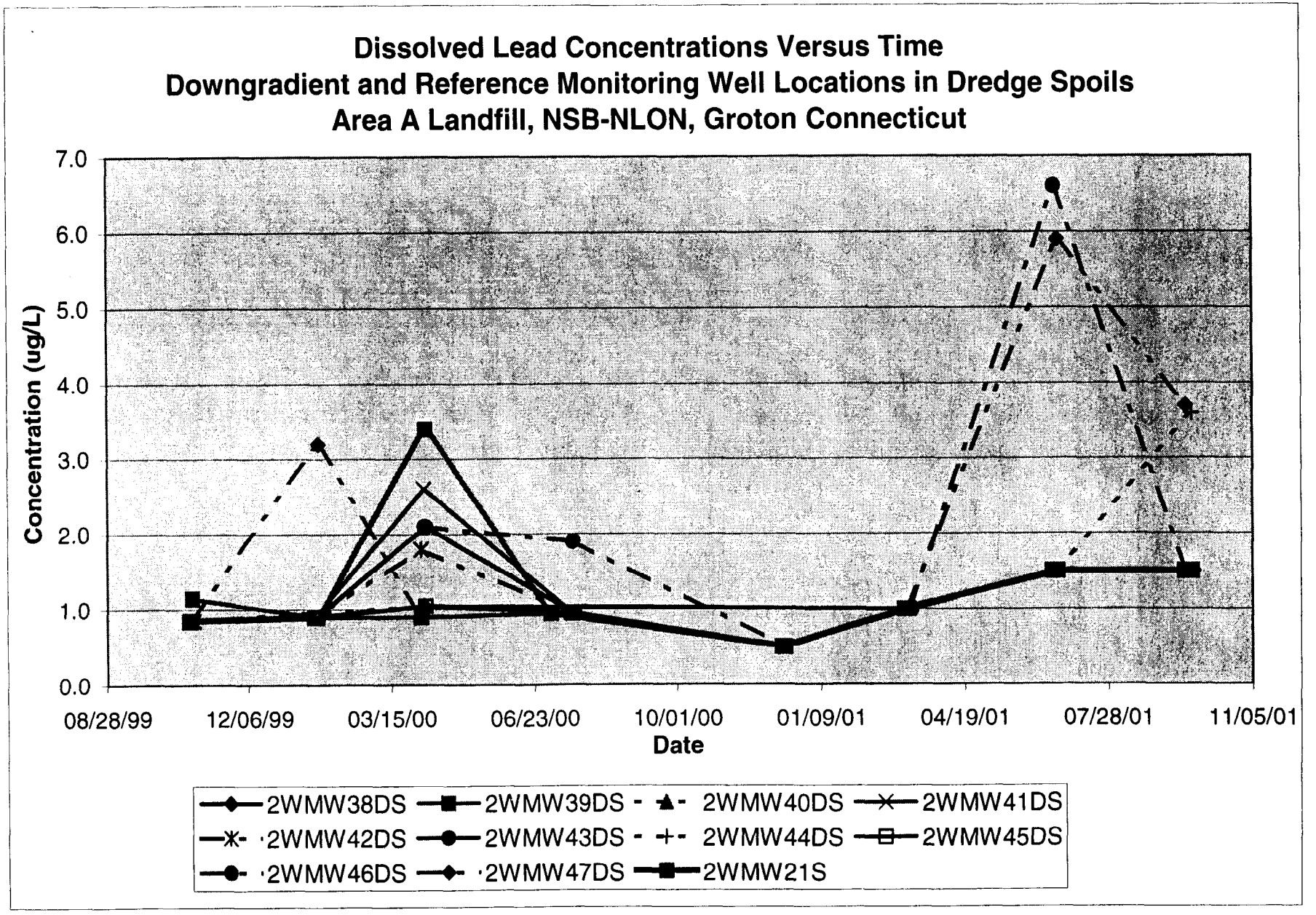
2WMW47DS
2WMW21S


Dissolved Lead Concentrations Versus Time
Upgradient and Downgradient Monitoring Wells in Alluvium and Bedrock
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
4MW1S
2LMW20S
3MW37S


Dissolved Lead Concentrations Versus Time
Downgradient and Reference Monitoring Well Locations in Dredge Spoils
Area A Landfill, NSB-NLON, Groton Connecticut
Concentration (ug/L)
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
08/28/99
12/06/99
03/15/00
06/23/00
10/01/00
01/09/01
04/19/01
07/28/01
11/05/01
Date
2WMW38DS
2WMW39DS
2WMW40DS
2WMW41DS
2WMW42DS
2WMW43DS
2WMW44DS
2WMW45DS
2WMW46DS
2WMW47DS
2WMW21S

APPENDIX I

RESPONSES TO COMMENTS

SPECIFIC COMMENTS

Comment 1 - p. 2-11, §2.3.6

The text notes that the Groundwater/Leaching Modeling Study predicted long-term changes in the groundwater elevations beneath the landfill cover, ranging from 0.1 feet along the Area A Wetland boundary to 0.5 feet at the eastern end of the landfill. Has this prediction been tested against water-level data collected before and after the cap installation? Such a test would add confidence to the model predictions.

Response

No. This same comment was provided by the EPA on the Basewide Groundwater Operable Unit Remedial Investigation (BGOURI) and the Navy's response has not changed (see Response to Comment No. 4, p. 5-12, Section 5.3.4.2, Original Specific Comment No. 68, Final BGOURI). To fully understand this issue, a comprehensive study of the groundwater elevations in the vicinity of the Area A Landfill would need to be completed under conditions similar to those when the pre-cap water levels were measured. Because of the variability in rainfall and recharge, it would be impossible to use a single round of water level measurements (i.e., the only information currently available) to confirm long-term changes in the elevation of the groundwater. Because the current Groundwater Monitoring Program does not include many of the original wells located within the landfill and the program does not include a comprehensive groundwater study, the Navy does not plan to conduct a long-term groundwater elevation study or verify the model's predictions.

Comment 2 - p. 4-2, §4.2.1

It is interesting to note that chloride is very high (*e.g.*, 19,000 mg/L in 2WMW43DS in Round 8; *e.g.*, Table 4-2) in dredged material wells, and sodium, where data are reported, is also high (*e.g.*, 8,400 mg/L in 2WMW43DS in Round 8; *e.g.*, Appendix A of Appendix F), and correlated strongly with chloride. In addition, salinity was measured in the dredged material samples as high as 33 ppt (2WMW46DS; Table D-1). Thus, the dredged material pore water appears to retain a strong signal of the seawater that presumably once saturated it when in the Thames estuary. While high chloride is sometimes associated with landfill leachate, it is noted that 2WMW21S, which is not downgradient of the landfill, shows chloride comparable to other dredged material wells (*e.g.*, 17 ppt in Round 8; >21 ppt in rounds 2 and 3). Note that the high-chloride wells also show high calcium, magnesium, potassium, and alkalinity (*e.g.*, 2WMW43DS in Round 8: 202 mg/L; 668 mg/L; 371 mg/L; and 2100 mg/L, respectively), with levels also approaching those of seawater. As a conceptual model emerges for transport processes that influence inorganics concentrations, these observations should be incorporated. For example, how have these indicators of seawater persisted since the time of emplacement of the dredged material?

Response

Agree. A conceptual model of the hydrogeologic conditions present at the Area A Landfill was provided in Section 2.3.6 of the Groundwater Monitoring Plan for the Area A Landfill (TtNUS, January 1999). The geochemical processes influencing the migration of inorganics in the groundwater in the vicinity of the Area A Landfill has been developed using historical and recent data collected from the site. The model is described below. This information will be incorporated into Section 2 of the Annual Report and other sections of the report (e.g., Sections 4 and 5) as necessary to aid in determining future groundwater monitoring efforts.

The conceptual model for the Area A Landfill groundwater begins with an understanding of the nature of the dredge spoil filling the valley. The dredge spoil material was originally sediment in the Thames River which is an estuarine system. Within the estuarine system, sediments and dissolved metals are co-deposited due to changes in the mix between freshwater and seawater. Typically, estuarine sediments are rich in organic carbon content. Following deposition and only moderate burial, estuarine sediments are typically anaerobic, due to microbial action on the rich deposits of organic carbon. Under anaerobic conditions, manganese and iron oxyhydroxide coatings on sediment grains will undergo reduction and dissolution. The primary result is mobilization of iron in the sediment porewater. Secondarily, trace metals sorbed to the oxyhydroxide coatings are both reduced and mobilized or simply released from the surface coating during dissolution. Redistribution of the major and minor metals within the sediment via concentration gradients in the porewaters may bring the metals to a more oxidizing, sediment-surface environment or areas of sulfate reduction and sedimentary pyrite formation. In either environment the major and minor metals will be precipitated, co-precipitated and/or re-adsorbed. The important point is that, in all likelihood, the dredge spoils deposited beneath and adjacent to the Area A Landfill contained discrete sedimentary iron sulfide minerals in addition to iron and manganese oxyhydroxide coatings. The dredging process created homogenized sediment with sulfide minerals and oxidized grains intimately mixed. The evolving groundwater geochemistry within the dredge spoils represents a process of re-equilibration among the homogenized spoils, entrained estuarine to marine porewater, and fresh groundwater and surface water.

The conceptual model for groundwater in the vicinity of the Area A Landfill continues with the conceptual model of groundwater flow developed for the Area A Landfill groundwater modeling study completed by Brown & Root Environmental in 1996. In that study, several cross-sections were developed showing the groundwater flow lines from the recharge area upgradient of the Area A Landfill to the discharge area downgradient of the Area A Landfill in the Area A Wetland. Two of those cross-sections (i.e., B-B' and C-C'), which were depicted on Figures 2-6 and 2-7 in the Groundwater Monitoring Plan for Area A Landfill (TtNUS, January 1999), were selected for more detailed examination of the major element geochemistry of samples from the wells. Monitoring wells installed and screened within the dredge spoils downgradient of the landfill for the Groundwater Monitoring Program, but after

completion of the modeling study, have been added to the geochemical data set. Monitoring wells are typically distinguished based on whether they are located upgradient or downgradient of a source of contamination. For the Area A Landfill, the wells need to be further discriminated on the basis of the screen interval material. In either selected transect, wells may be screened in one or more of four types of material: alluvium, bedrock, landfill, or dredge spoil. Based on the screen interval elevations and drilling logs, wells in transect B-B' have been divided into four groups, those screened in bedrock, alluvium/bedrock, landfill/dredge spoil and dredge spoil. In transect C-C', wells with geochemical data have been divided into three groups, those screened in bedrock, landfill, and dredge spoil. Figure 1, which is attached to these responses to comments, provides a conceptual model of groundwater flow.

The major element data set, taken from the data collected for the Phase II RI and groundwater monitoring program, is somewhat limited with major cation analyses (i.e., sodium, potassium, calcium, magnesium) available for most wells during most sampling events. Complete data for major anions (i.e., chloride, sulfate and alkalinity) are available only for the downgradient wells screened in dredge spoil material that were installed specifically for the monitoring program. Field measurements of stabilization parameters are available but data from wells sampled in the early 1990s do not have a complete set (e.g., missing ORP).

Based on the ranges of the major cation analyses (Table 1) and the information provided in Items 1 through 6 below, it is apparent that there are several distinct and surprisingly consistent water types present. The lowest concentrations of major cations are present in samples from the bedrock and alluvium/bedrock screened wells. Both of these screen intervals tend to represent groundwater that, even though physically located beneath the landfill and/or dredge spoils, is upgradient or side gradient of the landfill. Wells screened within landfill material have the next highest major cation concentrations with wells screened across the landfill/dredge spoil interface having slightly higher cation concentrations. The highest concentrations are present in wells screened within the dredge spoil material.

1 Bedrock
- Weathering type environment
- Low pH (5.5-6.5)
- Relatively aerobic (DO>2 mg/L)
- Low specific conductance (<1 mS/cm)
- Low concentration of major cations
- Low concentrations of major anions
- Major anion is alkalinity (predicted)
- Low TOC concentration (predicted)
- ORP positive (predicted)

2. Alluvium/Bedrock
   - Very similar to bedrock

3. Landfill
   - Moderate pH (6.5-7)
   - Slightly higher specific conductance (2-4 mS/cm)
   - Higher major cation concentrations
   - Higher major anion concentrations (predicted)
   - Major anion is alkalinity (predicted)
   - Borderline aerobic (1<DO<3 mg/L) (predicted)
   - Moderate TOC concentration (predicted)
   - ORP slightly positive to slightly negative, may fluctuate (predicted)

4. Dredge Spoil (near freshwater recharge)
   - Originally estuarine sediments
   - High pH (generally >7)
   - Relatively anaerobic (ORP < -300 mV)
   - High specific conductance
   - High major cation concentrations with sodium dominant
   - High major anion concentrations with chloride dominant
   - High TOC concentration (generally >20 mg/L)
   - High sulfate concentration

5. Dredge Spoil (far from freshwater recharge)
   - Originally estuarine sediments
   - Highest pH (generally >7) (predicted)
   - Strongly anaerobic (ORP < -400 mV) (predicted)
   - High specific conductance (predicted)
   - High major cation concentrations with sodium dominant (predicted)
   - High major anion concentrations with chloride dominant (predicted)
   - High TOC concentration (generally >20 mg/L) (predicted)
   - Lower sulfate concentration (predicted)

   - Measurable dissolved sulfide concentration (predicted)
   - Moderate dissolved iron concentration (predicted)
   - Measurable dissolved methane concentration (predicted)
   - Measurable dissolved hydrogen concentration (>3nM) (predicted)

6. Surface water discharge (predominantly dredge spoil groundwater)
   - Iron oxyhydroxide precipitation (predicted)
   - Trace metal concentrations low (sorbed or co-precipitated on iron floc) (predicted)
   - Relatively high specific conductance (predicted)
   - Minor carbonate mineral precipitation (predicted)
   - Moderate pH (predicted)
   - Chloride and sulfate are major anions (predicted)

It is clear that groundwater flow that intersects the landfill or dredge spoil material is dramatically altered. Additional geochemical parameters measured within these two populations of wells should indicate that the anion concentrations are significantly higher than those in either bedrock or alluvium. In addition, specific conductance and groundwater pH are significantly higher in the landfill and dredge spoil samples. The data available to evaluate landfill type groundwater are limited and relatively old (prior to 1995). Based on the limited data from wells screened in landfill material it is unlikely that the landfill has much impact on the groundwater composition observed in the dredge spoils. Geochemical data suggest that landfill groundwater is an intermediate between the alluvium/bedrock type and the dredge spoil groundwater. Major cation concentrations are still five to ten times higher in the dredge spoil monitoring wells.

Based on the likely distribution of sulfide minerals within the dredge spoils and their exposure to relatively oxidizing groundwater, it is likely there will be release of ferrous iron and sulfate along with hydrogen ion. Oxidation of the sulfides may mobilize other metals, e.g., As, that were co-precipitated in the sedimentary environment. Oxidation-reduction conditions within the dredge spoils are more oxidizing than in the sedimentary environment due to exposure to more aerobic groundwater. Dissolved iron released from sulfide mineral weathering may reprecipitate in more oxidizing areas within the wetland as a "green rust" (a mix of ferric and ferrous iron) or oxyhydroxide with subsequent adsorption of trace metals (e.g., As). Other areas of the wetland, more isolated from groundwater recharge may revert to sulfate reduction and subsequent sulfide mineral precipitation. Arsenic has been non-detect in monitoring wells in the Area A Downstream, which is downgradient of the Area A Landfill and Area A Wetland, indicating that arsenic is not migrating from the dredge spoil material and confirming the geochemical conceptual model.

To verify this geochemical conceptual model, the Navy proposes to conduct additional groundwater monitoring that would focus on major element geochemistry in two series of wells along two transects that follow the path of groundwater flow through the Area A Landfill. The monitoring wells that were selected cover the major aquifer materials present at the Area A Landfill (i.e., bedrock, alluvium, landfill, and dredge spoil). The first transect, which is through the west/central portion of the landfill, will include monitoring wells 4MW1S (bedrock), 2LMW29A (alluvium), 2LMW29F (fill), 2LMW7D (bedrock), 2LMW7S (fill/dredge spoil), and 2WMW40DS (dredge spoil). The second transect, which is through the eastern

portion of the landfill, will include 2LMW20S (fill/alluvium), 2LMW32F (fill), 2LMW32DS (dredge spoil), 2LMW32B (bedrock), and 2WMW46DS (dredge spoil). Monitoring well 2WMW21S (dredge spoil), which is not located along either transect, will also be included in the additional sampling activities as a reference dredge spoil monitoring well. The

locations of these wells are shown on Figure 2, which is attached to these responses to comments. It should be noted that monitoring wells 4MW1S, 2WMW40DS, 2LMW20S, 2MW46DS, and 2WMW21S are currently included in the Area A Landfill groundwater monitoring program.

A maximum of two rounds of groundwater samples will be collected from the proposed wells to confirm the general geochemical characteristics already identified in the conceptual model. The sampling activities will be conducted concurrent with sampling activities for the Area A Landfill groundwater monitoring program. Because many of the wells have not been sampled since before the Area A Landfill cap was installed, each monitoring well will be re-developed prior to sampling. If it is found that a proposed monitoring well is not functional, an alternative well will be selected, developed, and sampled in its place.

The groundwater samples collected from the additional monitoring wells will be analyzed for parameters that will provide geochemical evidence, primarily redox conditions and pH, for major metal mobilizing and precipitation/sorption processes. The samples will be analyzed for the same parameters currently included in the groundwater monitoring program [i.e., total and dissolved inorganics, alkalinity, COD, chloride, hardness, sulfate, TDS, TSS and water quality field parameters (pH, DO, ORP, salinity, conductivity, turbidity, and temperature)] as well as additional parameters (i.e., ferrous iron, dissolved sulfide, TOC, dissolved hydrogen, and methane).

The Navy, EPA, and CTDEP discussed this issue during a conference call on June 5, 2002. The details of the proposed additional monitoring activities will be documented in a Letter Work Plan. The results of the actual additional sampling and analysis activities will be presented in the Area A Landfill Year 3 Annual Groundwater Monitoring Report. The data interpretations presented in the report will focus on confirmation of the proposed conceptual model. If warranted, geochemical modeling may be conducted to provide supporting information for the conceptual model.

Comment 3 - p. 4-2, §4.2.1

Reference is made in the first paragraph on this page to well 2WMW21DS, rather than 2WMW21S. Please check nomenclature for consistency.

Response

Agree with clarification. The typographical error noted in the comment is in the first paragraph on p. 4-4. The monitoring well designation will be changed to 2WMW21S as requested.

Comment 4 - p. 4-4, §4.2.1

It is interesting to note that pH and ORP appear to be inversely correlated (see, *e.g.*, Table D-1). This may reflect the residence time of groundwater, or equivalently, the distance traveled from recharge/infiltration. Low-pH (acid rain), high-ORP water recharges groundwater (*e.g.*, near 4MW1S), and is buffered along its path, while simultaneously being depleted of oxygen by interaction with organic carbon in the aquifer and/or the landfill.

Response

Comment noted. Please refer to the response provided for Specific Comment 2.

Comment 5 - p. 4-20, §4.5

Following previous review comments suggesting that elevated arsenic in groundwater in the dredged material might be because of reductive dissolution of iron oxyhydroxides and consequent mobilization of sorbed arsenic, the report shows plots of total arsenic versus total iron (Fig. 4-14) and dissolved arsenic versus dissolved iron (Fig. 4-15). No correlation is apparent in these plots, as noted in the text. The lack of such an association is somewhat surprising, particularly given the strong correlation between arsenic and iron found in solid phases (see, *e.g.*, Fig. 4-13), along with the very low ORP found in groundwater in the dredged material. In view of the importance of understanding the processes controlling arsenic concentrations in groundwater at the site, and their implications for long-term monitoring, it is worthwhile to re-examine the existing data. In particular, it may be fruitful to seek factors that may mask a correlation between arsenic and iron in groundwater. First, the treatment of non-detects (NDs) may obscure a pattern. In the present case, it appears that Figures 4-14 and 4-15 are constructed by plotting As at half its detection limit when As is undetected. Detection limits for the arsenic analyses appear to be somewhat variable, ranging, for example, from 4 to 13.1 ug/L in Round 8 analyses on filtered samples. Analytical results for iron are not reported in Table 4-3; therefore, no assessment of iron detection limits and their possible influence on the plots can be made. In any event, perhaps the correlation should be sought only using analyses for which both As and Fe were quantified. Second, the text notes (p. 4-20, §4.5) that turbidity levels were high (visually), despite the low-flow sampling procedure. Although the correlation between As and Fe is not apparent even for the filtered samples, it is possible that the presence of very fine (<0.45 um) particulates introduces another variable. Finally, it is sometimes

found that careful separation of individual wells or groups of wells reveals a correlation, possibly owing to spatial variation in the ratio of arsenic to iron in solid phases. For future documentation of analytical results from the monitoring program, please report iron in the summary tables. (I note that iron analyses are reported in the QA tables provided in Appendix A (Qualified Analytical Results) of Appendix F (Round 8 Data Validation...), but only for samples that are qualified.) Given the potentially important role of iron in the transport of iron, these data should be documented.

In the absence of complete reporting of iron analyses, correlations between various metals were sought as a secondary indicator of reductive dissolution. It is expected that iron oxyhydroxides, if present, would sorb other metals in addition to arsenic. If these metals are present in groundwater in fixed ratios to iron, then they will also appear in fixed ratios to each other. Examination of data from Round 8 (Table 4-1) shows a correlation of copper and zinc for samples for which both elements were above detection limits. This test is limited, of course, by the small number of samples. However, it is suggestive of a role for reductive dissolution, even though a correlation of arsenic and iron is not apparent in the data presented in Figures 4-14 and 4-15.

Response

Agree with clarification. The effects of nondetects on Figures 4-14 and 4-15 will be evaluated and the results of the evaluation (i.e., additional figures) will be presented in the final Year 2 Annual report.

Iron was not identified as a COC for the Area A Landfill and as such it has not been provided in Table 4-3. Because it is not a COC, the Navy does not intend to present iron results in Table 4-3 in the future. The EPA can find the iron results, both detections and nondetects, for the Round 8 sampling event in the data summary tables provided in the validation letters in Appendix F. Iron data for previous rounds were provided in the previous quarterly and annual reports.

Please refer to the conceptual model discussed in the response to Specific Comment 2. Based on this conceptual model it appears that the source of the arsenic detected in the downgradient monitoring wells is the dredge spoils versus the Area A Landfill. The information provided in the referenced response and the Year 2 Annual Report also indicates that the arsenic is not migrating downgradient from the Area A Wetland. The Navy provides a proposal for additional sampling to confirm the conceptual model in the response to Specific Comment 2.

Comment 6 - p. 4-20, §4.5

I note in Table D-1 that DO is measurable at a few mg/L in many samples where ORP is very low (<-300 mV). For example, in 2WMW40DS in Round 8, DO is 3.36 mg/L, while ORP is -372 mV.

Similarly, 2WMW43DS in Round 8 shows DO at 4.13 mg/L and ORP at -390 mV. While disparity between DO and ORP measurements is not uncommon because of limitations on field instrumentation or disequilibrium among the redox couples, these data raise questions about the redox conditions. The sulfate data, too, seem inconsistent with the reported ORPs. Sulfate reported for 2WMW43DS in Round 8 (see, *e.g.*, Appendix A of Appendix F) is 530 mg/L. How can this high sulfate be reconciled with the low ORP observed at this well? Is it possible that sulfide formation and oxidation plays a role in controlling iron concentrations in solution, and, by association, arsenic?

Response

Agree with clarification. There are limitations on DO measurements using field instruments. Field test kits typically provide more accurate DO results than field probes. As can be seen in Table D-1, ORP readings for 2WMW40DS have consistently been approximately –325 mV through 8 rounds of monitoring, while DO readings have varied from 0 to 3.36 mg/L, excluding the anomalous DO reading recorded during Round 5. Therefore, some of the discrepancies between ORP and DO may be caused by the instruments.

The response to Specific Comment 2 provides a conceptual model of the geochemical processes affecting the dredge spoils. These dredge spoils were originally anaerobic estuarine sediments that may contain sedimentary sulfide minerals. As these minerals undergo oxidation they release iron (possibly some arsenic) and sulfate. ORP is difficult to interpret by itself. Based on available references (e.g., Stumm and Morgan, Aquatic Chemistry) it is likely that given the measured ORP in the groundwater, redox conditions may be in the iron reduction zone, but not quite reducing enough for significant sulfide production. Also, given the presence of abundant dissolved iron and relatively low concentrations of sulfide, if sulfide minerals start to precipitate, measurable concentrations of sulfide will not be seen in groundwater. The information suggests sedimentary sulfide mineral oxidation giving dissolved iron, sulfate and perhaps, releasing of some arsenic.

Comment 7 - p. 4-20, §4.5

The "threshold" effect found in the plots of As versus TDS (Figs. 4-10 and 4-11) is intriguing; elevated As appears to be associated with samples with TDS greater than about 2000 mg/L. Is there a proposed mechanism to explain this phenomenon? Is it possible that the dredged material wells tend to be high in TDS from the seawater characteristics discussed in a previous comment, and that, somewhat independently (*e.g.*, because the dredged material is high in organic carbon and groundwater velocities are small), the dredged material wells also sample a highly reducing environment?

Response

As mentioned in Section 4.5 of the Year 2 Annual Report, interferences with the ICP method was considered as one potential reason. The ICP methodology cautions that high TDS (>1,500 mg/L) and salts can cause interference with the analysis. However, the project laboratory was contacted about this issue and they indicated that appropriate dilutions were completed to compensate for high TDS. This laboratory also routinely analyzes samples collected from marine environments. Other explanations for this phenomenon are not evident.

See response to Specific Comment 2.

Comment 8 - §5.2

A number of recommendations are made in §5.2, and are addressed in this comment.

Monitoring frequency: Reduction from quarterly to bi-annual sampling is appropriate at this time. Sufficient quarterly data are in hand to evaluate short-term variability, including potential seasonal effects. There are no indications of rapid changes in COCs that would require high-frequency monitoring in order to resolve trends.

Analytes: I agree that analyses for VOCs, pesticides, and PCBs can be eliminated without loss of significant data. These compounds have been ND for two years. Dissolved metals analyses, as well as the miscellaneous parameters (*e.g.*, alkalinity, COD, chloride, hardness, sulfate, TDS, TOC), are important to developing a defensible conceptual model for the transport of arsenic in this environment, and should not be dropped at this time.

Arsenic monitoring criteria: I agree that the appropriate criterion for arsenic should be discussed. It is not apparent that arsenic concentrations in groundwater downgradient of the landfill can be expected to change in the foreseeable future. A sound conceptual model for the source(s) and controls on transport of arsenic in this setting, consistent with available site data, is essential to guide the discussion. Please evaluate all available data to support the development of a conceptual model for arsenic in this system. It is possible that the arsenic in the wetland wells (including those along the toe of the landfill) may be present in the dredged material, and mobilized by the reducing conditions that prevail. It is possible that the landfill has little influence on this picture. In particular, note that soil samples taken throughout the wetland correlate arsenic and iron, so the arsenic appears to be ubiquitous. Also, the wetland well 2WMW21S, which is a "reference" well - *i.e.*, not downgradient of the landfill --- seems to look chemically similar to the wells at the toe of the landfill. All of these are screened in the dredged material, all see highly reducing conditions, elevated As, high salinity, *etc.*

Another tool for getting at the hydrochemical facies is to look at major-element compositions of subdomains of the groundwater (and possibly the surface water). One way to do this is with Piper diagrams. For example, Piper diagrams could be used to see if the major-element chemistry of 2WMW21S fits with the other wetland wells downgradient of the landfill, which would suggest a minor role for the landfill in determining at least the major-element chemistry. In order to do this, the major element analytes on their PAL (Fe, Ca, Mg, Na, K, sulfate, chloride, and alkalinity) need to continue to be analyzed. This reviewer tried this with the few wells for which these results were reported (in the QA appendix). The wetland wells group tightly on the Piper diagram, so this is promising. However, the reviewer didn't have data for 21S. Surface waters grouped, too, but plotted in a different domain from the wetland groundwaters - not surprising, but verifying that the method can discriminate among waters.

Staff gauges and surface water sampling: The locations noted should be eliminated from the program, as surface water is not reliably present. Data from these locations will be sporadic, if any at all is collected, and their interpretation will be ambiguous, at best.

Downgradient well 3MW12S: The loss of downgradient monitoring well 3MW12S has been discussed in previous exchanges, and a convincing case has been made by Navy that the loss of these wells does not compromise the Area A Landfill monitoring program. In view of a historical lack of detections of constituents clearly associated with the landfill or the Area A wetlands, the stability of other monitoring points in the program, and the availability of another shallow downgradient well (3MW37S), the loss of the shallow downgradient well does not appear to result in a loss of critical data or monitoring coverage.

Downgradient well 3MW12D: I agree that the loss of 3MW12D leaves a significant gap in the coverage of the long-term monitoring program. Bedrock groundwater downgradient of the dike should be monitored in order to verify that contaminants are not transported from the Area A Landfill/Wetlands area and discharged upward to overburden groundwater and/or surface water in the remediated Area A Downstream area.

Response

Monitoring frequency: Agree with Clarification. The Navy recommends the following within the draft Year 2 Annual Report: (1) Completing one additional round (Round 11) of sampling for Year 3 in September 2002 for a total of 3 rounds of sampling for the year and (2) changing the sampling frequency from quarterly to annual starting with Year 4 of the monitoring program. The EPA's comment does not specifically disagree with the Navy's recommendation, but suggests that bi-annual sampling should be conducted. Further clarification is required from the EPA regarding sampling frequency.

The Navy, EPA, and CTDEP discussed this issue during a conference call on June 5, 2002. It was agreed that the sampling frequency should be changed to bi-annual and that completion of 3 rounds of sampling for Year 3 was sufficient. In addition, it was agreed to

postpone selection of the sampling frequency for Year 4 until the results for Year 3 are known and documented in the Year 3 Annual Report. The recommendations of the Year 2 report will be modified accordingly.

Analytes: Agree with clarification. VOCs, pesticides, and PCBs will be eliminated from the analytical suite. Dissolved metals and miscellaneous parameters will be maintained in the analytical suite until a defensible conceptual model for arsenic transport is developed and the source of arsenic can be shown to be unrelated to the Area A Landfill. Please see the response provided for Specific Comment 2 regarding the conceptual model for arsenic transport.

Arsenic monitoring criteria: Agree with clarification. Based on the conceptual model presented in the response to Specific Comment 2, it is highly likely that the elevated arsenic concentrations that have been detected in the downgradient monitoring wells are related to the dredge spoils in which the wells are screened and not the Area A Landfill. Further data collection activities will solidify the conceptual model.

The primary criteria selected for arsenic for the Groundwater Monitoring Program was the CTDEP Surface Water Protection Criteria (SWPC) since some of the groundwater passing through the Area A Landfill eventually discharges to the Area A Wetland. The criterion of 4 ug/L is based on detection limit issues versus risk. The secondary criterion selected for arsenic for the Groundwater Monitoring Program was the lower of the Federal and State Ambient Water Quality Criteria. The Federal criterion of 150 ug/L for arsenic, which is the lower of the two criteria, was selected and is based on protection of freshwater aquatic life for chronic effects. Upon further review of Section 22a-133k-3(b)(2) of the State of Connecticut regulations, it is evident that if a groundwater plume discharges to a wetland or an intermittent stream, such as the groundwater at the Area A Landfill to the Area A Wetland, that each substance within the plume should be remediated to a concentration equal to or less than the applicable aquatic life criteria contained in Appendix D of the most recent Water Quality Standards. Therefore, this information suggests that the secondary criteria being applied to the site should be adopted as the primary criteria. The Navy proposes to adopt the Federal Water Quality Criteria of 150 ug/L as the primary monitoring criteria for arsenic for the Area A Landfill monitoring program. This criteria is lower than the State of Connecticut Water Quality Criteria which is 190 ug/L. No concentrations of arsenic have been detected during the groundwater monitoring program that exceed this criterion, indicating that the detected levels of arsenic do not present a concern to ecological receptors.

The Navy, EPA, and CTDEP discussed this issue on June 5, 2002 during a conference call. During the call, the CTDEP indicated that they agreed with the Navy's interpretation of State

of Connecticut RSRs and the proposed arsenic criterion. At the time of the call, the EPA indicated that they required more time to research the issue and could not concur with the recommendation during the call. After several requests, the EPA did not provide the Navy with additional information. In order to finalize the Year 2 report, the Navy will maintain the current arsenic criteria, with the understanding that the arsenic CTDEP SWPC is very conservative and generally not applicable for the Area A Landfill. The Navy will adopt modified arsenic criteria in subsequent reports.

Staff gauges and surface water sampling: Agree. The recommended staff gauges and surface water sampling locations will be eliminated from the monitoring program.

Downgradient well 3MW12S: Agree. Monitoring well 3MW12S will not be reinstalled and will not be sampled in the future.

Downgradient well 3MW12D: Agree. Monitoring well 3MW12D will be reinstalled and will be sampled under the monitoring program. The well will be reinstalled in the fall of 2002.