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BUILDING 57 INTERIM REMEDIAL MEASURE (IRM) COMPLETION REPORT

OPERABLE UNIT #5/BUILDING 57 AREA

Union and Endicott, New York
AOC Index # A7-0502-0104
Site # 704014

Prepared for IBM
File No. 2466.02
November 2012

IBM

8976 Wellington Road
Manassas, VA 20109

November 30, 2012

Alex Czuhanich
Engineering Geologist
New York State Department of Environmental Conservation
Division of Environmental Remediation Bureau E
625 Broadway, 12th Floor
Albany, NY 12233-7017

Re: Transmittal of Documentation
Building 57 Interim Remedial Measure (IRM) Completion Report
Operable Unit #5/Building 57 Area
Union and Endicott, New York
AOC Index # A7-0502-0104, Site # 704014, Endicott, New York

Dear Mr. Czuhanich:

The attached report and documentation summarizes the completion of Interim Remedial Measure (IRM) of in-situ thermal treatment by Electrical Resistance Heating at Building 57 of Operable Unit#5 in Union and Endicott, New York. The IRM implementation activities were completed in accordance with the approved June 24, 2011 IRM Work Plan.

Should you have any questions, please contact Kevin Whalen at 703-257-2582 or me at 703-257-2587.

Sincerely,

M. E. Meyers

Mitch Meyers
Program Manager

cc: K. Anders, NYSDOH - Troy
K. Lynch, NYSDEC Region 7
D. Tuohy, NYSDEC – Albany, w/out enclosure
C. Edwards, Broome County Health Department
C.Pelto, Endicott Interconnect

Encl. Building 57 Interim Remedial Measure (IRM) Completion Report

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20 Foundry Street
Concord, NH 03301

Mr. Mitchell Meyers
IBM Corporate Environmental Affairs
8976 Wellington Road
Manassas, Virginia 20109

November 30, 2012
File No. 2466.02

Re: Building 57 Interim Remedial Measure (IRM) Completion Report
Operable Unit #5/Building 57 Area
Union and Endicott, New York
AOC Index # A7-0502-0104, Site # 704014, Endicott, New York

Dear Mr. Meyers:

Enclosed please find the subject Building 57 Interim Remedial Measure (IRM) Completion Report for the Operable Unit #5/Building 57 Area, which documents the completion of Interim Remedial Measure (IRM) of in situ thermal treatment (ISTT) by Electrical Resistance Heating at Building 57. This report was prepared for submission to, and approval by, the New York State Department of Environmental Conservation and the New York State Department of Health.

This report was prepared under my direction as a Professional Engineer registered in the State of New York.

Please contact us with any questions.

Very truly yours,
SANBORN, HEAD & ASSOCIATES, INC.

Jonathan Ordway, P.E.
Senior Project Director
20 Foundry Street
Concord, New Hampshire

AVK/LJJ/JO/DBC: avk

Encl. Building 57 Interim Remedial Measure Completion Report

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1.0 INTRODUCTION

Sanborn Head & Associates, Inc. (Sanborn Head) prepared this report on behalf of IBM Corporation (IBM), to document completion of the Interim Remedial Measure (IRM) of in-situ thermal treatment (ISTT) by Electrical Resistance Heating (ERH), at the Operable Unit #5 (OU#5)/Building 57 Area (Site) of the former IBM Endicott facility in Union & Endicott, NY. OU#5 is defined in the Administrative Order on Consent (AOC)[1]. This report summarizes the implementation and monitoring of the IRM, and presents data to confirm the objectives were achieved. The findings and conclusions presented in this report are subject to the limitations presented in Appendix A.

The IRM was designed for removal of volatile organic compound (VOC) mass from four identified "source zones" identified on Figure 1 that were contributing to the presence of VOCs in groundwater. This work was completed in accordance with the ISTT IRM Work Plan[2] approved by the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH), which are hereinafter referred to together as the Agencies.

The Remedial Action Objectives (RAOs) for ERH, as established in the IRM Work Plan, were to achieve Commercial Use Soil Cleanup Objectives (SCOs)[3] for the key VOCs identified in Exhibit 1.

Exhibit 1 – RAOs, Commercial Use SCOs presented in units of milligrams per kilogram (mg/Kg), equivalent to parts per million by volume (ppmv)

Trichloroethene (TCE)	1,1,1-Trichloroethane (TCA)	CFC-113
200 mg/Kg	**500 mg/Kg**	**500 mg/Kg**

Following application of approximately 70%, 85%, and 100% of budgeted power, confirmatory soil samples were collected from locations within each source zone to assess the remediation progress. The results from these sampling events indicate that IBM not only achieved the RAOs of Commercial Use SCOs, but also achieved "Unrestricted" SCOs within all four treatment zones.

The work documented in this report was successfully completed on IBM's behalf through collaborative efforts of Sanborn Head, O'Brien & Gere (OBG), TRS Group, Inc. (TRS) and Groundwater Sciences Corporation (GSC).

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1 Administrative Order on Consent Index # A7-0502-0104 (AOC) between the New York State Department of Environmental Conservation (NYSDEC) and IBM, executed on August 4, 2004 and effective on August 14, 2004.

2 Sanborn, Head Engineering, P.C., June 24, 2011, "In Situ Thermal Treatment IRM Work Plan – Operable Unit #5, Building 57, Former IBM Facility, Endicott, New York, AOC Index No. A7-0502-0104, NYSDEC Site No. 7-04-014".

3 Presented in 6 NYCRR Table 375-6.8(a) for primary VOCs and breakdown products with the exception of CFC-113, which was presented as a supplemental soil clean-up objective in NYSDEC Soil Cleanup Guidance, CP-51, dated October 21, 2010.

2.0 BACKGROUND

The subsurface data on which the IRM was designed were collected during the Supplemental Remedial Investigation (SRI) and follow-up exploration and testing described in the SRI Report[4]. The presence of six source zones were inferred from the findings of the SRI, as identified on Figure 1:

1. Building 57A Area (B57A Area);

2. Former Waste Solvent Area (Waste Solvent Area);

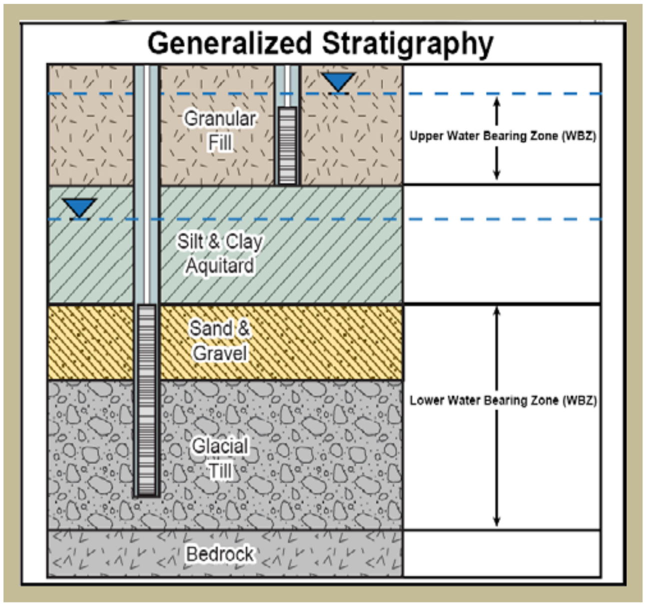
3. Former TCA Above Ground Storage Tank (AST) Area (TCA Area);

4. Former Chlorofluorocarbon-113 (CFC-113) AST Area (CFC Area);

5. Building 57 Area (B57 Area); and

6. Former Huron Lot #26 Area (Lot 26), which has since been purchased and redeveloped by Gault Toyota.

The first four source zones listed above were targeted for ERH. The B57 Area was considered a *de minimis* source and no remediation was required. Lot 26 was subject to a limited program of targeted soil excavation[5] and will continue to be addressed through groundwater extraction and treatment.



Although there were variations noted in the SRI Report, the generalized stratigraphy beneath the site consisted of bedrock (Shale) overlain by glacial till, overlain by alluvial deposits of silt, sand, and gravel, overlain by a local silt and clay aquitard, overlain by granular fill. The silt and clay aquitard separated two water bearing zones (upper and lower). Although the aquitard restricted the flow of groundwater between the two water bearing zones (WBZs), it did not prevent the migration of VOCs into the silt and clay and the lower WBZ soil.

As described in the SRI report, the primary VOCs present within the source

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4 Sanborn, Head Engineering, P.C., March 11, 2010, “Report of Findings, Supplemental Remedial Investigation, Operable Unit #5, Building 57 Area, Union and Endicott, New York.” Agency approval provided in a letter dated April 13, 2010.

5 Sanborn, Head Engineering, P.C., July 12, 2011 “IRM Completion Report - Lot # 26 Excavation – Operable Unit#5, Lot 26 Area, Union and Endwell, New York, AOC Index No. A7-0502-0104, NYSDEC Site No. 7-04-014”.

zones were chlorinated ethenes (TCE and associated biochemical degradation byproducts), chlorinated ethanes (111-TCA and breakdown products) and CFCs. The quantity and distribution of VOC mass varied between source zones, media (soil and groundwater), and depth. Due to the unknown circumstances of release, and the variability within which VOCs were detected during the SRI, the removal or treatment of all contamination was not feasible with ERH or excavation. Thus the goal of this IRM was to remove VOC mass from the soil within the identified source zones to the extent practicable.

2.1 In-Situ Thermal Treatment – Electrical Resistance Heating Technology

ERH technology involves application of electrical current through a network of subsurface electrodes. The soil and groundwater act as a resistor to the path of electrical current, which results in heat generation. ERH technology is capable of heating the subsurface to the boiling point of water (100 degrees Celsius [^oC]) which is sufficient for removal of key site-specific VOCs that have boiling points below 100 ^oC.

Through these processes, the contaminants were transferred into the vapor phase where they were carried to vapor recovery (VR) points (slotted subsurface piping) with the assistance of steam generation and a differential pressure induced by vacuum extraction. The extracted subsurface gas and steam were directed through a condenser/cooling tower system that was followed by the vacuum blowers and vapor phase granular activated carbon. Following treatment, the extracted gas was discharged through a 55-foot high stack to ambient air. Liquid condensate was diverted to the Clark Street groundwater treatment facility (GTF) for treatment.

2.2 ERH Design Basis

As discussed in the IRM Work Plan, the ERH system was designed to:

- Raise and maintain the temperature of soil and groundwater to the boiling point of water (100^oC) across the treatment zone soil profile;
- Recover gas, steam, and water from the subsurface for treatment;
- Separate water condensate from the extracted vapor stream and treat the resultant gas stream for VOCs prior to discharge; and
- Direct the water condensate to the Clark Street GTF.

The four ISTT treatment zones comprised an area of about 36,000 square feet with an average depth of treatment of 20 feet. The estimated volume of in-place soil in the treatment zones is about 27,000 cubic yards.

2.3 ERH System Components

The primary components of the ERH system are summarized in Exhibit 2. For details on ERH system components, refer to the final report summarizing ERH operations provided by TRS, included as Appendix B.

Exhibit 2 –ERH System Components

Component Description	Quantity
2000 kW Power Control Units	2
Monitoring, Control, and Data Acquisition System	1
Remote Access and Control System	1
Electrodes	128[1]
Temperature Monitoring Points (TMP)	23
Thermocouples	110
Vapor Recovery Points, Co-located with Electrodes	125
Chimney Wells[6]	20
Condenser and Cooling Towers	2
Vacuum Blowers	2
Vapor-Phase Granular Activated Carbon (GAC) Vessels	4

[1] Plus a sheet pile wall in the Waste Solvent Area roughly equivalent to 10 electrodes.

3.0 SYSTEM INSTALLATION

Sanborn Head, OBG & TRS completed installation of subsurface ERH components, which included chimney wells, temperature monitoring points, bored electrodes, and sheet pile electrodes identified on Figure 2. Subsurface installation was completed between August 1 and November 11, 2011.

The installation of subsurface ERH components was generally consistent with the design documents provided in the IRM Work Plan, with few exceptions. The sheet pile wall was re-designed from that included in the 30% design and IRM Work Plan, following the soil assessment in the Waste Solvent Area[7]. As-built documentation is provided in Appendix C. Additionally, vertical bored electrodes were substituted for the angled bored electrodes in the Waste Solvent Area and CFC Areas, and a pair of bored electrodes was substituted for a sheet pile electrode pair in B57A Area. These variations from the original design did not change the system effectiveness and were not considered significant. Based on the results of confirmatory soil sampling (discussed below), TRS installed 12 additional electrodes within the B57A and Waste Solvent Areas (refer to Figure 2) where confirmatory soil samples and temperature monitoring data indicated that remedial objectives would not be met within a reasonable timeframe.

Refer to Appendix C for detailed documentation of ERH system installation, including drilling documentation and installation records.

[6] Chimney wells are borings extended into the lower WBZ and backfilled with sand, used to provide a path for vapor to migrate more readily from the lower WBZ, through the silt and clay aquitard, and into the unsaturated vapor recovery zone.

[7] Sanborn, Head Engineering, P.C., October 14, 2011, "Building 57 Waste Solvent Area Excavation Report, Operable Unit #5/Building 57 Area, Union and Endicott, New York." Agency approval provided in a letter dated April 26, 2012.

Surface completions, above-grade piping and cable installation, set-up of treatment equipment, and other components of final system construction and installation were completed by OBG and TRS between November 2011 and February 2012. Details about system construction are included in the TRS final report, provided in Appendix B.

4.0 SYSTEM OPERATION

The ERH System was designed and operated by TRS. Testing in advance of full system operation included quality assurance inspection of piping and electrical connections; testing of data recording and management systems, system interlocks, and communication protocols; testing of operating conditions against design documents and standard procedures; and voltage safety testing. During ERH operation, TRS monitored soil temperatures, system operational parameters, and field screening and laboratory analytical data, and adjusted system configuration and operation to meet remediation goals. Details on ERH system operation are provided in the TRS final report (Appendix B).

5.0 SYSTEM MONITORING AND ASSESSMENT

Upon completion of ERH treatment, we estimated that approximately 7,000 pounds of VOC mass were recovered comprising mainly CFC-113 and TCE. Refer to Appendix D for a detailed summary of estimated weekly mass removed during treatment and a breakdown of mass removed by key VOC constituents.

5.1 Treatment System Monitoring

Sanborn Head monitored the performance and progress of ERH implementation through routine system measurements and confirmatory soil sampling, generally according to the IRM Work Plan. Treatment system and performance monitoring included:

- Routine field measurement of total VOCs and CFC-113 in vapor at various stages of the treatment system (influent and effluent from each GAC vessel and the combined stack discharge);
- Collection of vapor samples at various stages of the treatment system and submittal for laboratory analysis of VOCs;
- Collection of vapor samples from individual source zone headers (prior to condenser and cooling units) and submittal for laboratory analysis of VOCs;
- Continuous monitoring for VOCs within the building and VOCs at the downwind property boundary as required by the approved Community Air Monitoring Program (CAMP);
- Collection of condensate samples and submittal to a laboratory for VOC analysis;
- Collection and field screening of groundwater for bromide and temperature at downgradient sentinel monitoring wells; and

- Performing three rounds of confirmatory soil sampling at 70%, 85% and 100% of budgeted power use. Sampling included advancement of direct-push soil borings within each treatment zone and collection of soil samples (generally one sample from each stratum) for laboratory analysis.

Refer to Appendix D for a more detailed description of system monitoring and relevant field documentation.

5.2 Treatment System Vapor Screening

Field and laboratory analysis of vapor samples was performed to assess the effectiveness of the treatment system, appropriate times to change out the carbon vessels, and to estimate the rate of VOC mass removal by the system. Vapor screening data and mass removal estimates over the course of ERH treatment are summarized in Appendix D. For several weeks leading up to the 70% confirmatory soil sampling event we collected and analyzed vapor samples from individual treatment zone headers so that we could better assess the rate of VOC mass contribution to the system (most screening and laboratory sampling was conducted after the condensers where the vapor stream characteristics represented a combination of two areas). Note that the analytical results for samples collected after the condensers are more reliable than before the condensers due to water vapor interference.

5.3 Community Air Monitoring Program (CAMP)

Air monitoring according to the IRM Work Plan and Agency-approved Revised CAMP[8] was performed during installation and operation of ERH. The CAMP included monitoring dust or particulate matter and VOC presence during excavation ERH construction activities. During ERH implementation, the CAMP comprised continuous air monitoring for total VOCs and CFC-113 inside the building (the loading dock area between Building 57 and Building 57A), and continuous monitoring for total VOCs at the downwind property boundary. The system was configured to send an alarm notification and shut down the electrodes if the concentrations exceeded predetermined levels. Refer to Appendix E for documentation summary of CAMP procedures and recorded data.

5.4 Sodium Bromide Tracer Monitoring

Due to the generation of steam, thermal treatment typically causes a "sink" effect on groundwater flow, particularly in low permeability formations like at OU#5. A concern prior to implementing ERH was that VOCs may become more mobile in groundwater as the ground temperature rises, but before steam would be generated and extracted.

Prior to initiating the ERH treatment, Sanborn Head injected sodium bromide (NaBr) tracer through each of the three groundwater extraction wells (after pumping was discontinued). During ERH operations we monitored NaBr concentrations and temperature in sentinel monitoring wells to assess the potential for groundwater migration. As indicated in the IRM Work Plan, detection of elevated NaBr at the sentinel wells would trigger a broader assessment of groundwater quality. We found no NaBr or temperature evidence

8 Sanborn, Head Engineering, P.C., February 2, 2012. "Appendix E (Revised Feburary 2, 2012) – Community Air Monitoring Plan," IRM Work Plan, Operable Unit #5/Building 57 Area, Union and Endicott, New York.

suggesting groundwater migrated to the sentinel wells. The injection and sentinel wells are shown on Figure 2. Refer to Appendix F for detailed field method summary and Table F.1 for data collected during tracer monitoring.

5.5 Confirmatory Soil Sampling

Confirmatory soil sampling was completed in accordance with the IRM Work Plan. Soil samples were collected from multiple depths at each of the sampling locations indicated on Figure 2, and Figures 3 (A) through 3 (D). As discussed in the IRM Work Plan, confirmatory sampling locations were selected based on criteria including historical detections of higher VOC concentrations; mid-point locations between electrodes, which are typically the last to reach treatment temperatures; and areas where the silt and clay aquitards thickness is greatest. The soil samples were analyzed for VOCs and the results were compared to the RAOs. To assess progress and re-focus the application of energy, we conducted interim sampling (when approximately 70% and 85% of TRS's design power budget had been applied). Based on the results of initial sampling at each soil boring, we concluded that the RAOs (Commercial SCOs) had been met in all four treatment zones. In addition, most of the soil concentrations were below the Unrestricted SCOs.

IBM chose to continue treatment until soil within the treatment zone met the Unrestricted SCOs. After the 85% confirmatory soil sampling, TRS installed 12 additional electrodes to increase the rate of VOC removal in areas where the remedial progress appeared stalled. Based on the 100% confirmatory soil sampling event, we were able to conclude that unrestricted SCOs have been met at all four treatment zones.

Detailed documentation of the confirmatory sampling program is provided in Appendix D.

6.0 QUALITY CONTROL AND DATA VALIDATION

As outlined in the IRM Work Plan, Sanborn Head followed the QA/QC plan and completed QC analysis of Summa®-type vapor samples and condensate samples collected from both process treatment trains. A summary of QC analysis and data quality objectives for performance monitoring is provided in Appendix G. All laboratory analytical reports are provided in Appendix H (on disc).

Data validation and usability assessment of confirmatory soil sample data was completed by New Environmental Horizons (NEH) of Arlington, MA, a third party consultant to Sanborn Head. All final results were deemed valid and usable for project decisions. Refer to individual validation reports provided in Appendix H for additional information. Validated soil quality data are summarized in Appendix D (Table D.5).

7.0 SYSTEM DECOMMISSIONING & SITE RESTORATION

Following confirmation that soil samples collected within ERH treatment zones met Unrestricted SCOs for key VOCs, TRS discontinued power application to the subsurface on September 24, 2012. The vapor recovery system continued to operate for a two week period to continue capturing subsurface vapor as the ground began cooling. Complete system demobilization for all treatment equipment was completed by TRS on October 17, 2012.

Site restoration commenced upon demobilization and will continue into 2013. As described in the IRM Work Plan, electrodes will remain in place. Vapor extraction points above the electrodes have been or will be sealed by injection of bentonite/cement grout. The floor slab within the building has been or will be repaired.

Exterior paved surfaces within the work area will be milled and repaved in early 2013. Original property line fencing will be restored. Drilling and installation of replacement and new groundwater monitoring wells is planned in 2013 as indicated in the IRM Work Plan. The restoration plans east of the Waste Solvent Area will focus on establishing a vegetative community that enhances soil stabilization and limits the re-colonization of non-native and invasive species.

8.0 SUMMARY

Nearly 7,000 pounds of VOCs were estimated to have been extracted from the ground in vapor form. With the application of ERH treatment, all remedial objectives as established in the IRM Work Plan were met. Additionally, soil conditions for samples collected within the treatment zones indicate that Unrestricted Use SCOs have also been met. The site will be restored for subsequent use, and IBM will continue to monitor groundwater quality conditions in keeping with Agency-approved, area-wide water quality monitoring.

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FIGURES

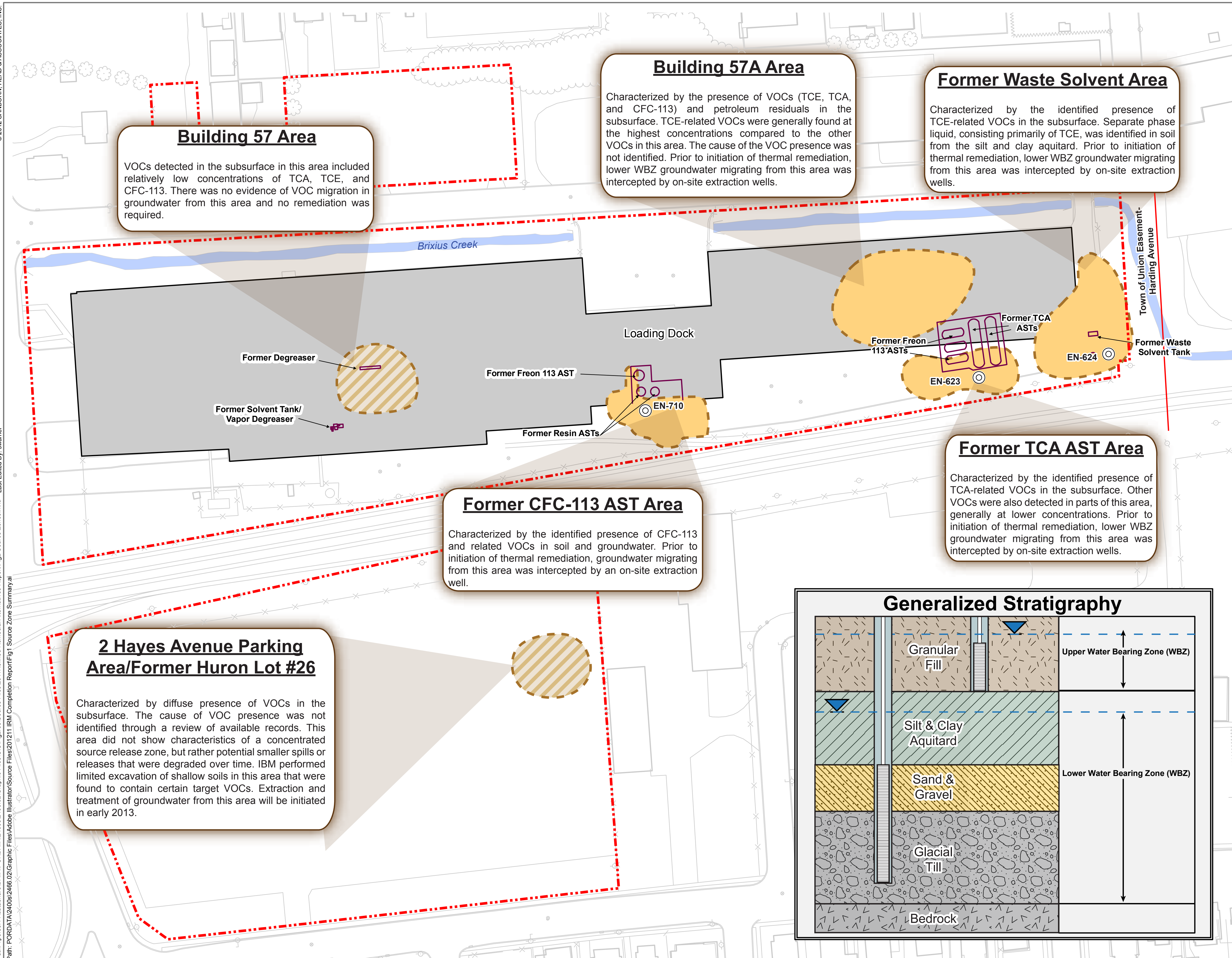


Figure 1

Source Zone Summary

IRM Completion Report
OU#5/Building 57 Area

Union and Endicott, New York

Drawn By:	S. Warner/A. Khandekar
Designed By:	L. Jacob
Reviewed By:	J. Ordway
Project No:	2466.02
Date:	November 2012

Figure Narrative

This map is intended to provide general information regarding source zones at the Building 57 (OU#5) site. The source zones were identified through a review of historical documents (see September 2005 Source Area Evaluation report prepared by Sanborn, Head Engineering, P.C.), and subsequent exploration and testing.

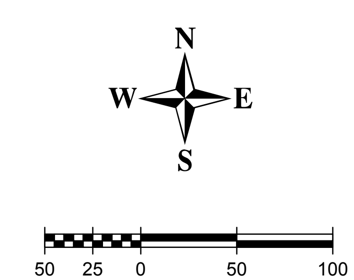
Please refer to the IRM Completion Report text, tables, and appendices for additional details.

Legend

Source Zone

Source Zone (no further assessment or mitigation is required)

Groundwater Extraction Well



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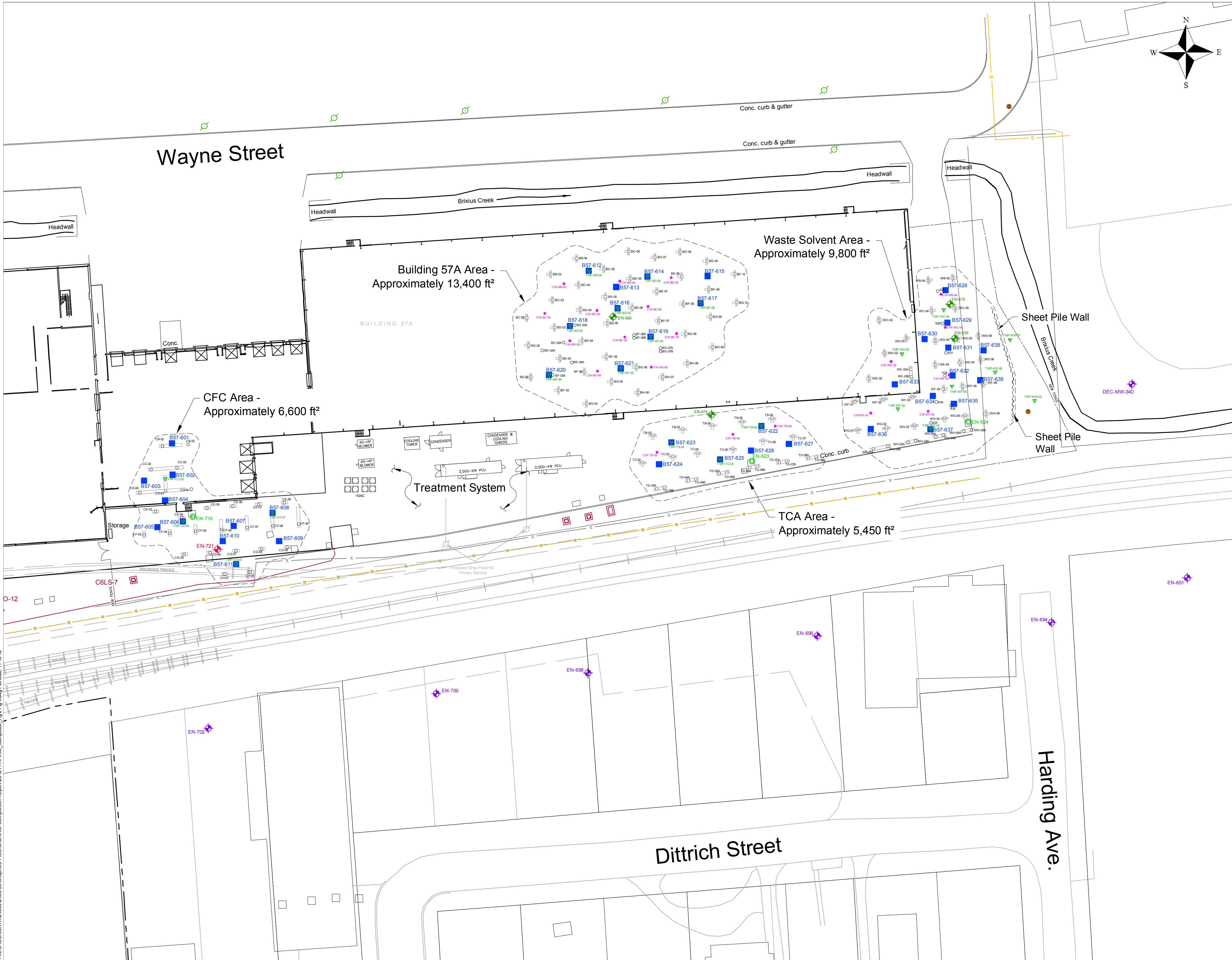

Figure 2

ERH Location Plan

IRM Completion Report

OU#5 / Building 57 Area
Union and Endicott, New York

Drawn By: E. Wright
Designed By: A. Khandekar
Reviewed By: J. Ordway/L. Jacob
Project No: 2466.02
Date: November 2012

Figure Narrative

This figure depicts the components of the ERH treatment system, multi-depth confirmatory soil sample locations to assess the effectiveness of ERH thermal system, bromide tracer injection and monitoring locations, and locations of new and replacement monitoring well at the Operable Unit # 5, Building 57, Union & Endicott, NY .

Refer to the IRM Completion Report and appendices for additional details.

Legend

- Temperature Monitoring Point
- Chimney Well
- Vertical Bored Electrode
- Confirmatory Soil Sample Location
- Tracer Injection Well
- Tracer Monitoring Well
- Replacement Well Location
- New Well Location
- Sheet Pile
- Nominal Extent of Treatment Area
- Sheet Pile/Electrode Wall

Feet
30' 15' 0 30' 60'

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Figure 3A

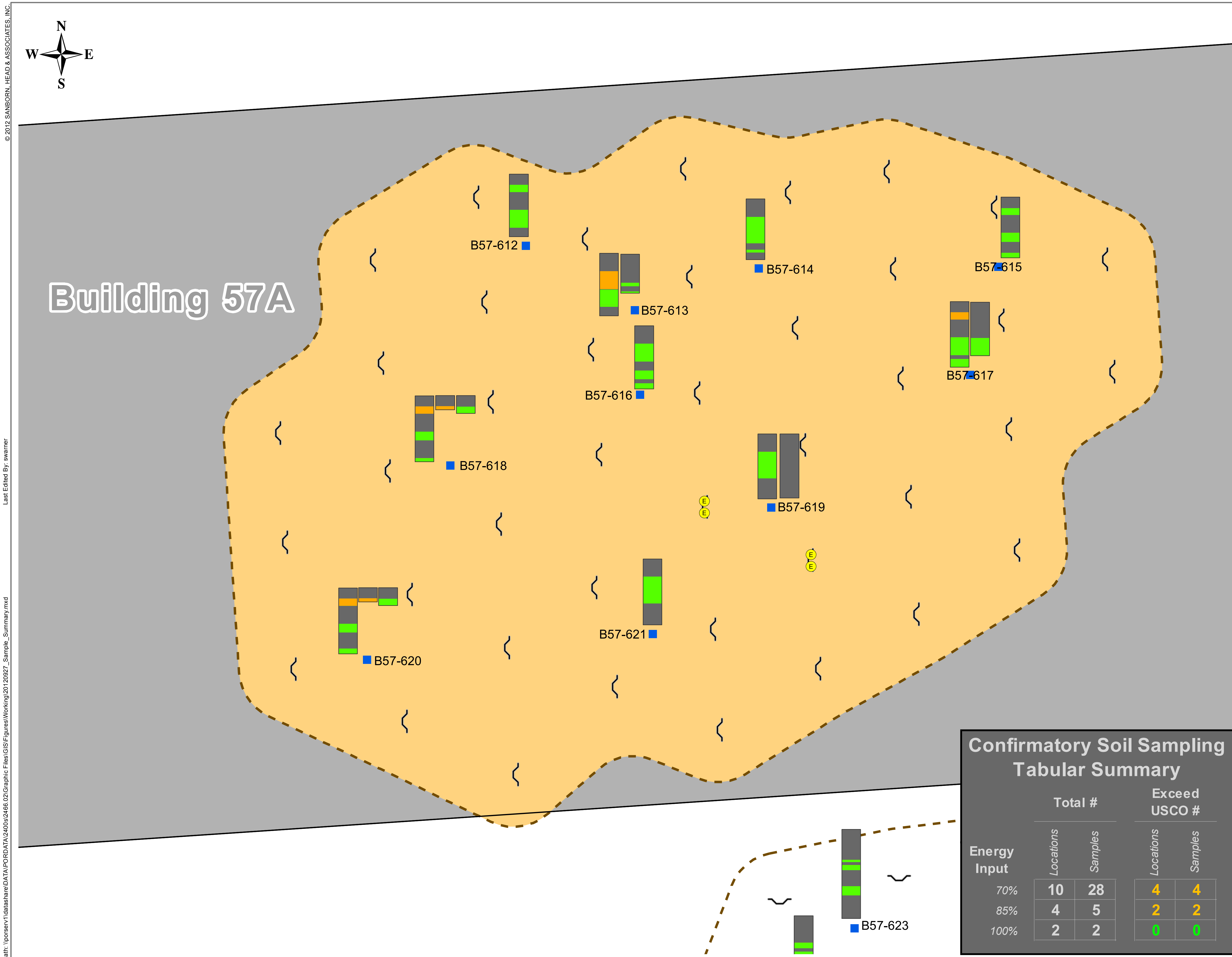
Confirmatory Soil Sampling Summary B57A Area

IRM Completion Report

OU#5 Building 57 Area

Union and Endicott, New York

Drawn By: S. Warner
Designed By: S. Warner
Reviewed By: J. Ordway/L. Jacob
Project No: 2466.02
Date: November, 2012



Confirmatory Soil Sampling Tabular Summary

Energy Input	Total # Locations	Total # Samples	Exceed USCO # Locations	Exceed USCO # Samples
70%	10	28	4	4
85%	4	5	2	2
100%	2	2	0	0

Figure Narrative

This figure is intended to show the distribution and summarize findings of confirmatory soil sampling conducted to assess the progress of electrical resistance heating at Operable Unit #5/Building 57. Confirmatory sampling was conducted at milestones corresponding to the application of 70%, 85%, and 100% of the design energy input. The graphical logs depict the relative depth below ground surface where samples were collected, and whether any of five key, site-specific VOCs were detected in exceedance of New York State Unrestricted Soil Clean Up Objectives (USCO). At locations and depths within the thermal treatment zones for which one or more key VOCs exceeded USCOs, subsequent samples were collected following additional treatment to confirm all remedial objectives were met.

See IRM report text and Appendix C for additional information.

Legend

Confirmatory Soil Sampling Log

Design Energy Input Milestone
70% 85% 100%

Feet (BGS) 0 5 10 20

B57-###

Not Sampled

One or more key VOCs detected at concentrations above USCO

All key VOCs detected at concentrations below USCOs

Features

Confirmatory Soil Sample Location

Vertical Bored Electrode

Sheet Pile

Nominal Extent of Treatment Area

7.5 3.75 0 7.5 15 Feet

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Last Edited By: swarner

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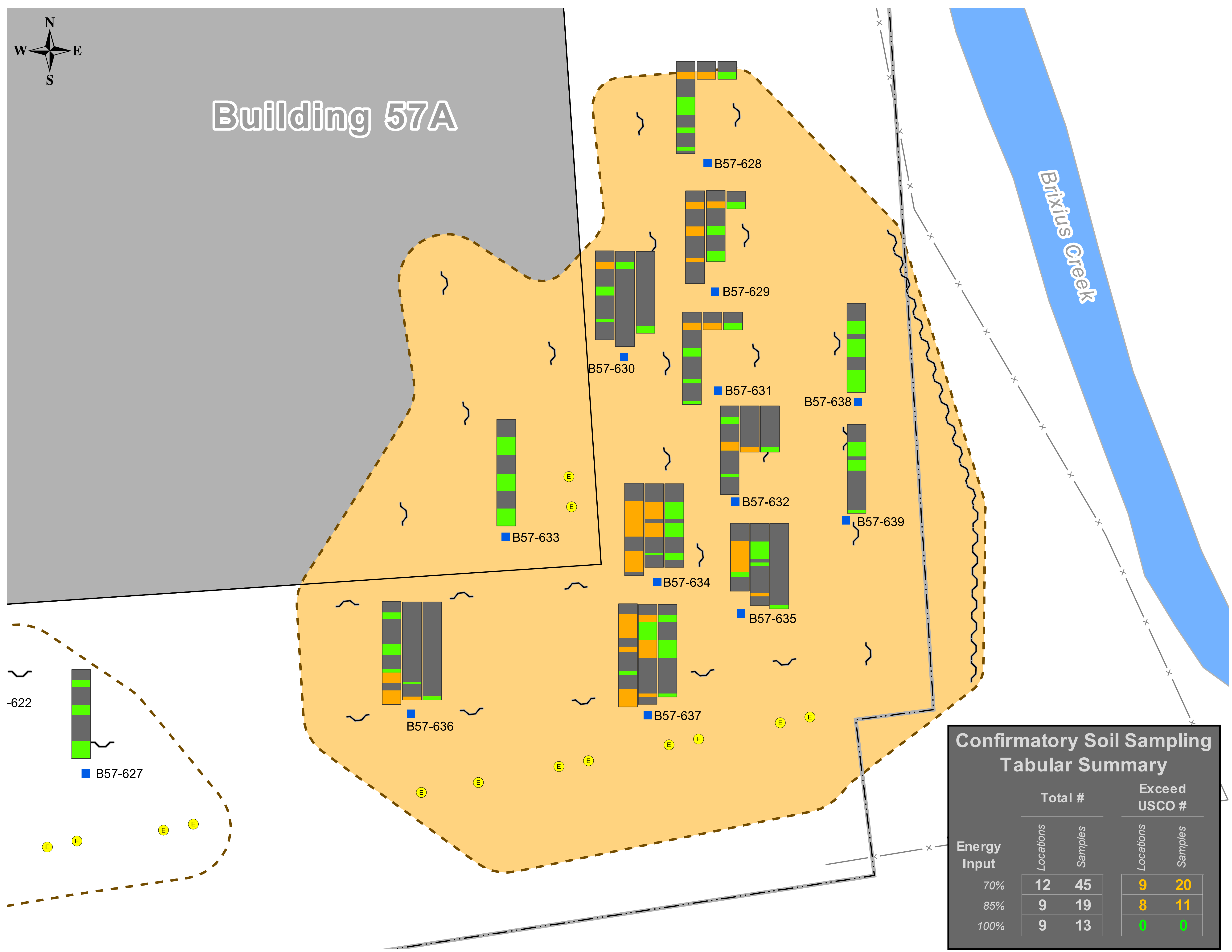


Confirmatory Soil Sampling Tabular Summary

Energy Input	Total # Locations	Total # Samples	Exceed USCO # Locations	Exceed USCO # Samples
70%	12	45	9	20
85%	9	19	8	11
100%	9	13	0	0

Figure 3B

Confirmatory Soil Sampling Summary Waste Solvent Area

IRM Completion Report

OU#5 Building 57 Area

Union and Endicott, New York

Drawn By: S. Warner
Designed By: S. Warner
Reviewed By: J. Ordway/L. Jacob
Project No: 2466.02
Date: November, 2012

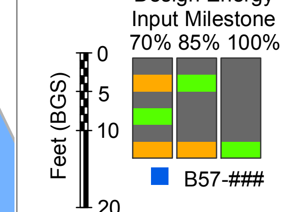
Figure Narrative

This figure is intended to show the distribution and summarize findings of confirmatory soil sampling conducted to assess the progress of electrical resistance heating at Operable Unit #5/Building 57. Confirmatory sampling was conducted at milestones corresponding to the application of 70%, 85%, and 100% of the design energy input. The graphical logs depict the relative depth below ground surface where samples were collected, and whether any of five key, site-specific VOCs were detected in exceedance of New York State Unrestricted Soil Clean Up Objectives (USCO). At locations and depths within the thermal treatment zones for which one or more key VOCs exceeded USCOs, subsequent samples were collected following additional treatment to confirm all remedial objectives were met.

See IRM report text and Appendix C for additional information.

Legend

Confirmatory Soil Sampling Log



Not Sampled

One or more key VOCs detected at concentrations above USCO

All key VOCs detected at concentrations below USCOs

Features

Confirmatory Soil Sample Location

Vertical Bored Electrode

Sheet Pile

Nominal Extent of Treatment Area

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Last Edited By: swarner

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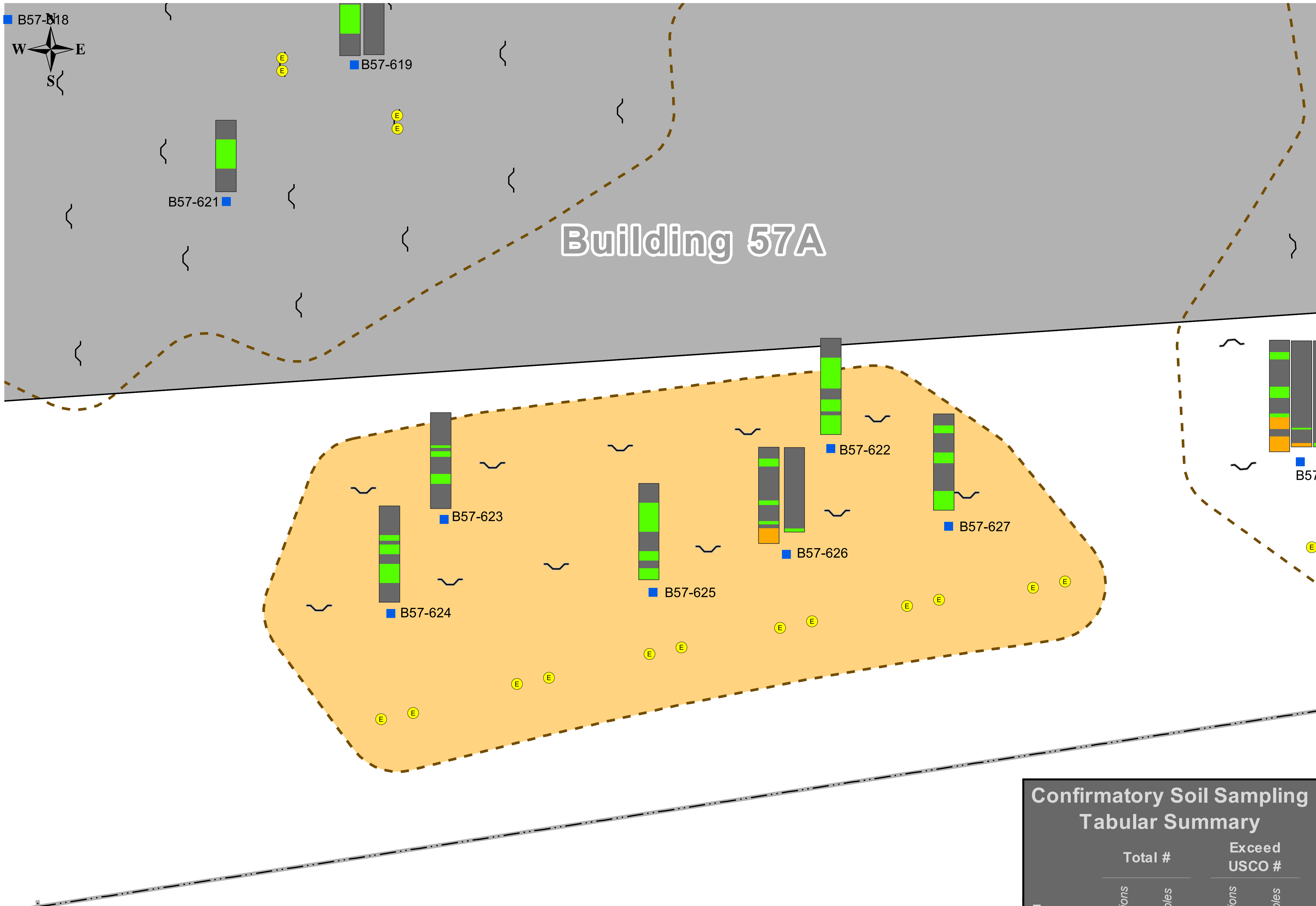


Confirmatory Soil Sampling Tabular Summary

Energy Input	Total # Locations	Total # Samples	Exceed USCO # Locations	Exceed USCO # Samples
70%	6	22	1	1
85%	1	1	0	0
100%	-	-	-	-

Figure 3C

Confirmatory Soil Sampling Summary TCA Area

IRM Completion Report

OU#5 Building 57 Area

Union and Endicott, New York

Drawn By: S. Warner
Designed By: S. Warner
Reviewed By: J. Ordway/L. Jacob
Project No: 2466.02
Date: November, 2012

Figure Narrative

This figure is intended to show the distribution and summarize findings of confirmatory soil sampling conducted to assess the progress of electrical resistance heating at Operable Unit #5/Building 57. Confirmatory sampling was conducted at milestones corresponding to the application of 70%, 85%, and 100% of the design energy input. The graphical logs depict the relative depth below ground surface where samples were collected, and whether any of five key, site-specific VOCs were detected in exceedance of New York State Unrestricted Soil Clean Up Objectives (USCO). At locations and depths within the thermal treatment zones for which one or more key VOCs exceeded USCOs, subsequent samples were collected following additional treatment to confirm all remedial objectives were met.

See IRM report text and Appendix C for additional information.

Legend

Confirmatory Soil Sampling Log

Design Energy Input Milestone
70% 85% 100%

Feet (BGS) 0 5 10 20

B57-###

Not Sampled

One or more key VOCs detected at concentrations above USCO

All key VOCs detected at concentrations below USCOs

Features

Confirmatory Soil Sample Location

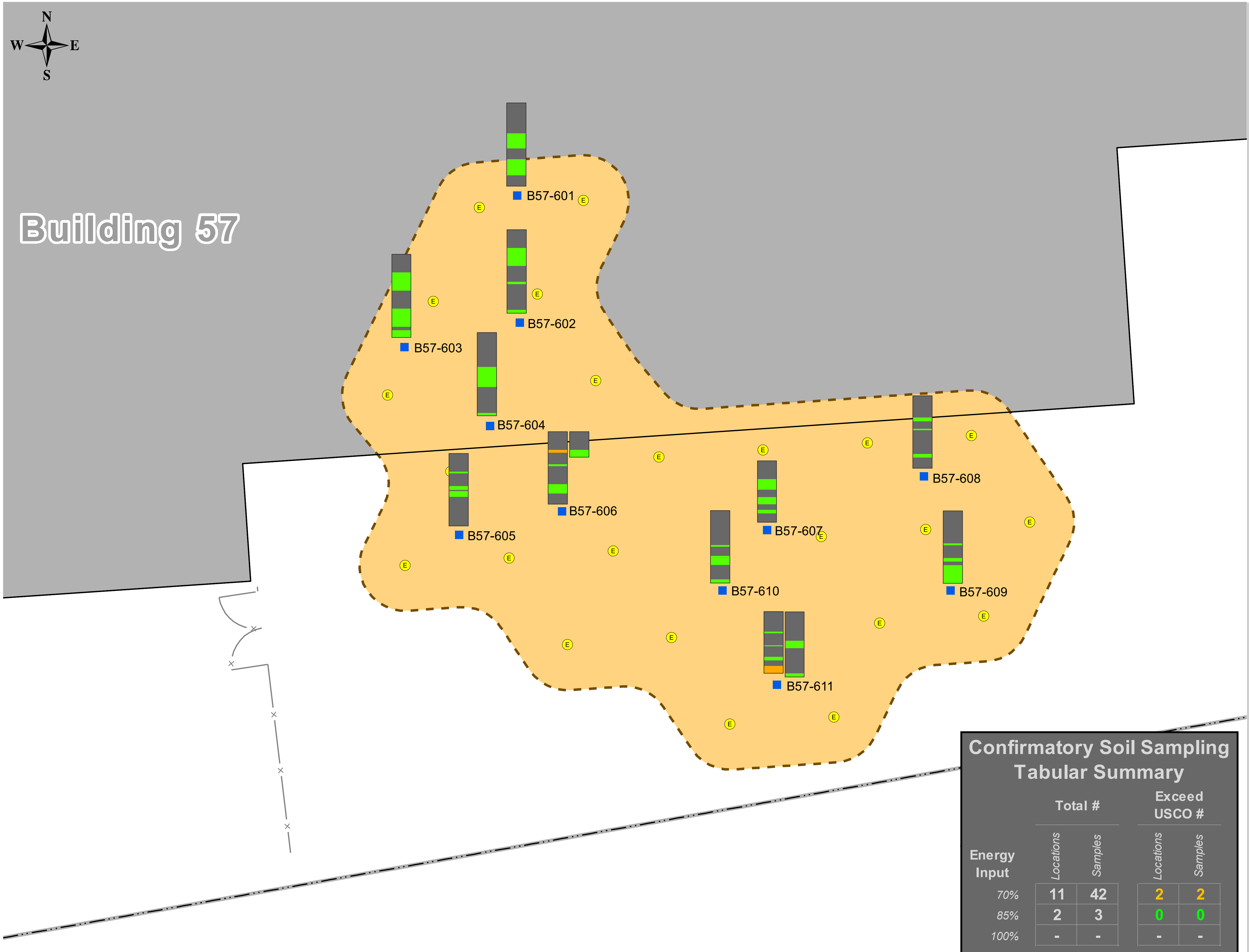
Vertical Bored Electrode

Sheet Pile

Nominal Extent of Treatment Area

7.5 3.75 0 7.5 15 Feet

SANBORN HEAD



Confirmatory Soil Sampling Tabular Summary

Energy Input	Total # Locations	Total # Samples	Exceed USCO # Locations	Exceed USCO # Samples
70%	11	42	2	2
85%	2	3	0	0
100%	-	-	-	-

Figure 3D

Confirmatory Soil Sampling Summary CFC Area

IRM Completion Report

OU#5 Building 57 Area

Union and Endicott, New York

Drawn By: S. Warner
Designed By: S. Warner
Reviewed By: J. Ordway/L. Jacob
Project No: 2466.02
Date: November, 2012

Figure Narrative

This figure is intended to show the distribution and summarize findings of confirmatory soil sampling conducted to assess the progress of electrical resistance heating at Operable Unit #5/Building 57. Confirmatory sampling was conducted at milestones corresponding to the application of 70%, 85%, and 100% of the design energy input. The graphical logs depict the relative depth below ground surface where samples were collected, and whether any of five key, site-specific VOCs were detected in exceedance of New York State Unrestricted Soil Clean Up Objectives (USCO). At locations and depths within the thermal treatment zones for which one or more key VOCs exceeded USCOs, subsequent samples were collected following additional treatment to confirm all remedial objectives were met.

See IRM report text and Appendix C for additional information.

Legend

Confirmatory Soil Sampling Log

Design Energy Input Milestone
70% 85% 100%

Feet (BGS) 0 5 10 20

B57-###

Not Sampled

One or more key VOCs detected at concentrations above USCO

All key VOCs detected at concentrations below USCOs

Features

Confirmatory Soil Sample Location

Vertical Bored Electrode

Sheet Pile

Nominal Extent of Treatment Area

7.5 3.75 0 7.5 15 Feet

SANBORN HEAD

Last Edited By: swarner

Path: \\porserv1\datashare\DATA\PORDATA\2400s\2466.02\Graphic Files\GIS\Figures\Working\20120927_Sample_Summary.mxd

APPENDIX A

LIMITATIONS

APPENDIX A
LIMITATIONS

1. The findings presented in this report were based solely upon the services described herein, and not on scientific tasks or procedures beyond the scope of described services.

2. Quantitative laboratory analyses were performed during IRM implementation and monitoring, as noted in the report. The analyses were performed for specific constituents of interest that were selected during the course of this study.

3. Quantitative laboratory testing was performed by others as part of the investigation as noted within the report. Where such analyses have been conducted by an outside laboratory, unless otherwise stated in the report, Sanborn Head has relied upon the data provided, and the opinion and findings of third party validation by qualified laboratory professional. The conclusions and recommendations contained in this report are based in part upon various types of chemical data. While Sanborn Head has reviewed the data and information as stated in this report, any of Sanborn Head's interpretations, conclusions, and recommendations that have relied on that information will be contingent on its validity. Should additional chemical data, historical information, or hydrogeologic information become available in the future, such information should be reviewed by Sanborn Head and the interpretations, conclusions and recommendations presented herein should be modified accordingly.

4. This report is prepared for, and is intended for the exclusive use of, the IBM Corporation for specific application to the Operable Unit #5/Building 57 Area in accordance with generally accepted professional practice. The contents of this report shall not be relied upon by any party other than IBM without the express written consent of IBM and Sanborn Head. No other warranty, express or implied, is made.

5. Sanborn Head is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or re-use of the subsurface data or engineering analyses without the express written authorization of Sanborn Head.

S:\CONDATA\2400s\2466.02\Source Files\2012 IRM Completion Report\Appendix A - Limitations\20121130 Appendix A - Limitations.docx

APPENDIX B

TRS GROUP FINAL REPORT, ELECTRICAL RESISTANCE HEATING

Final Report
Electrical Resistance Heating

IBM OU-5
6 Hayes Avenue
Endicott, NY

Issued: November 30, 2012

TRS Group, Inc.
PO Box 737
Longview, WA 98632
www.thermalrs.com

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Abbreviations and Acronyms

bgs	below grade surface
B57A	building 57A
ºC	degrees Celsius
CAMP	Community Air Monitoring Plan
CFC	chlorofluorocarbon
COC	Contaminants of concern
CPVC	chlorinated polyvinyl chloride
CVOC	Chlorinated Volatile Organic Compounds
DCE	cis-1,2-Dichloroethene
ERH	electrical resistance heating
Freon 113	Trichlorotrifluoroethane
ºF	degrees Fahrenheit
ft^2	square feet
ft bgs	feet below grade surface
gpm	gallons per minute
hp	horsepower
in Hg	inches of mercury vacuum
kW	kilowatt
kWh	kilowatt hour
mg/kg	Milligrams per kilograms
MW	monitoring well
NYDEC	New York State Department of Environmental Conservation
NYSEG	New York State Electric and Gas
OBG	O'Brien and Gere Inc. of North America
OU	Operable Unit
PCU	power control unit
PID	photo-ionization detector
ppb	parts per billion
PVC	polyvinyl chloride
SCO	soil cleanup objectives
scfm	standard cubic feet per minute
Sanborn Head	Sanborn, Head & Associates, Inc.
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
TMP	temperature monitoring point
TRS	TRS Group, Inc
VC	Vinyl Chloride
VGAC	Vapor-Phase Granular Activated Carbon
VOC	volatile organic compounds

VR	vapor recovery
WSA	Waste Solvent Area
yd^3	cubic yards

Executive Summary

This report presents the results of the electrical resistance heating (ERH) remediation performed at Operable Unit 5 (OU-5) at the Former IBM Facility in Endicott, New York (Site). Contaminants of concern (COCs) for OU-5 included trichloroethene (TCE), cis-1, 2-dichloroethene (DCE), 1,1,1-trichloroethane (TCA), vinyl chloride (VC) and Trichlorotrifluoroethane (Freon 113). The goal of the ERH remediation system was to reduce the above mentioned compounds to below New York State Department of Environmental Conservation (NYDEC) unrestricted use soil cleanup objectives (SCOs). Prior to the remediation, the project team estimated that approximately 1,668 lbs of Chlorinated Volatile Organic Compounds (CVOCs) were present in the treatment volume. The cleanup criteria (mg/kg) for each COC are; TCE (0.47), DCE (0.25), TCA (0.68), VC (0.02) and Freon 113 (6). Based on detection frequency, observed concentration and toxicity, TCE and Freon 113 were considered the two primary COCs in soil. The Site soil lithology is described as bedrock(shale) overlain with glacial till, overlain by alluvial deposits of silt, sand and gravel, overlain by local silt and clay aquitard, overlain by granular fill. The silt and clay aquitard separates two water bearing zones (upper and lower). Although the aquitard restricts the flow of groundwater between the two water bearing zones, it has not restricted the migration of COCs into the silt and clay in the lower water bearing zone.

The remediation had four distinct treatment areas separated by between 20 and 150 feet that were operated simultaneously. Each treatment area had a different COC or controlling characteristic. The areas are referred to as the waste solvent area (WSA), TCA area, building 57A area (B57A) and the chlorofluorocarbon (CFC) area.

Surface construction of the ERH system began in October 2011 and the system started normal operations on February 10, 2012. The system incorporated 128 individual electrodes with co-located vapor recovery (VR) wells and a 70 ft long sheet pile wall to treat a soil volume of approximately 27,000 cubic yards (yd^3). The shallow extent of treatment began between 3 to 5 feet below grade surface (ft bgs) depending on the area and extended to between 16 and 26 ft bgs. The variable depth of treatment approach was used to target COCs only where they were present, increasing the efficiency of the remediation. Subsurface temperatures were measured at 23 temperature monitoring points (TMPs), each containing thermocouples spaced vertically at 5-foot intervals through the heated interval. A total of 110 thermocouples provided a detailed subsurface temperature profile throughout the project.

The ERH system operated for a total of 228 days and applied a total of 7,951,699 kilowatt hours (kWh) of energy to the four treatment areas. The combined average rate of power application was 1,453 kilowatts (kW). On average, subsurface temperatures increased at a rate of 0.7 degrees Fahrenheit (ºF) per day as the treatment area temperature increased from ambient to 203º (ºF).

Soil sampling was conducted during the remediation at the applied energy intervals of 72%, 92% and 113% (percentages based on the actual vs. design energy input of 6,920,000 kWh). Soil samples were collected at multiple depths in 39 locations based on pre-ERH sample results and field screening. To increase the efficiency of the remediation, approximately 50% of the total treatment volume was decommissioned at the 72% energy mark based on sample results that demonstrated meeting the unrestricted SCOs within portions of each treatment area. Baseline soil sample concentrations ranged between 6 to 11,000 mg/kg for all CVOCs and averaged 793 mg/kg. Upon project completion, confirmatory soil sampling results from all intervals within the ERH treatment area were measured below New York State unrestricted soil clean up criteria and averaged 0.099 mg/kg or a reduction of 99.99% from baseline.

Vapor samples were collected weekly and submitted for laboratory analysis. Based on sample results and flow rates, it is estimated that 6,968 pounds of CVOCs were extracted from the treatment volume.

1.0 INTRODUCTION

This report provides a summary of the design, installation, operation, sampling, and decommissioning of the electrical resistance heating (ERH) treatment system at Operable Unit #5 (OU-5) at the Former IBM Facility in Endicott, New York (herein referred to as the "Site"). The information presented in this report is based on data collected by TRS or reported by Sanborn, Head & Associates, Inc. (Sanborn Head) from various media before, during, and after the ERH remediation. The report documents system performance and the achievement of specified project goals.

TRS was contracted by Sanborn Head to design the system and by O’Brien and Gere Inc. of North America (OBG) to install, operate and maintain the ERH system at the Site. Sanborn Head and OBG were contracted by IBM to manage environmental affairs at the Site. Sanborn Head and OBG were responsible for all permits, waste management, sub-surface installation and sampling at the Site.

The Site is located in a mixed industrial and residential area at 6 Hayes Avenue in Endicott, New York. The property is a level 200-foot wide by 600-foot long rectangle that covers approximately 2.8 acres. The northern three quarters of the facility contains a warehouse with a paved parking area covering the southern portion. A legend for ERH design symbols is provided on Figure 1. The ERH treatment area is delineated on the General Site Map on Figure 2. Select project photographs are provided in Appendix A.

2.0 PROJECT OBJECTIVES

The cleanup standards for the remediation were designed to remove the contaminant source from the soil which would in turn decrease the size and lifespan of the offsite plume. Reducing the impact of the plume would reduce potential human health impact from vapor intrusion or direct contact pathways. The project remedial objective was to:

- Reduce the concentration of TCE, DCE, TCA, VC, and CFC 113 in soil to below New York State Department of Environmental Conservation (NYDEC) unrestricted use soil cleanup objectives (SCO). Cleanup Criteria for each COC are detailed in Table 1.

Table 1. NYDEC SCO

	TCE	TCA	DCE	CFC 113	Vinyl Chloride
Cleanup Criteria (mg/kg)	0.47	0.68	0.25	6	0.02

3.0 THE ERH PROCESS

ERH is a process whereby soils and groundwater are heated by passing an electrical current through the subsurface volume to be remediated. Electrical energy is introduced to the subsurface at electrodes, and it is the resistance by the soil matrix to the flow of electricity between electrodes that heats the subsurface and boils a portion of the soil moisture into steam. This *in situ* steam generation occurs in all soil types, regardless of permeability. The heat generated by resistance to the induced electrical current also evaporates the target contaminants. The *in situ* steam generated by ERH acts as a carrier gas to sweep VOCs to negative pressure vapor recovery (VR) wells.

Once the *in situ* production of steam starts, it becomes the driving mechanism for the transport of contaminant vapors in the subsurface. Because steam is produced *in situ* and not injected during ERH, the only driving force for steam migration is gravity, producing a buoyancy affect. The effect of buoyancy on steam below the water table is to force it directly upward toward the surface similar to bubbles rising through a column of water. The buoyancy force is very strong and will cause the steam to find an upward path to the VR system.

Steam, contaminant vapors, and entrained groundwater are recovered from the subsurface into the VR system during ERH. The VR system includes either separate VR wells (chimney wells) or VR wells co-located with the electrodes and a header collection system. The header system consist of a network of chlorinated polyvinyl chloride (CPVC) pipes that progressively increase from 1-inch in diameter to a maximum of 8-inches in diameter before entering the steam condensing unit. The steam, air and soil vapors are transported by CPVC piping to the steam condenser where the recovered mixture passes through a vapor/liquid separator and heat exchanger. Condensate accumulated in the vapor/liquid separator tanks within the condenser and is used as cooling water within the condensing unit. Surplus water accumulated within the condenser cooling loop is discharged to the onsite water treatment system or re-injected into the electrode to rehydrate the soil electrode interface. Recovered soil vapors are routed through vapor phase granular activated carbon (VGAC) vessels prior to discharge to the atmosphere.

4.0 SITE SPECIFIC ERH DESIGN

The ERH treatment volume at the Site was approximately 27,000 cubic yards (yd^3). The treatment area covered approximately 36,000 square feet (ft^2). The Site was separated into four treatment areas that were separated by 20 to 150 feet. The size of the individual treatment areas and the extent of contamination are summarized in Table 2. The depth of the treatment volume varies between the four treatment areas. The maximum extend of the remediation is from 3 to 26 feet below ground surface (ft bgs). Figure 2 displays the Site plot plan detailing the four treatment zones, the electrode layout and the TMP layout.

Table 2. Treatment Area

	CFC	B57A	TCA	WSA
ERH Treatment Area (ft^2)	6,650	13,400	5,450	10,600
Shallow Extent of ERH	5	3	3	3
Average Deep Extent of ERH	21	16	24	26
Number of Electrodes	27	46	17	48*
Contaminant of Concern (COC)	Freon	TCE	TCA	TCE

*The sheet pile wall in the WSA area is roughly equivalent to 10 individual sheet pile electrodes.

4.1. ERH System Components

A list of the ERH system components is located in Table 3. A summary of the ERH process and supporting ancillary system components is also provided in the process flow diagram (PFD) illustrated on Figures 3 and 4.

Table 3. Treatment System Components

System Component	Quantity
2,000-kW PCUs	2
Step-Down Transformers	5
Monitoring, control, and data acquisition system	1
Remote access and control systems	2
Electrodes	138*
Steam condensers	2
40-hp vapor recovery blowers	2
1,800-2,200-pound vapor GAC vessels	10
3,000-pound permanganate polish vessel	2
TMPs	23
Vapor recovery wells, co-located with electrodes	125
Chimney Wells	20
Electrode wetting systems	2

*The sheet pile wall in the WSA area is roughly equivalent to 10 individual sheet pile electrodes.

4.1.1. Power Control Units

The ERH system used two 2,000 kW power control units (PCU) to deliver energy to the electrodes for subsurface heating. Each PCU is a variable voltage transformer system capable of providing three phase power output at adjustable levels between 100 to 860 volts. The PCUs are housed in steel enclosures that provide security and electrical insulation.

New York State Electric and Gas (NYSEG) provided a 12,475-volt electrical service that was split between the two units. Each unit was connected to the utility service by a New York state licensed electrician. All ancillary ERH system equipment was powered from the PCUs through an internal auxiliary transformer and electrical distribution panel. Power output from one of the PCUs was routed directly to the CFC and B57A treatment areas' 68 electrodes. Power was routed through step-down transformers used to modify the voltage to selected subsurface areas in the WSA and TCA treatment areas.

4.1.2. Electrodes

A total of 138 electrodes (128 individual electrode locations and a sheet pile wall in the WSA area which acted as 10 additional electrodes) were used to deliver energy to the subsurface within the treatment areas as shown on Figure 1. The electrodes design and layout concentrated energy to areas of known contamination; this approach conserves energy and increasing the efficiency of the remediation. The treatment area was divided into four zones that were delineated by the depth of contamination. A summary of the treatment intervals is presented in Table 2.Typical construction details for each electrode design are shown on Figures 5 and 6. The spacing between electrodes was approximately 17.5 to 19.5 feet.

The ERH system employed two types of electrodes within the design: Sheet pile electrodes were employed in portions of the B57A, TCA and WSA treatment areas. The sheet pile electrode consisted of two sheet piles welded together to form an electrode. They were driven by means of a vibrating pile driver to bedrock refusal within each treatment area. The average depth of the sheet pile installation in each treatment area is summarized in Table 2.

Bored electrodes were employed exclusively in the CFC area and in portions of the B57A, TCA and WSA where overhead restriction or shallow refusal prevented the installation of sheet pile electrodes. In the CFC area, 12- inch bored electrodes were installed via roto-sonic drilling methods. This was necessary to extend the electrodes five feet into the shallow fractured bedrock that was present from 20 to 25 ft bgs within the treatment area.

The WSA treatment area included a 140 foot sheet pile wall on the eastern end of the site. The sheet pile wall was employed to prevent the flow of heated water into Brixius creek from the shallow water-bearing zone. The southern 70 feet of the wall was used as an electrode to conduct energy within the WSA treatment area. The northern 70 feet was not part of the heating system and was used to stop water migration.

4.1.3. Electrode Drip Water

During operation, the area immediately surrounding each electrode has the potential for drying out, which may reduce the effectiveness of the electrode. This dry-out condition is addressed by periodically adding drip water to the electrodes. The ERH system utilized drip water to combat the effects of dry-out during ERH operations.

4.1.4. Temperature Monitoring Points

The ERH system used 23 TMPs to track the progress of the ERH remedial efforts. The TMPs locations are shown on Figure 2. Each TMP casing was constructed of 1.25 inch CPVC pipe and installed to a depth of the corresponding depth of remediation in the four specific treatment areas. A string of thermocouples was inserted into the casing with each thermocouple spaced out every five vertical feet from the bottom of treatment. After each thermocouple was tested and found to be functional, the annular space of the TMP casing was filled with cement slurry. The cement provides a thermal connection to the surrounding treatment area. Construction details of the TMPs are shown on Figure 7**.** Two of the TMPs were installed on the eastern side of the sheet pile wall to monitor for hot water migration outside of the sheet pile wall bordering Brixius Creek.

4.1.5.Vapor Recovery System

The site was designed with two independent vapor recovery systems. The first vapor recovery system was referred to as “Train 1” and encompassed the WSA and TCA treatment areas. The second vapor recovery system was referred to as “Train 2” and encompassed the CFC and B57A treatment areas. Each train had a 40-hp rotary lobe positive displacement blower which was used to apply vacuum to the VR wells through a CPVC conveyance piping system. The conveyance piping was connected to vapor recovery screens place above the electrodes within the four treatment areas.

Chimney wells were located strategically within the WSA, TCA and B57A treatment areas to provide supplemental vapor recovery. Six inch borings were advanced to the bottom of the treatment area and backfilled with sand. A stainless steel vapor recovery screen was inserted into the sand pack above the water table and attached to the vapor recovery system. Chimney well details are presented in

Figure 8. Vapor recovery piping was sized from one-inch up to eight inch CPVC pipe to move the vapor stream towards the ERH treatment equipment. A special feature within the WSA treatment area was the installation of a vapor recovery plenum made of low density polyethylene plastic sheeting to supplement vapor capture in the vicinity of the sheet pile wall. The vapor stream consisted of steam, air, and CVOC vapors and passed through the conveyance piping system to the ERH condenser units. Once the vapor stream passed through the ERH condenser and blower, the vapors were treated with the VGAC treatment vessels prior to atmospheric discharge (see Figures 3 and 4 for further details).

The vapor treatment systems for the ERH remediation were installed by TRS and OBG. OBG and Sanborn Head were responsible for the sampling and management of the vapor treatment system. The recovered air and contaminant vapors were treated using vapor-phase granular activated carbon. Two-1,800 lb VGAC vessels configured in series were assigned to treatment Train 1. Two-2,200 lb vessels were used on treatment Train 2. Each treatment train had a final polish vessel filled with approximately 3,000 lb of potassium permanganate infused GAC. Potassium permanganate was chosen as a final polish to treat vinyl chloride. Based on field readings and the decreasing concentration of vinyl chloride in the waste streams, the polish vessel for train 1 was removed from service on April 5, 2012 and the polish vessel for train 2 was removed from service on February 28, 2012.

4.1.6. Site Security

A chain link fence was installed prior to construction and operation of the ERH treatment system. A wireless, cellular based alarm system was installed by TRS around the perimeter of the ERH treatment area. Motion sensors were placed around the inside of the security fence and each sensor was equipped with dual beam infra-red detection. The base unit was located next to the PCU in a weather-resistant container. The security alarm system was interlocked with each PCU and was set to de-energize the electrodes in the event of unauthorized entry.

4.1.7. Ambient Air Monitoring

To ensure compliancy with the Community Air Monitoring Program (CAMP), Sanborn Head installed a CFC monitor and photo-ionization detector (PID) inside the CFC area, where daily work was performed. Approximately 400 feet east, a second PID was installed to monitor the air quality above the exterior portion of the ERH system. All three meters were interlocked to the PCUs so that any exceedance would remove power from the electrodes.

5.0 SYSTEM CONSTRUCTION

Sub-surface construction activities commenced at the Site on August 5, 2011. The first activity to occur was the installation of the temperature monitoring points and chimney wells. The drilling and installation of the bored electrodes in the CFC, TCA and WSA areas commenced on September 29, 2011. Drilling operations concluded on November 11, 2011. Sheet pile electrode installation commenced on October 5, 2011 and was completed on November 10, 2011.

OBG pressure tested and decommissioned the fire line that runs along the southern side of the building through all four treatment areas. OBG performed site utility mark outs during subsurface installation activities.

Surface installation commenced in November 2011 with the installation of the vapor recovery piping. The following surface installation activities occurred between October 13, 2011 and February 10, 2012:

- Mobilization of ERH equipment to the Site.
- Installation of vapor treatment equipment
- Completion of all cabling and above ground piping.
- Installation of vapor treatment system.
- Electrode cable connection.
- Drip system installation.
- Installation of liner in WSA treatment area.
- Primary power service installation and termination to the PCUs.
- Connection of thermocouples and system data transmitters to the ERH data logging system.
- Installation and testing of the interlocks, site security system, and communications system.
- Installation of ambient air monitoring systems.

6.0 ERH SYSTEM STARTUP

The ERH system startup occurs between construction and operations and includes: system shakedown, start-up testing, personnel safety testing, and personnel training. System shakedown began on January 30, 2012, with functionality testing of the ERH equipment and equipment interlocks, and the initial evaluation of energy application to the subsurface. Unattended ERH system operations commenced on February 10, 2012 after proper verification of all systems was made.

6.1. Pre-startup Tasks

Prior to installation and start-up, a final quality assurance inspection of all piping and electrical connections were completed. Quality assurance inspections and testing were completed on the electrode cable connections, condenser components, transformer connections, TMP field box connections, VR blower, and PCUs. TRS also completed Part I of the internal *TRS Start-up Safety Checklist* and all associated tasks prior to commencing start-up operations.

All equipment were visibly inspected for weld cracks or breaks, scrapes of protective coating, corrosion, structural damage, and inadequate installation or construction such as cracks, punctures, and damaged fittings. No discrepancies were identified. After review by IBM and OBG, the ERH Hazards notification letter was sent to the neighboring property owners on November 18, 2011.

6.2. System Startup and Optimization

The first phase of ERH system startup consisted of vapor recovery and treatment system operation without the application of electrical energy to the subsurface. The sumps of the condenser cooling towers and condenser vapor/liquid separators were filled with potable water and condenser operations were initiated. The ERH condensers and cooling towers and VR system were confirmed operational and optimized before the application of energy commenced. All pressure, temperature, flows, and remote monitoring equipment was verified for correct operation. Once the functionality of the system components was established, equipment interlocks testing commenced. The data recording and management systems and communication protocols were tested and refined. Functionality testing of the ERH equipment interlocks, and the evaluation of energy application to the subsurface followed. ERH system process flow diagrams are presented as Figure 3 and 4.

Energy was first applied at a very low voltage to the subsurface on January 30, 2011 to evaluate the electrical conductivity characteristics of the soil matrix in the treatment volume. This evaluation included observing cable and electrode amperages at various applied voltages. Concurrent with these evaluations, TRS performed step-and-touch and step-and-step voltage safety tests on the surface of the treatment area and the portions of the Site immediately adjacent to the treatment area. Initial power application and voltage survey protocols were performed consistent with TRS internal standard operating procedures (SOPs) 1.2 (Application of Electrical Power to ERH Sites) and 1.3 (Voltage Surveys).

Once all operating conditions were within accepted standards as outlined in design documents and TRS SOPs, the voltage to the electrode field was slowly increased. With each significant increase in applied voltage, operating parameters were reviewed, and step-and-touch and step-and-step voltage surveys were repeated.

As power application levels reached optimum design conditions, final safety inspections and data quality checks were completed. Part II of the internal *TRS Start-up Safety Checklist* was completed and the ERH system began continuous energy application and operation on February 10, 2012

6.3. Voltage Survey

The step-and-touch voltage safety test is a critical step in the application of the ERH technology. "Step-and-Touch" is the name given to the measurement of the voltage potential between objects near enough to one another that project staff, or a project visitor, could contact both objects at the same time. Contact could be with the hands, the feet, or between a hand and a foot. The TRS administrative electrical safety policy limit for exposed voltage is:

- 15 volts alternating current (VAC) for all Touch Potentials
- 30 VAC for all Step-and-Step Potentials

This maximum limit is less than the 50 VAC standard set by the Occupational Safety and Health Administration (OSHA) for worker exposure to voltage potentials.

During startup testing, TRS addressed a step-and-touch voltage exceedance along the northeastern fence and gate area by applying a surface neutral wire mesh to the adjacent ground and then bonding it to the chain link fence. Voltage mitigation was performed along the southern and eastern fence line where the three rows of barbed wire above the chain link were removed. After these mitigation measures were implemented, no voltages exceeding of the TRS 15 VAC/30 VAC limits were found under dry or wet conditions and the ERH system was deemed electrically safe and ready for uninterrupted operations. Step-and-touch and step-and-step voltage surveys were conducted throughout operations and whenever the applied voltage to the subsurface was increased.

7.0 ERH OPERATIONS

During ERH operations, TRS closely monitored operational parameters, soil temperatures, and laboratory analytical data to alter system configuration and operation to meet remedial goals at the Site. The following subsections describe major changes to the system that occurred during the ERH operational phase.

7.1. ERH Treatment System Operational Parameters

Steady state system operations began on February 10, 2012. Operational parameters such as power input, subsurface temperatures, steam production, vapor stream parameters, and CVOC concentrations in the recovered soil vapors were measured. This data was used to assess the efficiency of the ERH system and allow TRS personnel to target specific areas of the site and optimize system performance. Personnel monitored and recorded data in accordance with the weekly Site Specific Inspection, Maintenance, Sampling and Monitoring Schedule. TRS monitored the following ERH system parameters daily: Daily energy delivery, average applied power, condensate water generated, condensate water discharged, average daily heat up rate, Site average temperature, vapor stream vacuum, and vapor stream flow rate. OBG was responsible for management of the VGAC vessels and all waste generated during the ERH project. Sanborn Head was responsible for monitoring all soil, water, and air sampling of the ERH system.

7.1.1. Electrical Energy Application

The application of electrical energy to the subsurface was optimized throughout the project in an effort to achieve the most efficient CVOC phase change in the subsurface per unit of energy applied. Through weekly analysis of power input, subsurface temperatures, and CVOC recovery data, the optimal rate of energy application was determined. Continuous adjustments were made to the ERH system to maintain an optimal processing rate within system limitations.

All four treatment areas used a total of 7,929,744 kilowatt-hours (kWh) of energy application between startup and project's completion on September 24, 2012. The pre-remediation estimate was 6,920,000 kWh and the system exceeded that estimate by 15%. The initial site assessment indicated that there was approximately 1,668 lb of contaminate within the four treatment areas. Based on final analytical data provided by Sanborn Head, the total amount of mass removed was 6,968 pounds. The additional mass in the subsurface affected the amount of energy required to meet the project goals. Both PCUs averaged 1,449 kW of applied power to the treatment volume over the 228 day operational period, including down time. A breakdown of energy application by treatment area is presented in Table 4.

Table 4. Energy Data by Treatment Area

	WSA	TCA	B57A	CFC	Total
Average Power (kW)	645	200	400	204	1,449
Cumulative Energy Applied (kWh)	3,530,311	1,094,749	2,188,380	1,116,304	7,929,744
Estimated Energy Required (kWh)	2,943,784	939,121	2,107,003	930,091	6,920,000
Percentage of Applied Energy	120%	117%	104%	120%	115%

7.1.2. Subsurface Temperatures

The ERH system measured a baseline site temperature of 59 °F on February 10, 2012 and increased the temperature to a maximum average of 205 °F. The thermal performance details for each area are illustrated in Table 5. Graphs of the site average subsurface temperature over time are presented as Figure 9-12.

Table 5. Treatment Area Temperature Data

	WSA	TCA	B57A	CFC
Max Temp (°F)	225	221	216	218
Max average Temp (°F)	214	212	196	193
Average Heat Up Rate / day (°F)	0.7	1.0	0.7	0.9
Boiling Point for Primary COC (°F)	188	165	188	118

7.1.3. Vapor Recovery

The ERH vapor recovery system was separated into two separate treatment trains. Train 1 comprised the WSA and TCA treatment areas. Train 2 comprised the CFC and B57A treatment areas. During heating, the average vacuum applied to the subsurface was approximately 4.5 inches of mercury (in Hg). The combined air flow rate through the ERH condensers averaged 1,379 scfm over 228 days of ERH system operations, which includes all blower downtime. The ERH system generated 1,033,420 gallons of condensate during operations at an average rate of 3.1 gpm. The majority of the condensate water was reused by the system as cooling water and evaporated to the atmosphere with some re-injected as drip water to the electrodes. The system discharged 93,469 gallons at an average 0.3 gpm during ERH operations to the IBM Clark Street groundwater treatment facility. Totals for treatment train 1 and treatment train 2 are presented in Table 6.

Recovered soil vapors were sampled daily prior to treatment with VGAC, with a Mini Rae Photo ionization detector (PID) and Sapphire CFC detector at the influent, midpoint, and effluent of the VGAC vessels. Sanborn Head was responsible for all vapor sampling. Samples for laboratory analysis were also collected based on PID results of permit requirements. The results of the laboratory sampling events were used to calculate the total mass of CVOCs removed during ERH for monitoring the overall performance and effectiveness of the remediation effort.

Table 6. Water Management

	Train 1 (WSA/TCA)	Train 2 (CFC/B57A)
Total Condensate (gallons)	601,461	431,959
Condensate Rate (gpm)	1.8	1.3
Total Discharge Water (gallons)	26,794	66,675
Discharge Rate (gpm)	0.08	0.2

Automated condensate pumping functions were monitored, controlled, and recorded by the PCU computer and monitored on site and remotely by project staff. Sanborn Head was responsible for all water samples.

7.2. ERH System Optimization

7.2.1. Vapor Recovery Optimization

This section summarized changes the project team implemented during operations to adapt to site conditions that differed from the design model and anticipated mode of operations or to increase remediation efficiency.

Within two weeks of beginning heating, the CVOC mass removal rate was higher than anticipated to the point that the vapor treatment system could not handle the volume of mass being extracted from the subsurface. The project team recommended larger VGAC vessels on Train 2 to handle the mass and they were increased from 1,800 to 2,200-lb vessels. The vessel interconnect system was also reconfigured to allow for faster change-outs.

Concerns related to the potential shutdown of the vapor recovery blowers required the installation of vacuum switches in the interior portions of the vapor recovery manifold. If vacuum decreased below a pre-set limit, the electrodes would be de-energized.

A vapor recovery train cross link was installed to prevent the loss of vapor recovery on either independent treatment train while the blower was shut off for maintenance. In the event either blower stopped working, the cross link would open and maintain limited vapor recovery to the entire site.

7.2.2. Soil Sampling Optimization

On ERH sites, TRS proposes interim sampling events to potentially save time, energy, and ultimately client costs. The first round of soil sampling is generally conducted when remediation is 50-70 percent complete based on energy application and temperature profiles. TRS will then shut down the portions of the site where the remediation goals have been met and concentrate energy and efforts on those portions of the site that still contain significant contamination. This section describes the various interim and final sampling events and subsequent changes to the size of the ERH treatment volume.

The first interim soil sampling was performed during the weeks of June 18, 2012 at the 73% mark of the remediation based on energy. Laboratory analytical reports indicated that 22 of the 39 sampling locations had achieved the New York State unrestricted soil clean up standard for their respective COC. ERH soil sample locations are presented in Figures 13 - Figure 15. Based on these results, approximately 50% of the electrodes in the B57A, 75% of the TCA and 12% of the WSA treatment area were removed from service. Although all but one of the CFC samples had met the SCOs, the entire CFC area was left online due to the extracted vapor concentrations.

The second interim soil sampling was performed during the week of July 23, 2012 at the 93% mark of the remediation based on energy. Laboratory analytical reports indicated that an additional five (27 total) of the 39 sampling locations had achieved the New York State unrestricted soil clean up standard for their respective COC. TRS removed all the electrodes in the CFC and TCA treatment areas based on these results. This represented approximately a 50% reduction in the size of the electrode field for the entire site.

7.2.3. Supplemental Electrode Installation

A total of 12 supplementary bored electrodes were installed after the July 2012 soil sampling event. The 12 electrodes were installed in areas that needed to have higher energy concentrations in order to achieve the New York State SCOs within the contracted time that the system was scheduled to operate. Five of the 12 electrodes were installed on August 9, 2012 in the B57A area. The B57A electrodes were installed near sample locations 618 and 620, with a targeted treatment interval of two to seven ft bgs.

The remaining seven electrodes were installed in the WSA area. The four electrodes installed on August 9, 2012 near sample locations 628, 629, 631, and 632 had a targeted treatment interval of two to seven ft bgs. The three electrodes installed during week of August 13, 2012 near sample locations 634, 635, and 637 had a targeted treatment interval of 2 to 32 ft bgs. New electrode installation locations are presented in Figure 14 and Figure 15.

All 12 electrodes were completed above grade and were electrically isolated with either a 4-inch or 8-inch diameter chlorinated polyvinyl chloride (CPVC) over-sleeve grouted in place. The over-sleeve was then secured with a PVC cap to completely isolate the electrode electrical connection for safety. The new electrodes reduced the electrode spacing to approximately 10 to 12 feet in the targeted areas.

8.0 REMEDIATION RESULTS

8.1. Soil Results

The ERH system successfully reduced the COC soil concentrations within the treatment area to below New York State Department of Environmental Conservation (NYDEC) unrestricted use soil cleanup objectives (SCO). Representative ERH performance soil data is provided in Table 7. Thirty-nine locations were selected for confirmatory soil sampling. All thirty-nine sample locations were ultimately reduced to below the objective of each COC at all depth intervals as verified by the data from the three different sampling events. A total of 187 soil samples were taken.

Table 7. Pre and Post ERH Ave. CVOC Concentration.

	WSA(TCE)	**TCA(TCA)**	**B57A(TCE)**	**CFC(Freon)**
Ave. Pre-ERH Concentration (mg/kg)	1,118	3.2	4,775	1,467
Maximum Pre-ERH Concentration (mg/kg)	11,000	12	19	7,200
Ave. Post ERH Concentration (mg/kg)	0.07	0.003	0.07	0.2

The ERH system removed an estimated total of 6,968 lbs of COCs from both treatment trains. Treatment Train 1 (WSA/TCA) removed an estimated total of 1,346 pounds of COCs. The pre-ERH mass estimate for train 1 was 916 lb of total VOCs. Treatment train 2 removed an estimated total of 5,622 pounds of COCs. The pre-ERH mass estimate for Train 2 was 752 lb of COCs.

9.0 CONCLUSIONS

1. The ERH system achieved the soil remediation goals for all COCs, reducing soil concentrations to below New York State Department of Environmental Conservation (NYDEC) unrestricted use soil cleanup objectives.

2. The estimate of total COC mass in the source area prior to heating was approximately 1,668 pounds. Based upon chemical analysis of soil vapors recovered during ERH operations, approximately 6,968 pounds of COCs were removed from the treatment volume during the remediation.

3. At the start of the project, it was estimated that 6,920,000 kWh of energy applied over a period of up to 160 days would be required to reach the project clean-up goal. The actual requirements to achieve the reported clean-up results were 7,929,744 kWh of energy applied over 228 days.

4. The ERH system was able to heat and remediate underlying shale bedrock within treatment zone and treatment depth.

5. The ERH system removed condensate at a rate of 3.1 gpm and required no dewatering for the technology to operate normally.

6. The maximum subsurface temperature achieved was 225.5°F at TMP BD-08 on August 13, 2012, while the highest average subsurface temperature within the ERH treatment volume was 204.8°F on August 23, 2012. These temperatures were suitable for producing a phase change of CVOC contamination in the treatment volume resulting in a successful application of the ERH technology.

7. Throughout the project, site and public safety were maintained at all times and the project was compliant with all permits and regulations.

FIGURES

SYMBOLS

- BORED ELECTRODE (53)
- ADDITIONAL BORED ELECTRODE (12)
- SHEET PILE ELECTRODE (72)
- SHEET PILE WALL (1)
- TEMPERATURE MONITORING POINT (22)
- FIRE HYDRANT/VALVE
- UTILITY POLE
- CHIMNEY WELL (20)
- CLEANOUT LOCATION
- MONITORING WELL
- EXTRACTION WELL
- SOIL BORING
- DUAL PHASE WELL
- CATCH BASIN
- I I-BEAM
- I I-BEAM WITH 3' OFFSET
- CFC 113 2,800 MG/KG — HIGHEST CONCENTRATION LOCATION WITH PRIMARY CONTAMINANT IN MG/KG
- CONCRETE CUTTING
- WV BELOW GRADE ISOLATION VALVE (FIRE SUPRESSION SYSTEM)
- D DRAIN MANHOLE COVER
- SWING GATE
- LOADING DOCK LEVELER
- ATX SDTX FIELD LOCATED TRANSFORMER

LINE TYPES

- x EXISTING FENCE
- x NEW FENCE
- UNDERGROUND STORM DRAIN LINE
- BRIXIUS CREEK
- BURIED ELECTRIC UTILITY
- OVERHEAD ELECTRIC LINE
- PROPERTY LINE
- WTR WATER LINE
- WELL PIPING
- RAILROAD TRACKS
- APPROXIMATE EXTENT OF ERH TREATMENT
- EDGE OF PAVEMENT
- STORM SEWER PIPING
- TRENCH
- DEFUNCT DISCHARGE LINE
- WATER LINE (BUTLER SURVEYORS)
- CURB LINE

HATCHES

- ACCESS LANE
- SURFACE PLENUM

TRS
Accelerating Value

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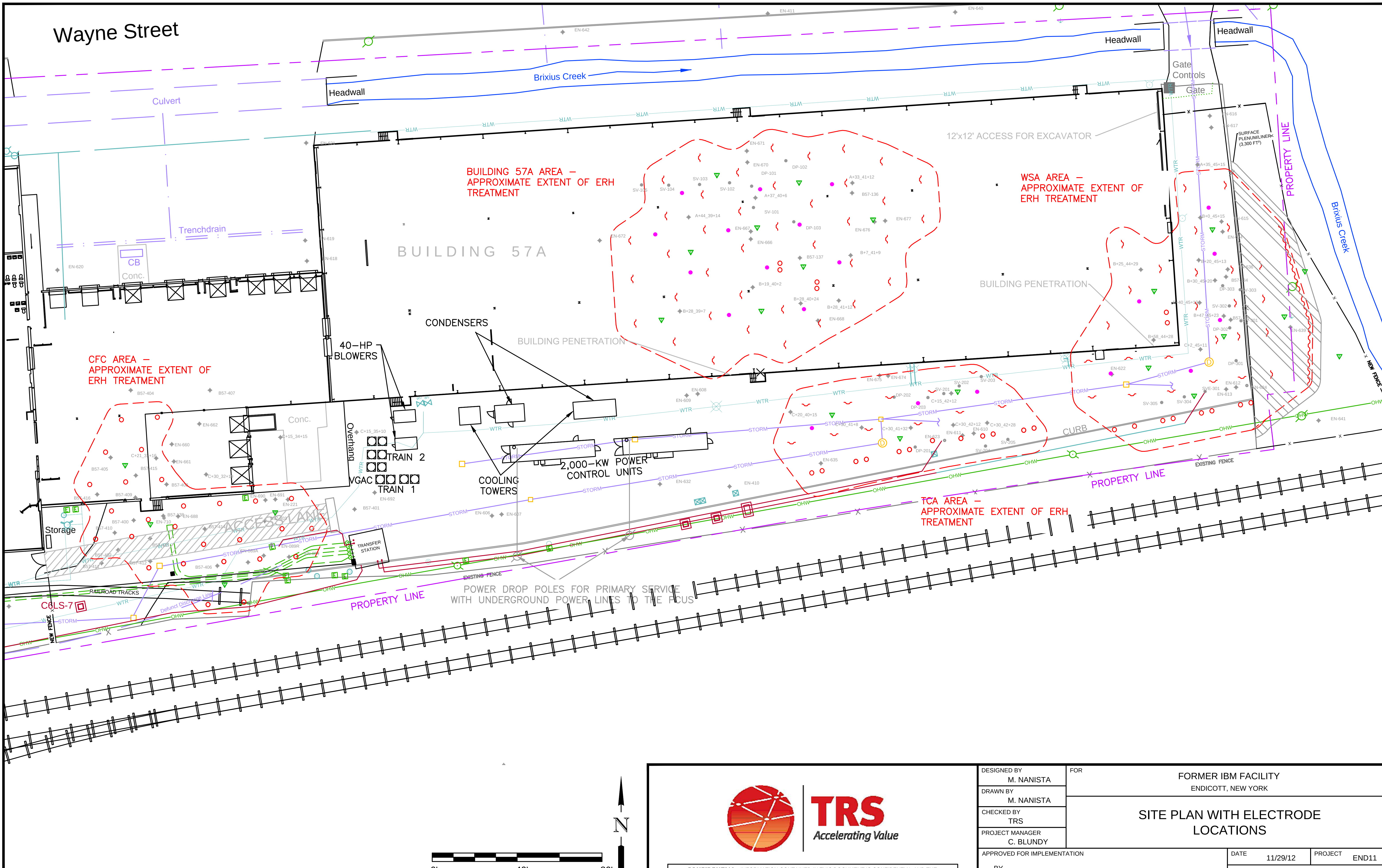
DRAWN BY M. NANISTA	
CHECKED BY TRS	GENERIC SITE PLAN LEGEND
PROJECT MANAGER C. BLUNDY	
APPROVED FOR IMPLEMENTATION BY ______ FOR DATE	DATE 11/29/12 PROJECT END11 SHEET FIGURE 1



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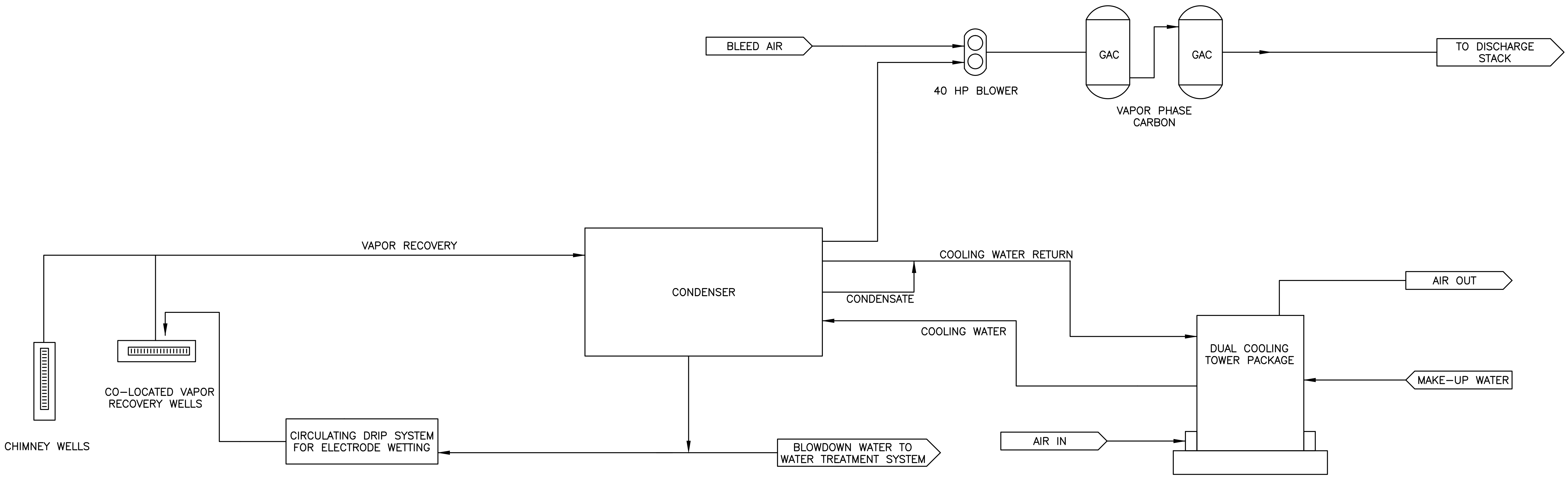
DESIGNED BY M. NANISTA	FOR FORMER IBM FACILITY, ENDICOTT, NEW YORK
DRAWN BY M. NANISTA	
CHECKED BY TRS	SITE PLAN WITH ELECTRODE LOCATIONS
PROJECT MANAGER C. BLUNDY	
APPROVED FOR IMPLEMENTATION	DATE 11/29/12 · PROJECT END11
BY	
FOR · DATE	SHEET FIGURE 2



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PROJECT MANAGER C. BLUNDY

FOR
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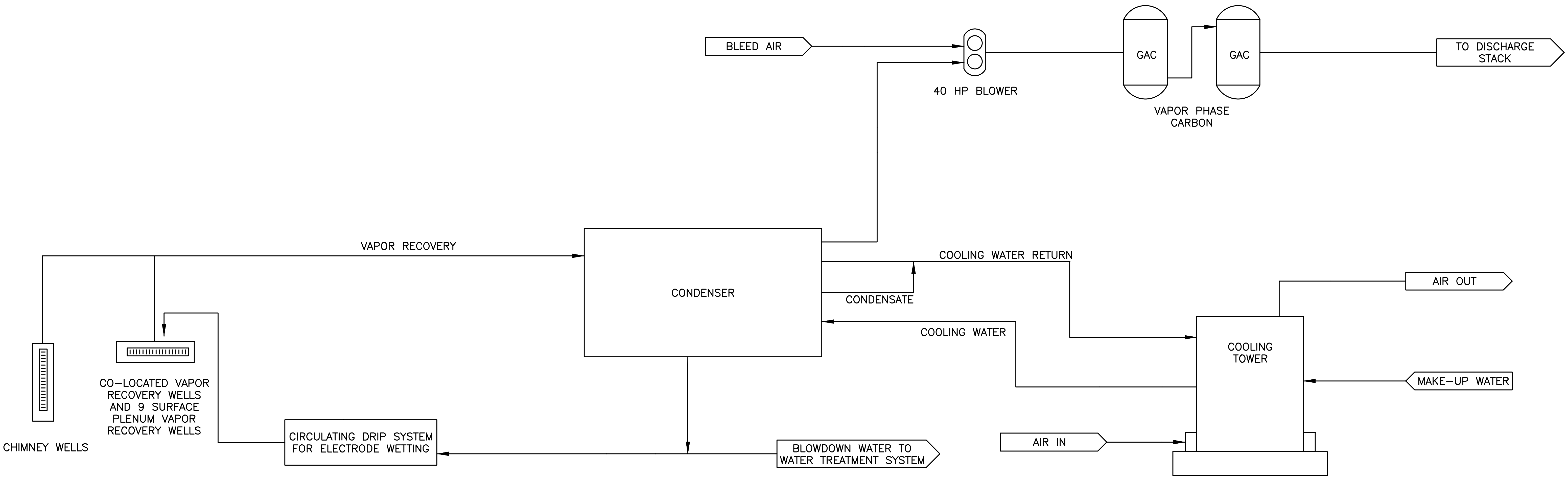
WSA AND TCA VAPOR RECOVERY AND CONDENSING PROCESS FLOW DIAGRAM

APPROVED FOR IMPLEMENTATION
BY ____________________
FOR ____________________ DATE

DATE 11/29/12
PROJECT END11
SHEET FIGURE 3



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CHECKED BY	TRS
PROJECT MANAGER	C. BLUNDY

FOR

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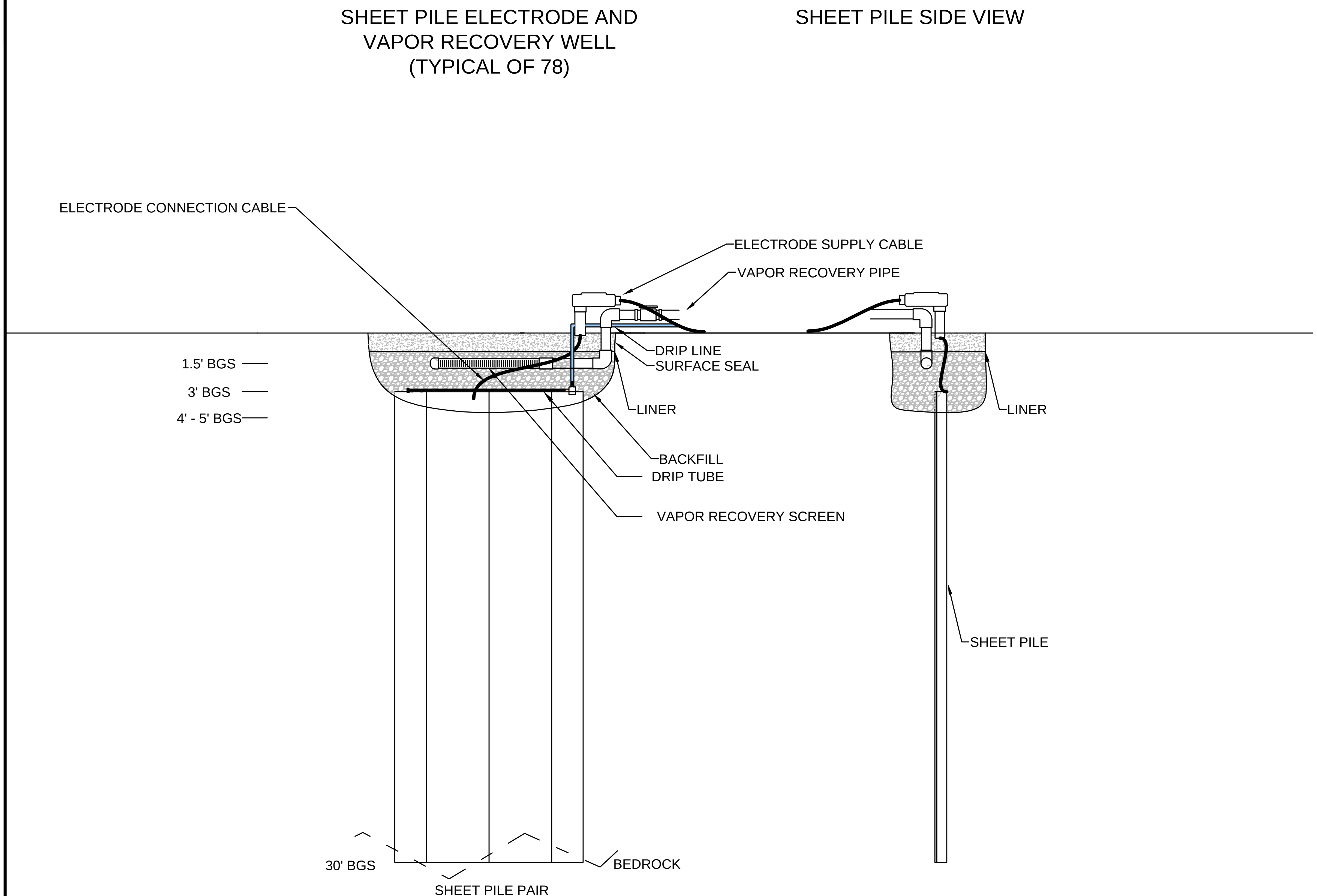
BUILDING 57A AND CFC VAPOR RECOVERY AND CONDENSING PROCESS FLOW DIAGRAM

APPROVED FOR IMPLEMENTATION

BY ____________________

FOR ____________________ DATE

DATE	11/29/12
PROJECT	END11
SHEET	FIGURE 4

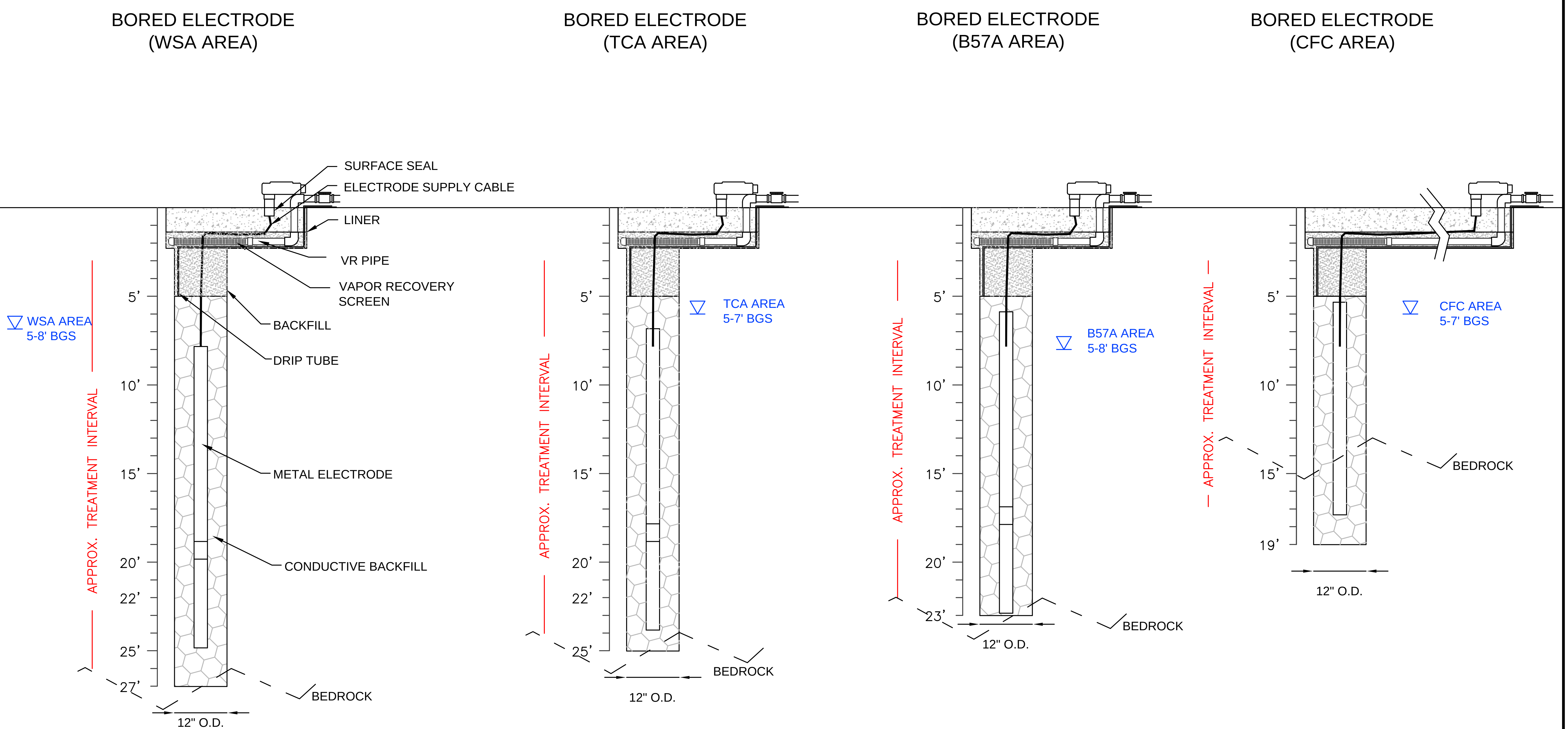


NOTES:

1. ELECTRODES WERE INSTALLED TO BEDROCK REFUSAL.

TRS Accelerating Value

DESIGNED BY M. NANISTA	FOR FORMER IBM FACILITY ENDICOTT, NEW YORK
DRAWN BY M. NANISTA	SHEET PILE ELECTRODE DETAIL
CHECKED BY TRS	
PROJECT MANAGER C. BLUNDY	
APPROVED FOR IMPLEMENTATION BY ______ FOR ______ DATE	DATE 11/29/12 PROJECT END11
	SHEET FIGURE 5



NOTES:

1. ELECTRODES WERE INSTALLED TO BEDROCK REFUSAL (EXCEPT IN THE CFC AREA).
2. ELECTRODES WERE INSTALLED 5 FEET BELOW FIRST ENCOUNTERED BEDROCK IN THE CFC AREA.

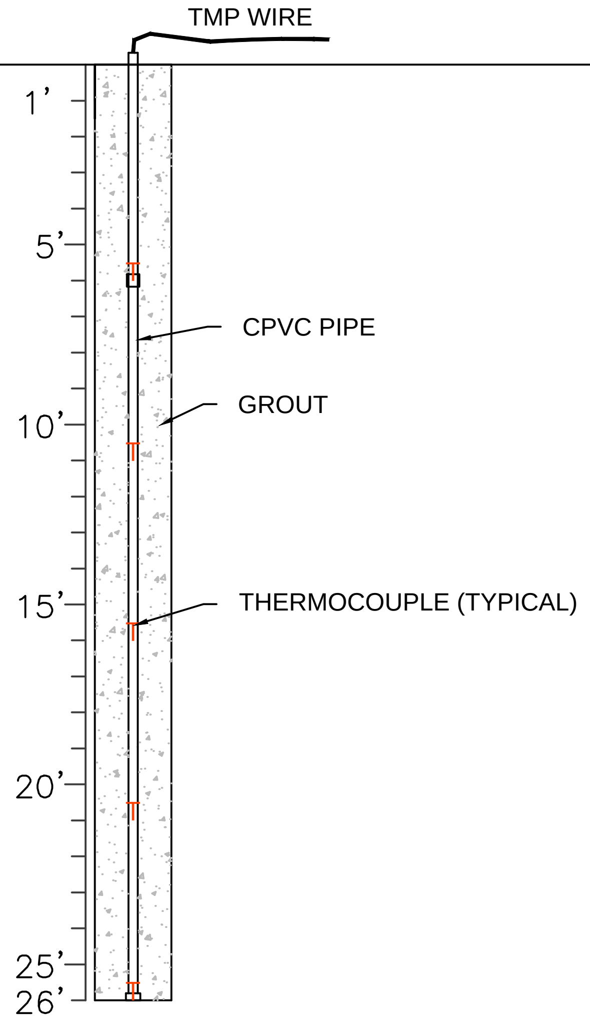
LEGEND

▽ GROUNDWATER ELEVATION

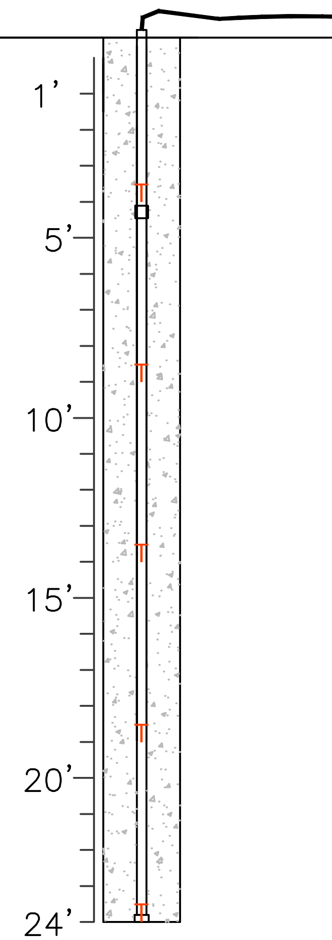
TRS Accelerating Value

DESIGNED BY M. NANISTA	FOR FORMER IBM FACILITY ENDICOTT, NEW YORK
DRAWN BY M. NANISTA	BORED ELECTRODE DETAILS
CHECKED BY TRS	
PROJECT MANAGER C. BLUNDY	
APPROVED FOR IMPLEMENTATION	DATE 11/29/12
BY	PROJECT END11
FOR DATE	SHEET FIGURE 6

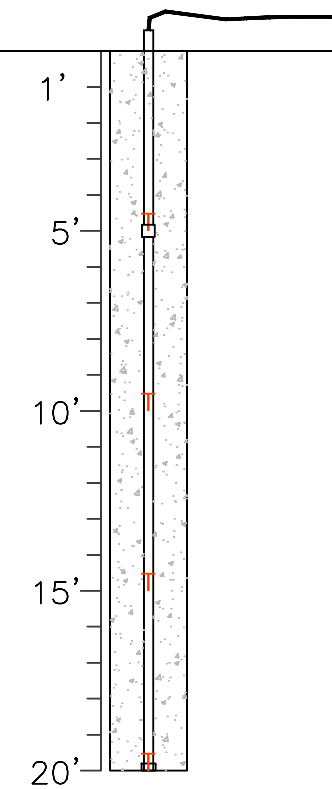
TEMPERATURE MONITORING POINT
(TYPICAL OF 8 - WSA AREA)



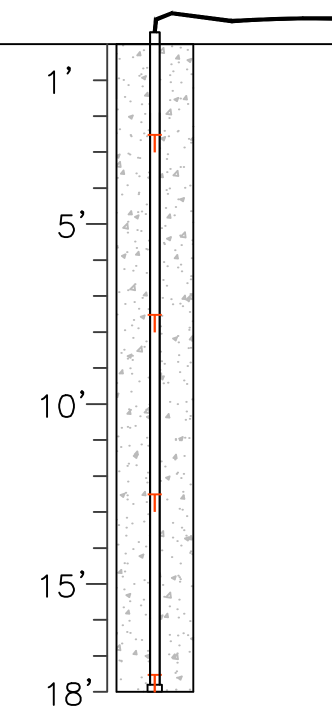
TEMPERATURE MONITORING POINT
(TYPICAL OF 3 - TCA AREA)



TEMPERATURE MONITORING POINT
(TYPICAL OF 8 - BUILDING 57A AREA)



TEMPERATURE MONITORING POINT
(TYPICAL OF 4 - CFC AREA)



NOTES:

1. THE FINAL DEPTH OF THE TEMPERATURE MONITORING POINTS WAS BASED ON THE AVERAGE DEPTH OF THE SURROUNDING ELECTRODES.
2. THE TMP IN THE LOADING DOCK AREA HAD AN OFFSET EXIT.
3. THE CASING WAS GROUTED IN PLACE AFTER THE THERMOCOUPLES WERE SET TO THE CORRECT DEPTH.

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DRAWN BY M. NANISTA
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PROJECT MANAGER C. BLUNDY

FOR
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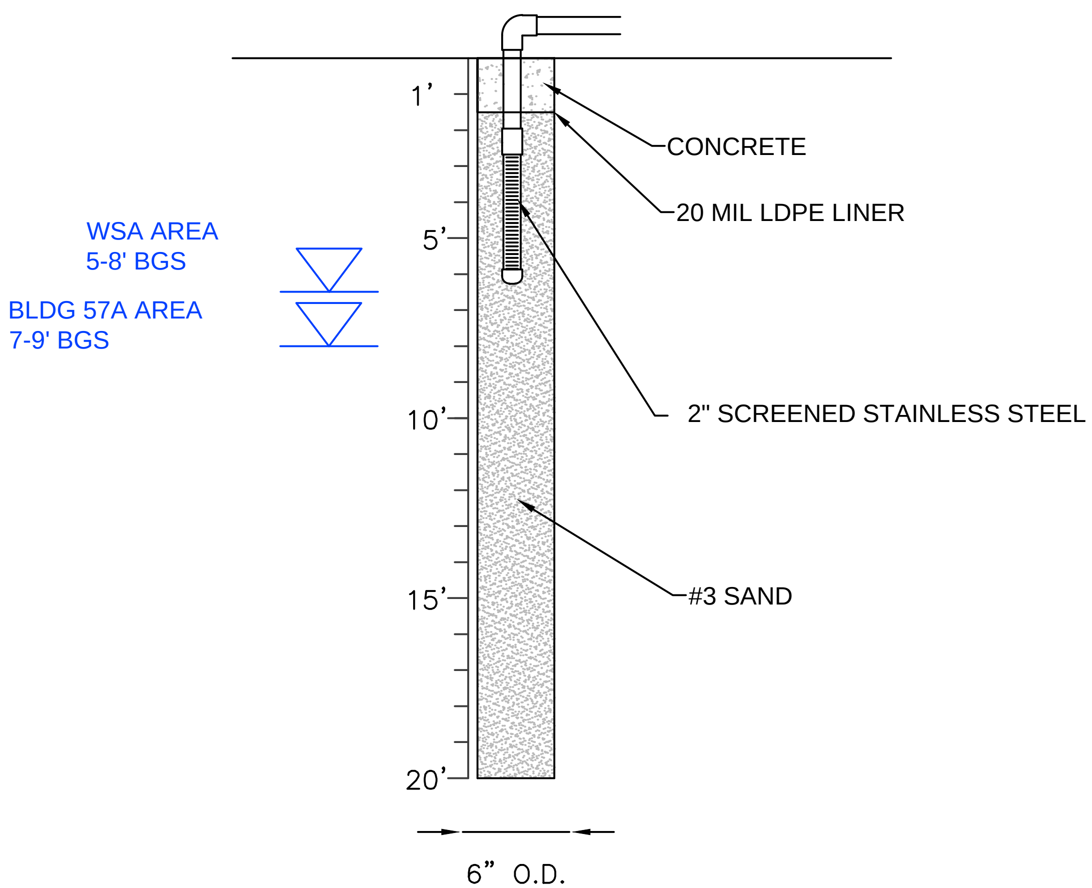
TEMPERATURE MONITORING
POINT DETAILS

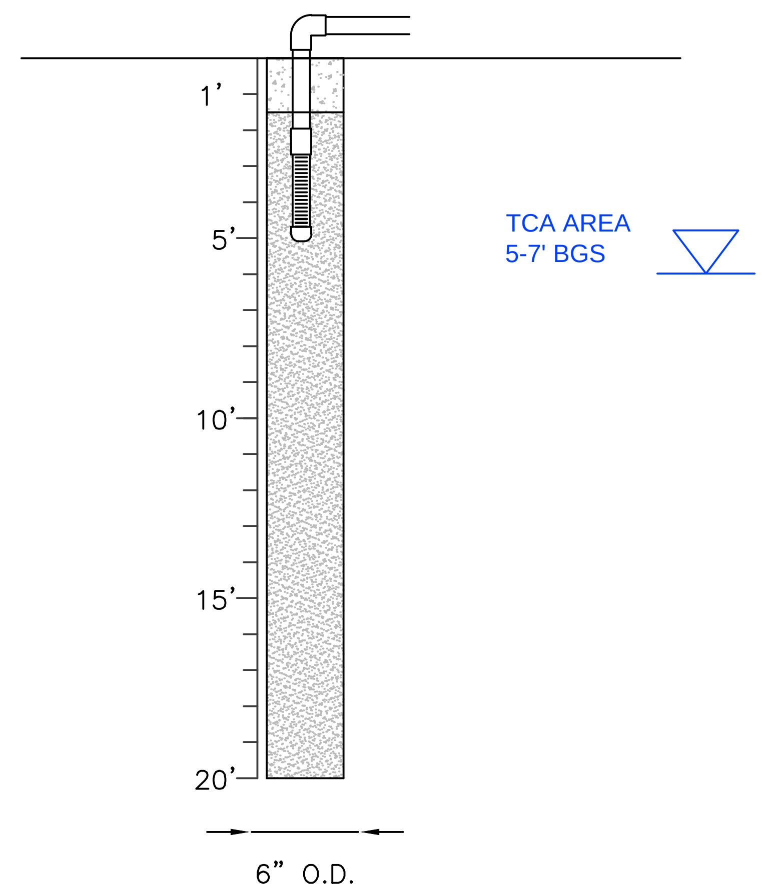
APPROVED FOR IMPLEMENTATION
BY
FOR DATE

DATE 11/29/12
PROJECT END11
SHEET FIGURE 7

CHIMNEY WELL
ABOVE GRADE
(BUILDING 57A AREA, WSA AREA)



CHIMNEY WELL
ABOVE GRADE
(TCA AREA)



NOTES:

1. THE BOTTOM OF THE SCREENED INTERVAL WAS A MINIMUM OF 2' ABOVE THE TOP OF THE HIGHEST WATER TABLE FOR THE AREA.

LEGEND

▽ GROUNDWATER ELEVATION

TRS Accelerating Value

DESIGNED BY M. NANISTA	FOR FORMER IBM FACILITY, ENDICOTT, NEW YORK
DRAWN BY M. NANISTA	
CHECKED BY TRS	CHIMNEY WELL DETAILS
PROJECT MANAGER C. BLUNDY	
APPROVED FOR IMPLEMENTATION	DATE 11/29/12 · PROJECT END11
BY	
FOR ________ DATE	SHEET FIGURE 8

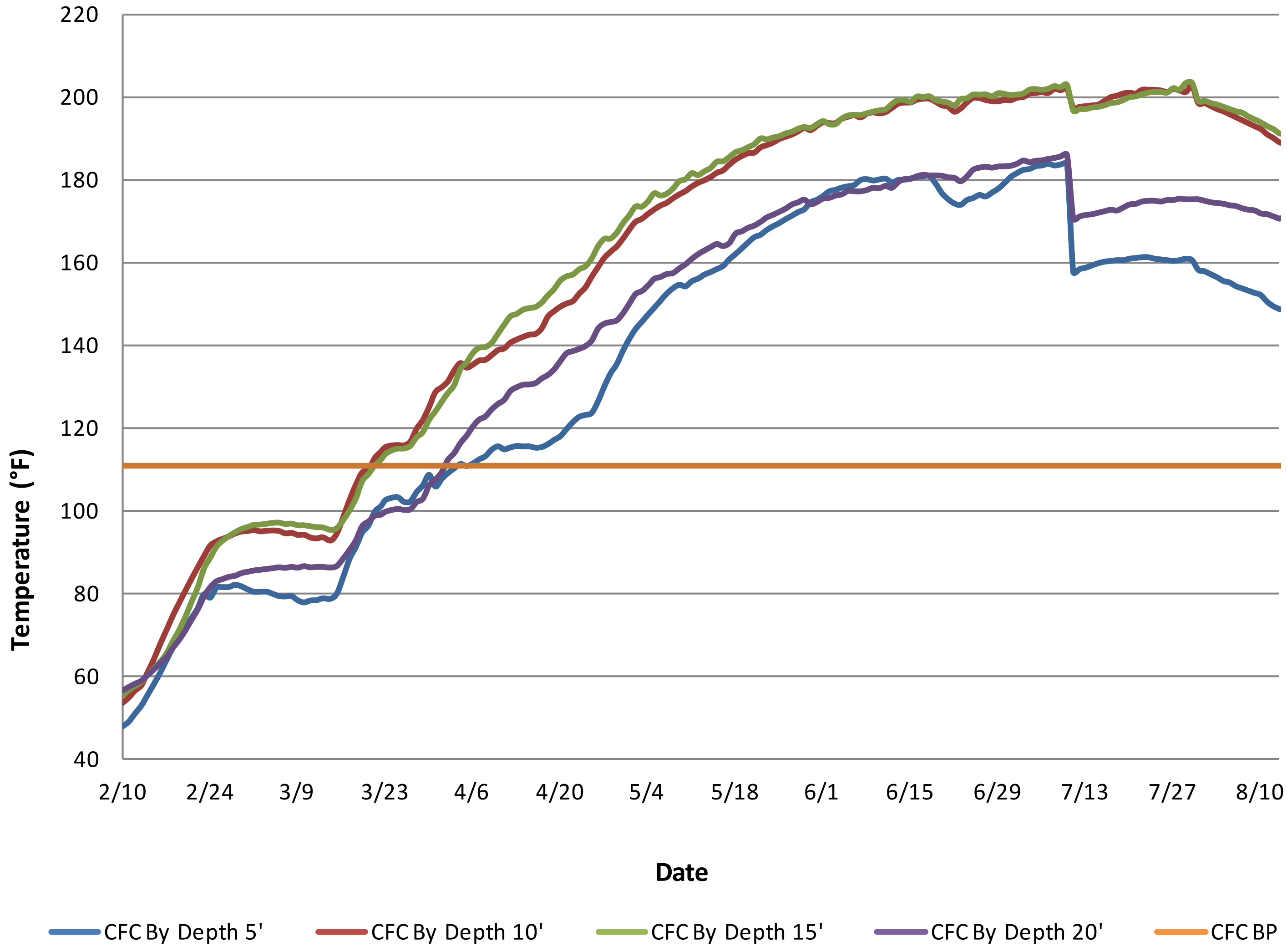


Figure 9. CFC Average Temperature vs. Time

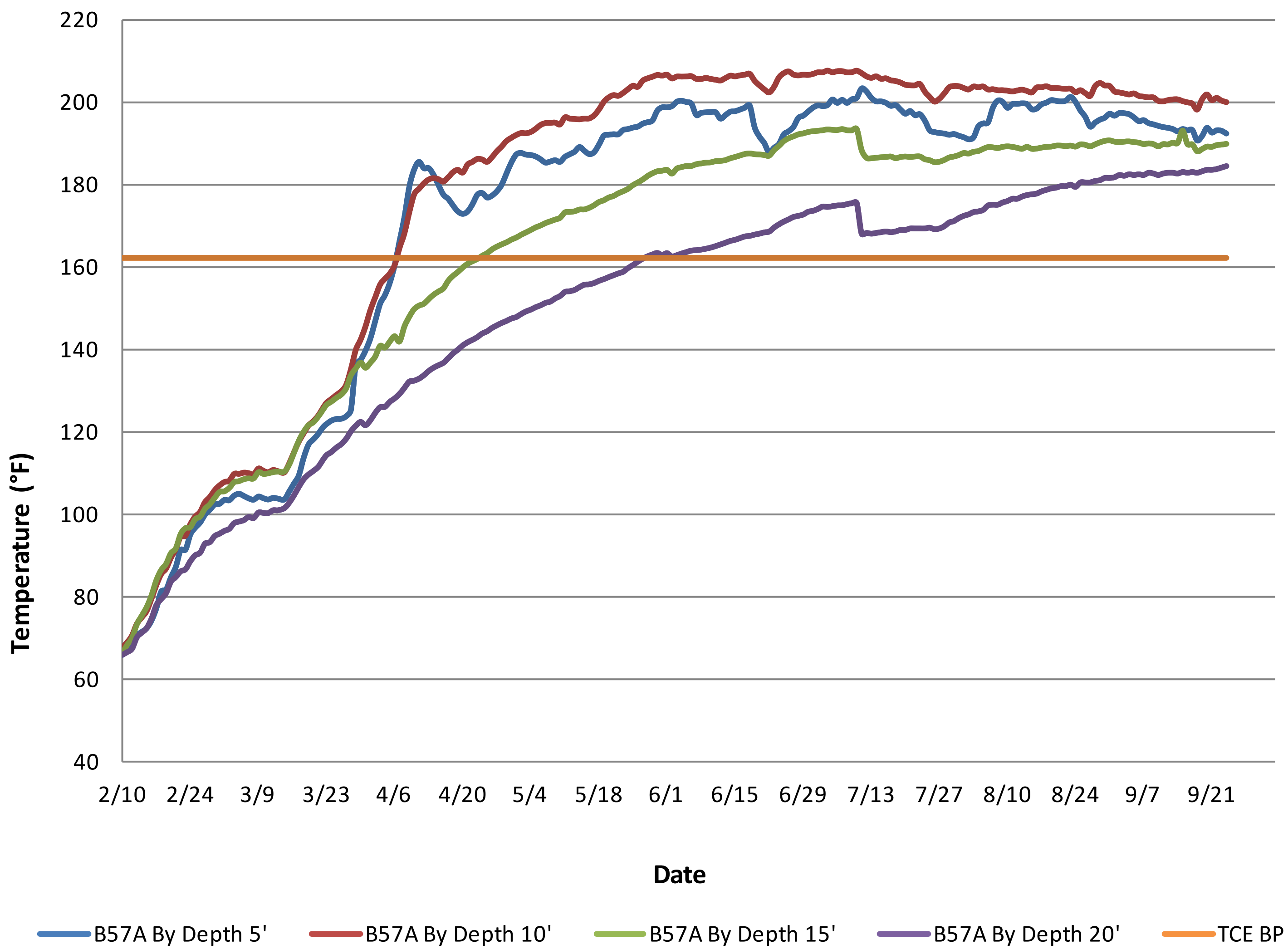


Figure 10. B57A Average Temperature vs. Time

TRS

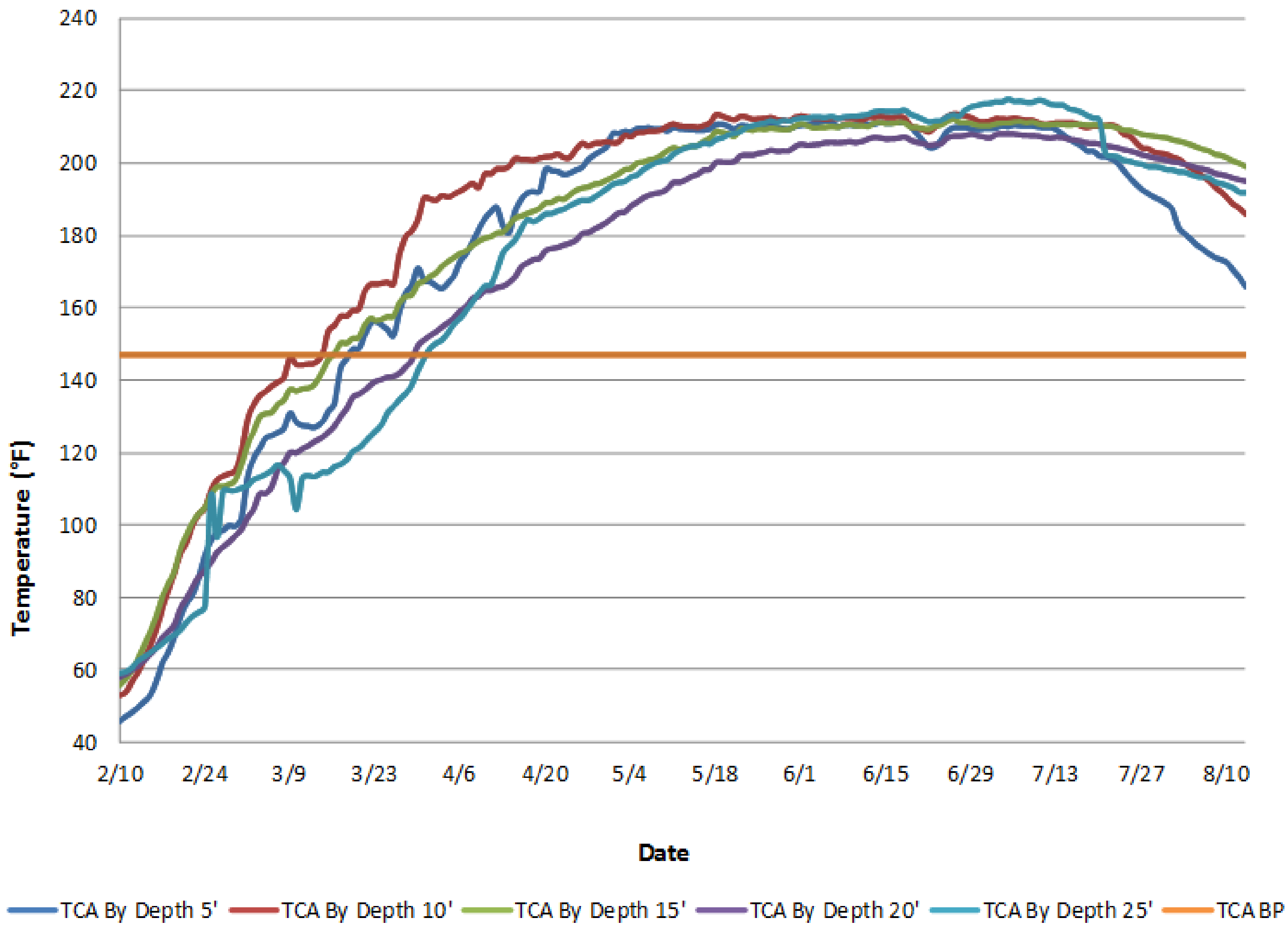


Figure 11. TCA Average Temperature vs. Time

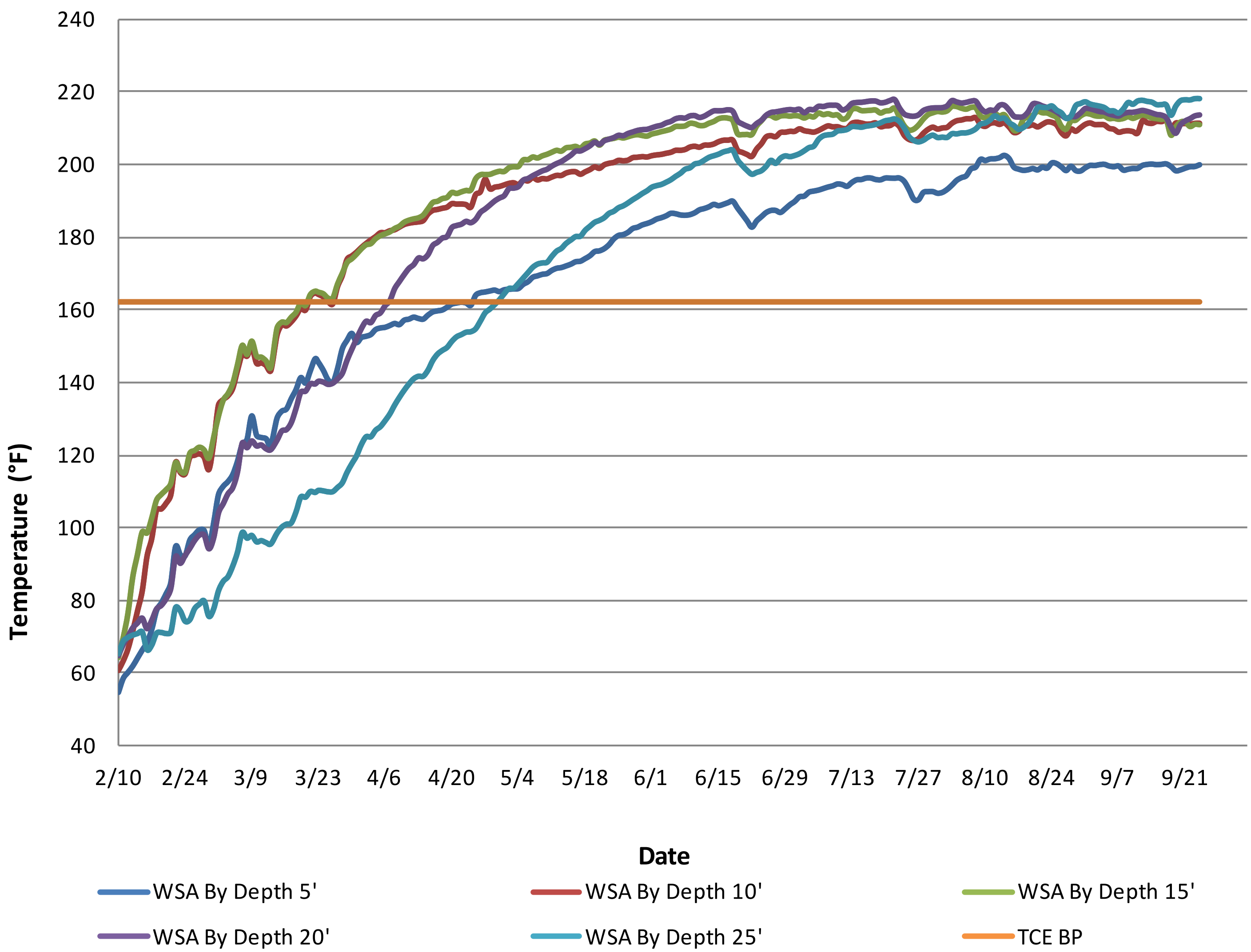
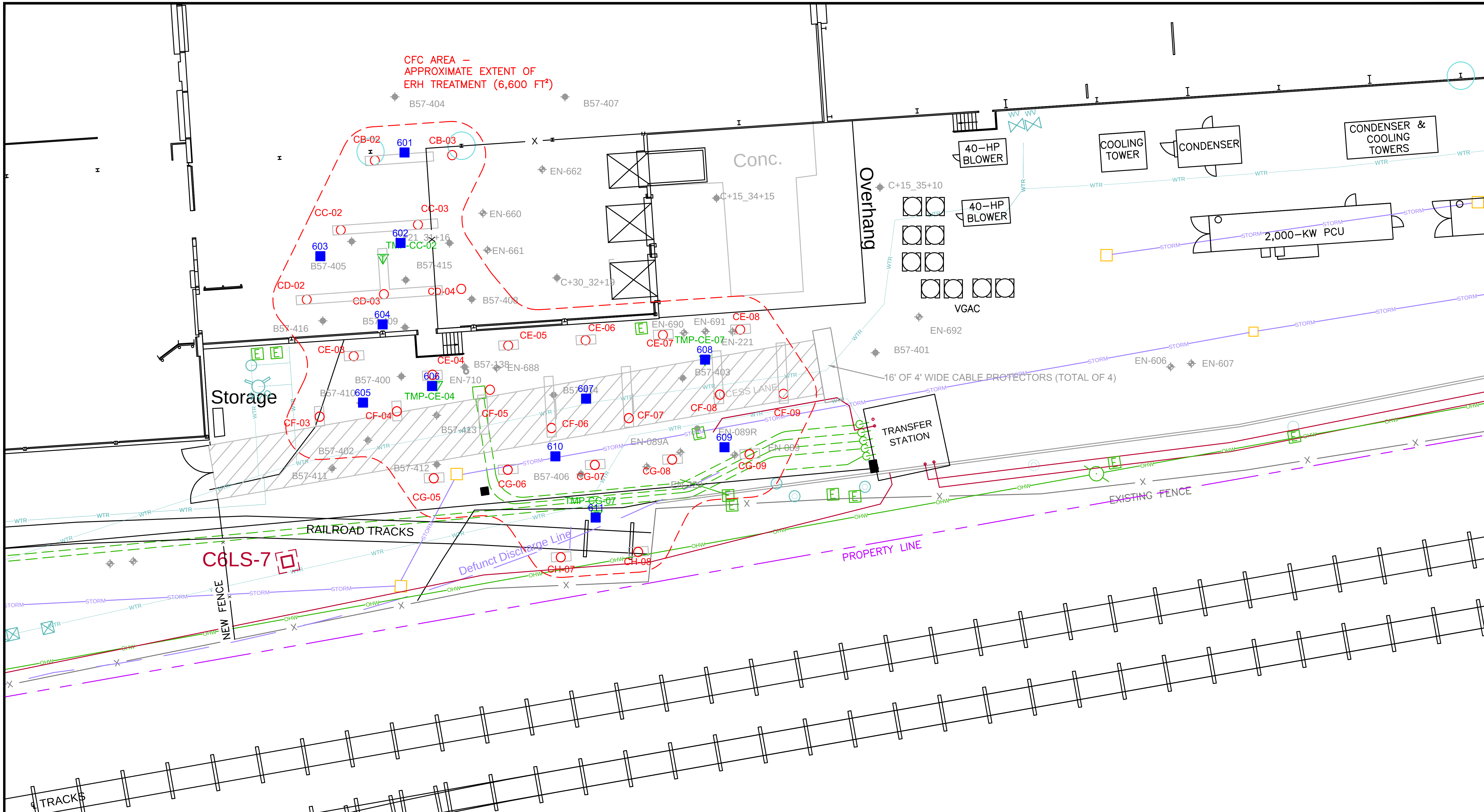


Figure 12. WSA Average Temperature vs. Time



N

0' 20' 40'

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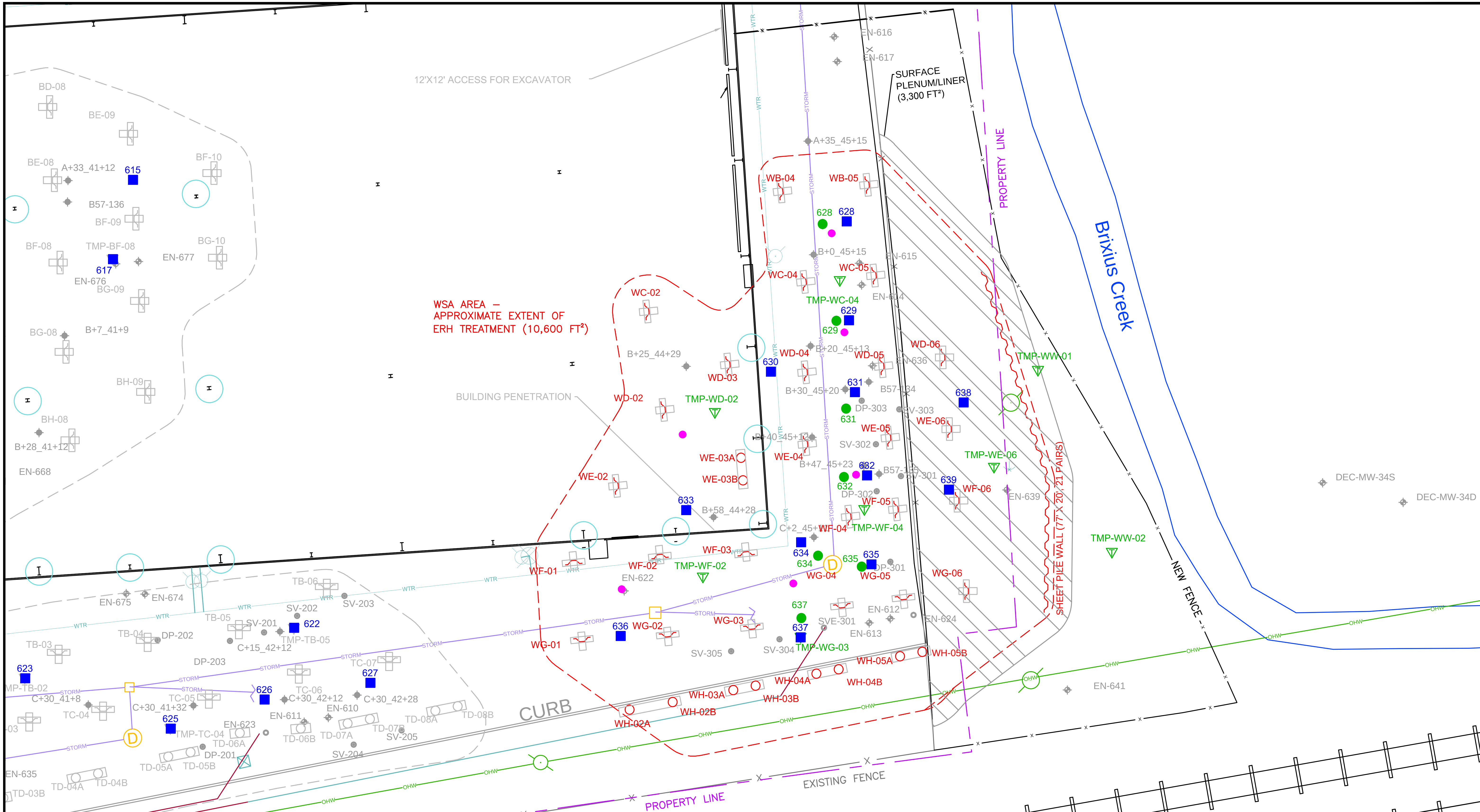
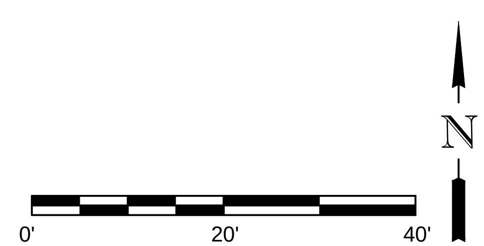
DRAWN BY: M. NANISTA		
CHECKED BY: TRS		CFC SOIL SAMPLE LOCATIONS
PROJECT MANAGER: C. BLUNDY		
APPROVED FOR IMPLEMENTATION BY FOR DATE	DATE 11/29/12	PROJECT END11
	SHEET	FIGURE 13





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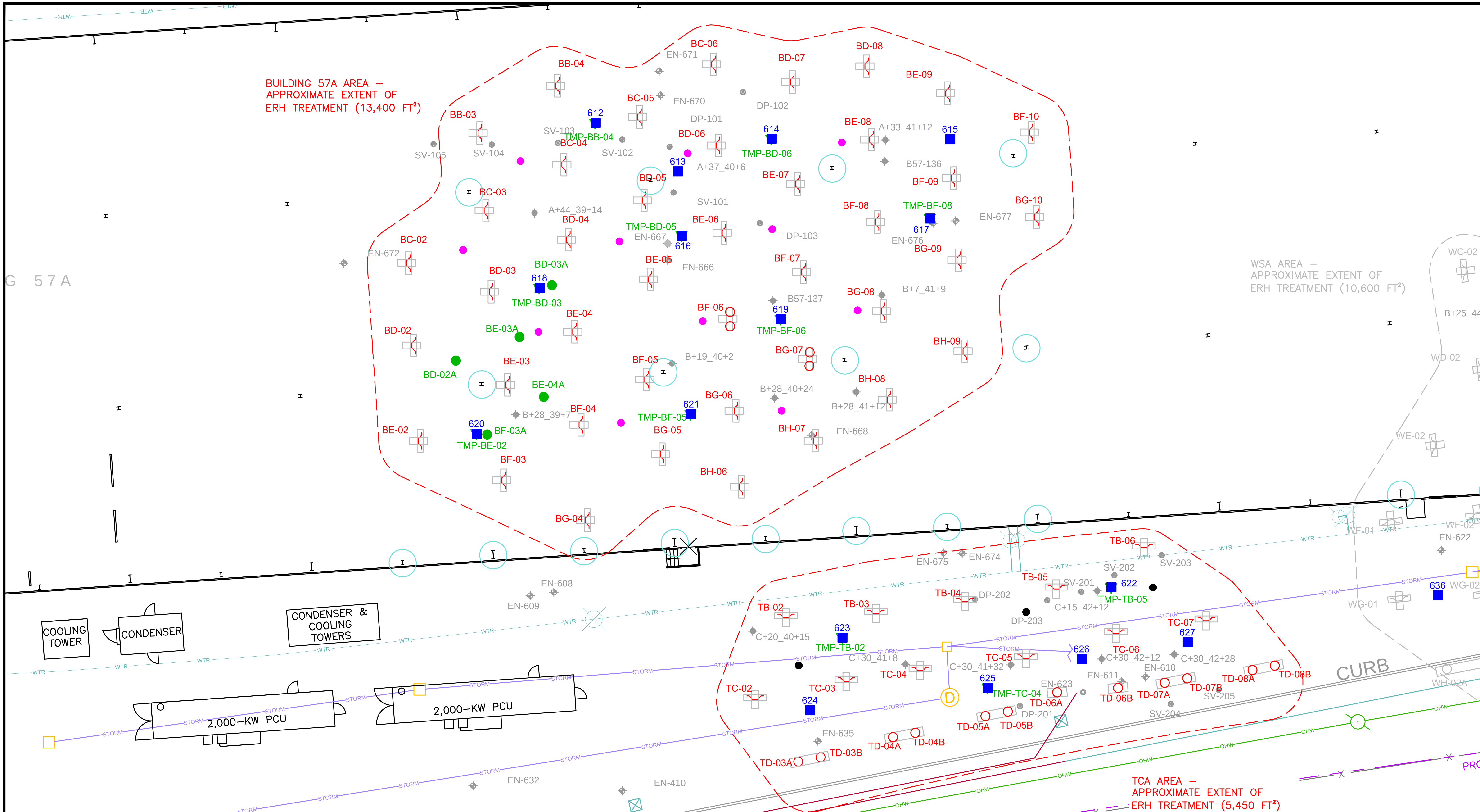
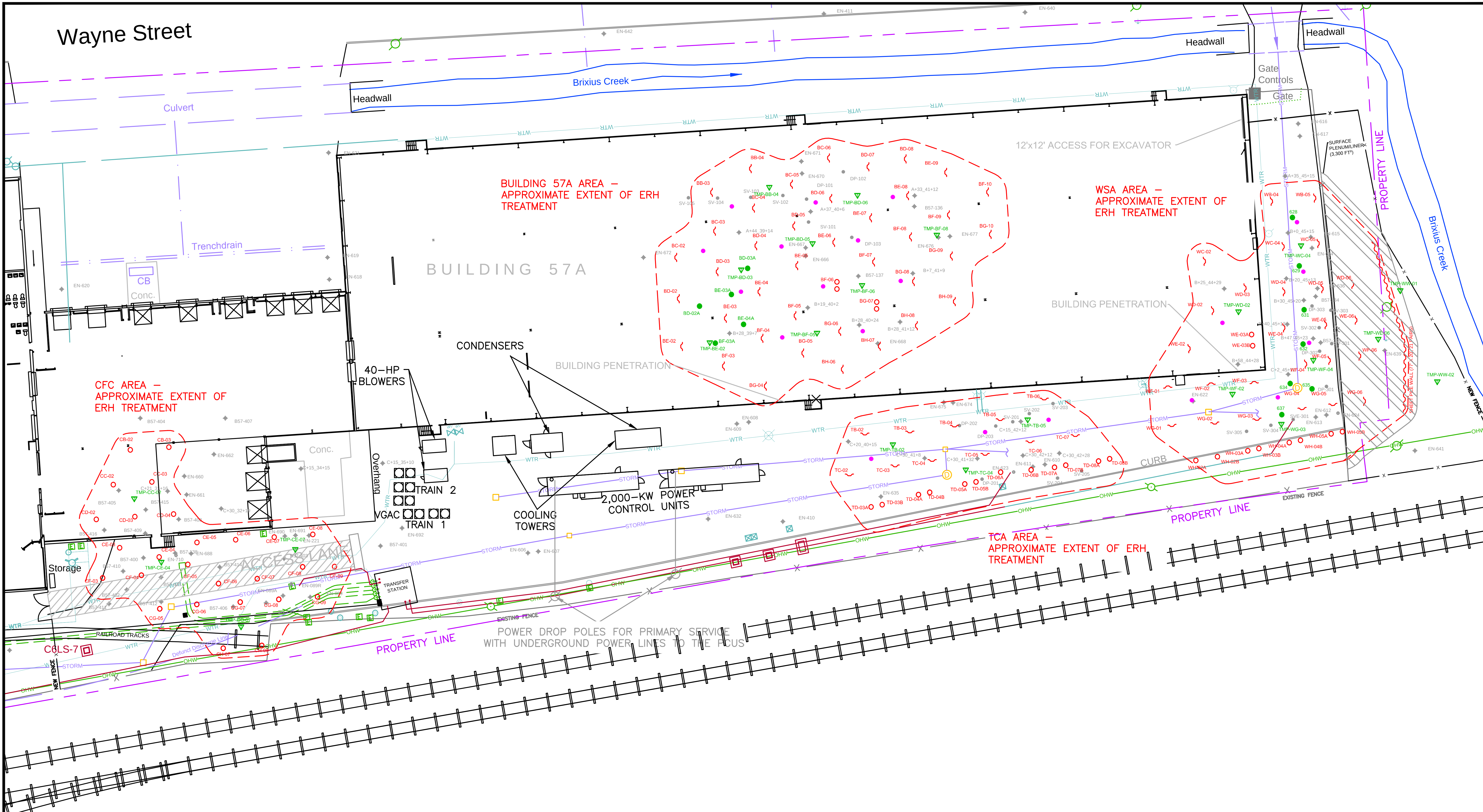
CHECKED BY TRS		WSA SOIL SAMPLE LOCATIONS
PROJECT MANAGER C. BLUNDY		
APPROVED FOR IMPLEMENTATION	DATE 11/29/12	PROJECT END11
BY		
FOR DATE	SHEET	FIGURE 14



DESIGNED BY M. NANISTA	FOR	FORMER IBM FACILITY ENDICOTT, NEW YORK
DRAWN BY M. NANISTA		
CHECKED BY TRS		BLDG 57A AND TCA SOIL SAMPLE LOCATIONS
PROJECT MANAGER C. BLUNDY		
APPROVED FOR IMPLEMENTATION	DATE 11/29/12	PROJECT END11
BY		
FOR DATE	SHEET	FIGURE 15

TRS
Accelerating Value



N

0' 40' 80'

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DESIGNED BY M. NANISTA	FOR FORMER IBM FACILITY ENDICOTT, NEW YORK
DRAWN BY M. NANISTA	
CHECKED BY TRS	SITE PLAN WITH ELECTRODE LOCATIONS
PROJECT MANAGER C. BLUNDY	
APPROVED FOR IMPLEMENTATION	DATE 11/29/12 · PROJECT END11
BY	SHEET FIGURE 16
FOR · DATE	

Appendix A

Site Photos

1. Equipment Compound

2. CFC Treatment Area

3. Equipment Compound with Vapor Treatment Vessels

4. TCA and WSA treatment Area

APPENDIX C

DRILLING AND INSTALLATION DETAILS FOR ELECTRODES, CHIMNEY WELLS & TEMPERATURE MONITORING POINTS

APPENDIX C
DRILLING AND INSTALLATION DETAILS FOR ELECTRODES, CHIMNEY WELLS & TEMPERATURE MONITORING POINTS
OPERABLE UNIT #5/BUILDING 57 AREA, UNION AND ENDICOTT, NY

TABLE OF CONTENTS

TABLES

FIGURES

ATTACHMENT

This Appendix summarizes the drilling and installation of bored/sheet pile electrodes, chimney wells (CWs), and temperature monitoring points (TMPs) for Electrical Resistance Heating (ERH) thermal treatment system completed by Sanborn Head & Associates, Inc. (Sanborn Head), O'Brien & Gere (OBG) and TRS Group, Inc. (TRS) at Building 57 (Site) located in IBM Operable Unit # 5, Union & Endicott, NY.

The work described herein was performed in accordance with the agency approved Interim Remedial Measure (IRM) Work Plan[1]. This Appendix is subject to limitations as described in Appendix A.

C.1 SCOPE OF SERVICES

The Scope of work completed by Sanborn Head from August 1, 2011 through November 11, 2011 for ERH installation included:

- Performing vacuum excavation for utility clearance at exterior locations where the potential presence of utilities was anticipated, to a depth of seven feet below ground surface (bgs) or to the top of the site silt/clay aquitard;
- Observation and documentation of drilling of ninety-seven (97) soil borings using the rotosonic drilling technique. Borings were completed in four source zones: Building 57A Area (B57A), CFC Area, TCA Area, and Waste Solvent Area (WSA), as identified on Figure C.1. Total borings completed in each area are listed in Exhibit 1 below;
- Characterization and field screening of soil samples;
- Observation of drilling and documentation of construction of bored electrodes, TMPs, and CWs;
- Conducting a Community Air Monitoring Program during excavation activities in interior and exterior locations;
- Containerization of all drill cuttings and excavated soils into roll-off containers provided by OBG; and
- Containerization of decontamination wash water in polypropylene storage tanks provided by Groundwater Sciences Corporation (GSC).

The general scope of work completed by OBG for ERH installation included:

- Completing subsurface trenching for all locations to allow for installation of sub-surface conveyance connections; and
- Observation and documentation of installation of sheet pile electrodes.

---

1 Sanborn, Head Engineering, P.C., June 24, 2011 "In situ Thermal Treatment IRM Work Plan – Operable Unit #5, Building 57, Former IBM Facility, Endicott, New York, AOC Index No. A7-0502-0104, NYSDEC Site No. 7-04-014".

TRS provided materials for the construction of bored electrodes, CWs and TMPs. Field method details are provided in Sections B.2 through B.5.

Exhibit 1: Total borings completed in each source zone by Sanborn Head (2011)

Source Zone	B57A Area[2]	CFC Area	TCA Area	WSA
Vertical bored electrodes	4	27	12	10
Chimney wells	11	0	3	6
Temperature monitoring points	8	4	3	9
Total Borings	23	31	18	25

During ERH implementation and based on results of 85% confirmatory soil sampling in July 2012, TRS added 12 additional electrodes in August 2012 using auger and rotosonic drilling techniques (refer to Figure C.1 and Table C.4 for locations). These electrodes were installed in order to supplement energy input and enhance remediation progress near confirmatory soil sampling locations exceeding the New York State Department of Environmental Conservation Soil Cleanup Objectives for Unrestricted Use. Additional electrode details are provided in Exhibit 2.

Exhibit 2: Total borings completed in each source zone by TRS (2012)

Source Zone	B57A Area	WSA
Shallow Electrodes	5	4
Deep Electrodes	0	3
Total Borings	5	7

C.2 METHODS

C.2.1 Vacuum Excavations for Utility Clearance

Sanborn Head retained the services of Crawford Drilling Services, LLC (Crawford) of Westminster, MA to perform vacuum excavation to identify sub-surface utilities using air knife and hand auger methods at exterior locations in the CFC, TCA, and Waste Solvent Areas where the potential presence of utilities was anticipated. The vacuum excavation was performed either:

- Until encountering an underground utility at which point the boring was terminated and or/relocated;

[2] Sheet pile electrodes BF-06 and BG-07 were replaced by vertical bored electrode pairs [BF-06(A&B)] and [BG-07(A&B)] due to early refusal from secondary concrete layer.

- Until reaching a depth of 7 feet bgs; or
- Until encountering the top of the silt and clay inferred aquitard, which separates the upper water bearing zone (UWBZ) and lower water bearing zone (LWBZ).

The vacuum excavations were later backfilled with the excavated material and the surface was completed with cold patch asphalt or native soil, as appropriate.

C.2.2 Drilling & ERH Installation

The drilling and installation of bored electrodes, CWs, and TMPs was performed by Boart Longyear (BLY) of Marietta, Ohio using a Boart Longyear™ Minisonic rig with sonic drilling capabilities. The sonic drilling method was selected due to anticipated difficult subsurface conditions, faster speed of drilling through the overburden material, and the ability to obtain continuous undisturbed core samples.

Summaries of drilling activities and stratigraphic observations for bored electrodes and TMPs/CWs are provided in Tables C.1 and Table C.2, respectively. A summary of sheet piles installed by OBG is provided in Table C.3, and a summary of supplemental bored electrodes installed by TRS is provided in Table C.4. CW and TMP boring logs are provided in Attachment C.1 (on disc).

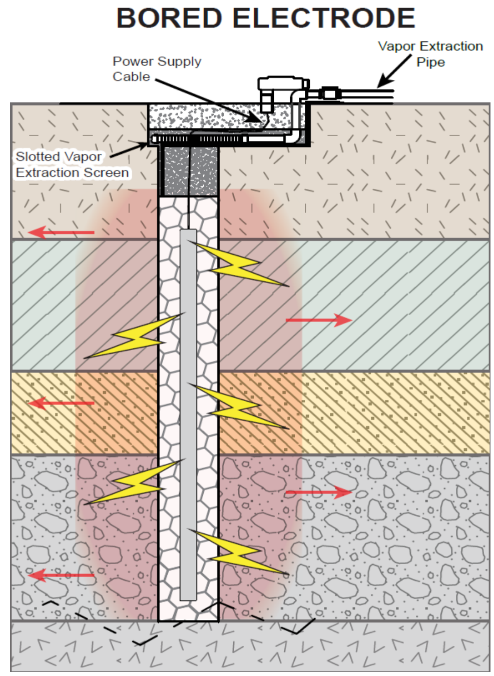
C.2.2.1 Vertical Bored Electrodes

Prior to drilling of each vertical bored electrode location, OBG completed subsurface trenching (2 feet square by 2.5 feet deep) using a Takeuchi TB235 mini excavator to allow for TRS installation of sub-surface conveyance connections following electrode construction. Each bored electrodes was drilled by first advancing an 8-inch (-in.) core barrel followed by a 12-in. core barrels. The core barrels were brought to the surface by BLY for sample core retrieval. The boring was then completed by driving the core barrel and override 12-in. casing to the desired depths.

Installation of Bored Electrode by Boart Longyear in Waste Solvent Area

Vertical bored electrodes were driven through the overburden typically 1 foot into bedrock in the B57A, TCA and Waste Solvent Areas, and 5 feet into bedrock in the CFC Area. A copper electrode element was placed inside the borehole, which was then backfilled using graphite and steel shot in ratio of 2:1 from the bottom of borehole to approximately 5 feet bgs. A drip tube (½-in. slotted copper pipe) was placed from approximately 2 to 5 feet bgs to ensure the soil-electrode interface remained moist and electrically-conductive during ERH operation. The electrode was then backfilled using grade 3 sand from approximately 2 to 5 feet bgs.

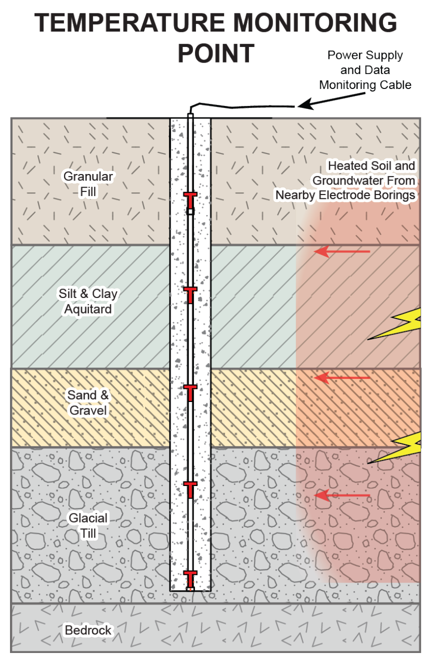
TRS completed the surface of each bored electrode with a two-foot thickness of pea gravel in the trench. A co-located horizontal vapor recovery point consisting of a 2-foot section of 1½-inch stainless steel pipe was installed in the top of the pea-gravel. The down-hole vertical drip tube was then connected to a ½-inch cross-linked polyethylene (PEX) water line. A 20 millimeter low density polyethylene (LDPE) liner was placed over the top; and the trench was then backfilled with approximately 1.5 feet of concrete to create an effective vapor seal.



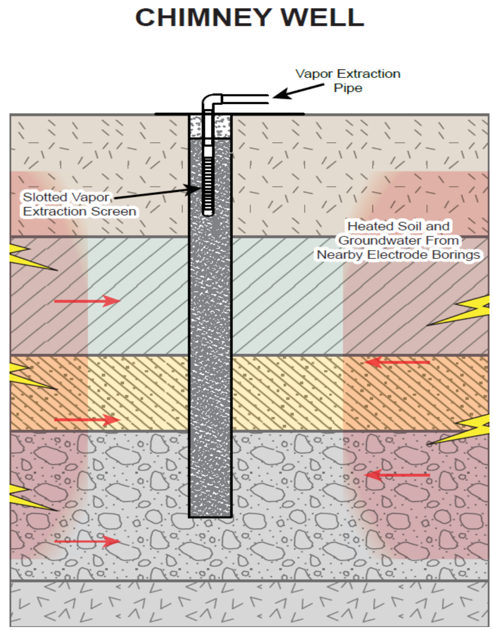
C.2.2.2 Temperature Monitoring Point

Temperature monitoring points were advanced by BLY using 5-in. or 6-in. core barrels through the overburden soil typically 1 foot into bedrock in the B57A, TCA, and Waste Solvent Areas and 5 feet into bedrock in the CFC Area. Chlorinated polyvinyl chloride (CPVC) pipe (1¼-in. diameter) was placed inside each borehole, which was then backfilled using Type II Portland cement grout from the bottom of the boring to 1 foot bgs.

TRS placed approximately 4 to 5 thermocouples in each TMP to measure and record the subsurface temperatures during treatment within each source zone. Thermocouples were placed evenly at 5 foot depth intervals within the CPVC pipe between the extents of treatment zone. Cement grout was placed into the casing to prevent unwarranted movement or groundwater water entering the TMP, and to create an effective vapor seal.



C.2.2.3 Chimney Well



Chimney wells were advanced by BLY using 6-in. core barrels through the overburden soil typically 1 foot into bedrock in the B57A, TCA and Waste Solvent Areas. Each borehole was backfilled using grade 3 sand from bottom of borehole to just above the water table, as observed from the presence of water in soil sample cores collected during drilling activities. A 2-in. stainless steel screen/riser with 0.010-in. slots was placed above the water table and the boring was backfilled with grade 3 sand to approximately 1 foot bgs.
The CW was completed at the ground surface with cement grout to create an effective vapor seal. CWs were used in addition to the electrode vapor recovery screens to improve vertical migration of steam within the treatment zones and to allow for adequate vapor recovery capture.

C.3 Soil Characterization and Sampling

During drilling of bored electrodes, TMPs, and CWs, soil samples were retrieved by BLY from the core barrels and collected using disposable plastic sleeves. Sanborn Head representatives observed, photographed, and characterized soils according to the modified Burmeister method.

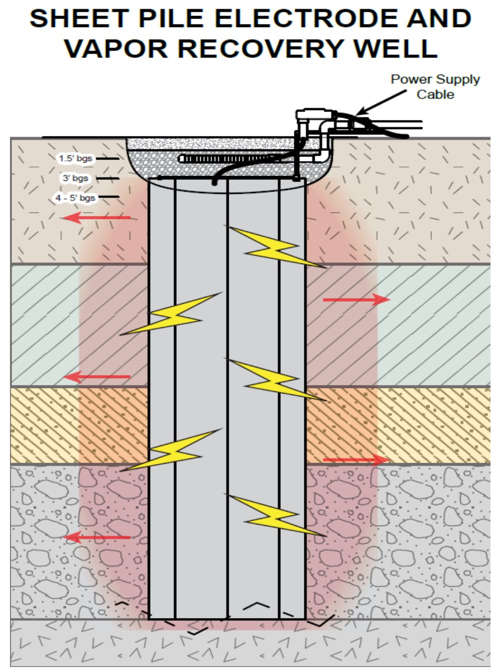
The generalized statigraphy observed during drilling in the four source zones consisted of granular fill material mainly composed of sand, gravel, and cobbles, with traces of cultural materials (e.g., bricks, slag, wood fragments, concrete and metal debris) in the uppermost layer. Cohesive soils, indicative of the previously identified silt and clay aquitard, were typically encountered below the granular fill material, and separate the UWBZ from the LWBZ. Glacial till was observed below the silt and clay aquitard in the LWBZ, and was observed to consist primarily of gravels (typically composed of fractured shale) with variable amounts of sand, silt and clay. Glacial till is underlain by weathered shale bedrock.

Soil samples were collected in Ziploc® bags and field screened for volatile organic compounds using a ppb Rae 3000 photoionization detector. No soil samples were collected for laboratory analysis.

C.4 Sheet Pile Electrode Installation

OBG contracted Abscope Environmental, Inc. (Abscope) to complete the installation of sheet pile electrodes in the B57A, TCA and Waste Solvent Areas, and a sheet pile wall east of the Waste Solvent Area (refer to Figures C.1 & C.2 for locations and details). The sheet pile installation was completed by Abscope using a Komatsu PC 300 LC excavator installed with a modified hydraulic head for driving sheet piles.

Sheet piles were installed as welded pairs in the B57A, TCA, and Waste Solvent Areas; and as individual sheet piles in the sheet pile wall. Sheet piles installed in each of the three sources zones are summarized in Exhibit 3 below.

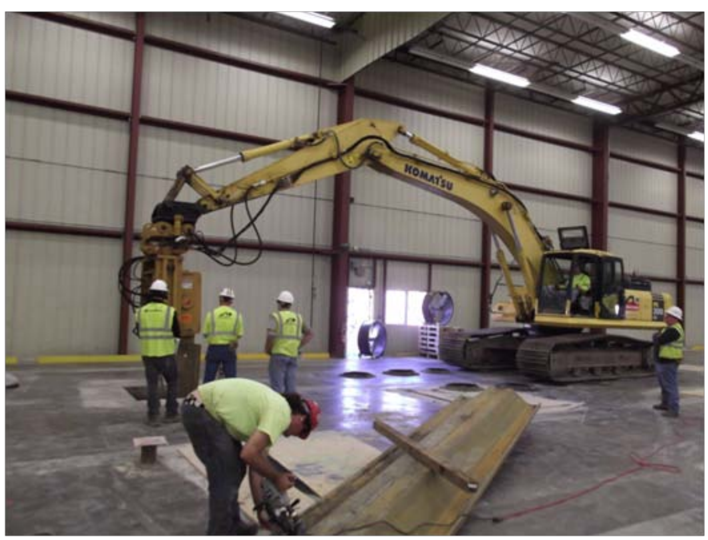


Sheet pile electrodes were completed at the ground surface by TRS in a similar manner to the vertical bored electrodes with the exception of a horizontal ½-in. slotted copper (instead of vertical) placed as a drip line and then connected to a ½-inch cross-linked PEX water line.

Surface completion of sheet pile wall in WSA differed from the vertical bored and sheet pile electrodes. A combination of artificial fill material and pea gravel was placed at the ground surface over the sheet pile wall, and used for leveling the area. Horizontal vapor capture lines were placed in the fill material. A LDPE liner was then placed over the fill and gravel to provide an effective vapor seal.

Exhibit 3: Total sheet piles installed by OBG (2011)

Source Zone	B57A Area	TCA Area	WSA	Total
Sheet Pile Electrode Welded Pairs	39	11	26	76
Sheet Pile Wall[3]	0	0	66	66



Sheet Pile Installation by Abscope in the Building 57A Area

[3] Energized portion of sheet pile wall equivalent to 10 electrodes (See Appendix B for additional details).

C.5 Waste Handling

All drill cuttings and excavated soils were contained in roll-off containers provided by OBG. Sanborn Head assisted OBG in waste characterization sampling of roll-off contents by collecting composite soil samples and submittal for laboratory analysis. Roll-off contents were later transported to the Broome County Landfill with approval following the receipt of laboratory analytical data by OBG.

The decontamination wash water stored in polypropylene storage tanks was transferred by GSC to the Clark Street Groundwater Treatment Facility for treatment when full.

Roll off Containers with stored drill cuttings awaiting disposal

TABLE C.1 (A)
Summary of Drilling Activities - Bored Electrodes
CFC Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	*Interior/ Exterior*	*Start Date*	*Completion Date*	*Top Depth (Feet)*	*Bottom Depth (Feet)*	*General Lithologic Description*	*PID Readings (ppmv)*
CB-02	***Interior***	11/1/2011	11/1/2011	0.6	6.5	Fill	0.7
				6.5	7.5	Concrete	NM
				7.5	11.5	Fill	0.1
				11.5	15	Silt and Clay	0.2
				15	20	Glacial Till + Shale	0.3
				20	23.3	Weathered Shale	0.5
CB-03	***Interior***	10/26/2011	10/26/2011	2.5	5	Concrete	NM
				5	6.8	Fill	0.1
				6.8	7.3	Silt and Clay	0.6
				7.3	9.5	Glacial Till	0.2
				9.5	10.5	Silt and Clay	NM
				10.5	13	Glacial Till	0.5
				13	15	Silt and Clay	ND
				15	20	Glacial Till	ND
				20	24.5	Severely Weathered Shale	0.1
				24.5	25	Competent Shale	NM
CC-02	***Interior***	11/1/2011	11/2/2011	2.5	3.6	Fill	0.8
				3.6	3.8	Concrete	NM
				3.8	9.3	Fill	1.2
				9.3	9.8	Silt and Clay + Organic Peat	1.4
				9.8	15	Silt and Clay	0.5
				15	18	Glacial Till	1
				18	20	Competent Shale	0.4
				20	23.4	Very Severely Weathered Shale	0.4
CC-03	***Interior***	11/2/2011	11/7/2011	2.5	10	Fill	0.8, 0.4
				10	14	Silt and Clay	0.3
				14	18	Glacial Till + Shale	0.3, 0.1
				18	19	Sand and Gravel	4.1
				19	20	Glacial Till + Shale	0.2
				20	20.5	Competent Shale	0.4
				20.5	23	Severely Weathered Shale	0.2
CD-02	***Interior***	11/7/2011	11/7/2011	2.5	5	Shale	NM
				5	10	Fill	ND, 0.1
				10	14	Silt and Clay	0.3
				14	19.2	Glacial Shale + Till	0.2, ND
				19.2	20	Moderately Weathered Shale	ND
				19.2	25	Very Severely Weathered Shale	3.6, 2
CD-03	***Interior***	11/7/2011	11/8/2011	2.5	4	Fill	NM
				4	5	Concrete	NM
				5	11.3	Fill	0.5, 1.4
				11.3	15	Silt and Clay	2, 4
				15	20.5	Glacial Till + Shale	3.2, 0.8
				20.5	22.6	Severely Weathered Shale	18
				22.6	23.5	Competent Shale	NM
				23.5	25.6	No Recovery	NM
CD-04	***Interior***	11/8/2011	11/10/2011	2.5	5	Concrete	NM
				5	10	Fill	0.3, 1.9
				10	15	Silt and Clay	2.1
				15	18.5	Glacial Till	2.3
				18.5	19.4	Glacial Till + Shale	3.8
				19.4	20	Competent Shale	NM
				20	24.6	Very Severely Wea. Shale	3.1
				24.6	25	Competent Shale	NM
CE-03	***Exterior***	10/17/2011	10/17/2011	2	6.3	Fill	0.5
				6.3	10	Silt and Clay	1.9
				10	11.3	Glacial Till	0.3
				11.3	13.5	Glacial Till + Shale	0.3
				13.5	14	Competent Shale	NM
				14	14.5	Shale + Glacial Till	NM
				14.5	18.5	Severely Weathered Shale	1.7
				18.5	20	Moderately Weathered Shale	NM
CE-04	***Exterior***	10/17/2011	10/17/2011	2	6.5	Fill	0.4
				6.5	10	Silt and Clay	0.8
				10	13	Glacial Till	0.4
				13	13.6	Glacial Till + Shale	0.4
				13.6	15	Competent Shale	0.1
				15	17	Glacial Till	NM
				17	18	Shale + Glacial Till	0.6
				18	20	Severely Weathered Shale	0.6
CE-05	***Exterior***	10/16/2011	10/17/2011	2	7	Fill	0.6
				7	10	Silt and Clay	0.4
				10	13	Glacial Till	1.7
				13	13.8	Moderately Weathered Shale	0.2
				13.8	14	Competent Shale	NM
				14	20	Completely Weathered Shale	NM
CE-06	***Exterior***	10/16/2011	10/16/2011	2	6.9	Fill	ND
				6.9	10	Silt and Clay	0.5
				10	15	Shale + Glacial Till	ND
				15	15.3	Competent Shale	5.9
				15.3	16	Shale + Glacial Till	5.9
				16	18	Competent Shale + Glacial Till	NM
				18	18.5	Competent Shale	NM
				18.5	20	Severely Weathered Shale	NM
CE-07	***Exterior***	10/15/2011	10/16/2011	2	6	Fill	NM
				6	10	Silt and Clay	NM
				10	13	Glacial Till	NM
				13	15	Moderately Weathered Shale	NM
				15	20	Completely Weathered Shale	NM
CE-08	***Exterior***	10/15/2011	10/15/2011	2	6.4	Fill	0.2
				6.4	10	Silt and Clay	0.2
				10	13	Glacial Till	0.7
				13	16	Shale + Glacial Till	0.3
				16	16.9	Moderately Weathered Shale	1.4
				16.9	20	Completely Weathered Shale	NM

TABLE C.1 (A)
Summary of Drilling Activities - Bored Electrodes
CFC Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	Interior/ Exterior	Start Date	Completion Date	Top Depth (Feet)	Bottom Depth (Feet)	General Lithologic Description	PID Readings (ppmv)
CF-03	Exterior	10/17/2011	10/18/2011	2	6.8	Fill	0.1
				6.8	10	Silt and Clay	1.7
				10	11	Competent Shale + Glacial Till	NM
				11	12.9	Weathered Shale + Glacial Till	0.9
				12.9	13.4	Competent Shale + Glacial Till	NM
				13.4	15	Shale + Glacial Till (Dry)	NM
				15	19.2	Shale + Glacial Till (Wet)	1.4
				19.2	20	Severely Weathered Shale	0.9
CF-04	Exterior	10/18/2011	10/18/2011	2	6.6	Fill	2.5
				6.6	10	Silt and Clay	4.4
				10	14.5	Shale + Glacial Till	0.7
				14.5	15	Competent Shale	NM
				15	20	Completely Weathered Shale	10
CF-05	Exterior	10/25/2011	10/26/2011	2	3.5	Fill	NM
				3.5	10	Silt and Clay	1
				10	11.3	Glacial Till	0.3
				11.3	15	Shale + Glacial Till	0.3
				15	17	Severely Weathered Shale	0.3
				17	19	Glacial Till	0.9
				19	20	Competent Shale	NM
CF-06	Exterior	10/24/2011	10/24/2011	2	5	Fill	0.1
				5	10	Silt and Clay	5.5
				10	11	Glacial Till	0.1
				11	15	Shale + Glacial Till	0.1
				15	15.7	Completely Weathered Shale	1.2
				15.7	19	Competent Shale	NM
				19	20	Completely Weathered Shale	NM
CF-07	Exterior	10/24/2011	10/25/2011	2	5	Fill	NM
				5	10	Silt and Clay	0.3
				10	11.6	Glacial Till (sand & gravel)	0.1
				11.6	13.3	Glacial Till (silt & gravel)	0.2
				13.3	15	Shale + Glacial Till	NM
				15	20	Completely Weathered Shale	7.8
CF-08	Exterior	10/25/2011	10/25/2011	2	4.9	Fill	NM
				4.9	10.6	Silt and Clay	0.3
				10.6	14.2	Glacial Till (sand & gravel)	0.4
				14.2	15.3	Shale + Glacial Till	0.1
				15.3	16.3	Completely Weathered Shale	1.9
				16.3	17	Competent Shale	NM
				17	19.7	Completely Weathered Shale	NM
				19.7	20	Competent Shale	NM
CF-09	Exterior	10/25/2011	10/25/2011	2	5	Fill	NM
				5	11	Silt and Clay	ND
				11	11.5	Glacial Till (silt and clay; sand & gravel)	0.1
				11.5	14.5	Glacial Till (silt & sand-gravel)	0.2
				14.5	15	Glacial Till (silt and clay; sand & gravel)	NM
				15	16.5	Shale + Glacial Till	0.5
				16.5	20	Severely Weathered Shale	1.7
CG-05	Exterior	10/18/2011	10/18/2011	2	8.2	Fill	1.5
				8.2	10	Silt and Clay	4.6
				10	12.5	Glacial Till	3.2
				12.5	13	Competent Shale	NM
				13	15	Shale + Glacial Till	4.1
				15	19.2	Completely Weathered Shale	7.5
				19.2	20	Competent Shale	NM
CG-06	Exterior	10/24/2011	10/24/2011	2	6.9	Fill	0.2
				6.9	11	Silt and Clay	4.3
				11	15	Glacial Till	0.2
				15	20	Severely Weathered Shale	4.6
CG-07	Exterior	10/19/2011	10/19/2011	2	6	Fill	1.5
				6	9.7	Silt and Clay	3.6
				9.7	16	Glacial Till	0.4
				16	20	Completely Weathered Shale	18
CG-08	Exterior	10/4/2011	10/4/2011	2	7.5	Fill	1.6
				7.5	10	Silt and Clay	1.8
				10	15	Glacial Till	0.2
				15	16.5	Weathered Shale	3
				16.5	17.8	Shale + Glacial Till	1.9
				17.8	20	Weathered Shale	2.3
CG-09	Exterior	10/4/2011	10/4/2011	2	8.2	Fill	0.6
				8.2	10.5	Silt and Clay	1.8
				10.5	15.8	Glacial Till	1.7
				15.8	17.2	Moderately Weathered Shale	1.4
				17.2	20	Completely Weathered Shale	0.8
CH-07	Exterior	10/3/2011	10/4/2011	2	6.6	Fill	1
				6.6	13.2	Silt and Clay	0.8
				13.2	15	Glacial Till	0.9
				15	16	Competent Shale	NM
				16	20	Weathered Shale	3
CH-08	Exterior	10/3/2011	10/3/2011	0	11.2	Fill	0.3
				11.2	15	Silt and Clay	0.1
				15	19.2	Glacial Till	1.2
				19.2	23	Severely Weathered Shale	9.7

Notes:

1) NM: Indicates PID reading not measured for the indicated depth interval.
   ND: Indicates non-detect PID reading for the indicated depth interval.

2) Lithology descriptions are based on sample cores observed during drilling program; deviations are possible from actual depths for subsurface conditions.

3) Depth to groundwater varies from 5 to 7 ft bgs and is based on data available from past groundwater sampling events; deviations are possible due to seasonal variations.

4) CE-04 was initially designed as bored angled electrode but was drilled as vertical bored electrode.

Table C.1 (B)
Summary of Drilling Activities - Bored Electrodes
B57A Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	*Interior/ Exterior*	*Start Date*	*Completion Date*	*Top Depth (Feet)*	*Bottom Depth (Feet)*	*General Lithologic Description*	*PID Readings (ppmv)*
BF-06A	***Interior***	10/28/2011	10/28/2011	3.5	7	Fill	3.2
				7	9	Concrete	0.1
				9	17	Silt and Clay	0.8
				17	19	Glacial Till	18
				19	20	Competent Rock	NM
BF-06B	***Interior***	10/28/2011	10/29/2011	3.5	9	Fill	NM
				9	17	Silt and Clay	NM
				17	18	Glacial Till	NM
				18	20	Competent Rock	NM
BG-07A	***Interior***	10/27/2011	10/27/2011	3.5	7.5	Fill	0.7
				7.5	8.5	Concrete	NM
				8.5	10	Fill	0.5
				10	17	Silt and Clay	1.7, 0.8
				17	20	Glacial Till (little Severely Weathered Shale)	31
BG-07B	***Interior***	10/27/2011	10/28/2011			Samples not observed. (Profile assumed similar to BG-07A)	

Notes:
1) Locations indicated above were initially planned as sheet pile electrodes; however due to secondary concrete encountered at these locations, they were drilled as vertical bored electrodes.

2)) NM: Indicates PID reading not measured for the indicated depth interval.
ND: Indicated non-detect PID reading for the indicated depth interval.

3) Lithology descriptions are based on sample cores observed during drilling program; deviations are possible from actual depths for subsurface conditions.

4) Depth to groundwater varies from 7 to 9 ft bgs and is based on data available from past groundwater sampling events; deviations are possible due to seasonal variations.

5) Bedrock not observed for locations BG-07A & BG-07B.

Table C.1 (C)
Summary of Drilling Activities - Bored Electrodes
Waste Solvent Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	Interior/ Exterior	Start Date	Completion Date	Top Depth (Feet)	Bottom Depth (Feet)	General Lithologic Description	PID Readings (ppmv)
WE-03A	Interior	10/31/2011	11/1/2011	0	0.6	Concrete	NM
				0.6	15	Fill	0.1, 0.9
				15	20	Clay and Silt	0.3
				20	24	Glacial Till	0.3
				24	25	Weathered-Competent Shale	0.1
WE-03B	Interior	10/31/2011	10/31/2011	0	0.6	Concrete	NM
				0.6	10	Fill	1.3
				10	14.5	No Recovery	NM
				14.5	20	Silt and Clay	119
				20	23.5	Glacial Till	7.7
				23.5	25.5	Weathered Shale	4.1
WH-02A	Exterior	9/29/2011	9/29/2011	0	11	Fill	NM
				11	18.4	Silt and Clay	NM
				18.4	23	Glacial Till	NM
				23	28	Severe-Slightly Weathered Shale	NM
WH-02B	Exterior	9/28/2011	9/29/2011	0	9	Fill	0.7
				9	10	Concrete	NM
				10	11.3	Fill	NM
				11.3	17.3	Silt and Clay	0.2, 0.4
				17.3	21.4	Glacial Till	0.2, 0.2
				21.4	28	Severe-Slightly Weathered Shale	0.4
WH-03A	Exterior	9/28/2011	9/28/2011	0	11.5	Fill	NM
				11.5	15	Clay and Silt	NM
				15	18	Silt and Clay	NM
				18	23	Glacial Till	NM
				23	26	Competent Shale	NM
				26	28	Severely Weathered Shale	NM
WH-03B	Exterior	9/27/2011	9/28/2011	0	10	Fill	5
				10	10.5	Organic Peat	6.6
				10.5	15.5	Clay and Silt	1.5, 2.1
				15.5	25	Glacial Till	4.7, 5.9
				25	28.4	Severely Weathered Shale	11, 14, 0.8
WH-04A	Exterior	9/27/2011	9/27/2011	0	10	Fill	0.6
				10	12.1	Organic Peat	1.1
				12.1	15	Fill	2.1
				15	18.5	Clay and Silt	0.2
				18.5	25	Glacial Till	1.2, 3.3
				25	28	Weathered Shale	0.6, 2.2
WH-04B	Exterior	9/26/2011	9/27/2011	0	9.7	Fill	2
				9.7	10	Organic Peat	0.9
				10	12.5	Silt and Clay	0.5
				12.5	15	Clay and Silt	0.3
				15	18.5	Silt and Clay	0.2
				18.5	26.5	Glacial Till	0.2, 3.3, 13.6, 2.1, 2.4
				26.5	28	Moderate - Severely Weathered Shale	2.4, 0.4
WH-05A	Exterior	9/30/2011	9/30/2011	0	14.5	Fill	1.1
				14.5	20	Silt and Clay	1.8
				20	25	Glacial Till	2.5
				25	27	Weathered Shale	0.9
				27	28	Competent Shale	0.8, 2, NM
WH-05B	Exterior	9/29/2011	9/30/2011	0	10	Fill	NM
				10	15	Silt and Clay	NM
				15	22.5	Glacial Till	NM
				22.5	28	Severely Weathered Shale	NM

Notes:
1) NM: Indicates PID reading not measured for the indicated depth interval.
ND: Indicates non-detect PID reading for the indicated depth interval.

2) Lithology descriptions are based on samples observed during drilling program; deviations are possible from actual depths for subsurface conditions.

3) Depth to groundwater varies from 5 to 8 ft below ground surface (ft bgs) and is based on data available from past groundwater sampling events; deviations are possible due to seasonal variations.

4) WH-02B, WH-03 (A&B), WH-04 (A& B), and WH-05 (A &B) were initially designed as bored angled electrodes; however after field survey were drilled as vertical bored electrodes.

Table C.1 (D)
Summary of Drilling Activities - Bored Electrodes
TCA Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	Interior/ Exterior	Start Date	Completion Date	Top Depth (Feet)	Bottom Depth (Feet)	General Lithologic Description	PID Readings (ppmv)
TD-03A	Exterior	10/15/2011	10/15/2011	2	10	Fill	0.7
				10	15	Silt and Clay	0.5
				15	16	Shale + Glacial Till	0.1
				16	18.5	Glacial Till	NM
				18.5	22	Shale + Glacial Till	ND
				22	23.5	Moderate Weathered Shale	ND
				23.5	25	Completely Weathered Shale	NM
TD-03B	Exterior	10/14/2011	10/14/2011			Samples not observed. (Profile assumed similar to TD-03A)	
TD-04A	Exterior	10/14/2011	10/14/2011	2	9	Fill	0.7
				9	15	Silt and Clay	0.3
				15	16	Glacial Till	0.1
				16	16.5	Severely Weathered Shale	0.1
				16.5	17.7	Stream Deposits	0.2
				17.7	20	Glacial Till	1.4
				20	23.5	Glacial Till + Shale	ND
				23.5	25	Competent Shale	NM
TD-04B	Exterior	10/13/2011	10/13/2011			Samples not observed. (Profile assumed similar to TD-04A)	
TD-05A	Exterior	10/13/2011	10/13/2011	2	10	Fill	1
				10	14.6	Silt and Clay	22
				14.6	18	Glacial Till	0.4
				18	20	Moderately Weathered Shale	0.3
				20	25	Completely Weathered Shale	NM
TD-05B	Exterior	10/12/2011	10/12/2011	2	10	Fill	0.2
				10	14.6	Silt and Clay	11
				14.6	17.7	Glacial Till	3.3
				17.7	20	Moderately Weathered Shale	0.2
				20	25	Completely Weathered Shale	0.5
TD-06A	Exterior	10/10/2011	10/12/2011	2	12.9	Fill	0.9
				12.9	15	Silt and Clay	2.1
				15	20	Glacial Till	1.2
				20	25	Competent Shale	NM
TD-06B	Exterior	10/10/2011	10/10/2011	2	12	Fill	NM
				12	14.5	Silt and Clay	NM
				14.5	22.5	Glacial Till	NM
				22.5	25	Severely Weathered Shale	NM
TD-07A	Exterior	10/2/2011	10/5/2011	2	11	Fill	2.1
				11	17.7	Silt and Clay	0.6
				17.7	19.4	Glacial Till	3.7
				19.4	24.1	Completely Weathered Shale	4.4
				24.1	25	Competent Shale	NM
TD-07B	Exterior	10/2/2011	10/2/2011	2	11	Fill	0.5
				11	16.8	Silt and Clay	9
				16.8	19	Glacial Till	2.1
				19	20	Moderately Weathered Shale	6
				20	23.5	Completely Weathered Shale	94
				23.5	25	Competent Shale	NM
TD-08A	Exterior	10/1/2011	10/1/2011	2	10	Fill	NM
				10	17	Silt and Clay	NM
				17	20	Glacial Till	NM
				20	24.7	Moderately Weathered Shale	NM
TD-08B	Exterior	9/30/2011	10/1/2011	2	12	Fill	NM
				12	17	Silt and Clay	0.8
				17	23.8	Glacial Till	NM
				23.8	25	Competent Shale	NM

Notes:
1) NM: Indicates PID reading not measured for the indicated depth interval.
ND: Indicates non-detect PID reading for the indicated depth interval.

2) Lithology descriptions are based on sample cores observed during drilling program; deviations are possible from actual depths for subsurface conditions.

3) Depth to groundwater varies from 5 to 7 ft bgs and is based on data available from past groundwater sampling events; deviations are possible due to seasonal variations.

Table C.2 (A)
Summary of Drilling Activities - Temperature Monitoring Points
CFC Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	Interior/ Exterior	Completion Date	Top Depth (feet)	Bottom Depth (feet)	General Lithologic Description	PID Readings (ppmv)
TMP-CC-02	***Interior***	8/8/2011	0	0.7	Concrete	NM
			0.7	6.5	Fill	2.2, 5.7
			6.5	11.9	Silt and Clay	1.1, 1.5
			11.9	20.1	Glacial Till	1.3, 1.7, 1.3
			20.1	25	Severe Weathered Shale	1.7
TMP-CE-07	***Exterior***	8/9/2011	0	0.4	Asphalt	NM
			0.4	5	Fill	NM
			5	9.2	Silt and Clay	1, 1.2
			9.2	16.8	Glacial Till	1.1, 2.6
			16.8	22	Severe Weathered Shale	3.6, 1.4
TMP-CE-04	***Exterior***	8/9/2011	0	0.4	Asphalt	NM
			0.4	6.5	Fill	NM
			6.5	10.2	Silt and Clay	1.9, 0.7
			10.2	18.2	Glacial Till	0.8, 1.6
			18.2	23	Severe Weathered Shale	3.3, 4.3
TMP-CG-07	***Exterior***	8/9/2011	0	4	Fill	0.2, 0.2
			4	8.8	Silt and Clay	0.7, 0.4
			8.8	16.7	Glacial Till	0.3, 0.5, 1.8
			16.7	18.4	Moderate Weathered Shale	3
			18.4	20	Severe Weathered Shale	1.7
			20	22	Moderate Weathered Shale	0.9

Notes:

1) NM: Indicates PID reading not measured for the indicated depth interval.
ND: Indicates non-detect PID reading for the indicated depth interval.

2) Lithology descriptions are based on sample cores observed during drilling program; deviations are possible from actual depths for subsurface conditions.

3) Depth to groundwater varies from 5 to 7 ft bgs and is based on data available from past groundwater sampling events; deviations are possible due to seasonal variations.

Table C.2 (B)
Summary of Drilling Activities - Temperature Monitoring Points and Chimney Wells
B57A Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	Interior/ Exterior	Completion Date	Top Depth (feet)	Bottom Depth (feet)	General Lithologic Description	PID Readings (ppmv)
CW-BB-03	Interior	8/8/2011	0	0.8	Concrete	3.7
			0.8	7.6	Fill	5.8, 87
			7.6	10.3	Silt and Clay	270, 68
			10.3	21.3	Glacial Till	47, 11, 39
			21.3	27.4	Severely Weathered Shale	33, 1.8, 2.1
			27.4	30	Moderate Weathered Shale	0.9
CW-BC-02	Interior	8/8/2011	0	0.7	Concrete	NM
			0.7	10.5	Fill	4.3, 221
			10.5	15.4	Clay and Silt	19, 75
			15.4	21.5	Glacial Till	56, 39, 1.5
			21.5	33.7	Severely Weathered Shale	1.5, 1.4
			33.7	35	Moderate Weathered Shale	1
CW-BC-05	Interior	8/3/2011	0	1	Concrete	NM
			1	7.3	Fill	0.3, 2.8, 2.3
			7.3	8	Concrete	NM
			8	10	Fill	NM
			10	11.3	Silt and Clay	51
			11.3	20	Glacial Till	0.6, 0.4, 0.8, 0.4
			20	28	Severely Weathered Shale	1.2, 1.5
CW-BD-03	Interior	8/4/2011	0	0.8	Concrete	NM
			0.8	8.6	Fill	0.4, 14, 1.3
			8.6	12.1	Stream Deposits	0.7, 1.3
			12.1	17.4	Clay and Silt	0.6, 4.2
			17.4	19.1	Silt and Clay	0.6
			19.1	20	Glacial Till	3.0
			20	23.6	Clay and Silt	3.9
			23.6	30	Glacial Till	12, 0.8
			30	36.4	Severely Weathered Shale	0.5, 0.5
			36.4	38	Moderate Weathered Shale	0.7
CW-BD-04	Interior	8/7/2011	0	0.5	Concrete	NM
			0.5	11.4	Fill	1.1, 19, 23
			11.4	15.3	Silt and Clay	11, 7.1
			15.3	22.4	Glacial Till	14, 23, 10, 32
			22.4	25	Slight Weathered Shale	2
CW-BD-07	Interior	8/2/2011	0	0.5	Concrete	NM
			0.5	10	Fill	0.8, 15, 1.2, 0.2
			10	15	Silt and Clay	0.2, 0.2
			15	15.7	Glacial Till	0.1
			15.7	20	Moderate Weathered Shale	0.4
CW-BE-05	Interior	8/3/2011	0	0.8	Concrete	NM
			0.8	6.7	Fill	0.5, 11, 6.9
			6.7	7.2	Concrete	NM
			7.2	10	Fill	NM
			10	15	Clay	0.1
			15	19.1	Glacial Till	0.5, 23
			19.1	20.9	Severely Weathered Shale	66, 31
			20.9	22.5	Slight Weathered Shale	2
CW-BE-06	Interior	8/3/2011	0	0.8	Concrete	NM
			0.8	6.5	Fill(Steel at 4.5 Ft)	0.1, 0.3
			6.5	7.5	Concrete	NM
			7.5	10	Fill	NM
			10	15	Silt and Clay	21
			15	18.1	Glacial Till	0.2
			18.1	20	Severely Weathered Shale	0.2
CW-BF-04	Interior	10/30/2011	0	1	Concrete	NM
			1	10	Fill	1.7
			10	20	Silt and Clay	1.5
			20	21.5	Glacial Till	1.7
			21.5	22	Severely Weathered Shale	2.8
CW-BF-07	Interior	8/3/2011	0	0.5	Concrete	NM
			0.5	10	Fill	0.3, 3, 1.3, 0.3
			10	15	Clay and Silt	0.1
			15	15.8	Silt and Clay	0.2
			15.8	21.7	Glacial Till	0.5, 0.6
			21.7	23	Severely Weathered Shale	0.2
CW-BG-06	Interior	10/29/2011	0	0.5	Concrete	NM
			0.5	8.8	Fill	1.8
			8.8	16.1	Silt and Clay	4
			16.1	20	Glacial Till	45
			20	21	No Recovery	NM
			21	22	Severely Weathered Shale	66
TMP-BB-04	Interior	8/5/2011	0	0.8	Concrete	NM
			0.8	6.4	Fill	0.7, 22, 0.7
			6.4	13.6	Silt and Clay	0.6, 0.8, 0.5, 0.9, 0.7
			13.6	20	Glacial Till	0.6, 0.9
			20	27	Very Severely Weathered Shale	0.4, 0.3
			27	30	Moderate Weathered Shale	0.1
TMP-BD-03	Interior	8/4/2011	0	1.2	Concrete	NM
			1.2	6.6	Fill	0.5, 16, 3.2
			6.6	11	Stream Deposits	14, 0.7, 9.1
			11	15	Silt and Clay	68, 1.7
			15	22.7	Glacial Till	64, 2, 11, 8.8, 26
			22.7	41	Very Severely Weathered Shale	13, 1.5, 0.5, 1.9, 0.6

Table C.2 (B)
Summary of Drilling Activities - Temperature Monitoring Points and Chimney Wells
B57A Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	Interior/ Exterior	Completion Date	Top Depth (feet)	Bottom Depth (feet)	General Lithologic Description	PID Readings (ppmv)
TMP-BD-05	Interior	8/7/2011	0	0.7	Concrete	NM
			0.7	10	Fill	1.2, 22, 91, 162
			10	16.1	Silt and Clay	8.5, 76
			16.1	23.8	Glacial Till	2.8, 48
			23.8	38.5	Severely Weathered Shale	23, 0.9, 1.1, 0.6
			38.5	39	Moderate Weathered Shale	0.7
TMP-BD-06	Interior	8/5/2011	0	1.1	Concrete	NM
			1.1	10	Fill	0.5, 3.0, 2.4, 1.4
			10	11.9	Clay and Silt	0.5
			11.9	15	Silt and Clay	0.5
			15	21	Glacial Till	0.6, 0.3
			21	22.4	Moderate Weathered Shale	0.4
			22.4	33.9	Severely Weathered Shale	0.3, 0.3, 0.4, 0.3
			33.9	35	Slight Weathered Shale	0.6
TMP-BE-02	Interior	10/31/2011	0	0.6	Concrete	NM
			0.6	10	Fill	4.2
			10	17.7	Silt and Clay	1.4
			17.7	20	Glacial Till	1.7
			20	22.5	Severely Weathered Shale	1.2, 0.5
TMP-BF-05	Interior	10/30/2011	0	0.5	Concrete	NM
			0.5	9.5	Fill	0.7
			9.5	18.1	Silt and Clay	ND
			18.1	21	Glacial Till	18
			21	23	Severely Weathered Shale	69
TMP-BF-06	Interior	8/6/2011	0	0.7	Concrete	NM
			0.7	7.3	Fill	5.9, 9.2, 3.7
			7.3	8.2	Concrete	NM
			8.2	10	Fill	NM
			10	20	Clay and Silt	1.8, 3.3
			20	25	Glacial Till	17, 52, 51
			25	43.1	Severely Weathered Shale	63, 30, 0.9
			43.1	44	Slight Weathered Shale	1.1
TMP-BF-08	Interior	8/6/2011	0	0.7	Concrete	NM
			0.7	4.6	Fill	1.9, 10
			4.6	5	Concrete	NM
			5	7.5	Fill	5.7
			7.5	10	Clay and Silt	3.1
			10	15.7	Clay	1.9, 2.4
			15.7	23.8	Glacial Till	4.5, 3.3
			23.8	28.4	Severely Weathered Shale	2.1, 1.2
			28.4	30	Moderate Weathered Shale	1.3

Notes:
1) NM: Indicates PID reading not measured for the indicated depth interval.
ND: Indicates non-detect PID reading for the indicated depth interval.

2) Lithology descriptions are based on sample cores observed during drilling program; deviations are possible from actual depths for subsurface conditions.

3) Depth to groundwater varies from 7 to 9 ft bgs and is based on data available from past groundwater sampling events; deviations are possible due to seasonal variations.

Table C.2 (C)
Summary of Drilling Activities - Temperature Monitoring Points and Chimney Wells
TCA Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	*Interior/ Exterior*	*Completion Date*	*Top Depth (feet)*	*Bottom Depth (feet)*	*General Lithologic Description*	*PID Readings (ppmv)*
CW-TB-02	***Exterior***	8/15/2011	0	0.4	Asphalt	NM
			0.4	7.5	Fill	3.3, 1.7, 3
			7.5	11.5	Clay and Silt	0.4, 0.3
			11.5	14.4	Silt and Clay	0.4
			14.4	15	Sand and Gravel	0.3
			15	15.5	Stream Deposits	0.4
			15.5	17	Glacial Till	0.5
			17	18.9	Shale	1.1
			18.9	20	Clayey Silt	1.1
			20	22.5	Sand	1.3
			22.5	23.5	Weathered Shale	1.1
			23.5	25	Fresh Shale	1.5
CW-TB-04	***Exterior***	8/15/2011	0	0.5	Asphalt	NM
			0.5	9.1	Fill	0.3, 0.8, 0.9, 0.3, 0.3, 0.4
			9.1	10.5	Clayey Silt	0.4, 0.3
			10.5	15	Silt and Clay	0.2
			15	16	Stream Deposits	0.2
			16	20	Glacial Till	0.4, 0.3
			20	24.3	Stream Deposits	0.4, 0.7
			24.3	24.6	Slightly Weathered Shale	4.5
			24.6	28.5	Glacial Till	3.3, 9.1
			28.5	30	Slightly Weathered Shale	7.6
CW-TB-06	***Exterior***	8/15/2011	0	0.5	Asphalt	NM
			0.5	10	Fill	4.6, 1.3, 0.8, 0.5, 0.4, 0.5
			10	16	Clay and Silt	0.5, 0.9, 0.5
			16	20	Stream Deposits	0.4, 0.5
			20	25	Glacial Till	0.3, 0.6
			25	28	Completely Weathered Shale	0.8
			28	30	Severe Weathered Shale	1.3
TMP-TB-02	***Exterior***	8/9/2011	0	0.3	Asphalt	NM
			0.3	9.5	Fill	0.6, 0.4, 0.6, 5
			9.5	14.3	Silt and Clay	1.3, 0.9
			14.3	20	Glacial Till	0.6, 2.2
			20	22.9	Severe Weathered Shale	1
			22.9	25	Moderate Weathered Shale	0.8
TMP-TB-05	***Exterior***	8/10/2011	0	0.4	Asphalt	NM
			0.4	7.5	Fill	0.7, 0.4, 0.3, 0.3
			7.5	15	Silt and Clay	0.2, 0.3
			15	20.8	Glacial Till	0.4, 0.7
			20.8	25	Severe Weathered Shale	0.3
TMP-TC-04	***Exterior***	8/9/2011	0	0.4	Asphalt	0.2, 0.2
			0.4	7.8	Fill	0.7, 0.4
			7.8	8.5	Organic Peat	2.3
			8.5	15	Silt and Clay	1.2
			15	19	Glacial Till	1.9
			19	19.8	Severe Weathered Shale	0.9
			19.8	20	Hard Fresh Gray Shale	0.6
			20	25	Severe Weathered Shale	1.3

Notes:
1) NM: Indicates PID reading not measured for the indicated depth interval.
ND: Indicated non-detect PID reading for the indicated depth interval.

2) Lithology descriptions are based on sample cores observed during drilling program; deviations are possible from actual depths for subsurface conditions.

3) Depth to groundwater varies from 5 to 8 ft bgs and is based on data available from past groundwater sampling events; deviations are possible due to seasonal variations.

Table C.2 (D)
Summary of Drilling Activities - Temperature Monitoring Points and Chimney Wells
Waste Solvent Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	*Interior/ Exterior*	*Completion Date*	*Top Depth (feet)*	*Bottom Depth (feet)*	*General Lithologic Description*	*PID Readings (ppmv)*
CW-WB-04	***Exterior***	8/16/2011	0	0.5	Asphalt	NM
			0.5	10	Fill	3, 21, 48, 1.4, 1
			10	11.5	Clay and Silt	1.1
			11.5	15	Silt and Clay	0.6
			15	15.9	Silt	0.9
			15.9	19	Clay and Silt	0.7
			19	20	Silt and Clay	0.7
			20	25.5	Glacial Till	0.7, 0.5, 0.5
			25.5	30	Shale	0.4, 0.4
CW-WC-04	***Exterior***	8/16/2011	0	0.5	Asphalt	NM
			0.5	9.2	Fill	11, 28, 14, 4
			9.2	10	Concrete	NM
			10	19.1	Silt and Clay	2.2, 84, 110, 58
			19.1	25	Sand and Gravel	22, 10, 3, 2.5
			25	27	Fresh Shale	NM
			27	29	Completely Weathered Shale	1.4
			29	30	Fresh Shale	NM
CW-WD-02	***Interior***	10/31/2011	0	0.5	Concrete	NM
			0.5	9	Fill	0.5, 2.4
			9	10	Concrete	NM
			10	11.2	Fill	2.3
			11.2	20	Silt and Clay	10
			20	25	Glacial Till	5.8
			25	27	Severely Weathered Shale	5.3
CW-WE-04	***Exterior***	8/16/2011	0	0.5	Asphalt	NM
			0.5	7	Fill	8.5, 92, 6.5, 13
			7	7.5	Concrete	NM
			7.5	11	Silt and Clay	421, 435
			11	14.6	Clay and Silt	1241, 488
			14.6	22	Stream Deposits	249, 250, 94
			22	23	Glacial Till	22
			23	24	Very Slightly Weathered Shale	4.7
			24	25	Glacial Till	3.0
CW-WF-01	***Exterior***	8/15/2011	0	0.4	Asphalt	NM
			0.4	8.5	Fill	0.7, 0.4, 0.6, 0.5
			8.5	11.9	Clay and Silt	0.3, 0.3
			11.9	17	Silt and Clay	0.3, 0.4, 0.3
			17	21	Sand	3.7, 0.9
			21	23.5	Slight Weathered Shale	7.1
			23.5	25	Very Severely Weathered Shale	0.5
CW-WF-03	***Exterior***	8/15/2011	0	0.5	Asphalt	NM
			0.5	9	Fill	0.1, 2.2, 8.8, 13, 47
			9	9.4	Organic Peat	53
			9.4	17.8	Silt and Clay	43, 77, 96, 111, 134
			17.8	20	Sand and Gravel	2.5
			20	21.5	Silt and Clay	36
			21.5	22.5	Sand and Gravel	7.9
			22.5	25	Glacial Till	1.2
			25	30	Very Slightly Weathered Shale	1.7
TMP-WC-04	***Exterior***	8/16/2011	0	0.4	Asphalt	NM
			0.4	9	Fill	16, 14, 16, 4.5
			9	10.9	Clay and Silt	0.7, 0.7
			10.9	19.1	Silt and Clay	0.7, 1.4, 5.3, 4.1
			19.1	20	Sand and Gravel	0.5
			20	22	Sand	0.7
			22	23.5	Fresh Shale	NM
			23.5	23.7	Very Severely Weathered Shale	0.3
TMP-WD-02	***Interior***	8/6/2011	0	0.6	Concrete	NM
			0.6	8.8	Fill	2, 11
			8.8	17.9	Silt and Clay	2.9, 1.8, 32, 116
			17.9	25	Glacial Till	82, 1.7, 2.6
			25	41.9	Severe Weathered Shale	1.8, 1.2, 1.4, 1.7, 1.5, 1.1
			41.9	43	Slight Weathered Shale	1.8
TMP-WD-05	***Exterior***	8/18/2011	0	1.5	Topsoil	0.8
			1.5	3.5	Fill	1.0
			3.5	5	Concrete	NM
			5	7	Concrete (Not Confirmed)	NM
			7	12.5	No Recovery	NM
			12.5	15.5	Concrete (Not Confirmed)	NM
			15.5	20	Silt and Clay	59
			20	21	Clay and Silt	274
			21	27.4	Sand and Gravel	12, 3.3
			27.4	29	Glacial Till	3.5, 5.1
			29	30	Shale	0.5
TMP-WE-06	***Exterior***	11/10/2011	0	5	No Recovery	NM
			5	10	Fill	4.1
			10	15	No Recovery	NM
			15	19	Glacial Till	232
			19	22.7	Sand and Gravel	13, 32
			22.7	25	Glacial Till	113
			25	30	Very Severely Weathered Shale	10

Table C.2 (D)
Summary of Drilling Activities - Temperature Monitoring Points and Chimney Wells
Waste Solvent Area
Operable Unit # 5/ Building 57 Area
Union and Endicott, NY

Boring Name	*Interior/ Exterior*	*Completion Date*	*Top Depth (feet)*	*Bottom Depth (feet)*	*General Lithologic Description*	*PID Readings (ppmv)*
TMP-WF-02	***Exterior***	8/10/2011	0	0.5	Asphalt	NM
			0.5	8.2	Fill	0.7, 0.8, 0.9, 1.0
			8.2	18.9	Silt and Clay	0.6, 0.5, 0.4
			18.9	21.7	Glacial Till	0.3, 3.4
			21.7	25	Severe Weathered Shale	1.6
TMP-WF-04	***Exterior***	(8-17-2011)	0	0.6	Asphalt	NM
			0.6	11	Fill	13, 15, 11, 3.4, 9.2, 24
			11	12.7	Clayey Silt	181
			12.7	14.4	Clay and Silt	460
			14.4	17.7	Silt and Clay	609, 905, 359
			17.7	18.7	Clay and Silt	312
			18.7	22.6	Sand and Gravel	21, 191
			22.6	39.5	Glacial Till	11, 2.1, 2.8, 4.8, 1.3
			39.5	42	Shale	0.3, 0.2
TMP-WG-03	***Exterior***	8/18/2011	0	0.4	Asphalt	NM
			0.6	10	Fill	0.7, 1.3, 1.0, 4.0, 19, 69
			10	10.9	Clay and Silt	35
			10.9	16.3	Silt and Clay	40, 34
			16.3	18.4	Clayey Silt	49
			18.4	22.4	Sand and Gravel	8.1, 1.1
			22.4	41.5	Till/Completely Weathered Shale	3.9, 2.7, 3.7, 1.3, 1.7, 0.9, 0.4
			41.5	42.7	Shale	NM
TMP-WW-01	***Exterior***	11/11/2011	0	9	Fill	0.6, 5.4, 3.6
			9	15	Silt and Clay	999, 68
			15	23	No Recovery	NM
			23	24.5	Sand and Gravel	4.6
			24.5	25	Glacial Till	4.7
			25	27.5	No Recovery	NM
			27.5	30.6	Severely Weathered Shale	6.1
TMP-WW-02	***Exterior***	11/10/2011	0	5	Fill	1.2
			5	14.3	Silt and Clay	8.9
			14.3	23.7	Glacial Till	0.8, 32, NM, NM
			23.7	30.4	Severely Weathered Shale	40

Notes:

1) NM: Indicates PID reading not measured for the indicated depth interval.

2) Lithology descriptions are based on sample cores observed during drilling program; deviations are possible from actual depths for subsurface conditions.

3) Depth to groundwater varies from 5 to 8 ft bgs and is based on data available from past groundwater sampling events; deviations are possible due to seasonal variations.

Table C.3 (A)
Summary of Sheet Pile Electrode Installation - Building 57A Area
Operable Unit # 5/Building 57 Area
Union and Endicott, New York

Pile ID #	Pile Length	Top Depth (Below Floor Surface [installed])	Sheet top depth upon completion (post cutoff)	Bottom Depth (Below Floor Surface [installed])	Driven Date	Plumbness / Alignment / Obstruction Notes
BB-03	17'-6"	1"		17'-7"	10/17/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BB-04	17'-6"	3'		20'-6"	10/17/2011	Sheet pile plumbness was maintained with a 3' level.
BC-02	17'-6"	2"		17'-8"	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BC-03	17'-6"	(1')		16'-6"	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BC-04	17'-6"	1"	2'-6"	17'-7"	10/17/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BC-05	17'-6"	1"	2'-6"	17'-7"	10/18/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BC-06	17'-6"	1"	2'-6"	17'-7"	10/18/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BD-02	17'-6"	2'-6"		20'	10/21/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BD-03	17'-6"	1'-6"		19'	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BD-04	17'-6"	1'		18'-6"	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BD-05	17'-6"	1"	2'-6"	17'-7"	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BD-06	17'-6"	(2")	2'-6"	17'-4"	10/18/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BD-07	17'-6"	(1'-6")	2'-6"	16'	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BD-08	17'-6"	(1'-6")	2'-6"	16'	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BE-02	17'-6"	2'-6"		20'	10/21/2011 & 10/24/2011	Attempted to drive sheet pile @ 11:17 A.M. on 10/21/11. Refusal encountered at 8' depth. Sheet pile was removed to avoid toppling. Re-attempted @ 10:55 A.M. on 10/24/11. Sheeting was driven without any observed obstructions.
BE-03	17'-6"	2'-6"		20'	10/21/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BE-04	17'-6"	1'		18'-6"	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BE-05	17'-6"	1'-6"		19'	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BE-06	17'-6"	2"		17'-8"	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BE-07	17'-6"	0	2'-6"	17'-6"	10/20/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BE-08	17'-6"	(6")	2'-6"	17'	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BE-09	17'-6"	(1'-6")	2'-6"	16'	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BF-03	17'-6"	1'-3"		18'-9"	10/21/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.25 in/min.Hit hard till @ ~18'-9" and could not drive through.
BF-04	17'-6"	7"		18'-1"	10/21/2011	Concrete obstruction would allow sheet pile insertion at one side of excavation only. Pile was driven as deep as machine head would allow.
BF-05	17'-6"	1'-6"		19'	10/21/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.25 in/min.Hit hard till @ ~19' and could not drive through.
BF-06					10/20/2011	Attempted to drive sheet pile @ 8:00 A.M. Refusal encountered at 8' depth. Sheet pile was removed to avoid toppling.
BF-07	17'-6"	(2")		17'-4"	10/20/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.25 in/min.Hit hard till @ ~17'-4" and could not drive through.
BF-08	17'-6"	10"		18'-4"	10/20/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.25 in/min.Hit hard till @ ~18' and could not drive through.
BF-09	17'-6"	11"		18'-5"	10/20/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.25 in/min.Hit hard till @ ~18'-5" and could not drive through.
BF-10	17'-6"	6"	2'-6"	18'	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BG-04	17'-6"	2'-6"		20'	10/21/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BG-05	17'-6"	2'-6"		20'	10/24/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BG-06	17'-6"	2'-6"		20'	10/21/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.
BG-07	17'-6"				10/21/2011	Attempted to drive sheet pile @ 9:27 A.M. Refusal encountered at 8' depth. Sheet pile was removed to avoid toppling.
BG-08	17'-6"	2'-6"		20'	10/18/2011	Sheet pile plumbness was maintained with a 3' level.
BG-09	17'-6"	1'-5"		18'-11"	10/20/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.25 in/min.Hit hard till @ ~18' and could not drive through.
BG-10	17'-6"	1'-8"		19'-2"	10/20/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.25 in/min.Hit hard till @ ~19'-2" and could not drive through.
BH-06	17'-6"	1'-8"		19'-2"	10/21/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.25 in/min.Hit hard till @ ~19'-2" and could not drive through.
BH-07	17'-6"	2'-6"		20'	10/21/2011	Monitoring well was removed from sheet pile pair location.
BH-08	17'-6"	2'-6"		20'	10/19/2011	Sheet pile plumbness was maintained with a 3' level.
BH-09	17'-6"	1'-8"		19'-2"	10/19/2011	Sheet pile plumbness was maintained with a 3' level. Sheet Pile was driven until hard till slowed driving velocity to approximately 0.5 in/min.

Notes:

1) Sheet pile electrode data provided by O' Brien & Gere of Syracuse, NY. All sheet piles installed as single sheet piles.

2) Sheet pile electrodes BG-07 and BF-06 replaced as vertical bored electrodes as sheet piles encountered early refusal due to secondary concrete layer.

Table C.3 (B)
Summary of Sheet Pile Electrode Installation - TCA Area
Operable Unit # 5/Building 57 Area
Union and Endicott, New York

Location	Existing Grade El.	Top of Pile Installation Below Exist. Grade	Bottom of Pile Installation Below Exist. Grade	Final Length of Pile	Installation Date
TB-02		-3'-0"	-24'-0"	21'-0"	11/10/2011
TB-03		-3'-0"	-26'-0"	23'-0"	11/10/2011
TB-04		-3'-0"	-20'-0"	17'-0"	11/10/2011
TB-05		-3'-0"	-26'-0"	23'-0"	11/10/2011
TB-06		-3'-0"	-21'-0"	18'-0"	11/10/2011
TC-02		-3'-0"	-26'-0"	23'-0"	11/10/2011
TC-03		-3'-0"	-26'-0"	23'-0"	11/10/2011
TC-04		-3'-0"	-26'-0"	23'-0"	11/10/2011
TC-05		-3'-0"	-26'-0"	23'-0"	11/10/2011
TC-06		-2'-10"	-25'-10"	23'-0"	11/10/2011
TC-07		-2'-11"	-25'-11"	23'-0"	11/9/2011

Notes:
1) Sheet pile data provided by O' Brien & Gere of Syracuse, NY. All sheet piles installed in pairs.

Table C.3 (C)
Summary of Sheet Pile Electrode Installation - Waste Solvent Area
Operable Unit # 5/Building 57 Area
Union and Endicott, New York

Location	Existing Grade El.	Top of Pile Installation Below Exist. Grade	Bottom of Pile Installation Below Exist. Grade	Final Length of Pile	Installation Date
WB-04		-3'-0"	-26'-0"	23'	11/8/2011
WB-05		-3'-0"	-26'-0"	23'	11/8/2011
WC-02		-2'-6"	25'-0"	22'-6"	
WC-04		-3'-0"	-26'-0"	23'	11/8/2011
WC-05		-3'-0"	-26'-0"	23'	11/8/2011
WD-02		-2'-6"	25'-0"	22'-6"	
WD-03		-2'-6"	25'-0"	22'-6"	
WD-04		-3'-0"	-26'-0"	23'	11/8/2011
WD-05		-3'-0"	-26'-0"	23'	11/8/2011
WD-06		-3'-0"	-26'-0"	23'	11/7/2011
WE-02		-2'-6"	25'-0"	22'-6"	
WE-04		-3'-0"	-26'-0"	23'	11/8/2011
WE-05		-3'-0"	-26'-0"	23'	11/8/2011
WE-06		-3'-0"	-26'-0"	23'	11/7/2011
WF-01		-3'-0"	-26'-0"	23'	11/9/2011
WF-02		-3'-0"	-26'-0"	23'	11/9/2011
WF-03		-3'-0"	-26'-0"	23'	11/8/2011
WF-04		-3'-0"	-26'-0"	23'	11/8/2011
WF-05		-3'-0"	-26'-0"	23'	11/8/2011
WF-06		-3'-0"	-26'-0"	23'	11/7/2011
WG-01		-2'-11"	-30'-11"	28'	11/9/2011
WG-02		-3'-0"	-31'-0"	28'	11/8/2011
WG-03		-3'-0"	-31'-0"	28'	11/8/2011
WG-04		-3'-0"	-31'-0"	28'	11/8/2011
WG-05		-3'-0"	-31'-0"	28'	11/7/2011
WG-06		-3'-0"	-31'-0"	28'	11/7/2011

Notes:
1) Sheet pile data provided by O' Brien & Gere of Syracuse, NY. All sheet piles installed in pairs.

Table C.3 (D)
Summary of Sheet Pile Wall Installation - Waste Solvent Area
Operable Unit # 5/Building 57 Area
Union and Endicott, New York

Pile ID #	Pile Length	Top El. (installed)	Bottom El. (installed)	Installation Began	Installation Completed	Plumbness / Alignment / Obstruction Notes
1 - N of 3' Gap	15'-3"	839'	823'-9"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joint of neighboring sheet pile.
2 - N of 3' Gap	15'-3"	839'-1"	823'-10"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
3 - N of 3' Gap	14'	839'-1"	825'-1"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
4 - N of 3' Gap	14'	839'-2"	825'-2"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
5 - N of 3' Gap	15'	839'-2"	824'-2"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
6 - N of 3' Gap	15'	839'-3"	824'-3"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
7 - N of 3' Gap	15'-1"	839'-3"	824'-2"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
8 - N of 3' Gap	15'-1"	839'-4"	824'-3"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
9 - N of 3' Gap	14'	839'-4"	825'-4"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
10 - N of 3' Gap	14'	839'-5"	825'-5"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
11 - N of 3' Gap	15'	839'-5"	824'-5"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
12 - N of 3' Gap	15'	839'-6"	824'-6"	10/5/2011	10/5/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
13 - N of 3' Gap	10'	839'-6"	829'-6"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
14 - N of 3' Gap	10'	839'-6"	829'-6"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
15 - N of 3' Gap	10'	839'-6"	829'-6"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
16 - N of 3' Gap	10'-1"	839'-6"	829'-5"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
17 - N of 3' Gap	10'-1"	839'-6"	829'-5"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
18 - N of 3' Gap	10'	839'-6"	829'-6"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
19 - N of 3' Gap	10'	839'-7"	829'-7"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
20 - N of 3' Gap	10'	839'-7"	829'-7"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
21 - N of 3' Gap	10'	839'-9"	829'-9"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
22 - N of 3' Gap	10'	839'-9"	829'-9"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
23 - N of 3' Gap	10'	839'-10"	829'-10"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
24 - N of 3' Gap	10'	839'-10"	829'-10"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
25 - N of 3' Gap	10'	839'-11"	829'-11"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
26 - N of 3' Gap	10'	839'-11"	829'-11"	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
27 - N of 3' Gap	10'	840'	830'	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
28 - N of 3' Gap	10'	840'	830'	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joints of neighboring sheet piles.
29 - N of 3' Gap	10'	840'	830'	10/6/2011	10/6/2011	Leveled on vertical planes prior to driving (3' Level). Caulking was applied between joint of neighboring sheet pile.

Table C.3 (D)
Summary of Sheet Pile Wall Installation - Waste Solvent Area
Operable Unit # 5/Building 57 Area
Union and Endicott, New York

Pile ID #	Pile Length	Top El. (installed)	Bottom El. (installed)	Installation Began	Installation Completed	Plumbness / Alignment / Obstruction Notes
30 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joint between neighboring sheet pile. Sheet pile was welded to neighboring pile (top 4"-6" of joint).
31 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
32 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
33 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
34 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
35 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
36 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
37 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
38 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
39 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
40 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
41 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
42 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
43 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
44 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
45 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
46 - S of 3' Gap	21'	839'	818'	10/7/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
47 - S of 3' Gap	21'	839'	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
48 - S of 3' Gap	21'	839'	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
49 - S of 3' Gap	21'	839'	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
50 - S of 3' Gap	21'	839'	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
51 - S of 3' Gap	20'-10"	838'-10"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).

Table C.3 (D)
Summary of Sheet Pile Wall Installation - Waste Solvent Area
Operable Unit # 5/Building 57 Area
Union and Endicott, New York

Pile ID #	Pile Length	Top El. (installed)	Bottom El. (installed)	Installation Began	Installation Completed	Plumbness / Alignment / Obstruction Notes
52 - S of 3' Gap	20'-8"	838'-8"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
53 - S of 3' Gap	20'-5"	838'-5"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
54 - S of 3' Gap	20'-3"	838'-3"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
55 - S of 3' Gap	20'-1"	838'-1"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
56 - S of 3' Gap	19'-11"	837'-11"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
57 - S of 3' Gap	19'-8"	837'-8"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
58 - S of 3' Gap	19'-6"	837'-6"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
59 - S of 3' Gap	19'-3"	837'-3"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
60 - S of 3' Gap	19'-1"	837'-1"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
61 - S of 3' Gap	19'-4"	836'-11"	817'-7"	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
62 - S of 3' Gap	18'-9"	836'-9"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
63 - S of 3' Gap	18'-7"	836'-7"	818'	10/10/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
64 - S of 3' Gap	18'-5"	836'-5"	818'	10/11/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
65 - S of 3' Gap	18'-2"	836'-2"	818'	10/11/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joints between neighboring sheet piles. Sheet pile was welded to neighboring piles (top 4"-6" of joints).
66 - S of 3' Gap	18'	836'	818'	10/11/2011	10/12/2011	Leveled on vertical planes prior to driving and at 10' depth (3' Level). No caulking of joint between neighboring sheet pile. Sheet pile was welded to neighboring pile (top 4"-6" of joint).

Notes:
1) Sheet pile data provided by O' Brien & Gere of Syracuse, NY. All sheet piles installed as single sheet piles.

Table C.4 (A)
Supplemental Electrode Installation Summary (by TRS Group)
B57A Area
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Location	Top of Bored Electrode - feet below ground surface	Top of Bored Electrode - feet below ground surface	Final length of electrode	Installation Date
BD-03A	2	7	5	8/9/2012
BE-03A	2	7	5	8/9/2012
BE-04A	2	7	5	8/9/2012
BF-03A	2	7	5	8/9/2012
BD-02A	2	7	5	8/9/2012

Notes:
1) Bored electrodes were installed by TRS Group of Longview, WA on dates indicated.

Table C.4(B)
Supplemental Electrode Installation Summary (by TRS Group)
Waste Solvent Area
Operable Unit # 5/Building 57 Area
Union and Endicott,NY

Location	Top of Bored Electrode - feet below ground surface	Top of Bored Electrode - feet below ground surface	Final length of electrode in feet	Installation date of electrodes
628	2	7	5	8/9/2012
629	2	7	5	8/9/2012
630	2	7	5	8/9/2012
631	2	7	5	8/9/2012
632	2	7	5	8/9/2012
633	2	7	5	8/9/2012
634	2	32	30	8/17/2012
635	2	32	30	8/15/2012
637	2	32	30	8/16/2012

Notes:
1) Bored electrodes were installed by TRS Group of Longview, WA on dates indicated.

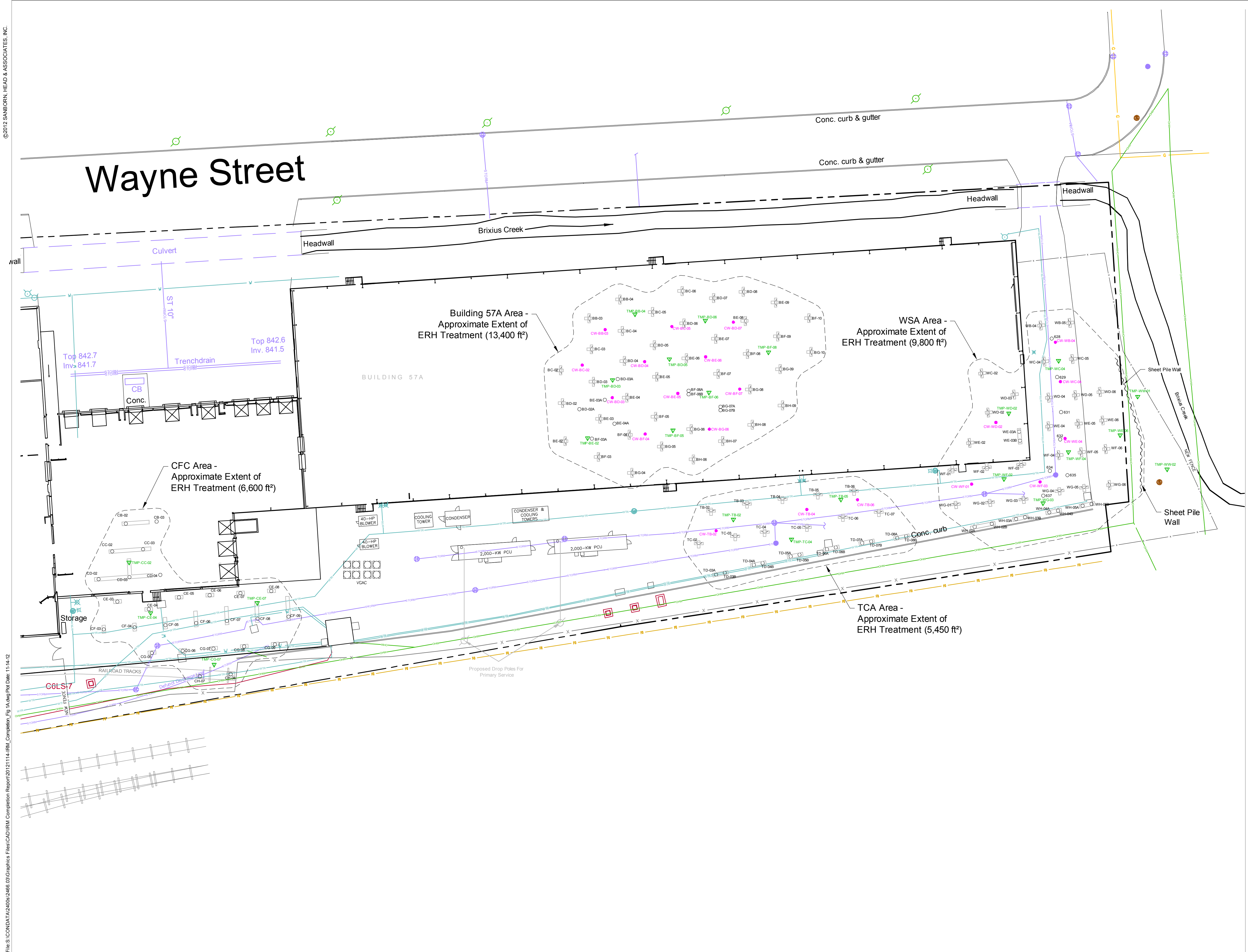


Figure C.1

ERH System Components and Treatment Location Plan

IRM Completion Report

OU#5 / Building 57 Area
Union and Endicott, New York

Drawn By: E. Wright
Designed By: A. Khandekar
Reviewed By: J. Ordway/L. Jacob
Project No: 2466.02
Date: November 2012

Figure Narrative

This figure depicts the locations completed for ERH implementation in the source zones of Building 57 (OU#5), Endicott, New York. Refer to Appendix C and IRM Completion Report for additional details.

Notes

1. ISTT drilling for temperature monitoring points, chimney wells was completed by Sanborn Head; vertical bored electrodes were installed by Sanborn Head & TRS Group.

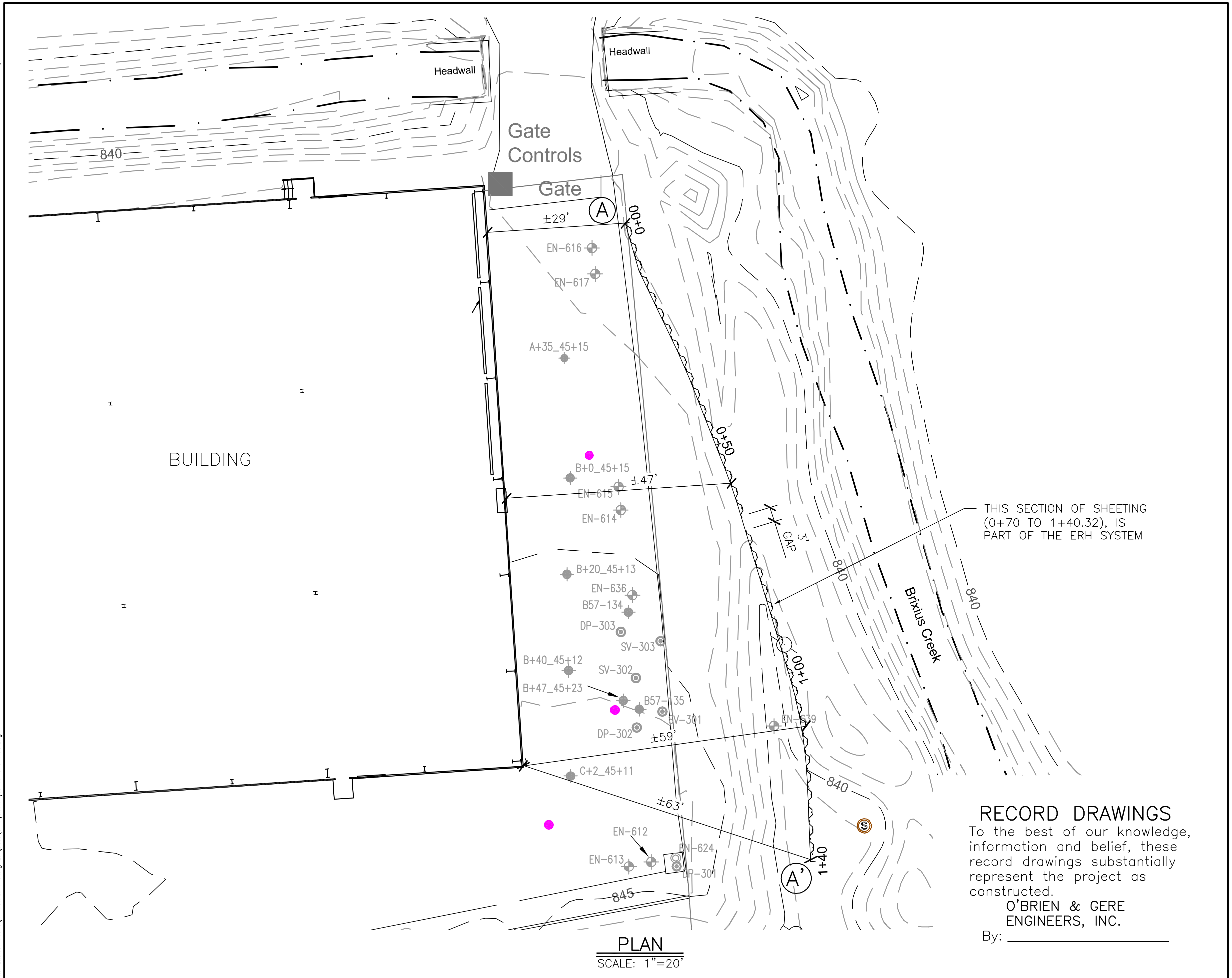
2. Sheet pile electrode installation was completed by O'Brien & Gere of Syracuse, New York.

Legend

- Temperature monitoring point
- Chimney well
- Vertical bored electrode
- Sheet pile
- Treatment zone limits
- Sheet pile/electrode wall

SANBORN HEAD

Figure C.2 (A)



LEGEND

- 840 — EXISTING GRADE CONTOURS
- EDGE OF WATER
- PROP. LINE
- EN-615 — MONITORING WELL
- B+0_45+15 — SOIL BORING
- CHIMNEY WELL
- DP-301 — DUAL PHASE WELL
- EN-624 — EXTRACTION WELL
- PROPOSED SHEETING

NOTE:

1. SHEETING SHALL BE AZ-12 OR APPROVED EQUAL.
2. ALL JOINTS SHALL BE SEALED USING ROXAN OR EQUAL.

IBM
ENDICOTT, NEW YORK

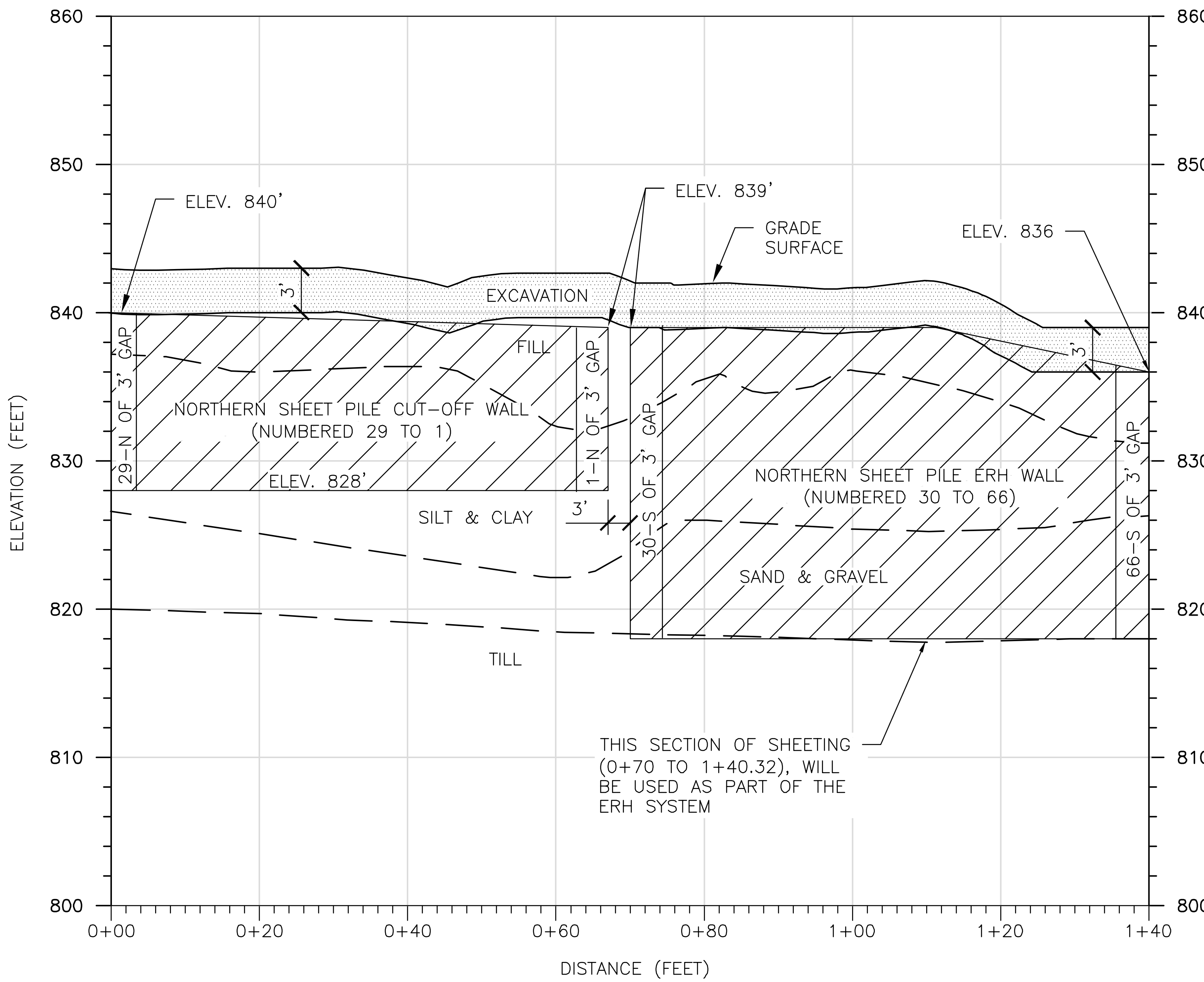
SITE PLAN

HORIZONTAL SCALE IN FEET
20 0 20
1"=20'

FILE NO. 10905.46133-005
NOVEMBER 2012

O'BRIEN & GERE

Figure C.2 (B)



LEGEND

PROPOSED EXTENTS OF EXCAVATION

PROPOSED SHEETING

NOTE:

1. SHEETING SHALL BE AZ-12 OR APPROVED EQUAL.
2. ALL JOINTS SHALL BE SEALED USING ROXAN OR EQUAL.

IBM
ENDICOTT, NEW YORK

CROSS SECTION
A-A'

HORIZONTAL SCALE IN FEET
20 0 20
1"=20'

VERTICAL SCALE IN FEET
10 0 10
1"=10'

RECORD DRAWINGS

To the best of our knowledge, information and belief, these record drawings substantially represent the project as constructed.

O'BRIEN & GERE
ENGINEERS, INC.

By: ____________

FILE NO. 10905.46133-006
NOVEMBER 2012

O'BRIEN & GERE

Nov 16, 2012 - 8:48am

i:\Ibm-Endicott.10905\46133.005-Parking-Lot\Docs\DWG\Sheets\46133-005-FIG1.dwg

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BB-03

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/08/11 **Date Finished: 08/08/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE	(0 to 0.8'): Concrete.	
					PID: 3.7 ppmv	-----0.8'-----	S-1A (0.8 to 3.7'): Light brown, fine to coarse SAND & GRAVEL, trace Silt. Sub-rounded to sub-angular. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5')
2								2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9')
								2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
4					PID: 5.8 ppmv	FILL	S-1B (3.7 to 5'): Dark brown, fine to coarse SAND, little Gravel, little Silt. Sub-angular to rounded. Moist. FILL.	
	S-2	5 - 10		5/5	PID: 87 ppmv		S-2A (5 to 7.6'): Dark brown to black, fine to medium SAND, trace Silt, trace Gravel, black staining from 7.2 to 7.6' bgs. Sub-rounded to sub-angular. FILL.	2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6								
8					PID: 270 ppmv	-----7.6'----- SILT & CLAY	S-2B (7.6 to 10'): Olive gray, CLAY & SILT. Wet.	
10	S-3	10 - 15		5/5	PID: 68 ppmv	-----10.3'-----	S-3A (10 to 10.3'): Grayish tan, CLAY & SILT, extensive red mottling.	
					PID: 47 ppmv		S-3B (10.3 to 15'): Olive gray, SILT & CLAY, little fine Sand, little Gravel, and Cobbles. Sub-rounded to angular. Moist.	
12								
14								
	S-4	15 - 20		5/5	PID: 11 ppmv	TILL	S-4 (15 to 20'): Olive tan & brown, SILT & CLAY, little fine Sand, little , Gravel and Cobbles. Sub-rounded to angular. Moist. TILL.	#3 Sand (1.5 to 30')
16								
18								
20	S-5	20 - 25		5/5	PID: 39 ppmv		S-5A (20 to 21.3'): Olive tan, Clayey SILT, some , Gravel and Cobbles, trace Sand. Sub-rounded to angular. Moist.	
					PID: 33 ppmv	-----21.3'----- SHALE	S-5B (21.3 to 25'): Soft, very severely weathered, gray, aphanitic SHALE.	
22								
24								

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

APPENDIX A
LIMITATIONS

1. The findings presented in this report were based solely upon the services described herein, and not on scientific tasks or procedures beyond the scope of described services.

2. Quantitative laboratory analyses were performed during IRM implementation and monitoring, as noted in the report. The analyses were performed for specific constituents of interest that were selected during the course of this study.

3. Quantitative laboratory testing was performed by others as part of the investigation as noted within the report. Where such analyses have been conducted by an outside laboratory, unless otherwise stated in the report, Sanborn Head has relied upon the data provided, and the opinion and findings of third party validation by qualified laboratory professional. The conclusions and recommendations contained in this report are based in part upon various types of chemical data. While Sanborn Head has reviewed the data and information as stated in this report, any of Sanborn Head's interpretations, conclusions, and recommendations that have relied on that information will be contingent on its validity. Should additional chemical data, historical information, or hydrogeologic information become available in the future, such information should be reviewed by Sanborn Head and the interpretations, conclusions and recommendations presented herein should be modified accordingly.

4. This report is prepared for, and is intended for the exclusive use of, the IBM Corporation for specific application to the Operable Unit #5/Building 57 Area in accordance with generally accepted professional practice. The contents of this report shall not be relied upon by any party other than IBM without the express written consent of IBM and Sanborn Head. No other warranty, express or implied, is made.

5. Sanborn Head is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or re-use of the subsurface data or engineering analyses without the express written authorization of Sanborn Head.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BB-03

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/08/11 Date Finished: 08/08/11
Logged By: AVK/EMB Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
	S-6	25 - 30		5/5	PID: 1.8 ppmv			S-6A (25 to 25.9'): Soft, very severely weathered, gray, aphanitic SHALE.		
26					PID: 2.1 ppmv			S-6B (25.9 to 27.4'): Soft, severely weathered, gray, aphanitic SHALE. Increasing number of hard, slightly weathered Shale fragments with depth.		
					PID: 0.9 ppmv		SHALE	S-6C (27.4 to 30'): Moderately hard, moderately weathered, gray, aphanitic SHALE.		
28										
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered.		
32								NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed at about 7.6 ft. bgs during drilling. 3. Weathered bedrock observed at about 21.3 ft. bgs, more competent bedrock encountered at about 27.4 ft. bgs.		
34										
36										
38										
40										
42										
44										
46										
48										
50										

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BC-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 Date Finished: 08/07/11
Logged By: AVK/EMB Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Description	Geologic Description	Well Description
0	S-1	0 - 7		7/2		-----0'----- CONCRETE	(0 to 0.7'): Concrete.	
					PID: NA	-----0.7'-----	S-1A (0.7 to 3'): Light brown, fine to coarse SAND & GRAVEL, trace Silt. Sub-angular to sub-round. Dry. FILL.	Concrete - to be completed by others. (0 to 1.5')
2						FILL		2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9')
						-----3'----- CONCRETE	(3 to 4'): Concrete. FILL.	2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
4						-----4'-----	(4 to 5'): No recovery.	
					PID: 4.3 ppmv		S-1B (5 to 7'): Dark brown, fine to coarse SAND, little Gravel, little Silt. Sub-angular to rounded. Moist. FILL.	2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6								
						FILL	(7 to 10'): No recovery.	
8								
10	S-2	10 - 15		5/5	PID: 221 ppmv PID: 19 ppmv	-----10.5'-----	S-2A (10 to 10.5'): Dark brown to black, fine to medium SAND, some Silt, trace Gravel, trace Cobbles. Sub rounded. Moist. Black sludge observed. FILL.	
							S-2B (10.5 to 15'): Olive gray, CLAY & SILT. Wet.	
12						SILT & CLAY		
14								
	S-3	15 - 20		5/5	PID: 75 ppmv	-----15.4'-----	S-3 (15 to 15.4'): Olive gray, CLAY & SILT. Moist.	
16							(15.4 to 20'): Not recorded.	
18								#3 Sand (1.5 to 35')
20	S-4	20 - 25		5/5	PID: 56 ppmv	-----20'-----	S-4A (20 to 21.5'): Olive gray, fine to coarse SAND and Clayey Silt, trace Gravel, trace Cobbles. Sub-angular. Moist.	
					PID: 39 ppmv		S-4B (21.5 to 25'): Gray, fine to coarse SAND & GRAVEL and Clayey Silt, trace Cobbles. Sub-rounded. Moist.	
22						TILL		
24								

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BC-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 **Date Finished: 08/07/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log	Stratum Description	Geologic Description	Well Diagram	Well Description
	S-5	25 - 30		5/5	PID: 1.5 ppmv		-----25'-----	S-5 (25 to 30'): Soft, very severely weathered, gray, aphanitic SHALE. Hard, slightly weathered Shale boulder from 28 to 29'. Moist.		
26										
28										
30	S-6	30 - 35		5/	PID: 1.4 ppmv		SHALE	S-6A (30 to 33.7'): Soft, severely weathered, gray, aphanitic SHALE.		
32										
34					PID: 1 ppmv			S-6B (33.7 to 35'): Medium hard, moderately weathered, gray, aphanitic SHALE. Frequent pieces of hard, slightly weathered Shale.		
							-----35'-----	Boring terminated at 35 feet. No refusal encountered.		
36										
38										
40										
42										
44										
46										
48										
50										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Groundwater observed at about 10.5 ft. bgs during drilling.

3. Weathered bedrock encountered at about 21.5 ft. bgs, more competent bedrock encountered at about 33.7' bgs.

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BC-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/03/11 **Date Finished: 08/03/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
0	S-1	0 - 5		5/5			-----0'----- CONCRETE	(0 to 1'): Concrete.		Concrete - to be completed by others. (0 to 1.5')
1					PID: 0.3 ppmv		-----1'-----	S-1A (1 to 3.1'): Light brown, fine to coarse SAND, some Silt, little Gravel, little Cobbles. Rounded to sub-angular. Dry. FILL.		2" Dia. Sch. 40 CPVC Riser (0.1 to 1.7')
3					PID: 2.8 ppmv		FILL	S-1B (3.1 to 5'): Dark brown, fine to coarse SAND, some Silt, little Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.		2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.7 to 5.9')
5	S-2	5 - 10		5/3	PID: 2.3 ppmv			S-2 (5 to 7.3'): Dark brown, fine to coarse SAND and Silt, little Gravel, trace Cobbles. Rounded to sub-angular. Moist. FILL.		2" Dia. Sch. 40 CPVC End Cap (5.9 to 6')
7.3							-----7.3'----- CONCRETE	(7.3 to 8'): Concrete. FILL.		
8							-----8'----- FILL	(8 to 10'): No recovery.		
10	S-3	10 - 15		5/5	PID: 51 ppmv		-----10'-----	S-3A (10 to 11.3'): Dark gray, SILT & CLAY. Moist.		
11.3					PID: 0.6 ppmv		SILT & CLAY	S-3B (11.3 to 15'): Light gray, Clayey SILT, with reddish mottling. Moist.		
15	S-4	15 - 20		5/5	PID: 0.4 ppmv		-----15'-----	S-4A (15 to 16.1'): Light gray, SILT & CLAY, little Gravel, trace Cobbles, trace reddish mottling observed. Sub-angular to angular. Moist.		#3 Sand (1.5 to 28.5')
16.1					PID: 0.8 ppmv		TILL	S-4B (16.1 to 18.7'): Gray, SILT & CLAY, little fine to coarse Sand, trace Gravel. Sub-angular to angular. Moist.		
18.7					PID: 0.4 ppmv			S-4C (18.7 to 20'): Gray, SILT & CLAY, some fine to coarse Sand, some Silt, trace Gravels. Sub-angular to angular. Dry.		
20	S-5	20 - 23		3/3	PID: 1.2 ppmv		-----20'-----	S-5A (20 to 20.1'): Medium hard, very severely weathered, dark gray, aphanitic SHALE.		
20.1					PID: 1.5 ppmv		SHALE	S-5B (20.1 to 23'): Medium hard, very severely weathered, dark gray, aphanitic SHALE.		
23	S-6	23 - 28		5/5	PID: ND			S-6A (23 to 26.9'): Medium hard, very severely weathered, dark gray, aphanitic SHALE.		

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BC-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/03/11 Date Finished: 08/03/11
Logged By: AVK/EMB Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
26–28					PID: ND		SHALE -----28'-----	S-6B (26.9 to 28'): Medium hard, very severely weathered, dark gray, aphanitic SHALE.		
28–50								Boring terminated at 28.5 feet. No refusal encountered. NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed at <10 ft. bgs during drilling (no recovery from 8 to 10 ft. bgs). 3. Borehole inadvertently deepened to 28.5 ft. bgs prior to backfilling (no recovery). 4. Weathered bedrock encountered at about 20.0 ft bgs, more competent bedrock not encountered before 28.5 ft. bgs.		

Depth scale: 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50

BORING LOG S:\PORDATA\2400S\2466.02\WORK\LOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BD-03

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/04/11 **Date Finished: 08/04/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/4		-----0'----- CONCRETE -----0.8'-----	(0 to 0.8'): Concrete.	Concrete - to be completed by others. (0 to 1.5')
					PID: 0.4 ppmv	FILL	S-1A (0.8 to 3.6'): Light brown, fine to coarse SAND & GRAVEL, little Silt, little Cobbles. Rounded to angular. Dry. FILL.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.7')
4					PID: 14 ppmv		S-1B (3.6 to 5'): Dark gray, fine to coarse SAND, some Gravel, little Silt, trace Cobbles. Sub-rounded to angular. Moist. FILL.	2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.7 to 5.9')
	S-2	5 - 10		5/5	PID: 1.3 ppmv		S-2A (5 to 8.6'): Dark gray, fine to coarse SAND, little Gravel, little Silt, trace Cobbles, trace Organic PEAT. Sub-rounded to angular. Moist. FILL.	2" Dia. Sch. 40 CPVC End Cap (5.9 to 6')
					PID: 0.7 ppmv	-----8.6'----- STREAM DEPOSITS	S-2B (8.6 to 10'): Dark gray, SILT & CLAY, some fine to coarse Sand, little Silt, trace Gravels. Rounded to sub-angular. Wet. STEAM DEPOSITS.	
10	S-3	10 - 15		5/5	PID: 1.3 ppmv		S-3A (10 to 12.1'): Dark gray, SILT & CLAY, some fine to coarse Sand, little Gravel, trace Cobbles, trace Organic Peat, trace Glass. Rounded to sub-angular. Moist. STEAM DEPOSITS.	
12					PID: 0.6 ppmv	-----12.1'----- SILT & CLAY	S-3B (12.1 to 15'): Dark gray, CLAY & SILT, trace fine to coarse Sand, trace Gravel. Sub-angular. Moist.	
	S-4	15 - 20		5/5	PID: 4.2 ppmv		S-4A (15 to 17.4'): Light gray, CLAY & SILT, trace fine to coarse Sand. Sub-angular to angular. Wet.	
					PID: 0.6 ppmv		S-4B (17.4 to 19.1'): Light gray, SILT & CLAY, reddish mottling observed. Moist.	
					PID: 3.0 ppmv	-----19.1'----- SAND & GRAVEL -----20'-----	S-4C (19.1 to 20'): Tan, fine to coarse SAND, some Gravel, trace Silt, trace Cobbles. Sub-angular to angular. Dry.	#3 Sand (1.7 to 38')
20	S-5	20 - 25		5/5	PID: 3.9 ppmv	SILT & CLAY	S-5A (20 to 23.6'): Light gray, CLAY & SILT, trace fine to medium Sand, trace Cobbles. Sub-angular to angular. Moist.	
24					PID: 12 ppmv	-----23.6'----- SAND & GRAVEL	S-5B (23.6 to 25'): Gray & tan, fine to coarse SAND, trace Gravel, trace Cobbles, trace Silt. Sub-angular to angular. Moist.	

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BD-03

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/04/11 Date Finished: 08/04/11
Logged By: AVK/EMB Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
25 - 30	S-6	25 - 30		5/5	PID: 0.8 ppmv	SAND & GRAVEL	S-6 (25 to 30'): Light gray, CLAY & SILT and fine to coarse Sand, trace Gravel, trace Cobbles. Sub-angular to angular. Moist.	
30						-----30'-----		
30 - 35	S-7	30 - 35		5/5	PID: 0.5 ppmv	SHALE	S-7 (30 to 35'): Very soft, severely weathered, dark gray, aphanitic SHALE. Tan, gravelly zone at 33.9 - 34.2'.	
35 - 38	S-8	35 - 38		3/3	PID: 0.5 ppmv	SHALE	S-8A (35 to 36.4'): Very soft, severely weathered, dark gray, aphanitic SHALE. Moist.	
					PID: 0.7 ppmv		S-8B (36.4 to 38'): Medium hard, moderately weathered, dark gray, aphanitic SHALE. Dry.	
38						-----38'-----	Boring terminated at 38 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Groundwater observed at about 8.6 ft. bgs during drilling.

3. Weathered bedrock encountered at about 30.0 ft. bgs, more competent bedrock encountered at about 36.4 ft. bgs.

Depth scale (ft): 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BD-04

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 Date Finished: 08/07/11
Logged By: EMB Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE -----0.5'-----	(0 to 0.5'): Concrete.	
					PID: 1.1 ppmv		S-1A (0.5 to 2.3'): Light brown, fine to coarse SAND & GRAVEL, trace Silt. Sub-angular to rounded. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5')
2					PID: 19 ppmv		S-1B (2.3 to 5'): Dark brown, fine to coarse SAND, little Gravel, little Silt. Sub-angular to rounded. Moist. FILL.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.7')
4								2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.7 to 5.9')
	S-2	5 - 10		5/0			S-2 (5 to 10'): No recovery.	
6						FILL		2" Dia. Sch. 40 CPVC End Cap (5.9 to 6')
8								
10	S-3	10 - 15		5/5	PID: 23 ppmv		S-3A (10 to 11.4'): Dark brown, fine to coarse SAND, little Gravel, trace Silt. Sub-angular to rounded. Moist. FILL.	#3 Sand (1.5 to 20.7')
					PID: 11 ppmv	-----11.4'-----	S-3B (11.4 to 15'): Gray, SILT & CLAY. Wet.	
12								
						SILT & CLAY		
14								
	S-4	15 - 17.5		3/3	PID: 7.1 ppmv	-----15.3'-----	S-4A (15 to 15.3'): Olive gray, CLAY & SILT. Moist.	
16					PID: 14 ppmv		S-4B (15.3 to 16'): Olive gray, Clayey SILT, trace Gravel. Sub-rounded to angular. Moist.	
					PID: 23 ppmv		S-4C (16 to 17.5'): Gray, hard, slightly weathered, gray, aphanitic SHALE (Boulder). Dry.	
18	S-5	17.5 - 20		3/3	PID: 10 ppmv		S-5 (17.5 to 20'): Olive gray, Silty CLAY, trace Gravel, and Cobbles, trace Sand. Angular Moist.	
						TILL		
20	S-6	20 - 25		5/	PID: 32 ppmv		S-6A (20 to 22.4'): Olive gray, CLAY & SILT, some Gravel, trace Sand. Angular Dry.	
22					PID: 2 ppmv	-----22.4'-----	S-6B (22.4 to 25'): Hard, slightly weathered, gray, aphanitic SHALE.	
24						SHALE		

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BD-04

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 **Date Finished: 08/07/11**
Logged By: EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
							-----25'-----	Boring terminated at 25 feet. No refusal encountered. NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed <10' bgs during drilling (no recovery from 5 to 10 ft bgs). 3. Bedrock encountered at about 22.4 ft bgs, weathered Shale not encountered.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BD-07

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

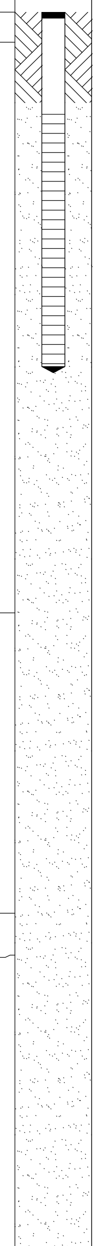
Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/02/11 **Date Finished: 08/02/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Spoon Blows per 6 in	Sample Information: Pen/ Rec (in)	Sample Information: Field Testing Data	Stratum: Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE -----0.5'-----	(0 to 0.5'): Concrete.	
					PID: 0.8 ppmv		S-1A (0.5 to 3.7'): Dark brown, fine to coarse SAND, little Gravel, trace Silt. Rounded to sub-angular. Dry. FILL.	Concrete - to be completed by others. (0 to 1.5')
2								2" Dia. Sch. 40 CPVC Riser (0.1 to 1.7')
4					PID: 15 ppmv		S-1B (3.7 to 5'): Gray, SILT, trace Gravel. Dry. FILL.	2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.7 to 5.9')
	S-2	5 - 10		5/5	PID: 1.2 ppmv	FILL	S-2A (5 to 8.2'): Dark brown, fine to coarse SAND, little Silt, trace Gravel. Rounded to sub-angular. Moist. FILL.	
6								2" Dia. Sch. 40 CPVC End Cap (5.9 to 6')
8					PID: 0.2 ppmv		S-2B (8.2 to 10'): Gray, SILT and fine to coarse Sand, little Gravel. Rounded to sub-angular. Dry. FILL.	
10	S-3	10 - 15		5/5	PID: 0.2 ppmv	-----10'-----	S-3A (10 to 13.5'): Gray, CLAY & SILT. Moist.	
								#3 Sand (1.5 to 20.7')
12						SILT & CLAY		
14					PID: 0.2 ppmv		S-3B (13.5 to 15'): Light gray, SILT & CLAY, trace Cobbles, reddish mottling. Sub-angular to angular. Moist.	
	S-4	15 - 20		5/7	PID: 0.1 ppmv	-----15'----- TILL	S-4A (15 to 15.7'): SILT & CLAY, trace Gravel. Sub-angular to angular. Moist.	
16					PID: 0.4 ppmv	-----15.7'-----	S-4B (15.7 to 20'): Medium hard, slightly weathered, dark gray, aphanitic SHALE. Moist.	
18						SHALE		
20								
						-----20.7'-----	Boring terminated at 20.7 feet. No refusal encountered.	
22							NOTES:	
24							1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the	

Well Diagram



SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BD-07

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/02/11 Date Finished: 08/02/11
Logged By: AVK/EMB Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
26								typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.		
28								2. Groundwater observed at approximately 10 ft bgs during drilling. 3. Borehole inadvertently deepened to 20.7 ft bgs prior to backfilling (no recovery).		
30								4. Weathered bedrock encountered at about 15.7 ft bgs, more competent bedrock not encountered before 20.7 ft bgs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BE-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/03/11 Date Finished: 08/03/11
Logged By: AVK/EMB Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE -----0.8'-----	(0 to 0.8'): Concrete.	Concrete - to be completed by others. (0 to 1.5')
					PID: 0.5 ppmv	FILL	S-1A (0.8 to 3.1'): Light brown, fine to coarse SAND, some Silt, some Gravel, some Cobbles. Rounded to sub-angular. Dry. FILL.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.7')
					PID: 11 ppmv		S-1B (3.1 to 5'): Dark brown, SILT, some Gravel, little Cobbles, trace, fine to coarse Sand. Steel nail observed. Sub-rounded to sub-angular. Moist. FILL.	2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.7 to 5.9')
5	S-2	5 - 10		5/2	PID: 6.9 ppmv		S-2 (5 to 6.7'): Dark brown, fine to medium SAND and Silt, trace Gravel. Sub-rounded. Moist. FILL.	2" Dia. Sch. 40 CPVC End Cap (5.9 to 6')
						-----6.7'----- CONCRETE -----7.2'-----	(6.7 to 7.2'): Concrete. FILL.	
						FILL	(7.2 to 10'): No recovery.	
10	S-3	10 - 15		5/5	PID: 0.1 ppmv	-----10'----- SILT & CLAY	S-3 (10 to 13.5'): Gray, CLAY & SILT. Moist.	#3 Sand (1.5 to 22.5')
15	S-4	15 - 20		5/5	PID: 0.5 ppmv		S-4A (15 to 15.7'): SILT & CLAY, trace Gravel. Sub-angular to angular. Moist.	
					PID: 23 ppmv	-----15.7'----- SAND & GRAVEL	S-4B (15.7 to 19.1'): Fine to coarse SAND, little Gravel, trace Silt, trace Cobbles. Rounded to angular. Moist.	
					PID: 66 ppmv	-----19.1'----- SHALE	S-4C (19.1 to 20'): Medium hard, very severely weathered, dark gray, aphanitic SHALE. Moist.	
20	S-5	20 - 22.5		---	PID: 31 ppmv		S-5A (20 to 20.9'): Medium hard, severely weathered, dark gray, aphanitic SHALE.	
					PID: 2 ppmv		S-5B (20.9 to 22.5'): Medium hard, slightly weathered, light gray, aphanitic SHALE. Dry.	
						-----22.5'-----	Boring terminated at 22.5 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BE-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/03/11 Date Finished: 08/03/11
Logged By: AVK/EMB Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log	Description			
26								compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.		
28								2. Groundwater observed at <10 ft bgs during drilling (no recovery from 7.2 to 10 ft bgs).		
30								3. Weathered bedrock encountered at about 19.1 ft bgs, more competent bedrock encountered at approximately 20.9 ft. bgs.		
32										
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BE-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/03/11 **Date Finished:** 08/03/11
Logged By: AVK/EMB **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE -----0.8'-----	(0 to 0.8'): Concrete.	Concrete - to be completed by others. (0 to 1.5')
1					PID: 0.1 ppmv	FILL	S-1A (0.8 to 3.1'): Brown, fine to coarse SAND and Silt, some Gravel, little Cobbles. Rounded to sub-rounded. Moist. FILL.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.7')
3					PID: 0.3 ppmv		S-1B (3.1 to 5.2'): Dark brown, fine to coarse SAND, some Silt, little Gravel, trace Cobbles. Steel piece at 4.5'. Rounded to sub-angular. Moist. FILL.	2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.7 to 5.9')
5	S-2	5 - 10		5/2				2" Dia. Sch. 40 CPVC End Cap (5.9 to 6')
6.5						-----6.5'----- CONCRETE -----7.5'-----	S-2 (6.5 to 7.5'): Concrete. FILL.	
7.5						FILL	(7.5 to 10'): No recovery.	
10	S-3	10 - 15		5/5	PID: 21 ppmv	-----10'----- SILT & CLAY	S-3 (10 to 15'): Gray, CLAY & SILT. Some red mottling. Odor noted throughout core immediately upon opening plastic liner. Moist.	#3 Sand (1.5 to 20')
15	S-4	15 - 20		5/5	PID: 0.2 ppmv		S-4A (15 to 18.1'): Gray, SILT & CLAY. Some reddish mottling. Odor noted from 15 to approximately 16' bgs. Moist.	
18.1					PID: 0.2 ppmv	-----18.1'----- SHALE	S-4B (18.1 to 20'): Medium hard, severely weathered, light gray, aphanitic SHALE. Dry.	
20						-----20'-----	Boring terminated at 20 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BE-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/03/11 **Date Finished: 08/03/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
								screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Weathered bedrock encountered at about 18.1 ft bgs, more competent bedrock not encountered before 20.0 ft bgs		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BF-04

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/30/11 **Date Finished: 10/30/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0		0 - 1		---		-----0'----- CONCRETE -----1'-----	(0 to 1'): Concrete.	Concrete - to be completed by others. (0 to 1.5')
	S-1	1 - 10		---	PID: 1.7 ppmv	FILL	S-1 (1 to 10'): Dark brown, fine to coarse SAND & GRAVEL, little Silt, trace Cobbles. Moist. FILL.	2" Dia. Sch. 40 CPVC Riser (0 to 2.9')
4								2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (2.9 to 5.9')
6								2" Dia. Sch. 40 CPVC End Cap (5.9 to 6')
10	S-2	10 - 20		---	PID: 1.5 ppmv	-----10'----- SILT & CLAY	S-2A (10 to 18.1'): Gray with red mottling, SILT & CLAY. Moist. SILT & CLAY.	
12								#3 Sand (1.5 to 22')
18							S-2B (18.1 to 20'): SILT & CLAY, trace Cobbles. Moist. SILT & CLAY.	
20	S-3	20 - 21.5		---	PID: 1.7 ppmv	-----20'----- TILL	S-3 (20 to 21.5'): Gray, fine to coarse SAND & GRAVEL, some Silt & Clay, trace Cobbles. Wet. TILL.	
22	S-4	21.5 - 22		---	PID: 2.8 ppmv	-----21.5'----- ROCK -----22'-----	S-4 (21.5 to 22'): Soft-medium hard, severely-completely weathered SHALE. Dry. WEATHERED ROCK.	
							Boring terminated at 22 feet. No refusal encountered.	
24							NOTES: 1. Soil samples were screened for volatile organic	

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BF-04

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/30/11 Date Finished: 10/30/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log	Description			
26								compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.		
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30								2. Groundwater observed at about 9 feet bgs during drilling. 3. Weathered Bedrock observed at about 21.5 bgs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BF-07

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/03/11 **Date Finished: 08/03/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE -----0.5'-----	(0 to 0.5'): Concrete.	
					PID: 0.3 ppmv	FILL	S-1A (0.5 to 3.6'): Brown, fine to coarse SAND & GRAVEL, some Silt, little Cobbles. Sub-rounded to sub-angular. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5')
2								2" Dia. Sch. 40 CPVC Riser (0.1 to 1.6')
4					PID: 3 ppmv		S-1B (3.6 to 5'): Dark brown, fine to coarse SAND, some Silt, some Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.6 to 5.8')
	S-2	5 - 10		5/5	PID: 1.3 ppmv		S-2A (5 to 8.9'): Dark brown, fine to coarse SAND, some Silt, little Gravel, trace Cobbles, trace Glass pieces observed. Sub-rounded to sub-angular. Moist. FILL.	2" Dia. Sch. 40 CPVC End Cap (5.8 to 5.9')
6								
8					PID: 0.3 ppmv		S-2B (8.9 to 10'): Light brown, fine to coarse SAND, some Silt, some Gravel, trace Cobbles. Rounded to sub-angular. Moist. FILL.	
10	S-3	10 - 15		5/5	PID: 0.1 ppmv	-----10'----- SILT & CLAY	S-3 (10 to 15'): CLAY & SILT, slight reddish mottling observed. Moist.	
12								#3 Sand (1.5 to 23')
14								
	S-4	15 - 20		5/5	PID: 0.2 ppmv		S-4A (15 to 15.8'): Gray, SILT & CLAY, reddish mottling observed. Moist.	
16					PID: 0.5 ppmv	-----15.8'----- TILL	S-4B (15.8 to 20'): Light gray, Clayey SILT, little Cobbles, little Gravel, trace Silt. Sub-angular to angular. Moist.	
18								
20	S-5	20 - 23		3/3	PID: 0.6 ppmv		S-5A (20 to 21.7'): Light gray, Clayey SILT, some Gravel, little Cobbles. Sub-angular to angular. Moist.	
22					PID: 0.2 ppmv	-----21.7'----- SHALE -----23'-----	S-5B (21.7 to 23'): Medium hard, completely weathered, dark gray, aphanitic Shale. Moist.	
24							Boring terminated at 23 feet. No refusal encountered. NOTES:	

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BF-07

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/03/11 **Date Finished: 08/03/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
26								1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed at approximately 8.9 ft bgs during drilling. 3. Borehole inadvertently deepened to 20.7 ft bgs prior to backfilling (no recovery). 4. Weathered bedrock encountered at about 21.7 ft bgs, more competent bedrock not encountered before 23.0 ft bgs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BG-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/29/11 **Date Finished: 10/29/11**
Logged By: AVK **Checked By: EMB/JSP**

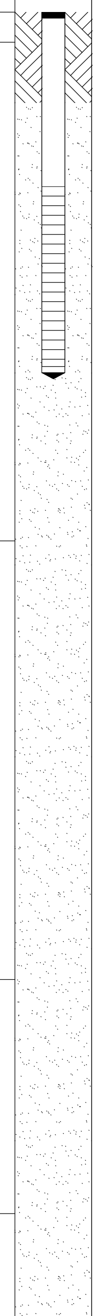
Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0					PID: NA	-----0'----- CONCRETE -----0.5'-----	(0 to 0.5'): Concrete.	
	S-1	0.5 - 8.8		---	PID: 1.8 ppmv	FILL	S-1 (0.5 to 8.8'): Dark brown, fine to coarse SAND & GRAVEL, trace Cobbles. Sub-angular to angular. Moist. FILL. (Water table at approximately 8.8 ft).	Concrete - to be completed by others. (0 to 1.5') 2" Dia. Sch. 40 CPVC Riser (0 to 2.9') 2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (2.9 to 5.9') 2" Dia. Sch. 40 CPVC End Cap (5.9 to 6')
	S-2	8.8 - 16.1		---	PID: 4 ppmv	-----8.8'----- SILT & CLAY	S-2 (8.8 to 16.1'): Dark gray, SILT & CLAY. Moist. SILT & CLAY.	#3 Sand (1.5 to 21.9')
	S-3	16.1 - 20		---	PID: 45 ppmv	-----16.1'----- TILL	S-3 (16.1 to 20'): Gray, Clayey SILT, little Gravel, trace Cobbles. Sub-angular to angular. Moist. TILL.	
20					PID: 66 ppmv	-----20'-----	(20 to 21'): No recovery.	
	S-4	21 - 21.9		---		WEATHERED ROCK -----21.9'-----	S-4 (21 to 21.9'): Soft, severely weathered, aphinatic SHALE. Moist. ROCK.	
22							Boring terminated at 21.9 feet. No refusal encountered.	

Depth scale (ft): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

Well Diagram



NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp,

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-BG-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/29/11 Date Finished: 10/29/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
26								calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.		
28								2. Groundwaterobserved at about 8.8 feet bgs during drilling.		
30								3. Severely Weathered bedrock observed at about 21.5 feet bgs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-TB-02

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 Date Finished: 08/15/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---		-----0'----- ASPHALT -----0.4'-----	(0 to 0.4'): Asphalt.	
					PID: 3.3 ppmv	FILL	S-1 (0.4 to 2'): Brown, fine to coarse SAND & GRAVEL, little Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5')
2	S-2	2 - 4		---	PID: 1.7 ppmv		S-2 (2 to 4'): Brown, fine to coarse SAND & GRAVEL, little Silt. Sub-rounded to angular. Moist. FILL.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9')
4	S-3	4 - 7		---	PID: 3 ppmv		S-3 (4 to 7'): Brown, fine to coarse SAND & GRAVEL, little Silt. Sub-rounded to angular. Moist. FILL.	2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
								2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6								
7	S-4	7 - 10		---	PID: 0.4 ppmv	-----7'----- SILT & CLAY	S-4 (7 to 10'): Gray, CLAY & SILT, trace fine to coarse Sand, brown mottling. Rounded. Moist.	
8								
10	S-5	10 - 15		---	PID: 0.3 ppmv		S-5A (10 to 11.5'): Gray, CLAY & SILT, trace fine to coarse Sand, brown mottling. Rounded. Moist.	
12					PID: 0.4 ppmv		S-5B (11.5 to 14.4'): Gray to light brown, SILT & CLAY, trace Gravel, trace fine to coarse Sand, trace Cobbles, extreme light brown mottling. Rounded to sub-rounded. Moist.	#3 Sand (1.5 to 25')
14					PID: 0.3 ppmv	-----14.4'----- SAND & GRAVEL	S-5C (14.4 to 15'): Gray, fine to coarse SAND & GRAVEL, some Silt. Rounded to sub-rounded. Wet.	
	S-6	15 - 20		---	PID: 0.4 ppmv	-----15.5'-----	S-6A (15 to 15.5'): Gray - brown, SAND & GRAVEL, some Cobbles, little Silt. Rounded to sub-angular. Wet. STREAM DEPOSITS.	
16					PID: 0.5 ppmv	TILL	S-6B (15.5 to 17'): Gray, SILT & CLAY, little fine to coarse Sand, little Gravel. Sub-rounded to angular. Moist. TILL.	
					PID: 1.1 ppmv	-----17'----- SLIGHTLY WEATHERED SHALE	S-6C (17 to 18.9'): Gray, moderately hard, slightly weathered, aphanitic SHALE. Dry.	
18								
					PID: 1.1 ppmv	-----18.9'----- CLAYEY SILT	S-6D (18.9 to 20'): Gray, Clayey SILT, some fine to coarse Sand, trace Gravel. Sub-rounded to sub-angular. Wet.	
20	S-7	20 - 25		---	PID: 1.3 ppmv	-----20'----- SAND	S-7A (20 to 22.5'): Brown, fine to coarse SAND, trace Gravel, trace Silt. Sub-rounded to sub-angular. Wet.	
22					PID: 1.1 ppmv	-----22.5'----- SHALE	S-7B (22.5 to 23.5'): Gray, SILT, some fine to coarse Sand, trace Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist. WEATHERED BEDROCK.	
24					PID: 1.5 ppmv		S-7C (23.5 to 25'): Gray, moderately hard, fresh, aphanitic SHALE. Dry.	

SANBORN HEAD Sanborn, Head & Associates, Inc.	Project: Building 57 Location: Endicott, NY Project No.: 2466.03	**Log of Chimney Well CW-TB-02** Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 Date Finished: 08/15/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Spoon Blows per 6 in	Sample Information: Pen/ Rec (in)	Sample Information: Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
							-----25'-----	Boring terminated at 25 feet. No refusal encountered. NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Weathered bedrock observed at about 17' bgs, more competent rock encountered at 23/5' bgs.		
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SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-TB-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/07/11 **Date Finished:** 08/15/11

Logged By: AVK/JSP/JWC **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---		-----0'----- ASPHALT	(0 to 0.5'): Asphalt.	
					PID: 0.3 ppmv	-----0.5'-----	S-1 (0.5 to 2'): Brown, fine to coarse SAND & GRAVEL, some Silt, little Cobbles. Rounded to sub-rounded. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5') 2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9')
2	S-2	2 - 4		---	PID: 0.8 ppmv		S-2 (2 to 4'): Brown, fine to coarse SAND & GRAVEL, some Silt, little Cobbles. Rounded to sub-rounded. Moist. FILL.	2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
4	S-3	4 - 7		---	PID: 0.9 ppmv	FILL	S-3 (4 to 7'): Fine to coarse SAND & GRAVEL, some Silt, little Cobbles. Rounded to sub-angular. Moist. FILL.	2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6								
	S-4	7 - 10		---	PID: 0.3 ppmv		S-4A (7 to 8'): Brown, fine to coarse SAND & GRAVEL, little Silt. Sub-rounded to sub-angular. Wet. FILL.	
8					PID: 0.3 ppmv		S-4B (8 to 8.7'): Brown, fine to coarse SAND & GRAVEL, some Silt, trace , Roots/Organics, trace Steel. Sub-rounded to sub-angular. Wet. FILL.	
					PID: 0.4 ppmv		S-4C (8.7 to 9.1'): Black/dark brown, fine to coarse SAND (Asphalt), trace Gravel. Sub-rounded to angular. Wet. FILL.	
					PID: 0.4 ppmv	-----9.1'----- SILT & CLAY	S-4D (9.1 to 10'): Gray, Clayey SILT, trace fine to medium Sand, trace Roots. Moist.	
10								

SANBORN HEAD	Project: Building 57 Location: Endicott, NY Project No.: 2466.03	Log of Chimney Well CW-TB-04 Ground Elevation: Not Available

Sanborn, Head & Associates, Inc.

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/07/11 Date Finished: 08/15/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
10	S-5	10 - 15		---	PID: 0.3 ppmv			S-5A (10 to 10.5'): Gray, Clayey SILT, trace fine to medium Sand, trace Roots. Moist.		
					PID: 0.2 ppmv			S-5B (10.5 to 15'): Gray, SILT & CLAY, trace Roots (at 12.5 to 12.8'), brown mottling. Moist.		
12							SILT & CLAY			
14										
	S-6	15 - 20		---	PID: 0.2 ppmv		-----15'----- SAND & GRAVEL	S-6A (15 to 16'): Gray, SAND and Gravel, some Silt, trace Cobbles. Rounded to sub-rounded. Wet. STREAM DEPOSITS.		#3 Sand (1.5 to 30')
16							-----16'-----	S-6B (16 to 20'): Olive brown to gray, SILT & CLAY, some fine to coarse Sand, some Gravel (Broken Shale), trace Cobbles, little brown mottling. Sub-rounded to angular. Moist. TILL.		
					PID: 0.4 ppmv					
18							TILL			
					PID: 0.3 ppmv					
20										

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-TB-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/07/11 **Date Finished:** 08/15/11

Logged By: AVK/JSP/JWC **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
20	S-7	20 - 25		---	PID: 0.4 ppmv	-----20'----- SAND & GRAVEL	S-7A (20 to 23.6'): Fine to coarse SAND and Gravel, trace Cobbles, trace Silt. Rounded to sub-rounded Wet. STREAM DEPOSITS.	
					PID: 0.7 ppmv		S-7B (23.6 to 24.3'): Olive brown to gray, SILT & CLAY, some fine to coarse Sand, some Gravel, trace Cobbles, little brown mottling. Sub-rounded to angular. Wet. STREAM DEPOSITS.	
24					PID: 4.5 ppmv	-----24.3'----- SHALE	S-7C (24.3 to 24.6'): Dark gray, moderately hard, slightly weathered, SHALE. Moist.	
					PID: NA	-----24.6'-----	S-7D (24.6 to 25'): Dark gray, SILT & CLAY, little Gravel, trace fine to coarse Sand. Sub-angular to angular. Moist.	
	S-8	25 - 30		---	PID: 3.3 ppmv		S-8A (25 to 26.5'): Gray, fine to coarse SAND, some Silt, little Gravel. Rounded. Wet. (More washed out to coarse Sand & Gravel at bottom).	
26					PID: 9.1 ppmv	TILL	S-8B (26.5 to 28.5'): Gray, Clayey SILT, some medium to coarse Sand, little Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist.	
28					PID: 7.6 ppmv	-----28.5'----- SHALE	S-8C (28.5 to 30'): Dark gray, hard, slightly weathered (at top) to very severely weathered, SHALE. Moist.	
30								

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-TB-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/07/11 Date Finished: 08/15/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered.		
32										
34										
36										
38										
40										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Groundwater first observed at about 7' bgs.
3. Competent bedrock observed at 28.5' bgs.

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-TB-06

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/07/11 **Date Finished:** 08/15/11

Logged By: AVK/JSP/JWC **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---		-----0'----- ASPHALT -----0.5'-----	(0 to 0.5'): Asphalt.	
					PID: 4.6 ppmv		S-1 (0.5 to 2'): Light brown, fine to coarse SAND & GRAVEL, some Silt, trace Cobbles. Rounded to sub-rounded. Wet. FILL.	Concrete - to be completed by others. (0 to 1.5')
2	S-2	2 - 4		---	PID: 1.3 ppmv		S-2 (2 to 4'): Brown, fine to coarse SAND & GRAVEL, some Silt, trace Cobbles. Rounded to sub-angular. Wet. FILL. Secondary Asphalt at 2' bgs.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9')
								2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
4	S-3	4 - 7		---	PID: 0.8 ppmv	FILL	S-3 (4 to 7'): Brown, fine to coarse SAND and Silt, some Gravel, trace Cobbles. Sub-rounded to sub-angular. Wet. FILL.	2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6								
7	S-4	7 - 10		---	PID: 0.5 ppmv		S-4A (7 to 9'): Olive brown, SAND & GRAVEL, little Silt. Rounded to sub-rounded. Wet. FILL.	
8								
9					PID: 0.4 ppmv PID: 0.5 ppmv		S-4B (9 to 9.5'): Olive brown, SILT, some Gravel, little fine to coarse Sand, trace Roots, trace Cobbles. Rounded to sub-rounded. Wet. FILL.	
10	S-5	10 - 15		---	PID: 0.5 ppmv	-----10'-----	S-4C (9.5 to 10'): Black, fine to coarse Sand (Asphalt), trace Gravel. Angular to sub-angular. Wet. FILL.	
							S-5 (10 to 15'): Gray, CLAY & SILT, brown mottling starting at ~12.5' bgs. Moist.	
12						SILT & CLAY		
14								
15	S-6	15 - 20		---	PID: 0.8 ppmv PID: 0.5 ppmv		S-6A (15 to 16'): Gray, CLAY & SILT, brown mottling. Moist.	#3 Sand (1.5 to 30')
16					PID: 0.4 ppmv	-----16'-----	S-6B (16 to 17.9'): Gray, SAND & GRAVEL, some Silt, little Cobbles. Rounded to sub-angular. Wet. STREAM DEPOSITS.	
18					PID: 0.5 ppmv	SAND & GRAVEL	S-6C (17.9 to 20'): Olive brown to gray, SILT & CLAY, some Gravel, little Sand. Rounded to angular. Moist. STREAM DEPOSITS.	
20	S-7	20 - 25		---	PID: 0.3 ppmv	-----20'-----	S-7A (20 to 23'): Brownish gray, SILT & CLAY and fine to coarse Sand, little Gravel. Angular to sub-angular. Wet.	
22						TILL		
23					PID: 0.6 ppmv		S-7B (23 to 25'): Light gray, SILT & CLAY, little Gravel, trace Sand, trace Cobbles. Angular to sub-angular. Moist.	
24								

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-TB-06

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/07/11 Date Finished: 08/15/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
25	S-8	25 - 30		---	PID: 0.8 ppmv		-----25'-----	S-8A (25 to 28'): Gray, CLAY & SILT, some fine to coarse Sand, some Gravel, trace Cobbles. Angular to sub-rounded. Wet. WEATHERED BEDROCK.		
26										
27							SHALE			
28					PID: 1.3 ppmv			S-8B (28 to 30'): Gray, moderately hard, very severely to slightly weathered, aphanitic SHALE. Angular. Moist.		
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered.		
32										
34										
36										
38										
40										
42										
44										
46										
48										
50										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Discernable groundwater level was not observed. All fill was wet.

3. Weathered bedrock observed at 25' bgs, more competent rock encountered at 28' bgs.

SANBORN ||| HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WB-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 **Date Finished: 08/16/11**

Logged By: AVK/JSP/JWC **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---		-----0'----- ASPHALT -----0.5'-----	(0 to 0.5'): Asphalt.	
					PID: 3 ppmv		S-1 (0.5 to 2'): Dark brown, fine to coarse SAND & GRAVEL, trace Silt, trace Cobbles. Rounded to sub-angular. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5')
2	S-2	2 - 4		---	PID: 21 ppmv		S-2 (2 to 4'): Dark brown, fine to coarse SAND & GRAVEL, trace Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9')
								2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
4	S-3	4 - 6		---	PID: 48 ppmv		S-3 (4 to 6'): Dark brown to gray, fine to coarse SAND & GRAVEL, trace Clayey Silt. Sub-rounded to sub-angular. Moist. FILL. Concrete Fill at 6' bgs.	
						FILL		2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6	S-4	6 - 10		---	PID: 1.4 ppmv		S-4A (6 to 6.7'): Brown, fine to coarse SAND & GRAVEL, some Silt. Rounded to sub-angular. Wet. FILL.	
					PID: 1 ppmv		S-4B (6.7 to 10'): Brown to gray, SILT & CLAY, little fine to coarse Sand, trace Gravel, trace Cobbles, trace Roots. Rounded to sub-angular. Moist. FILL.	
8								
10	S-5	10 - 15		---	PID: 1.1 ppmv	-----10'-----	S-5A (10 to 11.5'): Gray, CLAY & SILT. Moist.	
					PID: 0.6 ppmv		S-5B (11.5 to 15'): Gray, SILT & CLAY, brown mottling increasing with depth. Moist.	
12								
14								#3 Sand (1.5 to 27.5')
	S-6	15 - 20		---	PID: 0.9 ppmv	SILT & CLAY	S-6A (15 to 15.9'): Brownish gray, Clayey SILT, some Gravel, little fine to coarse Sand. Rounded to sub-rounded. Wet.	
16					PID: 0.7 ppmv		S-6B (15.9 to 19'): Gray, CLAY & SILT, little brown mottling; dark brown - black staining (18 to 19' bgs). Moist.	
18								
					PID: 0.7 ppmv		S-6C (19 to 20'): Blueish-gray, SILT & CLAY, trace Gravel, trace fine to coarse Sand, trace fossil Shells. Moist.	
20								

SANBORN ||| HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WB-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 Date Finished: 08/16/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
20	S-7	20 - 25		---			-----20'-----	S-7 (20 to 25'): Gray, CLAY & SILT, little fine to coarse Sand, little Gravel (broken Shale), trace Cobbles. Angular to sub-angular. Moist/Wet (22.9 to 23.5' bgs).		
22					PID: 0.7 ppmv		TILL			
					PID: 0.5 ppmv					
24										
25	S-8	25 - 30		---	PID: 0.5 ppmv		-----25'----- TILL -----25.5'-----	S-8A (25 to 25.5'): Gray brown, SILT & CLAY, little Gravel (various lithologies), trace fine to coarse Sand. Rounded to sub-rounded. Moist.		
26								S-8B (25.5 to 30'): Gray, hard, fresh, aphanitic SHALE. Slightly more weathered at bottom. Dry.		
28							SHALE			Benseal Bentonite (hydrated) (27.5 to 30')
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered.		
32										
34										
36										
38										
40										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Discrete water table not observed. Soils below about 4' bgs were wet.

3. Competent bedrock observed at 25.5' bgs.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WC-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 **Date Finished:** 08/16/11

Logged By: AVK/JSP/JWC **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---		-----0'----- ASPHALT -----0.5'-----	(0 to 0.5'): Asphalt.	
					PID: 11 ppmv		S-1 (0.5 to 2'): Gray, fine to coarse SAND & GRAVEL, little Silt, trace Cobbles. Sub-rounded. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5')
2	S-2	2 - 4		---	PID: 28 ppmv		S-2 (2 to 4'): Brown, fine to coarse SAND and Clayey Silt, trace Gravel, trace Cobbles. Sub-rounded. Moist. FILL.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9'); 2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
4	S-3	4 - 6		---	PID: 14 ppmv	FILL	S-3 (4 to 6'): Clayey SILT and fine to coarse Gravel. Sub-angular. Moist. FILL.	2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6	S-4	6 - 10		---	PID: 4 ppmv		S-4A (6 to 9.2'): Brown, SILT & CLAY, little fine to medium Sand, trace Gravel, trace Roots. Rounded to sub-rounded. Moist. FILL.	
8								
					PID: NA	-----9.2'----- CONCRETE -----10'-----	S-4B (9.2 to 10'): Concrete. FILL.	
10	S-5	10 - 15		---			S-5 (10 to 15'): Gray, CLAY & SILT, brown mottling starting at ~12.5' bgs. Moist.	
					PID: 2.2 ppmv			
12								
					PID: 84 ppmv			
14						SILT & CLAY		#3 Sand (1.5 to 28')
	S-6	15 - 20		---	PID: 110 ppmv		S-6A (15 to 17.6'): Gray, CLAY & SILT, little brown mottling. Moist.	
16								
					PID: 58 ppmv		S-6B (17.6 to 19.1'): Blue-gray, SILT & CLAY, little Gravel, trace fine Sand. Rounded. Moist.	
18								
					PID: 22 ppmv	-----19.1'-----	S-6C (19.1 to 20'): Gray, Clayey SILT, some fine to coarse Sand, little Gravel, trace Cobbles. Rounded. Wet. STREAM DEPOSITS.	
20	S-7	20 - 25		---	PID: 10 ppmv		S-7A (20 to 23'): Olive brown, SILT, some fine to coarse Sand, little Gravel. Rounded to sub-angular. Wet. STREAM DEPOSITS.	
22						SAND & GRAVEL		
					PID: 3 ppmv		S-7B (23 to 24.8'): Olive brown, GRAVEL, little Cobbles, trace fine to coarse Sand. Rounded to sub-rounded. Wet. STREAM DEPOSITS.	
24								

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WC-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 **Date Finished: 08/16/11**

Logged By: AVK/JSP/JWC **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
	S-8	25 - 30		---	PID: 2.5 ppmv		-----25'-----	S-7C (24.8 to 25'): Olive brown, fine to medium SAND, some Silt, little Gravel, trace Cobbles. Rounded to sub-angular. Wet. STREAM DEPOSITS.		
26								S-8A (25 to 27'): Dark gray, hard, fresh, fine-grained SHALE. Wet.		
					PID: 1.4 ppmv		SHALE	S-8B (27 to 29'): Gray, SILT & CLAY, some fine to coarse Sand, little Gravel (broken Shale). Angular to sub-angular Wet.		
28										
								S-8C (29 to 30'): Gray, moderately hard, fresh, fine-grained Shale. Wet.		Benseal Bentonite (hydrated) (28 to 30')
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered.		
32										
34										
36										
38										
40										
42										
44										
46										
48										
50										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Competent rock observed at around 25' bgs, transitioning to more weathered rock from about 27 to 29' ngs, followed by more competent rock at 29' bgs.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WD-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/31/01 **Date Finished: 10/31/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0		0 - 0.5		---		-----0'----- CONCRETE -----0.5'-----	(0 to 0.5'): Concrete.	
	S-1	0.5 - 5		---	PID: 0.5 ppmv	FILL	S-1 (0.5 to 5'): Light brown, fine to coarse SAND & GRAVEL, little Cobbles. Sub-rounded to sub-angular. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5')
2								2" Dia. Sch. 40 CPVC Riser (0 to 1.9')
4								2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
	S-2	5 - 9		---	PID: 2.4 ppmv		S-2 (5 to 9'): Gray, SILT & CLAY, trace Gravel. Sub-rounded. Moist. FILL.	2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6								
8								
	S-3	9 - 10		---	PID: NA	-----9'----- CONCRETE	S-3 (9 to 10'): (9 to 10'): Concrete. Secon Conc FILL.	
10	S-4	10 - 11.2		---	PID: NA	-----10'----- FILL	S-4 (10 to 11.2'): Gray, SILT & CLAY. Sub-rounded. Moist. FILL.	
	S-5	11.2 - 17.5		---	PID: 2.3 ppmv	-----11.2'----- SILT & CLAY	S-5 (11.2 to 17.5'): SILT & CLAY. Moist. SILT & CLAY.	
12								
14								#3 Sand (1.5 to 27')
16								
18	S-6	17.5 - 20		---	PID: 10 ppmv		S-6 (17.5 to 20'): SILT & CLAY, trace Cobbles, trace, medium-hard SHALE. Moist. SILT & CLAY.	
20	S-7	20 - 25		---	PID: 5.8 ppmv	-----20'----- GLACIAL TILL	S-7A (20 to 24.5'): Fine to coarse SAND & GRAVEL. Sub-angular Moist to wet. TILL.	
22								
24							S-7B (24.5 to 25'): Fine to coarse SAND & GRAVEL.	

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WD-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/31/01 Date Finished: 10/31/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
	S-8	25 - 27		---	PID: 5.3 ppmv		-----25'-----	Sub-angular Moist. TILL.		
26							WEATHERED BEDROCK	S-8 (25 to 27'): Soft, severely weathered aphinatic SHALE. Dry. ROCK.		
							-----27'-----	Boring terminated at 27 feet. No refusal encountered.		
28								NOTES:		
30								1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.		
32										
34								2. Groundwater observed at about 5.8 feet bgs during drilling.		
								3. Severely Weathered bedrock observed at about 25 feet.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WE-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 **Date Finished: 08/16/11**

Logged By: AVK/JSP/JWC **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---	PID: 8.5 ppmv	-----0'----- ASPHALT -----0.5'-----	(0 to 0.5'): Asphalt. S-1 (0.5 to 2'): Brown, fine to coarse SAND & GRAVEL, little Silt, little Cobbles. Rounded to sub-angular. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5')
2	S-2	2 - 4		---	PID: 92 ppmv		S-2 (2 to 4'): Dark brown, fine to coarse SAND & GRAVEL, trace Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9') 2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
4	S-3	4 - 6		---	PID: 6.5 ppmv	FILL	S-3 (4 to 6'): Gray, SILT & CLAY and fine to coarse Sand, little Gravel. Sub-angular. Moist. FILL. Steel plates at 4.7' bgs.	2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6	S-4	6 - 10		---	PID: 13 ppmv	-----7'----- CONCRETE -----7.5'-----	S-4A (6 to 7'): Gray, SILT & CLAY and fine to coarse Sand, little Gravel. Sub-angular. Moist. FILL. S-4B (7 to 7.5'): Concrete. FILL.	
8					PID: 421 ppmv		S-4C (7.5 to 10'): Blocked by Concrete plug, unable to get representative sample. Gray, SILT & CLAY pushed up around plug. Petroleum odor. Wet.	
10	S-5	10 - 15		---	PID: 435 ppmv PID: 1241 ppmv	SILT & CLAY	S-5A (10 to 11'): Gray, SILT & CLAY. Moist. S-5B (11 to 13.6'): Gray, CLAY & SILT, brown mottling and some black staining. Moist.	
14					PID: 488 ppmv	-----14.6'-----	S-5C (13.6 to 14.6'): Brownish gray, CLAY & SILT, some fine to coarse Sand, little Gravel, trace Cobbles. Rounded to angular. Moist. S-5D (14.6 to 15'): Gray, Clayey SILT, some fine to coarse Sand, some Gravel, trace Cobbles. Rounded to sub-rounded. Moist to wet. STREAM DEPOSITS.	#3 Sand (1.5 to 25')
15	S-6	15 - 21		6/2	PID: 249 ppmv PID: 250 ppmv	SAND & GRAVEL	S-6 (15 to 21'): Gray - olive brown, SILT & CLAY, little fine to medium Sand, trace Gravel, trace Cobbles. Rounded to sub-rounded. Wet. STREAM DEPOSITS.	
21	S-7	21 - 25		---	PID: 94 ppmv	-----22'-----	S-7A (21 to 22'): Olive brown - gray, SILT & CLAY and fine to coarse Sand, little Gravel, trace Cobbles. Rounded to sub-rounded. Wet. STREAM DEPOSITS.	
22					PID: 22 ppmv	TILL -----23'-----	S-7B (22 to 23'): Olive brown - gray, SILT & CLAY, little fine to coarse Sand, little Gravel. Sub-angular to angular. Moist.	
23					PID: 4.7 ppmv	SHALE	S-7C (23 to 24'): Dark gray, moderately hard, very slightly weathered, aphanitic SHALE. Dry.	
24					PID: 3 ppmv	-----25'-----	S-7D (24 to 25'): Gray, SILT & CLAY, little fine to coarse Sand, little Gravel. Angular. Moist. WEATHERED BEDROCK.	
26							Boring terminated at 25 feet. No refusal encountered.	
28								

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WE-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 Date Finished: 08/16/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
28								NOTES:		
30										
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34										
36										
38										
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NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Groundwater observed at about 7.5' bgs during drilling.

3. Competent bedrock observed at about 23' bgs.

4. S-6 is a composite of 1.5' recovery over 5' of depth. Driller was unable to get soil to stay in the core barrel. Drilling action indicated wet and/or softer soils.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WF-01

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/09/11 **Date Finished:** 08/15/11

Logged By: AVK/JSP/JWC **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---		0' ASPHALT 0.4'	(0 to 0.4'): Asphalt.	
					PID: 0.7 ppmv		S-1 (0.4 to 2'): Brown, fine to coarse SAND & GRAVEL, little Silt, trace Cobbles. Rounded to sub-angular. Moist. FILL.	Concrete - to be completed by others. (0 to 1.5')
2	S-2	2 - 4		---	PID: 0.4 ppmv		S-2 (2 to 4'): Brown, SILT & CLAY and fine to coarse Sand, little Gravel. Sub-angular. Moist. FILL.	2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9')
								2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
4	S-3	4 - 6		---	PID: 0.6 ppmv	FILL	S-3 (4 to 6'): Brown, SILT & CLAY, some fine to coarse Sand, trace Gravel. Sub-angular. Wet. FILL.	
	S-4	5 - 10		---				2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6					PID: 0.5 ppmv		S-4A (6 to 8.5'): Brown, SILT and fine to coarse Sand, little Gravel (fining downward). Rounded to sub-angular. Wet. FILL.	
8					PID: 0.3 ppmv	8.5'	S-4B (8.5 to 10'): Brownish-gray, CLAY & SILT, little Gravel, trace Sand, trace Organics. Peat-layering. Moist.	
10	S-5	10 - 15		---	PID: NA		S-5A (10 to 11'): Gray, CLAY & SILT, little Gravel, trace Sand, trace Organics. Moist.	
					PID: 0.3 ppmv		S-5B (11 to 11.9'): CLAY & SILT. Moist.	
12					PID: 0.3 ppmv	SILT & CLAY	S-5C (11.9 to 15'): Gray, SILT & CLAY, trace fine to medium Sand. Brown mottling. Moist.	#3 Sand (1.5 to 25')
14								
	S-6	15 - 20		---	PID: 0.4 ppmv		S-6A (15 to 16'): Gray, SILT & CLAY, little fine to coarse Sand, trace Gravel, trace Roots. Wet.	
16					PID: 0.3 ppmv		S-6B (16 to 17'): Gray, SILT & CLAY, trace fine to medium Sand, trace Gravel. Brown mottling. Moist.	
					PID: 3.7 ppmv	17'	S-6C (17 to 20'): Gray, Clayey SILT, some Sand, some Gravel, trace Cobbles. Rounded to sub-angular. Wet. STREAM DEPOSITS.	
18						SAND & GRAVEL		
20	S-7	20 - 25		---	PID: 0.9 ppmv		S-7A (20 to 21'): Gray, Clayey SILT, some Sand, some Gravel, trace Cobbles. Rounded to sub-angular. Wet. STREAM DEPOSITS.	
					PID: 7.1 ppmv	21'	S-7B (21 to 23.5'): Dark gray, moderately hard, slightly weathered SHALE (becoming more weathered with depth). Dry.	
22						SHALE		
24					PID: 0.5 ppmv		S-7C (23.5 to 25'): Dark gray, moderately hard, very severely weathered SHALE (solid rock fragments in weathered soil matrix). Wet.	

SANBORN HEAD Sanborn, Head & Associates, Inc.	Project: Building 57 Location: Endicott, NY Project No.: 2466.03	Log of Chimney Well CW-WF-01 Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/09/11 **Date Finished:** 08/15/11

Logged By: AVK/JSP/JWC **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
							-----25'-----	Boring terminated at 25 feet. No refusal encountered.		
26								NOTES:		
28								1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.		
30								2. Competent bedrock observed at about 21' bgs.		
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SANBORN ||| HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WF-03

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/09/11 **Date Finished:** 08/15/11

Logged By: AVK/JSP/JWC **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
0	S-1	0 - 2		---			-----0'----- ASPHALT -----0.5'-----	(0 to 0.5'): Asphalt.		
					PID: 0.1 ppmv			S-1 (0.5 to 2'): Brown, fine to coarse SAND & GRAVEL, trace Silt, trace Cobbles. Sub-rounded. Moist. FILL.		Concrete - to be completed by others. (0 to 1.5')
2	S-2	2 - 4		---	PID: 2.2 ppmv			S-2 (2 to 4'): Gray, fine to coarse SAND & GRAVEL, some Clayey Silt. Sub-angular. Moist. FILL.		2" Dia. Sch. 40 CPVC Riser (0.1 to 1.9')
										2" Dia. Sch. 40 Stainless Steel Well Screen (0.010" Slots) (1.9 to 4.9')
4	S-3	4 - 6		---	PID: 8.8 ppmv		FILL	S-3 (4 to 6'): Gray, CLAY & SILT, some fine to coarse Sand, reddish mottling. Sub-angular. Moist. FILL.		2" Dia. Sch. 40 CPVC End Cap (4.9 to 5')
6	S-4	6 - 10		---	PID: 13 ppmv			S-4A (6 to 7'): Olive brown, SILT & CLAY, some fine to coarse Sand, little Gravel. Rounded to sub-rounded. Moist. FILL.		
					PID: 47 ppmv		-----7'-----	S-4B (7 to 9'): Gray, CLAY & SILT, trace Gravel, little black staining. Sub-rounded to sub-angular. Moist.		
8							SILT & CLAY			
					PID: 53 ppmv		-----9'----- PEAT -----9.4'-----	S-4C (9 to 9.4'): Black, CLAY & SILT, some Organic Material (Wood, Roots), trace Metal. Slight petroleum odor. Moist. PEAT.		
					PID: 43 ppmv			S-4D (9.4 to 10'): Olive brown to gray, SILT & CLAY, little Gravel, trace fine to coarse Sand, trace Roots. Sub-angular to angular. Moist.		
10	S-5	10 - 15		---	PID: 77 ppmv			S-5 (10 to 15'): Gray, SILT & CLAY, brown mottling at 12' bgs. Slight petroleum order at 12' bgs. Moist.		
12										
14					PID: 96 ppmv		SILT & CLAY			
	S-6	15 - 20		---	PID: 111 ppmv			S-6A (15 to 16.7'): Gray, SILT & CLAY, brown mottling, visible staining at top. Moist.		
16										#3 Sand (1.5 to 30')
					PID: 134 ppmv			S-6B (16.7 to 17.8'): Grayish brown, SILT & CLAY, little Gravel, trace Sand. Rounded to sub-rounded. Moist.		
18					PID: 2.5 ppmv		-----17.8'-----	S-6C (17.8 to 20'): Gray, fine to coarse SAND, some Silt, some Gravel, trace Cobbles. Rounded to sub-rounded. Wet. STREAM DEPOSITS.		
20	S-7	20 - 25		---	PID: 36 ppmv		SAND & GRAVEL	S-7A (20 to 21.5'): Gray, SILT & CLAY, little Gravel, trace Sand, trace Cobbles. Rounded to sub-angular. Moist. STREAM DEPOSITS.		
					PID: 7.9 ppmv			S-7B (21.5 to 22.5'): Fine to coarse SAND, some Gravel, some Silt. Rounded to sub-angular. Wet. SAND & GRAVEL.		
22					PID: 1.2 ppmv		-----22.5'-----	S-7C (22.5 to 25'): Gray, SILT & CLAY, little Gravel (broken Shale), trace fine to coarse Sand. Angular to sub-angular. Moist.		
24							TILL			

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SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Chimney Well CW-WF-03

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Hand Auger (0 - 7')/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/09/11 Date Finished: 08/15/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
25	S-8	25 - 30		---	PID: 1.7 ppmv		-----25'----- SHALE	S-8 (25 to 30'): Gray, hard to moderately hard, very slightly weathered, aphanitic SHALE. 27 - 28.5' increased Clay weathering. Wet.		
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered.		

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Competent bedrock observed at about 25' bgs.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BB-04

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/05/11 **Date Finished: 08/05/11**
Logged By: EMB/AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE	(0 to 0.8'): Concrete.	
					PID: 0.7 ppmv	-----0.8'-----	S-1A (0.8 to 1.9'): Light brown, fine to coarse SAND, some Gravel, little Silt, trace Cobbles. Sub-rounded to angular. Dry. FILL.	1¼" Dia. CPVC Riser (0.7 to 29.9')
2					PID: 22 ppmv		S-1B (1.9 to 5'): Dark brown, fine to coarse SAND, little Silt, trace Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	Portland Cement Grout (1.6 to 30')
4						FILL		
	S-2	5 - 10		5/5	PID: 0.7 ppmv		S-2A (5 to 6.4'): Dark brown, fine to coarse SAND, little Gravel, little Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	Thermocouple installed (5')
6					PID: 0.5 ppmv	-----6.4'-----	S-2B (6.4 to 7.2'): Gray, CLAY & SILT, little fine to coarse Sand, trace Gravel, trace Cobbles. Rounded to sub-angular. Moist.	
8					PID: 0.8 ppmv		S-2C (7.2 to 7.8'): Clayey SILT and fine Sand, trace Gravel. Sub-rounded. Wet.	
					PID: 0.5 ppmv		S-2D (7.8 to 10'): Gray, CLAY & SILT, trace fine to medium Sand, trace Gravel. Sub-angular. Moist.	
10	S-3	10 - 15		5/5	PID: 0.9 ppmv	SILT & CLAY	S-3A (10 to 11.2'): Dark gray, fine SAND and SILT, trace Gravel. Sub-angular. Wet.	Thermocouple installed (10')
12					PID: 0.7 ppmv		S-3B (11.2 to 13.6'): Gray & tan, fine SAND and SILT, trace Gravel. Sub-angular. Moist.	
14					PID: 0.6 ppmv	-----13.6'-----	S-3C (13.6 to 15'): Brown, fine CLAY & SILT, trace medium to coarse Sand, trace Cobbles. Angular. Moist.	
	S-4	15 - 20		5/5	PID: 0.9 ppmv		S-4 (15 to 20'): Brown, Clayey SILT, little Gravel, trace Sand, Gray Weathered Bedrock in tip of core barrel. Angular. Moist.	Thermocouple installed (15')
16						TILL		
18								
20	S-5	20 - 25		5/6	PID: 0.4 ppmv	-----20'-----	S-5 (20 to 25'): Soft, very severely weathered, gray, aphanitic SHALE with some gravel-sized Shale fragments.	Thermocouple installed (20')
22						SHALE		
24								

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BB-04

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/05/11 **Date Finished: 08/05/11**
Logged By: EMB/AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
	S-6	25 - 30		5/5	PID: 0.3 ppmv			S-6A (25 to 27'): Soft, very severely weathered, gray, aphanitic SHALE with some gravel-sized Shale fragments.		Thermocouple installed (25')
26										
					PID: 0.1 ppmv		SHALE	S-6B (27 to 30'): Moderately hard, moderately weathered, gray, aphanitic SHALE.		
28										
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered.		
32										
34										
36										
38										
40										
42										
44										
46										
48										
50										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Groundwater observed at about 7.5 ft bgs during drilling.
3. Weathered bedrrock encountered at about 20.0 ft bgs, more competent bedrock encountered at about 27.0 ft bgs.

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SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BD-03

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/04/11 **Date Finished: 08/04/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE	(0 to 1.2'): Concrete.	1¼" Dia. CPVC Riser (0.7 to 40.9')
					PID: 0.5 ppmv	-----1.2'-----	S-1A (1.2 to 2.9'): Light brown, fine to coarse SAND, some Gravel, trace Cobbles, trace Silt. Rounded to sub-angular. Dry. FILL.	Portland Cement Grout (1.4 to 41')
2					PID: 16 ppmv	FILL	S-1B (2.9 to 5'): Dark brown, fine to coarse SAND & GRAVEL, little Silt, trace Brick. Rounded to angular. Moist. FILL.	
4	S-2	5 - 10		5/5	PID: 3.2 ppmv		S-2A (5 to 6.6'): Dark brown, fine to coarse SAND, little Gravel, little Silt, trace Cinders. Rounded to angular. Moist. FILL.	Thermocouple installed (5')
6					PID: 14 ppmv	-----6.6'-----	S-2B (6.6 to 8.9'): Dark gray, fine to coarse SAND and SILT, little Gravel, little Organics. Rounded to angular. Moist. STREAM DEPOSITS.	
8					PID: 0.7 ppmv	STREAM DEPOSITS	S-2C (8.9 to 10'): Light brown, fine to coarse SAND, little Gravel, trace Silt. Rounded to angular. Moist. STREAM DEPOSITS.	
10	S-3	10 - 15		5/5	PID: 9.1 ppmv		S-3A (10 to 11'): Dark gray, fine to coarse SAND and SILT, little Gravel, little Organics. Rounded to sub-angular. Wet. STREAM DEPOSITS.	Thermocouple installed (10')
					PID: 68 ppmv	-----11'-----	S-3B (11 to 11.9'): Dark gray, CLAY & SILT, trace fine to coarse Sand, trace Gravel. Sub-angular to angular. Wet.	
12					PID: 1.7 ppmv		S-3C (11.9 to 15'): Gray, Silty CLAY. Wet.	
14						SILT & CLAY		
	S-4	15 - 20		5/3	PID: 64 ppmv		S-4A (15 to 17.9'): Gray, Silty CLAY, trace coarse Sand, trace Gravel. Sub-angular to angular. Wet.	Thermocouple installed (15')
16								
18					PID: 2 ppmv	-----17.9'-----	S-4B (17.9 to 18.2'): Hard, slightly weathered, light gray, aphanitic SHALE (Cobble). Dry.	
					PID: 11 ppmv		S-5A (18.2 to 19.5'): Gray, SILT & CLAY, trace Gravel. Sub-rounded to rounded. Moist.	
					PID: 8.8 ppmv		S-5B (19.5 to 20.3'): Hard, gray & tan, Clayey SILT, little Gravel. Sub-rounded to sub-angular. Dry.	
20	S-5	20 - 25		5/7	PID: 26 ppmv	TILL	S-5C (20.3 to 22.7'): Gray, CLAY & SILT, little fine to coarse Sand, trace Gravel. Sub-rounded to angular. Wet.	Thermocouple installed (20')
22					PID: 13 ppmv	-----22.7'-----	S-5D (22.7 to 25'): Soft, very severely weathered, light gray, aphanitic SHALE.	
24						SHALE		

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BD-03

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/04/11 **Date Finished: 08/04/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
	S-6	25 - 30		5/5	PID: 1.5 ppmv			S-6 (25 to 30'): Soft, very severely weathered, gray, aphanitic SHALE.		Thermocouple installed (25')
26										
28										
30	S-7	30 - 35		5/5	PID: 0.5 ppmv			S-7 (30 to 35'): Soft, very severely weathered, gray, aphanitic SHALE. Slightly more competent 32.3 - 32.7' and 34.8 - 35'.		Thermocouple installed (30')
32										
							SHALE			
34										
	S-8	35 - 39		4/4	PID: 1.9 ppmv			S-8 (35 to 39'): Soft, very severely weathered, gray, aphanitic SHALE. More competent zone from 38.6 - 38.9'.		Thermocouple installed (35')
36										
38										
	S-9	39 - 41		2/2	PID: 0.6 ppmv			S-9 (39 to 41'): Soft, severely weathered, gray, aphanitic SHALE. Grading more competent with depth.		
40										Thermocouple installed (40')
							-----41'-----	Boring terminated at 41 feet. No refusal encountered.		
42										
44										
46										
48										
50										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Groundwater observed at about 10 ft bgs during drilling.

3. Weathered bedrock encountered at about 22.7 ft bgs, more competent bedrock not encountered before 41.0 ft bgs.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BD-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 **Date Finished: 08/07/11**
Logged By: EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
0	S-1	0 - 5		5/5			-----0'----- CONCRETE -----0.7'-----	(0 to 0.7'): Concrete.		1¼" Dia. Sch. 40 CPVC Riser (0 to 38')
					PID: 1.2 ppmv			S-1A (0.7 to 3.5'): Light brown, fine to coarse SAND & GRAVEL, trace Silt. Sub-rounded to sub-angular. Moist. FILL.		Portland Cement Grout (1.5 to 38')
2										
4					PID: 22 ppmv			S-1B (3.5 to 5'): Dark brown, fine to coarse SAND, little Gravel, little Silt. Sub-rounded to sub-angular. Moist. FILL.		
	S-2	5 - 10		5/5	PID: 91 ppmv		FILL	S-2A (5 to 8.2'): Dark brown to black, fine to coarse SAND, little Gravel, little Silt. Sub-rounded to sub-angular. Wet. Strong odor and black staining from 7.2 - 8.2' bgs. FILL.		Thermocouple installed (5')
6										
8					PID: 162 ppmv			S-2B (8.2 to 10'): Olive gray, fine to medium SAND, little Silt, trace Gravel. Sub-rounded to angular. Wet. FILL.		
10	S-3	10 - 15		5/5	PID: 8.5 ppmv		-----10'-----	S-3 (10 to 15'): Gray, Silty CLAY, trace Gravel. Sub-rounded. Wet.		Thermocouple installed (10')
12										
							SILT & CLAY			
14										
	S-4	15 - 20		5/5	PID: 76 ppmv			S-4A (15 to 16.1'): Gray with red mottling, Silty CLAY. Moist.		Thermocouple installed (15')
16					PID: 2.8 ppmv		-----16.1'-----	S-4B (16.1 to 20'): Olive gray, CLAY & SILT and Gravel, trace Sand. Large Cobble from 18.5 - 20' bgs (gray Shale). Sub-rounded to angular. Moist.		
18										
20	S-5	20 - 25		5/6	PID: 48 ppmv		TILL	S-5A (20 to 23.8'): Olive gray, CLAY & SILT, little Gravel, trace Sand. Sub-rounded to angular. Moist.		Thermocouple installed (20')
22										
24					PID: 23 ppmv		-----23.8'----- SHALE	S-5B (23.8 to 25'): Soft, very severely weathered, gray, aphanitic SHALE. Gravel-sized competent Shale fragments.		

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BD-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

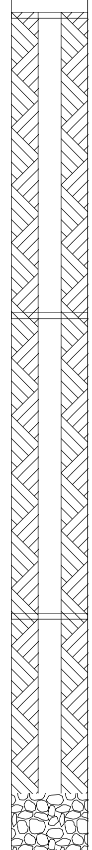
Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 **Date Finished: 08/07/11**
Logged By: EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Description
	S-6	25 - 30		5/5	PID: 0.9 ppmv			S-6 (25 to 30'): Soft, very severely weathered, gray, aphanitic SHALE. Gravel-sized competent Shale fragments.	Thermocouple installed (25')
26									
28									
30	S-7	30 - 35		5/5	PID: 1.1 ppmv			S-7 (30 to 35'): Soft, very severely weathered, gray, aphanitic SHALE. Gravel to Cobble-sized Shale fragments.	Thermocouple installed (30')
32							SHALE		
34									
	S-8	35 - 39		4/4	PID: 0.6 ppmv			S-8A (35 to 38.5'): Medium hard, severely weathered, gray, aphanitic SHALE, more intact Shale pieces than above.	Thermocouple installed (35')
36									
38					PID: 0.7 ppmv		-----39'-----	S-8B (38.5 to 39'): Medium hard, moderately weathered, gray, aphanitic SHALE.	Formation Material (38 to 39')
40								Boring terminated at 39 feet. No refusal encountered.	
42									
44									
46									
48									
50									

Well Diagram



NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Groundwater observed at about 8 ft bgs during drilling.

3. Weathered bedrock encountered at about 23.8 ft bgs, more competent bedrock encountered at about 38.5 ft bgs.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BD-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/05/11 | **Date Finished: 08/05/11**
Logged By: EMB/AVK | **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		---		-----0'----- CONCRETE	(0 to 1.1'): Concrete.	1¼" Dia. Sch. 40 CPVC Riser (0 to 33')
					PID: 0.5 ppmv	-----1.1'-----	S-1A (1.1 to 3.3'): Brown, fine to coarse SAND, little Gravel, little Cobbles, little Silt. Rounded to angular. Dry. FILL.	Portland Cement Grout (1 to 33')
					PID: 3 ppmv		S-1B (3.3 to 5'): Dark brown, fine to coarse SAND, little Silt, little Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
5	S-2	5 - 10		---	PID: 2.4 ppmv	FILL	S-2A (5 to 7.7'): Dark brown, fine to coarse SAND, little Silt, little Gravel, trace Cobbles. Rounded to sub-rounded. Moist. FILL.	Thermocouple installed (5')
					PID: 1.4 ppmv		S-2B (7.7 to 10'): Fine to coarse SAND and SILT, trace Gravel, trace Cobbles. Sub-rounded to angular. Wet. FILL.	
10	S-3	10 - 15		---	PID: 0.5 ppmv	-----10'-----	S-3A (10 to 11.9'): Dark gray, fine SAND and SILT, trace Gravel. Sub-angular. Wet.	Thermocouple installed (10')
					PID: 0.5 ppmv	SILT & CLAY	S-3B (11.9 to 15'): Gray & tan, SILT & CLAY with reddish mottling, trace Gravels, trace medium to coarse Sand, trace Cobbles. Sub-angular to angular. Moist.	
15	S-4	15 - 20		---	PID: 0.6 ppmv	-----15'----- TILL	S-4 (15 to 20'): Light gray & tan, medium to coarse SAND, little Silt & Clay, little Gravel, little Cobbles. Angular. Dry.	Thermocouple installed (15')
20	S-5	20 - 25		---	PID: 0.3 ppmv		S-5A (20 to 21'): Light gray & tan, fine to coarse SAND, little Silt & Clay, trace Gravel, trace Cobbles. Sub-angular to angular. Moist.	Thermocouple installed (20')
					PID: 0.4 ppmv	-----21'-----	S-5B (21 to 22.9'): Medium hard, moderately weathered, gray, aphanitic SHALE with gravel-sized Shale fragments.	
					PID: 0.3 ppmv	SHALE	S-5C (22.9 to 25'): Soft, very severely weathered, gray, aphanitic SHALE.	

SANBORN HEAD Sanborn, Head & Associates, Inc.	Project: Building 57 Location: Endicott, NY Project No.: 2466.03	Log of Temperature Monitoring Point TMP-BD-06 Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/05/11 Date Finished: 08/05/11
Logged By: EMB/AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
	S-6	25 - 30		---	PID: 0.3 ppmv			S-6A (25 to 28.7'): Soft, severely weathered, gray, aphanitic SHALE.		Thermocouple installed (25')
26										
28										
					PID: 0.4 ppmv			S-6B (28.7 to 30'): Very soft, severely weathered, light brown, aphanitic SHALE.		
30	S-7	30 - 35		---	PID: 0.3 ppmv		SHALE	S-7A (30 to 33.9'): Very soft, severely weathered, light brown, aphanitic SHALE, with some gravel-sized Shale fragments.		Thermocouple installed (30')
32										
34					PID: 0.6 ppmv			S-7B (33.9 to 35'): Hard, slightly weathered, gray, aphanitic SHALE.		Formation Material (33 to 35')
							-----35'-----	Boring terminated at 35 feet. No refusal encountered.		
36										
38										
40										
42										
44										
46										
48										
50										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Groundwater observed at about 7.7 ft bgs during drilling.

3. Weathered bedrock encountered at about 21.0 ft bgs, more competent bedrock encountered at about 33.9 ft bgs.

SANBORN ||| HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BE-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/31/11 Date Finished: 10/31/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log	Description			
										1¼" Dia. CPVC Riser (1 to 22.4')
2										
4										
	S-2	5 - 10		---	PID: 1.4 ppmv		FILL	S-2 (5 to 10'): Dark brown - blackish, fine to coarse SAND & GRAVEL. Sub-angular. Moist. FILL. (Wet at approximately 9.4 ft bgs.).		Thermocouple installed (5')
6										
8										
10	S-3	10 - 17.7		---	PID: 1.7 ppmv		-----10'-----	S-3 (10 to 17.7'): Gray, SILT & CLAY. Moist. SILT & CLAY.		Thermocouple installed (10')
12										Portland Cement Grout (1 to 22.5')
14							SILT & CLAY			
										Thermocouple installed (15')
16										
18	S-4	17.7 - 20		---	PID: 1.2 ppmv		-----17.7'----- TILL	S-4 (17.7 to 20'): Light gray, Clayey SILT, little medium to coarse Sand, and Gravel, trace Cobbles, trace Weathered SHALE.		
20	S-5	20 - 22.5		---	PID: 0.5 ppmv		-----20'----- WEATHERED BEDROCK	S-5 (20 to 22.5'): Soft, severely weathered, aphanitic SHALE. Moist. Weathered BEDROCK.		Thermocouple installed (20')
22							-----22.5'-----	Boring terminated at 22.5 feet. No refusal encountered.		
24								NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume		

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BE-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/31/11
Date Finished: 10/31/11
Logged By: AVK
Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
26								(ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed at about 9.5 feet bgs during drilling. 3. Severely Weathered bedrock observed at about 20 feet bgs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BF-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/29/11 **Date Finished: 10/30/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
1								1¼" Dia. CPVC Riser (1 to 22.5')
5						FILL		Thermocouple installed (5')
9.5	S-2	9.5 - 18.1		---	PID: ND	-----9.5'-----	S-2 (9.5 to 18.1'): Gray & tan, SILT & CLAY, little Gravel, trace Cobbles, trace, weathered, gray, aphanitic SHALE. Sub-angular Moist. TILL.	
10								Thermocouple installed (10')
12								Portland Cement Grout (1 to 22.6')
14						SILT & CLAY		
15								Thermocouple installed (15')
18.1	S-3	18.1 - 20		---	PID: 18 ppmv	-----18.1'-----	S-3 (18.1 to 20'): Gray, SILT & CLAY and fine to coarse Sand, some Gravel. Moist.	
19						TILL		
20	S-4	20 - 21		---			(20 to 21'): No recovery.	Thermocouple installed (20')
21	S-5	21 - 22.6		---	PID: 69 ppmv	-----21'----- WEATHERED BEDROCK	S-4 (21 to 22.6'): Gray, soft, severely weathered, aphanitic SHALE. Dry. ROCK.	
22.6						-----22.6'-----	Boring terminated at 22.5 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BF-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 10/29/11 Date Finished: 10/30/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
26								(ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed at about 9.5 feet bgs during drilling. 3. Severely Weathered bedrock observed at about 21 feet bgs.		
28										
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BF-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/06/11 **Date Finished: 08/07/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE -----0.7'-----	(0 to 0.7'): Concrete.	1¼" Dia. Sch. 40 CPVC Riser (0 to 43')
					PID: 5.9 ppmv	FILL	S-1A (0.7 to 4.1'): Light brown, fine to coarse SAND, some Silt, some Gravel, little Cobbles. Rounded to angular. Dry. FILL.	Portland Cement Grout (1.5 to 43')
4					PID: 9.2 ppmv		S-1B (4.1 to 5'): Dark brown, fine to coarse SAND, some Gravel, little Silt. Rounded to sub-angular. Moist. FILL.	
	S-2	5 - 10		5/3	PID: 3.7 ppmv		S-2 (5 to 7.3'): Brown, fine to coarse SAND & GRAVEL, some Silt, trace Cobbles. Rounded to sub-angular. Moist. FILL.	Thermocouple installed (5')
						-----7.3'----- CONCRETE -----8.2'-----	(7.3 to 8.2'): Concrete.	
8							(8.2 to 10'): No recovery.	
10	S-3	10 - 15		5/5	PID: 1.8 ppmv	-----10'----- SILT & CLAY	S-3 (10 to 15'): Gray, CLAY & SILT. Moist.	Thermocouple installed (10')
	S-4	15 - 20		5/5	PID: 3.3 ppmv		S-4A (15 to 17.1'): Gray & tan, CLAY & SILT with reddish mottling. Moist.	Thermocouple installed (15')
					PID: 17 ppmv	-----17.1'----- TILL	S-4B (17.1 to 20'): Gray & tan, Clayey SILT, some medium to coarse Sand, trace Gravel. Sub-angular to angular. Dry.	
20	S-5	20 - 25		5/5	PID: 52 ppmv		S-5A (20 to 20.9'): Gray, SILT & CLAY and fine to coarse Sand, some Gravel. Moist.	Thermocouple installed (20')
					PID: 51 ppmv	-----20.9'----- SHALE	S-5B (20.9 to 25'): Very soft, very severely weathered, gray, aphanitic SHALE.	
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BF-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/06/11 **Date Finished: 08/07/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
	S-6	25 - 30		5/5	PID: 63 ppmv			S-6 (25 to 30'): Very soft, very severely weathered, gray, aphanitic SHALE. Wet from 28.2 to 30' bgs.		Thermocouple installed (25')
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30	S-7	30 - 35		5/5	PID: 30 ppmv			S-7 (30 to 35'): Soft, severely weathered, gray, aphanitic SHALE. Wet from 33.2 - 34.1' bgs. More competent from 31.3 - 32.4' bgs.		Thermocouple installed (30')
32										
34							SHALE			
	S-8	35 - 40		5/5	PID: NA			S-8 (35 to 40'): Soft, severely weathered, gray, aphanitic SHALE.		Thermocouple installed (35')
36										
38										
40	S-9	40 - 44		4/4	PID: 0.9 ppmv			S-9A (40 to 43.1'): Medium hard, severely weathered, gray, aphanitic SHALE.		Thermocouple installed (40')
42										
					PID: 1.1 ppmv			S-9B (43.1 to 44'): Hard, slightly weathered, gray, aphanitic SHALE.		Formation Material (43 to 44')
44							-----44'-----	Boring terminated at 44 feet. No refusal encountered.		
46								NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the		
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SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BF-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/06/11 Date Finished: 08/07/11
Logged By: AVK/EMB Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
50								presence of VOCs. 2. Groundwater observed at <10 ft bgs during drilling (no recovery from 8.2 - 10 ft bgs). 3. Weathered bedrock encountered at about 25.0 ft bgs, more competent bedrock encountered at about 43.1 ft bgs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BF-08

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/05/11 **Date Finished: 08/06/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		5/5		-----0'----- CONCRETE -----0.7'-----	(0 to 0.7'): Concrete.	1¼" Dia. Sch. 40 CPVC Riser (0 to 30')
					PID: 1.9 ppmv	FILL	S-1A (0.7 to 2.8'): Brown, fine to coarse SAND, little Gravel, little Cobbles, trace Silt. Rounded to sub-angular. Moist. FILL.	Portland Cement Grout (1.2 to 30')
2					PID: 10 ppmv		S-1B (2.8 to 4.6'): Dark brown, fine to coarse SAND, little Silt, trace Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
4						-----4.6'----- CONCRETE -----5'-----	(4.6 to 5'): Concrete. FILL.	
	S-2	5 - 10		---	PID: 5.7 ppmv	FILL	S-2A (5 to 7.5'): Dark brown, fine to coarse SAND, little Silt, trace Gravel, trace Cobbles. Sub-rounded. Moist. FILL.	Thermocouple installed (5')
6						-----7.5'-----		
8					PID: 3.1 ppmv	SILT & CLAY	S-2B (7.5 to 10'): Gray, CLAY & SILT, some fine to coarse Sand, trace Gravel, trace Cobbles. Sub-angular to angular. Moist.	
10	S-3	10 - 15		---	PID: 1.9 ppmv		S-3A (10 to 11.2'): Dark gray, fine SAND and SILT, trace Gravel. Sub-angular. Wet.	Thermocouple installed (10')
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	S-4	15 - 20		5/5	PID: 2.4 ppmv	-----15.7'-----	S-4A (15 to 15.7'): Gray, Silty CLAY with reddish mottling. Moist.	Thermocouple installed (15')
16					PID: 4.5 ppmv	TILL	S-4B (15.7 to 20'): Clayey SILT and fine to coarse Sand, trace Gravel, trace Cobbles. Sub-rounded to angular. Dry.	
18								
20	S-5	20 - 25		5/5	PID: 3.3 ppmv		S-5A (20 to 23.8'): Clayey SILT, some fine to coarse Sand, trace Gravel, trace Cobbles. Sub-angular to angular. Moist.	Thermocouple installed (20')
22						-----23.8'-----		
24					PID: 2.1 ppmv	SHALE	S-5B (23.8 to 25'): Very soft, severely weathered, aphanitic, light gray SHALE.	

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-BF-08

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/05/11 **Date Finished: 08/06/11**
Logged By: AVK/EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
	S-6	25 - 30		5/5	PID: 1.2 ppmv			S-6A (25 to 28.4'): Very soft, severely weathered, aphanitic, light gray SHALE.		Thermocouple installed (25')
26										
							SHALE			
28					PID: 1.3 ppmv			S-6B (28.4 to 30'): Medium hard, moderately weathered, gray, aphanitic SHALE.		
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered.		
32								NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed at about 7.5 ft bgs during drilling. 3. Weathered bedrock encountered at about 23.8 ft bgs, more competent bedrock encountered at about 28.4 ft bgs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-CC-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/08/11 **Date Finished: 08/08/11**
Logged By: EMB **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 6.5		7/7		-----0'----- CONCRETE -----0.7'-----	(0 to 0.7'): Concrete.	1¼" Dia. Sch. 40 CPVC Riser (0 to 25')
					PID: 2.2 ppmv	FILL	S-1A (0.7 to 4.4'): Light brown, fine to coarse SAND & GRAVEL, trace Silt. Sub-angular to rounded. Moist. FILL.	Portland Cement Grout (1.5 to 25')
2								
4					PID: 5.7 ppmv	-----4'----- CONCRETE	S-1B (4.4 to 6.5'): Light gray, Concrete. Dry. FILL.	Thermocouple installed (5')
6	S-2	6.5 - 10		3/3	PID: 1.1 ppmv	-----6.5'----- SILT & CLAY	S-2 (6.5 to 10'): Gray, CLAY & SILT. Moist.	
8								
10	S-3	10 - 15		5/5	PID: 1.5 ppmv		S-3A (10 to 11.9'): Olive gray, CLAY & SILT, red mottling. Wet.	Thermocouple installed (10')
12					PID: 1.3 ppmv	-----11.9'----- TILL	S-3B (11.9 to 15'): Tan & gray, SILT & CLAY, little Gravel. Angular to rounded Moist.	
14								
	S-4	15 - 20		5/5	PID: 1.7 ppmv		S-4 (15 to 20'): Olive tan, Clayey SILT, little Gravel. Round to angular Moist. Wet from 16.9 - 18.4' bgs.	Thermocouple installed (15')
16								
18								
20	S-5	20 - 25		5/6	PID: 1.3 ppmv	-----20.1'-----	S-5A (20 to 20.1'): Olive tan, Clayey SILT, some Gravel. Sub-angular to angular. Moist.	Thermocouple installed (20')
					PID: 1.7 ppmv	SHALE	S-5B (20.1 to 25'): Soft to moderately hard, very severely to moderately weathered, gray, aphanitic SHALE grading more competent with depth.	
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-CC-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/08/11 | **Date Finished: 08/08/11**
Logged By: EMB | **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
							-----25'-----	Boring terminated at 25 feet. No refusal encountered. NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed at about 7.5 ft bgs during drilling.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-CE-07

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/09/11 **Date Finished: 08/09/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---	PID: 0.8 ppmv	-----0'----- FILL	(0 to 0.4'): Asphalt. S-1 (0.4 to 2'): Dark brown, fine to coarse SAND & GRAVEL, trace Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	1¼" Dia. Sch. 40 CPVC Riser (0 to 22'); Portland Cement Grout (1.5 to 22')
2	S-2	2 - 4		---	PID: 0.3 ppmv		S-2 (2 to 4'): Brown, fine to coarse SAND & GRAVEL, little Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
4	S-3	4 - 6		---	PID: 0.5 ppmv		S-3 (4 to 6'): Dark brown, fine to coarse SAND & GRAVEL, some Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Wet. FILL.	
	S-4	5 - 10		5/5				Thermocouple installed (5')
6					PID: 1 ppmv	-----6'----- SILT & CLAY	S-4A (6 to 9.2'): Gray, CLAY & SILT with orange mottling. Wet. SILT & CLAY. Water table at 5' bgs.	
8								
					PID: 1.2 ppmv	-----9.2'----- TILL	S-4B (9.2 to 10'): Tan & gray, Clayey SILT, trace Gravel, trace Sand. Sub-angular to round. Moist. TILL.	
10	S-5	10 - 15		5/4	PID: 1.1 ppmv		S-5 (10 to 15'): Tan & gray, Clayey SILT, little Gravel, trace Sand. Sub-rounded to angular Wet. TILL. Very wet above 12.1' bgs.	Thermocouple installed (10')
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	S-6	15 - 20		5/5	PID: 2.6 ppmv		S-6A (15 to 16.8'): Tan & gray, Clayey SILT, little Gravel, trace Sand. Sub-rounded to angular Moist. TILL.	Thermocouple installed (15')
16								
					PID: 3.6 ppmv	-----16.8'----- SHALE	S-6B (16.8 to 20'): Soft, severely weathered, gray, aphanitic SHALE with fragments of hard, slightly weathered Shale.	
18								
20	S-7	20 - 22		2/2	PID: 1.4 ppmv		S-7 (20 to 22'): Soft, severely weathered, gray, aphanitic SHALE with increasing portions of hard, slightly weathered Shale.	Thermocouple installed (20')
22						-----22'-----	Boring terminated at 22 feet. No refusal encountered.	
24							NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp,	

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-CE-07

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/09/11 Date Finished: 08/09/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
26								calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-CF-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/09/11 **Date Finished: 08/09/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---	PID: 1 ppmv	-----0'-----	(0 to 0.4'): Asphalt. S-1 (0.4 to 2'): Brown, fine to coarse SAND & GRAVEL, trace Cobbles, trace Silt. Sub-rounded to sub-angular. Moist. Secondary asphalt layer at 1' bgs. FILL.	1¼" Dia. Sch. 40 CPVC Riser (0 to 23'); Portland Cement Grout (1.5 to 23')
2	S-2	2 - 4		---	PID: 0.4 ppmv	FILL	S-2 (2 to 4'): Brown, fine to coarse SAND and Gravel, little Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
4	S-3	4 - 6		---	PID: 0.9 ppmv		S-3 (4 to 6'): Gray, SILT & CLAY, some fine to coarse Sand, some Gravel. Sub-rounded to angular. Wet. FILL.	
	S-4	5 - 10		5/5				Thermocouple installed (5')
6					PID: 1.9 ppmv	-----6.5'-----	S-4A (6 to 6.5'): Gray, SILT & CLAY and fine to coarse Sand, some Gravel. Sub-rounded to angular. Wet. FILL.	
8						SILT & CLAY	S-4B (6.5 to 10'): Gray, SILT & CLAY with orange mottling. Wet.	
10	S-5	10 - 15		5/5	PID: 0.7 ppmv PID: 0.8 ppmv	-----10.2'-----	S-5A (10 to 10.2'): Gray, SILT & CLAY with orange mottling. Wet. S-5B (10.2 to 15'): Tan & gray, SILT & CLAY, little Gravel, trace Sand. Angular. Moist.	Thermocouple installed (10')
12								
14						TILL		
	S-6	15 - 20		5/5	PID: 1.6 ppmv		S-6A (15 to 18.2'): Tan & gray, SILT & CLAY, little Gravel, trace Sand. Angular. Wet.	Thermocouple installed (15')
16								
18					PID: 3.3 ppmv	-----18.2'-----	S-6B (18.2 to 20'): Soft, very severely weathered, gray, aphanitic SHALE with hard, slightly weathered Shale fragments.	
20	S-7	20 - 23		3/	PID: 4.3 ppmv	SHALE	S-7 (20 to 23'): Soft, very severely weathered, gray, aphanitic SHALE with hard, slightly weathered Shale fragments.	Thermocouple installed (20')
22						-----23'-----	Boring terminated at 23 feet. No refusal encountered.	
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SANBORN HEAD	Project: Building 57 Location: Endicott, NY Project No.: 2466.03	Log of Temperature Monitoring Point TMP-CF-04 Ground Elevation: Not Available
Sanborn, Head & Associates, Inc.		

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/09/11 Date Finished: 08/09/11

Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log	Description			
26								NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed at about 4.5 ft bgs during vacuum-assisted excavation.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-CG-07

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 **Date Finished: 08/07/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---	PID: 0.2 ppmv	-----0'----- FILL	S-1 (0 to 2'): Dark brown, fine to coarse SAND, some Gravel, trace Silt, trace Cobbles. Sub-angular. M. FILL.	1¼" Dia. Sch. 40 CPVC Riser (0 to 22')
1.5								Portland Cement Grout (1.5 to 22')
2	S-2	2 - 4		---	PID: 0.2 ppmv		S-2 (2 to 4'): Gray, SILT & CLAY and fine to coarse Sand, some Gravel, little Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
4	S-3	4 - 6		---	PID: 0.7 ppmv		S-3 (4 to 6'): Gray, SILT & CLAY with little reddish mottling. Moist. FILL.	
5	S-4	5 - 10		5/4				Thermocouple installed (5')
6					PID: 0.4 ppmv	-----6'----- SILT & CLAY	S-4A (6 to 8.8'): Gray & tan, Silty CLAY with orange mottling. Moist.	
8.8					PID: 0.3 ppmv	-----8.8'----- TILL	S-4B (8.8 to 10'): Gray & tan, CLAY & SILT, little Gravel, trace Sand. Sub-angular to rounded. Moist.	
10	S-5	10 - 15		5/4	PID: 0.5 ppmv		S-5 (10 to 15'): Olive gray, CLAY & SILT, some Gravel, trace Sand. Sub-angular to rounded. Very Wet.	Thermocouple installed (10')
15	S-6	15 - 20		5/5	PID: 1.8 ppmv		S-6A (15 to 16.7'): Olive gray, CLAY & SILT, some Gravel, trace Sand. Sub-angular to rounded. Very Wet.	Thermocouple installed (15')
16.7					PID: 3 ppmv	-----16.7'----- SHALE	S-6B (16.7 to 18.4'): Moderately hard, moderately weathered, gray, aphanitic SHALE.	
18.4					PID: 1.7 ppmv		S-6C (18.4 to 20'): Soft, severely weathered, gray, aphanitic SHALE.	
20	S-7	20 - 22		2/2	PID: 0.9 ppmv		S-7 (20 to 22'): Moderately hard, moderately weathered, gray, aphanitic SHALE.	Thermocouple installed (20')
22						-----22'-----	Boring terminated at 22 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp,

SANBORN HEAD	Project: Building 57 Location: Endicott, NY Project No.: 2466.03	Log of Temperature Monitoring Point TMP-CG-07 Ground Elevation: Not Available
Sanborn, Head & Associates, Inc.		

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/07/11 Date Finished: 08/07/11

Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Spoon Blows per 6 in	Sample Information: Pen/ Rec (in)	Sample Information: Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
26								calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2 Groundwater observed at about 4.5 ft bgs during vacuum-assisted excavation. 3. Weathered bedrock encountered at about 16.7 ft bgs, more competent bedrock encountered at about 20 ft bgs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-TB-02

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 **Date Finished: 08/07/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---	PID: 0.6 ppmv	0' ASPHALT 0.3'	(0 to 0.3'): Asphalt. S-1 (0.3 to 2'): Brown, fine to coarse SAND & GRAVEL, little Silt, little Cobbles. Rounded to sub-angular. Moist. FILL.	1¼" Dia. Sch. 40 CPVC Riser (0 to 25') Portland Cement Grout (1.5 to 25')
2	S-2	2 - 4		---	PID: 0.4 ppmv		S-2 (2 to 4'): Fine to coarse SAND and Silt & Clay, little Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
4	S-3	4 - 6		---	PID: 0.6 ppmv	FILL	S-3 (4 to 6'): Fine to coarse SAND & GRAVEL, little Cobbles (brick), little Silt. Sub-rounded to sub-angular. Moist. FILL.	
	S-4	5 - 10		5/4				Thermocouple installed (5')
6								
8					PID: 5.0 ppmv		S-4A (7 to 9.5'): Dark brown, fine to coarse SAND, little Gravel, trace Silt. Sub-rounded to angular. Wet. FILL.	
					PID: 1.3 ppmv	9.5'	S-4B (9.5 to 10'): Gray, CLAY & SILT. Wet.	
10	S-5	10 - 15		5/5	PID: 0.9 ppmv		S-5A (10 to 14.3'): Olive gray, Silty CLAY with orange mottling. Wet.	Thermocouple installed (10')
12						SILT & CLAY		
14					PID: 0.6 ppmv	14.3'	S-5B (14.3 to 15'): Tan & gray, SILT & CLAY, little Gravel, trace Sand. Sub-rounded to angular. Wet.	
	S-6	15 - 20		5/5	PID: 2.2 ppmv		S-6 (15 to 20'): Tan & gray, SILT & CLAY, little Gravel, trace Sand. Sub-rounded to angular. Moist.	Thermocouple installed (15')
16						TILL		
18								
20	S-7	20 - 25		5/5	PID: 1.0 ppmv	20'	S-7A (20 to 22.9'): Soft, severely weathered, gray, aphanitic SHALE.	Thermocouple installed (20')
22						SHALE		
					PID: 0.8 ppmv		S-7B (22.9 to 25'): Medium hard, moderately weathered, gray, aphanitic SHALE.	
24								

SANBORN HEAD Sanborn, Head & Associates, Inc.	Project: Building 57 Location: Endicott, NY Project No.: 2466.03	# Log of Temperature Monitoring Point TMP-TB-02 Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/07/11 Date Finished: 08/07/11

Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
							-----25'-----	Boring terminated at 25 feet. No refusal encountered. NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Groundwater observed at about 5ft bgs during vacuum assisted excavation. 3. Weathered bedrock encountered at about 20 ft bgs, more compent bedrock encountered at about 22.9 ft bgs.		
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SANBORN HEAD Sanborn, Head & Associates, Inc.	**Project: Building 57** **Location: Endicott, NY** **Project No.: 2466.03**

Log of Temperature Monitoring Point TMP-TB-05

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 **Date Finished: 08/10/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---	PID: 0.7 ppmv	----0'----- ASPHALT -----0.4'-----	(0 to 0.4'): Asphalt. S-1 (0.4 to 2'): Brown, fine to coarse SAND & GRAVEL, little Silt, trace Cobbles. Rounded to sub-rounded. Moist. FILL.	1¼" Dia. Sch. 40 CPVC Riser (0 to 25') Portland Cement Grout (1.5 to 25')
2	S-2	2 - 4		---	PID: 0.4 ppmv		S-2 (2 to 4'): Brown, fine to coarse SAND & GRAVEL, some Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
4	S-3	4 - 6		---	PID: 0.3 ppmv	FILL	S-3 (4 to 6'): Brown, Clayey SILT and fine to coarse Sand, trace Gravel, trace Cobbles. Sub-rounded to sub-angular. Wet. FILL.	
	S-4	5 - 10		5/5				Thermocouple installed (5')
6					PID: 0.3 ppmv		S-4A (6 to 6.9'): Brown, Clayey SILT and fine to coarse Sand, trace Gravel, trace Cobbles. Sub-rounded to sub-angular. Wet. FILL. S-4B (6.9 to 7.5'): Tan, Concrete. Dry. FILL.	
8					PID: 0.2 ppmv	-----7.5'-----	S-4C (7.5 to 10'): Gray to dark gray, CLAY & SILT, trace Roots. Sub-angular. Moist. Sand & Gravel layer from 9.1 - 9.3'.	
10	S-5	10 - 15		5/5	PID: 0.3 ppmv	SILT & CLAY	S-5 (10 to 15'): Tan & gray, CLAY & SILT. Wet.	Thermocouple installed (10')
12								
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	S-6	15 - 20		5/3	PID: 0.4 ppmv	-----15'-----	S-6 (15 to 20'): Tan, fine to coarse SAND and Clayey Silt, little Gravel, trace Cobbles. Sub-rounded to sub-angular Wet.	Thermocouple installed (15')
16								
18						TILL		
20	S-7	20 - 25		5/7	PID: 0.7 ppmv		S-7A (20 to 20.8'): Tan, fine to coarse SAND and Silt, little Gravel. Sub-rounded to sub-angular Moist.	Thermocouple installed (20')
					PID: 0.3 ppmv	-----20.8'-----	S-7B (20.8 to 25'): Soft to moderately hard, severely to slightly weathered, gray, aphanitic SHALE. Alternating zones of weathered and more competent zones. WEATHERED BEDROCK.	
22						SHALE		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-TB-05

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 Date Finished: 08/10/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Well Diagram	Well Description
							-----25'-----	Boring terminated at 25 feet. No refusal encountered. NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.		
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-TC-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 Date Finished: 08/07/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---	PID: 7.8 ppmv	0' ASPHALT 0.4'	(0 to 0.4'): Asphalt.	1¼" Dia. Sch. 40 CPVC Riser (0 to 25')
						FILL	S-1 (0.4 to 2'): Gray, Clayey SILT and fine to coarse Sand, little Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	Portland Cement Grout (1.5 to 25')
2	S-2	2 - 4		---	PID: 1.2 ppmv		S-2 (2 to 4'): Fine to coarse SAND & GRAVEL, little Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
4	S-3	4 - 6		---	PID: 2.6 ppmv		S-3 (4 to 6'): Fine to coarse SAND & GRAVEL, little Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
	S-4	5 - 15		10/10				Thermocouple installed (5')
6							S-4A (6 to 7.8'): Fine to coarse SAND & GRAVEL, little Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
8					PID: 2.3 ppmv	7.8' PEAT 8.5'	S-4B (7.8 to 8.5'): Dark gray/black, PEAT, trace Sand, trace Silt. Wet.	
					PID: 1.2 ppmv	SILT & CLAY	S-4C (8.5 to 15'): Gray to tan & gray, Clayey SILT. Change from gray to tan & gray with orange mottling at 11.6'. Wet.	
10								Thermocouple installed (10')
12								
14								
	S-5	15 - 20		5/4	PID: 1.9 ppmv	15' TILL	S-5A (15 to 19'): Tan & gray, SILT & CLAY, some Gravel, trace Sand. Sub-angular to sub-rounded. Wet.	Thermocouple installed (15')
16								
18								
					PID: 0.9 ppmv	19' SHALE	S-5B (19 to 19.8'): Soft, severely weathered, gray, aphanitic SHALE with fragments of hard, slightly weathered Shale.	
20	S-6	20 - 25		5/5	PID: 0.6 ppmv		S-5C (19.8 to 20'): Very hard, fresh, gray aphanitic SHALE.	Thermocouple installed (20')
					PID: 1.3 ppmv		S-6 (20 to 25'): Soft, severely weathered, gray, aphanitic SHALE. Becomes hard and slightly weathered at 24.0' bgs.	
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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-TC-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/07/11 Date Finished: 08/07/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
							-----25'-----	Boring terminated at 25 feet. No refusal encountered.		
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NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Groundwater observed at about 5 ft bgs during vacuum-assisted excavation.

3. Weathered bedrock encountered at about 19 ft bgs, more competent bedrock encountered at about 24 ft bgs.

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SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WC-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Hand Auger/Post-hole Digger (0 - 6')/Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 **Date Finished: 08/16/11**

Logged By: AVK/JSP/JWC **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---	PID: 16 ppmv	-----0'----- ASPHALT -----0.4'-----	(0 to 0.4'): Asphalt. S-1 (0.4 to 2'): Light brown, fine to coarse SAND & GRAVEL, trace Silt, trace Cobbles. Rounded to sub-rounded. Dry. FILL.	1¼" Dia. Sch. 40 CPVC Riser (0 to 23') Portland Cement Grout (1 to 23')
2	S-2	2 - 4		---	PID: 14 ppmv		S-2 (2 to 4'): Brown, fine to coarse SAND & GRAVEL, trace Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
4	S-3	4 - 6		---	PID: 16 ppmv	FILL	S-3 (4 to 6'): Brown, fine to coarse SAND & GRAVEL, trace Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
5	S-4	5 - 10		---				Thermocouple installed (5')
6					PID: 4.5 ppmv		S-4A (6 to 9'): Brown, SILT & CLAY, little fine to coarse Sand, trace Gravel, trace Cobbles. Rounded to sub-rounded. Moist. FILL.	
9					PID: 0.7 ppmv	-----9'-----	S-4B (9 to 10'): Gray, CLAY & SILT, trace Gravel, trace Roots. Slight petroleum odor. Moist.	
10	S-5	10 - 15		---	PID: 0.7 ppmv		S-5A (10 to 10.9'): Gray, CLAY & SILT. Moist. S-5B (10.9 to 15'): Olive brown - gray, SILT & CLAY, some brown mottling. Moist.	Thermocouple installed (10')
13					PID: 1.4 ppmv	SILT & CLAY		
15	S-6	15 - 20		---	PID: 5.3 ppmv		S-6A (15 to 17.4'): Olive brown - gray, SILT & CLAY, some brown mottling; some black staining at 16.5' bgs. Moist.	Thermocouple installed (15')
17.4					PID: 4.1 ppmv		S-6B (17.4 to 19.1'): Gray, SILT & CLAY, little Gravel, trace Sand, trace Cobbles. Rounded to sub-rounded. Moist.	
19.1					PID: 0.5 ppmv	-----19.1'-----	S-6C (19.1 to 20'): Gray, SILT and fine to coarse Sand, some Gravel. Rounded to sub-rounded. Wet. STREAM DEPOSITS.	
20	S-7	20 - 23.7		---	PID: 0.7 ppmv	SILTY SAND	S-7A (20 to 22'): Brown, fine to medium SAND and Silt, some Gravel. Rounded to sub-angular. Wet. STREAM DEPOSITS.	Thermocouple installed (20')
22								

SANBORN ||| HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WC-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Hand Auger/Post-hole Digger (0 - 6')/Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 **Date Finished: 08/16/11**

Logged By: AVK/JSP/JWC **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
22							-----22'----- SHALE	S-7B (22 to 23.5'): Hard, fresh, gray, very fine-grained SHALE.		
					PID: 0.3 ppmv		-----23.7'-----	S-7C (23.5 to 23.7'): Soft, very severely weathered, gray, very fine-grained SHALE.		Benseal Bentonite Plug (23 to 24')
24								Boring terminated at 23.7 feet. No refusal encountered.		
26										
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NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Competent bedrock observed at 22' bgs.

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WD-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/06/11 **Date Finished: 08/06/11**
Logged By: EMB/AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Description	Geologic Description	Well Description
0	S-1	0 - 5		5/3		-----0'----- CONCRETE -----0.6'-----	(0 to 0.6'): Concrete.	1¼" Dia. Sch. 40 CPVC Riser (0 to 42.5')
					PID: 2 ppmv		S-1 (0.6 to 5'): Brown, fine to coarse SAND & GRAVEL, trace Silt. Sub-angular to rounded. Moist. FILL.	Portland Cement Grout (1 to 42.5')
2								
4						FILL		
	S-2	5 - 10		5/5	PID: NA		S-2A (5 to 7.1'): Brown, fine to coarse SAND & GRAVEL, trace Silt. Sub-angular to rounded. Moist. FILL.	Thermocouple installed (5')
6								
					PID: 11 ppmv		S-2B (7.1 to 8.8'): Brown, Clayey SILT, some Sand, little Gravel. Sub-angular to rounded. Moist. FILL.	
8								
					PID: 2.9 ppmv	-----8.8'-----	S-2C (8.8 to 10'): Olive tan, CLAY & SILT, trace Cobble with red mottling at 9.4 - 9.7' bgs. Sub-angular. Moist.	
10	S-3	10 - 15		5/5	PID: 1.8 ppmv		S-3A (10 to 14.3'): Olive gray, Silty Clay with red mottling. Moist.	Thermocouple installed (10')
12								
14					PID: 32 ppmv		S-3B (14.4 to 15'): Olive gray, Clayey SILT. Moist.	
	S-4	15 - 20		5/5	PID: 116 ppmv	SILT & CLAY	S-4A (15 to 17.9'): Olive gray, SILT & CLAY. Moist.	Thermocouple installed (15')
16								
18					PID: 82 ppmv		S-4B (17.9 to 20'): Olive gray, SILT & CLAY, trace Gravel. Sub-angular to angular. Moist.	
20	S-5	20 - 25		5/4	PID: 1.7 ppmv		S-5A (20 to 22.2'): Gray, SILT & CLAY, trace Gravel. Sub-angular to angular. Wet.	Thermocouple installed (20')
22					PID: 2.6 ppmv	-----22.2'-----	S-5B (22.2 to 25'): Gray, fine to coarse SAND and Silt, little Gravel. Sub-rounded to angular. Wet.	
24						TILL		
	S-6	25 - 30		5/5	PID: 1.8 ppmv	-----25'----- SHALE	S-6 (25 to 30'): Very soft, very severely weathered, gray, aphanitic SHALE. Wet 27.6 - 28.2' bgs. WEATHERED BEDROCK.	Thermocouple installed (25')
26								

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WD-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/06/11 **Date Finished:** 08/06/11
Logged By: EMB/AVK **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
30	S-7	30 - 35		5/5	PID: 1.2 ppmv	SHALE	S-7 (30 to 35'): Very soft, very severely weathered, gray, aphanitic SHALE. Tan gravelly zone from 33.2 - 34.2' bgs.	Thermocouple installed (30')
35	S-8	35 - 38		3/3	PID: 1.4 ppmv		S-8 (35 to 38'): Soft, severely weathered, gray, aphanitic SHALE. Competent fragments from 36.1 - 36.5' and 37.6 - 37.8' bgs.	Thermocouple installed (35')
38	S-9	38 - 40		2/2	PID: 1.7 ppmv		S-9 (38 to 40'): Soft, severely weathered, gray, aphanitic SHALE. Slightly more competent from 38.4 - 38.7' bgs.	
40	S-10	40 - 43		3/3	PID: 1.5 ppmv		S-10A (40 to 41'): Soft, severely weathered, gray, aphanitic SHALE.	Thermocouple installed (40')
41					PID: 1.1 ppmv		S-10B (41 to 41.9'): Medium hard, severely weathered, gray, aphanitic SHALE.	
42					PID: 1.8 ppmv		S-10C (41.9 to 43'): Hard, slightly weathered, gray, aphanitic SHALE.	Formation Material (42.5 to 43')
43						-----43'-----	Boring terminated at 43 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Groundwater observed at about 10' bgs during drilling.
3. Weathered bedrock encountered at about 25 ft bgs, more competent bedrock encountered at about 41.9 ft bgs.

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WD-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/18/11 **Date Finished: 08/18/11**
Logged By: JSP/JWC **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 5		---	PID: 0.8 ppmv	-----0'----- TOPSOIL	S-1A (0 to 1.5'): Topsoil. Moist. TOPSOIL.	1¼" Dia. Sch. 40 CPVC Riser (0 to 30'); Portland Cement Grout (1 to 30')
					PID: 1 ppmv	-----1.5'----- SILT	S-1B (1.5 to 3.5'): Brown, SILT, some fine to coarse Sand, trace Roots, trace Gravel, trace Rope, trace Metal. Dry. FILL.	
2								
						-----3.5'-----	S-1C (3.5 to 5'): Concrete - Based on drilling action, no recovery. FILL.	
4								
	S-2	5 - 10		---			S-2A (5 to 7'): Concrete - Based on drilling action, no recovery. FILL.	Thermocouple installed (5')
6								
							S-2B (7 to 12.5'): No recovery.	
8						NO RECOVERY		
10	S-3	10 - 15		---				Thermocouple installed (10')
12							S-3 (12.5 to 15.5'): Concrete - Based on drilling action, no recovery. FILL.	
14								
	S-4	15 - 20		---	PID: 59 ppmv	-----15.5'-----	S-4 (15.5 to 20'): Gray, SILT & CLAY. Moist.	Thermocouple installed (15')
16								
18						SILT & CLAY		
20	S-5	20 - 25		5/1	PID: 274 ppmv		S-5A (20 to 21'): Brownish-gray, CLAY & SILT, trace fine to medium Sand, trace Cobbles, trace Gravel. Rounded. Evidence of Clay weathering/brown mottling. Wet. Large Cobble at base of Silt and Clay.	Thermocouple installed (20')
					PID: 12 ppmv	-----21'-----	S-5B (21 to 25'): Brownish-gray, fine to coarse SAND, some Silt, some Gravel, trace Cobbles. Rounded to sub-rounded. Wet.	
22								
						SILTY SAND		
24								

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WD-05

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/18/11 **Date Finished:** 08/18/11
Logged By: JSP/JWC **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
	S-6	25 - 30		---	PID: 3.3 ppmv	SILTY SAND	S-6A (25 to 27.4'): Dark gray, fine to coarse SAND, some Silt, some Gravel. Sub-rounded to sub-angular. Wet.	Thermocouple installed (25')
26						-----27.4'-----		
28					PID: 3.5 ppmv	TILL	S-6B (27.4 to 28.5'): Dark gray, SILT & CLAY, some Gravel, some fine to coarse Sand. Sub-angular. Wet.	
					PID: 5.1 ppmv	-----29'-----	S-6C (28.5 to 29'): Dark gray, SILT & CLAY, some fine to coarse Sand, some Gravel, trace Cobbles (broken Shale). Sub-angular to angular. Wet.	
					PID: 0.5 ppmv	SHALE		
30						-----30'-----	S-6D (29 to 30'): Gray, hard, very slightly weathered, gray, very fine-grained SHALE. Dry.	
							Boring terminated at 30 feet. No refusal encountered.	
32								
34								
36								
38								
40								
42								
44								
46								
48								
50								

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. For sample S-4, driller lowered core barrel, raised it, and lowered it again. Evidence of soil from top 10' bgs in recovery (Silty soil with Roots; Concrete in base of recovery.) Indicates fallen material picked up with 2nd lowering of core barrel. Silt & Clay depth is approximate.

3. Competent bedrock observed at 29' bgs.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WE-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 11/10/11 **Date Finished: 11/10/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
								1¼" Dia. CPVC Riser (1 to 30')
5	S-2	5 - 10		5/4	PID: 4.1 ppmv	FILL	S-2 (5 to 10'): Gray, Clayey SILT, little Gravel, trace Cobbles. Sub-angular. Moist. FILL.	Thermocouple installed (5')
10	S-3	10 - 15		---		-----10'-----	S-3 (10 to 15'): No recovery.	Thermocouple installed (10')
15	S-4	15 - 19		---	PID: 232 ppmv	-----15'-----	S-4 (15 to 19'): Clayey SILT and medium to coarse Sand, and Gravel, trace Cobbles. Sub-angular to angular. Wet. TILL.	Thermocouple installed (15') Portland Cement Grout (1 to 30.4')
19	S-5	19 - 20		---	PID: 13 ppmv		S-5 (19 to 20'): SAND & GRAVEL, little Cobbles, trace Silt. Wet. TILL.	
20	S-6	20 - 22.7		---	PID: 32 ppmv	TILL	S-6 (20 to 22.7'): SAND & GRAVEL, little Cobbles, trace Silt. Moist. TILL.	Thermocouple installed (20')
22.7	S-7	22.7 - 25		---	PID: 113 ppmv		S-7 (22.7 to 25'): Clayey SILT, some Gravel. Moist. TILL.	
25	S-8	25 - 30		---	PID: 10 ppmv	-----25'----- ROCK	S-8 (25 to 30'): Soft, very severely weathered, aphanatic SHALE. Moist. ROCK.	Thermocouple installed (25')

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WE-06

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 11/10/11 **Date Finished: 11/10/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
26										
28							ROCK			
30							-----30'-----	Boring terminated at 30 feet. No refusal encountered. NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Severely Weathered bedrock observed at about 25 feet bgs.		
32										
34										
36										
38										
40										
42										
44										
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48										
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BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WF-02

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/09/11 **Date Finished: 08/10/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---		-----0'----- ASPHALT -----0.5'-----	(0 to 0.5'): Asphalt.	1¼" Dia. Sch. 40 CPVC Riser (0 to 25')
					PID: 0.7 ppmv		S-1 (0.5 to 2'): Brown, fine to coarse SAND & GRAVEL, little Silt, little Cobbles. Sub-rounded. Moist. FILL.	Portland Cement Grout (1.5 to 25')
2	S-2	2 - 4		---	PID: 0.8 ppmv		S-2 (2 to 4'): Dark brown, fine to coarse SAND & GRAVEL, little Cobbles, trace Clayey Silt. Sub-rounded to sub-angular. Moist. FILL.	
4	S-3	4 - 6		---	PID: 0.9 ppmv	FILL	S-3 (4 to 6'): Dark brown, fine to coarse SAND & GRAVEL and Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
	S-4	5 - 10		5/4				Thermocouple installed (5')
6					PID: 1 ppmv		S-4A (6 to 6.9'): Dark brown, fine to coarse SAND & GRAVEL and Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
							S-4B (7 to 8.2'): Brown, fine to coarse SAND & GRAVEL, little Silt. Sub-rounded. Wet. FILL.	
8					PID: 0.6 ppmv	-----8.2'-----	S-4C (8.2 to 10'): Dark gray, SILT & CLAY, trace Sand, trace Roots. Sand & Gravel layer 9.0 - 9.2' bgs. Wet.	
10	S-5	10 - 15		5/5	PID: 0.5 ppmv		S-5 (10 to 15'): Gray to olive gray, Silty CLAY. Wet.	Thermocouple installed (10')
12								
14						SILT & CLAY		
	S-6	15 - 20		5/5	PID: 0.4 ppmv		S-6A (15 to 18.9'): Olive gray, CLAY & SILT. Wet.	Thermocouple installed (15')
16								
18								
					PID: 0.3 ppmv	-----18.9'-----	S-6B (18.9 to 20'): Tan, Clayey SILT, little Gravel, trace Sand. Sub-rounded to angular. Wet.	
20	S-7	20 - 25		5/5	PID: 3.4 ppmv	TILL	S-7A (20 to 21.7'): Grayish tan, Clayey SILT, some Gravel, trace Sand. Sub-rounded to angular. Wet.	Thermocouple installed (20')
22					PID: 1.6 ppmv	-----21.7'-----	S-7B (21.7 to 25'): Soft, very severely weathered, gray, aphanitic SHALE. Fragments of hard, slightly weathered Shale.	
24						SHALE		

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WF-02

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Post-hole Digger/Boart Minisonic, 6" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 08/09/11 Date Finished: 08/10/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
							-----25'-----	Boring terminated at 25 feet. No refusal encountered.		
26										
28										
30										
32										
34										
36										
38										
40										
42										
44										
46										
48										
50										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

SANBORN HEAD
Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WF-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Hand Auger/Post-hole Digger (0 - 6')/Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 **Date Finished: 08/17/11**

Logged By: AVK/JSP/JWC **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
0	S-1	0 - 2		---		-----0'----- ASPHALT -----0.6'-----	(0 to 0.6'): Asphalt.	1¼" Dia. Sch. 40 CPVC Riser (0.5 to 40.5') Portland Cement Grout (1 to 40.5')
					PID: 13 ppmv		S-1 (0.6 to 2'): Brown, fine to coarse SAND & GRAVEL, little Silt, little Cobbles. Rounded to sub-rounded. Moist. FILL.	
2	S-2	2 - 4		---	PID: 15 ppmv		S-2 (2 to 4'): Brown, fine to coarse SAND & GRAVEL, trace Silt, trace Cobbles. Rounded to sub-rounded. Moist. FILL.	
4	S-3	4 - 6		---	PID: 11 ppmv		S-3 (4 to 6'): Grayish brown, SILT & CLAY and fine to coarse Sand, some Gravel. Sub-rounded to sub-angular. Moist. FILL.	Thermocouple installed (5')
6	S-4	6 - 10		---	PID: 3.4 ppmv	FILL	S-4A (6 to 8.8'): Brown, SILT & CLAY, little Gravel, little fine to coarse Sand, trace Cobbles. Rounded. Moist. FILL.	
8					PID: 9.2 ppmv		S-4B (8.8 to 10'): Olive brown, SILT & CLAY, some fine to coarse Sand, trace Gravel, trace Cobbles, trace Roots. Rounded. Wet. FILL.	
10	S-5	10 - 15		---	PID: 24 ppmv		S-5A (10 to 11'): Olive brown, SILT & CLAY, some fine to coarse Sand, trace Gravel, trace Cobbles, trace Roots. Rounded. Slight petroleum odor. Wet. FILL.	Thermocouple installed (10')
					PID: 181 ppmv	-----11'-----	S-5B (11 to 12.7'): Gray, Clayey SILT, little Roots, trace Sand, trace Gravel, trace gleying. Moist.	
12					PID: 460 ppmv		S-5C (12.7 to 14.4'): Gray, CLAY & SILT. Moist.	
14					PID: 609 ppmv	SILT & CLAY	S-5D (14.4 to 15'): Gray, SILT & CLAY, little brown mottling. Moist (Wet at base).	
	S-6	15 - 20		---	PID: 905 ppmv		S-6A (15 to 16.7'): Gray, SILT & CLAY, little black staining, little brown mottling. Slight petroleum odor. Moist.	Thermocouple installed (15')
16					PID: 359 ppmv		S-6B (16.7 to 17.7'): Bluish gray, SILT & CLAY, brown mottling. Moist.	
18					PID: 312 ppmv		S-6C (17.7 to 18.7'): Bluish gray - brown, CLAY & SILT, trace fine to medium Sand, trace Gravel. Rounded to sub-rounded. Moist.	
					PID: 21 ppmv	-----18.7'-----	S-6D (18.7 to 20'): Gray, fine to coarse SAND & GRAVEL, some Silt, trace Cobbles. Rounded to sub-angular. Wet.	
20	S-7	20 - 25		---	PID: 191 ppmv	SAND & GRAVEL	S-7A (20 to 22.6'): Brown, fine to coarse SAND & GRAVEL, little Silt, trace Cobbles. Rounded to sub-angular. Wet.	Thermocouple installed (20')
22					PID: 11 ppmv	-----22.6'----- TILL	S-7B (22.6 to 25'): Grayish, SILT & CLAY, some fine to coarse Sand, trace Gravel, trace Cobbles (broken Shale). Angular to sub-angular. Moist.	
24								

BORING LOG S:\PORDATA\2400S\2466.02\WORKLOGS\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 8/29/12

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WF-04

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Hand Auger/Post-hole Digger (0 - 6')/Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 Date Finished: 08/17/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
	S-8	25 - 30		---				S-8 (25 to 30'): Grayish, SILT & CLAY, some fine to coarse Sand, some Gravel, little Cobbles (broken Shale). Angular to sub-angular. Moist.		Thermocouple installed (25')
26					PID: 2.8 ppmv					
28										
					PID: 2.1 ppmv					
30	S-9	30 - 35		---	PID: 4.8 ppmv			S-9 (30 to 35'): Blue-gray, SILT & CLAY, some fine to coarse Sand, little Gravel, little Cobbles (Extremely Weathered Bedrock). Angular to sub-angular. Moist. (Wet from 33.8 - 34' bgs).		Thermocouple installed (30')
32							TILL			
34										
	S-10	35 - 40		---	PID: 1.3 ppmv			S-10A (35 to 39.5'): Gray, SILT & CLAY, little fine to coarse Sand, little Gravel, trace Cobbles (broken Shale). Angular to sub-angular. Moist. TILL.		Thermocouple installed (35')
36										
38										
					PID: NM		-----39.5'-----	S-10B (39.5 to 40'): Hard, slightly weathered, gray, aphantic SHALE. Dry to Moist. SHALE.		
40	S-11	40 - 42		---	PID: 0.3 ppmv		SHALE	S-11A (40 to 40.9'): Dark gray, hard, fresh, dark gray, aphantic SHALE. Dry. SHALE.		Thermocouple installed (40')
					PID: 0.2 ppmv			S-11B (40.9 to 42'): Dark gray, soft, completely weathered, dark gray, aphantic SHALE, gravel-sized fragments of more competent SHALE. Moist. SHALE.		Banseal Bentonite Plug (40.5 to 42')
42							-----42'-----	Boring terminated at 42 feet. No refusal encountered.		
44										
46										
48										
50										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Water table encountered at about 8.8' bgs.

SANBORN HEAD	Project: Building 57 Location: Endicott, NY Project No.: 2466.03	Log of Temperature Monitoring Point TMP-WF-04 Ground Elevation: Not Available
Sanborn, Head & Associates, Inc.		

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Hand Auger/Post-hole Digger (0 - 6')/Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/08/11 Date Finished: 08/17/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information					Stratum		Geologic Description	Well Diagram	Well Description
	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Log	Description			
50								3. Competent bedrock observed at 39.5' bgs.		
52										
54										
56										
58										
60										
62										
64										
66										
68										
70										
72										
74										

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WG-03

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Hand Auger/Post-hole Digger (0 - 6')/Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/09/11 **Date Finished:** 08/17/11

Logged By: AVK/JSP/JWC **Checked By:** EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Spoon Blows per 6 in	Sample Information: Pen/Rec (in)	Sample Information: Field Testing Data	Stratum: Description	Geologic Description	Well Description
0	S-1	0 - 2		---	PID: 0.7 ppmv	0' ASPHALT 0.4'	(0 to 0.4'): Asphalt. S-1 (0.4 to 2'): Dark brown, fine to coarse SAND & GRAVEL, little Silt, little Cobbles. Sub-rounded to sub-angular. Moist. FILL.	1¼" Dia. Sch. 40 CPVC Riser (0.5 to 42.7') Portland Cement Grout (1 to 42.7')
2	S-2	2 - 4		---	PID: 1.3 ppmv		S-2 (2 to 4'): Gray, SILT & CLAY. fine to coarse Sand, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
4	S-3	4 - 6		---	PID: 1 ppmv		S-3 (4 to 6'): Gray, SILT & CLAY. fine to coarse Sand, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
	S-4	5 - 10		---		FILL		Thermocouple installed (5')
6					PID: 4 ppmv		S-4 (6 to 10'): Dark gray, SILT & CLAY, some medium to coarse Sand, trace Gravel, trace Cobbles. Rounded to sub-angular. Seam of black soil and Roots (Peat) 9.6 - 9.9' bgs. Moist. FILL.	
8					PID: 19 ppmv			
10	S-5	10 - 15		---	PID: 69 ppmv PID: 35 ppmv PID: 40 ppmv	10'	S-5A (10 to 10.9'): Gray, CLAY & SILT, trace Roots. Moist. S-5B (10.9 to 15'): Gray, SILT & CLAY, some brown mottling. Moist.	Thermocouple installed (10')
12								
14						SILT & CLAY		
	S-6	15 - 20		---	PID: 34 ppmv		S-6A (15 to 16.3'): Gray, SILT & CLAY, some brown mottling. Moist.	Thermocouple installed (15')
16					PID: 49 ppmv		S-6B (16.3 to 18.4'): Brownish gray, Clayey SILT, little Gravel, trace fine to coarse Sand, extensive brown mottling. Rounded to sub-rounded. Moist.	
18					PID: 8.1 ppmv	18.4'	S-6C (18.4 to 20'): Gray, fine to coarse SAND, some Gravel, some Silt, trace Cobbles. Rounded to sub-rounded. Wet.	
20	S-7	20 - 25		---	PID: 1.1 ppmv	SAND & GRAVEL	S-7A (20 to 22.4'): Olive brown to gray, fine to coarse SAND & GRAVEL, little Silt, trace Cobbles. Rounded to sub-rounded. Wet.	Thermocouple installed (20')
22					PID: 3.9 ppmv	22.4'	S-7B (22.4 to 25'): Gray, SILT & CLAY, some Gravel (broken Shale), some, fine to coarse Sand, trace Cobble (broken Shale). Sub-angular to angular. Moist.	
24						TILL		
	S-8	25 - 30		---	PID: 2.7 ppmv		S-8A (25 to 27.5'): Gray, SILT & CLAY, some fine to coarse Sand, some Gravel. Rounded. Moist.	Thermocouple installed (25')
26								

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WG-03

Ground Elevation: Not Available

Drilling Method: Air Knife/Vacuum Excavation/Boart Minisonic

Sampling Method: Hand Auger/Post-hole Digger (0 - 6')/Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear

Foreman: L. Hunsberger

Date Started: 08/09/11 Date Finished: 08/17/11

Logged By: AVK/JSP/JWC Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
28					PID: 3.7 ppmv			S-8B (27.5 to 30'): Gray, SILT & CLAY, some fine to coarse Sand, some Gravel (broken Shale). Angular. Moist.		
30	S-9	30 - 35		---				S-9 (30 to 35'): Gray, SILT & CLAY, some fine to coarse Sand, some Gravel (broken Shale). Angular. Wet (30 - 32.8'); Moist (32.8 - 35').		Thermocouple installed (30')
32					PID: 1.3 ppmv					
					PID: 1.7 ppmv					
34							TILL			
	S-10	35 - 40		---	PID: 0.9 ppmv			S-10 (35 to 40'): Gray, SILT & CLAY, some Gravel (broken Shale), little, fine to coarse Sand. Angular. Moist. Becoming very dense with depth.		Thermocouple installed (35')
36										
38										
40	S-11	40 - 42.9		---	PID: 0.4 ppmv			S-11A (40 to 41.5'): Gray, SILT & CLAY, some Gravel (broken Shale), little, fine to coarse Sand. Angular. Wet.		Thermocouple installed (40')
					PID: NA		-----41.5'----- SHALE	S-11B (41.5 to 42.7'): Moderately hard, slightly weathered, dark gray, fine-grained SHALE. Dry. SHALE.		
42							-----42.7'-----	Boring terminated at 42.7 feet. No refusal encountered.		
44										
46										
48										
50										
52										
54										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WW-01

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 11/11/11 **Date Finished: 11/11/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
1								1¼" Dia. CPVC Riser (1 to 30.5')
5	S-2	5 - 10		5/5	PID: 5.4 ppmv	FILL	S-2A (5 to 8.3'): Gray, SILT & CLAY and medium to coarse Sand, and Gravel. Sub-angular. Moist. FILL.	Thermocouple installed (5')
8.3					PID: 3.6 ppmv		S-2B (8.3 to 9'): Light brown, fine to coarse SAND, trace Silt, some Gravel, trace Cobbles. Sub-rounded to sub-angular. Moist. FILL.	
9					PID: NA	-----9'-----	S-2C (9 to 10'): Gray, SILT & CLAY. Moist. SILT & CLAY.	
10	S-3	10 - 15		5/5	PID: 999 ppmv	SILT & CLAY	S-3A (10 to 14.2'): Gray, SILT & CLAY. Moist. SILT & CLAY.	Thermocouple installed (10')
14.2					PID: 68 ppmv		S-3B (14.2 to 15'): Gray with orange mottling, SILT & CLAY. Moist. SILT & CLAY.	
15	S-4	15 - 20		---		-----15'-----	S-4 (15 to 20'): No recovery.	Thermocouple installed (15') Portland Cement Grout (1 to 30.6')
20	S-5	20 - 25		5/3		-----20'----- TILL	No recovery.	Thermocouple installed (20')
23					PID: 4.6 ppmv		S-5A (23 to 24.5'): Dark brown, SAND & GRAVEL, trace Cobbles. Sub-rounded to sub-angular. Wet. TILL.	
24.5					PID: 4.7 ppmv		S-5B (24.5 to 25'): Dark gray, Clayey SILT, fine to coarse Sand, and Gravel, trace Cobbles. Sub-angular. Wet. TILL.	
25	S-6	25 - 30.6		5/3		-----25'----- ROCK		Thermocouple installed (25')

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WW-01

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 11/11/11 Date Finished: 11/11/11
Logged By: AVK Checked By: EMB/JSP

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Well Diagram	Well Description
26										
28					PID: 6.1 ppmv		ROCK	S-6 (27.5 to 30'): Soft, severely weathered, aphanatic SHALE. Wet. ROCK.		
30							-----30.6'-----			Thermocouple installed (30')
								Boring terminated at 30.5 feet. No refusal encountered.		
32										
34										
36										
38										
40										
42										
44										
46										
48										
50										

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Severely Weathered bedrock observed at about 25 feet bgs.

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WW-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 11/10/11 **Date Finished: 11/10/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum Description	Geologic Description	Well Description
1								1¼" Dia. CPVC Riser (1 to 30.3')
2–4						FILL		
4					PID: 1.2 ppmv		S-1B (4 to 5'): Dark brown, fine to coarse SAND, some Gravel, little Silt, trace Cobbles. Sub-rounded to sub-angular. Wet. FILL.	
5	S-2	5 - 10		5/5	PID: 8.9 ppmv	-----5'-----	S-2 (5 to 10'): Gray with little orange mottling, SILT & CLAY. Moist. SILT & CLAY.	Thermocouple installed (5')
10	S-3	10 - 14.3		5/5	PID: NA	SILT & CLAY	S-3 (10 to 14.3'): Gray with orange mottling, SILT & CLAY, little Gravel, little Cobbles. Moist. SILT & CLAY.	Thermocouple installed (10')
14.3	S-4	14.3 - 15		---	PID: .8 ppmv	-----14.3'-----	S-4 (14.3 to 15'): Gray, fine to coarse SAND & GRAVEL, little Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. TILL.	
15	S-5	15 - 18.5		5/5	PID: 32 ppmv		S-5 (15 to 18.5'): Gray, fine to coarse SAND & GRAVEL, little Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. TILL.	Thermocouple installed (15') Portland Cement Grout (1 to 30.4')
18.5	S-6	18.5 - 19		---	PID: NA	TILL	S-6 (18.5 to 19'): SAND & GRAVEL, trace Cobbles. Sub-rounded to sub-angular. Moist. TILL.	
19	S-7	19 - 23.7		---	PID: NA		S-7 (19 to 23.7'): Gray, fine to coarse SAND & GRAVEL, little Clayey Silt, trace Cobbles. Sub-rounded to sub-angular. Moist. TILL.	Thermocouple installed (20')
23.7	S-8	23.7 - 30		---	PID: 40 ppmv	-----23.7'----- WEATHERED BEDROCK	S-8 (23.7 to 30'): Medium hard, severely weathered, aphanatic SHALE. Wet. ROCK.	Thermocouple installed (25')

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Temperature Monitoring Point TMP-WW-02

Ground Elevation: Not Available

Drilling Method: Boart Minisonic

Sampling Method: Boart Minisonic, 5" dia. Core barrel

Drilling Company: Boart Longyear
Foreman: L. Hunsberger
Date Started: 11/10/11 **Date Finished: 11/10/11**
Logged By: AVK **Checked By: EMB/JSP**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/Rec (in)	Field Testing Data	Stratum: Log	Stratum: Description	Geologic Description	Well Diagram	Well Description
26										
28							WEATHERED BEDROCK			
30	S-9	30 - 30.4		---	PID: NA		-----30.4'-----	S-9 (30 to 30.4'): Medium hard, severely weathered, aphanatic SHALE. Wet. ROCK.		Thermocouple installed (30')
32										
34										
36										
38										
40										
42										
44										
46										
48										
50										

Boring terminated at 30.4 feet. No refusal encountered.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRae3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Severely Weathered bedrock observed at about 23.7 feet bgs.

APPENDIX D

ELECTRICAL RESISTANCE HEATING (ERH) TREATMENT PERFORMANCE MONITORING

APPENDIX D

ELECTRICAL RESISTANCE HEATING TREATMENT PERFORMANCE MONITORING
OPERABLE UNIT #5/BUILDING 57 AREA, UNION AND ENDICOTT, NY

TABLE OF CONTENTS

TABLES

FIGURES

ATTACHMENTS

This appendix summarizes the performance monitoring of Electrical Resistance Heating (ERH) thermal treatment system operation performed by Sanborn Head & Associates, Inc. (Sanborn Head) from February 9, 2012 through September 24, 2012 at Building 57 (Site) located in IBM Operable Unit #5, Union and Endicott, NY. The work described herein was performed in accordance with the agency approved Interim Remedial Measure (IRM) Work Plan[1]. This appendix is subject to the limitations provided in Appendix A.

Performance monitoring activities included collection and submittal for laboratory analysis for the presence of volatile organic compounds (VOCs) of the following:

- Vapor phase samples from sample ports of the treatment process trains (refer to the Treatment Train Schematic provided in Exhibit 1 for sample port locations);

- Condensate samples from both treatment trains; and

- Confirmatory soil samples at three stages of remedial progress.

Further detail is provided in the sections below.

D.1 ERH PROCESS TRAIN MONITORING

D.1.1 Vapor-Phase Sampling

Process Treatment Trains & Discharge Stack

Sanborn Head along with assistance from O'Brien & Gere (OBG) conducted ERH treatment system monitoring, which included routine collection of screening-level measurements of total VOCs using a photoionization detector (PID), flame ionization detector (FID), and Miran SapphIRe; and collection of Summa®-type (Summa) canister vapor samples from three locations within each treatment train (sample ports B, C, and D) and one stack effluent sample (sample port F) as prescribed in the IRM Work Plan. Samples were submitted to Air Toxics Ltd. (ATL) of Folsom, CA for analysis by US Environmental Protection Agency (USEPA) Method TO-15.

Vapor-phase sample were used for following supporting purposes:

---

1 Sanborn, Head Engineering, P.C., June 24, 2011 "In situ Thermal Treatment IRM Work plan – OU #5, Building 57, Former IBM Facility, Endicott, New York, AOC Index No. A7-0502-0104, NYSDEC Site No. 7-04-014".

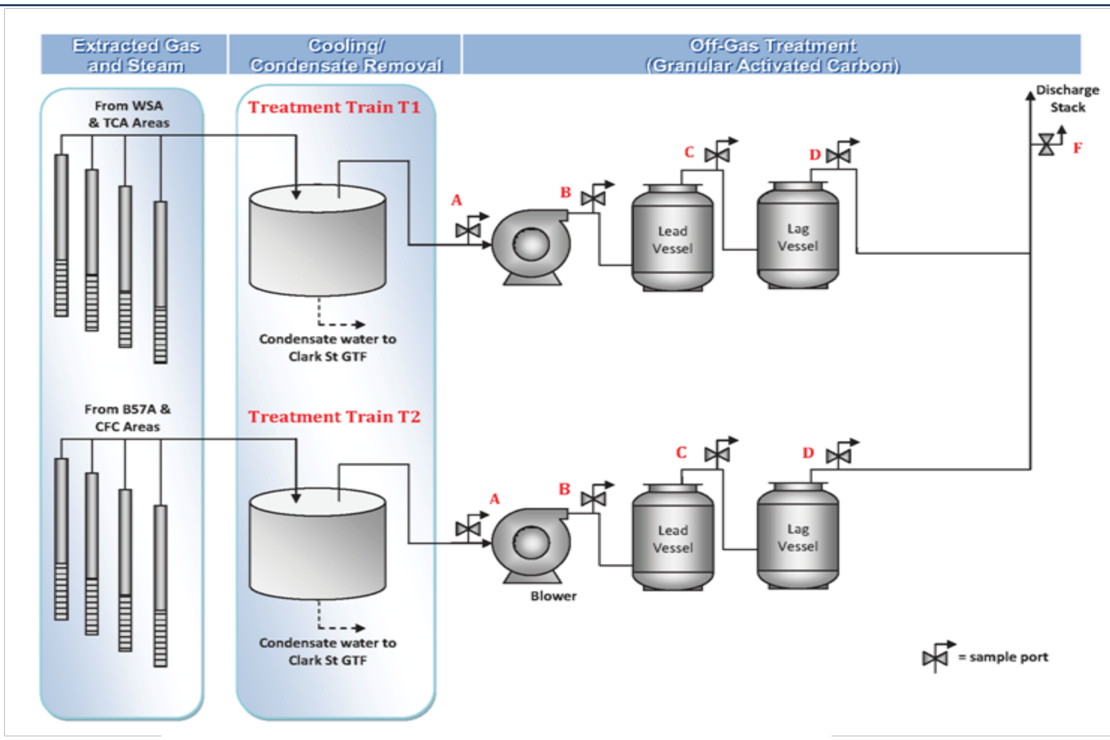

Exhibit 1 – Treatment Process Train Schematic

- To assess whether the influent (Port B) and effluent (Port F) vapor met the applicable Short-term Guideline Concentrations and Annual Guideline Concentrations as provided in New York State Department of Environmental Conservation (NYSDEC) Policy DAR-1: Guidelines for the Control of Toxic Ambient Air Contaminants;
- To monitor for "breakthrough" of VOC vapors between the lead and lag granular activated carbon (GAC) vessels, and assess the need for carbon change-outs;
- To estimate VOC mass removal from the subsurface through each treatment train; and
- To assess the removal efficiency of the individual GAC units to better predict the carbon use rates during system operation.

For a brief period from May 7, 2012 through June 12, 2012 screening-level vapor samples were collected from various points in both source zone headers in each treatment train, in an effort to qualitatively predict the VOC contributions from each source zone. Samples were collected into Tedlar bags for field screening using a PID and FID. Samples were also collected for laboratory analysis in glass vials between May 11, 2012 and June 4, 2012 and submitted to Microseeps Inc., (Microseeps) of Pittsburgh, Pennsylvania for analysis of VOCs by lab-proprietary method AM 4.02.

Based on the field screen and laboratory analytical data Sanborn Head, estimated the total VOC mass removed[2] per week from each treatment train for the duration of treatment, provided in Exhibit 2 below. Table D.1 (A) provides a summary of detected concentrations of key VOCs in the influent extracted vapor at treatment ports A/B for both treatment trains & Table D.1 (B) provides summary of detected concentrations of key VOCs in the individual treatment zone headers. Influent field screening data vs. cumulative mass removed and influent Summa concentrations vs. cumulative mass removed for both treatment trains are summarized on Figures D.1 and D.2, respectively.

Exhibit 2 - Weekly Mass Removal Estimates

Week Ending	Treatment Train 1	Treatment Train 1	Treatment Train 2[3]	Treatment Train 2
	Weekly Mass Removed, lbs	**Cumulative Weekly Mass Removed, lbs**	**Weekly Mass Removed, lbs**	**Cumulative Weekly Mass Removed, lbs**
2/17/2012	83	83	481	481
2/24/2012	340	423	1255	1736
3/2/3012	102	525	0	1736
3/9/2012	183	708	0	1736
3/16/2012	50	758	152	1888
3/23/2012	114	872	885	2773
3/30/2012	47	919	392	3165
4/6/2012	63	982	649	3814
4/13/2012	43	1025	428	4242
4/20/2012	54	1079	177	4418
4/27/2012	39	1118	140	4559
5/4/2012	25	1143	191	4789
5/11/2012	16	1160	125	4914
5/18/2012	18	1178	63	4976
5/25/2012	22	1199	73	5049
6/1/2012	26	1226	56	5105
6/8/2012	14	1240	40	5145
6/15/2012	14	1254	53	5198
6/22/2012	9.3	1264	60	5258
6/29/2012	9.3	1273	62	5320
7/6/2012	8.4	1283	49	5369
7/13/2012	8.6	1292	70	5439
7/20/2012	11	1303	46	5486
7/27/2012	7	1310	29	5515
8/3/2012	5.6	1316	19	5534
8/10/2012	6.7	1322	21	5555
8/17/2012	4.6	1327	22	5577
8/24/2012	4.2	1331	17	5594

2 Mass removal estimates were made based on influent concentrations associated with Summa samples. Mass removal estimates for days without laboratory samples were made with a combination of interpolation between data points and the assumption that changes in mass removal were proportional to changes in field screening results.

3 Mass removal estimates after 4-27-12 based on influent concentrations associated with Summa samples (prior mass estimates in Treatment Train 2 were made based on Miran SapphIRe field screening data). Mass removal estimates for days without laboratory samples were made using interpolation based on field screening, as described above.

Week Ending	Treatment Train 1	Treatment Train 1	Treatment Train 2[4]	Treatment Train 2
	Weekly Mass Removed, lbs	**Cumulative Weekly Mass Removed, lbs**	**Weekly Mass Removed, lbs**	**Cumulative Weekly Mass Removed, lbs**
8/31/2012	4.0	1335	11	5605
9/7/2012	3.4	1339	8.5	5613
9/14/2012	3.4	1342	6	5619
9/21/2012	2.7*	1345*	3*	5622*
9/24/2012	0.9*	1346*	0.4*	5622*

*** Indicates values are extrapolated based on the Summa samples collected on 9-19-2012.**

A breakdown of estimated key VOC constituents (trichloroethene [TCE], cis 1,2-dichloroethene [cDCE], vinyl chloride [VC], 1,1,1, trichloroethane [1,1,1 TCA] and CFC-113) mass removed from subsurface is provided in Exhibit 3 below.

Exhibit 3 - Key Constituent VOC Mass Removal Estimate

Key Constituent	**Estimated VOC Mass Removed[5] (lbs)**
TCE	614
cDCE	267
VC	25
1,1,1 TCA[6]	Not Estimated
CFC1113	4,942
Other VOCs	1,120
Total VOCs Removed	6,968

A total of 32,400 lbs of GAC was used for treating vapor through Treatment Train 1 and 44,100 lbs for treating vapor through Treatment Train 2 prior to discharge in ambient air. A summary of carbon management is provided as Attachment D.1. Soil vapor sampling field summary forms are provided as Attachment D.2 (on disc); all analytical laboratory reports collected during vapor sampling are compiled in Appendix H (on disc).

D.1.2 Condensate Sampling

Condensate removed from the extracted soil gas stream of each treatment train was sampled and analyzed for VOCs on a biweekly basis to assess influent water quality for treatment at the Clark Street Groundwater Treatment Facility (GTF). Samples were collected and submitted to Lancaster Laboratories of Lancaster, PA for analysis of VOCs by USEPA Method 8260B. The quantity of condensate generated and transferred to the Clark Street GTF was monitored by TRS. Concentrations of key VOCs detected in condensate samples are provided in Table D.2.

---

4 Mass removal estimates after 4-27-12 based on influent concentrations associated with Summa samples (prior mass estimates in Treatment Train 2 were made based on Miran SapphIRe field screening data). Mass removal estimates for days without laboratory samples were made using interpolation based on field screening, as described above.

5 Mass removal rates were calculated using estimated vapor extraction rates and laboratory measured sample concentrations for each constituent. The constituent concentrations between sampling rounds were normalized to the daily field measurements.

6 1,1,1 TCA was not detected in the samples of extracted vapor and is typically degraded through the heating process; therefore, extracted mass could not be estimated. The biodegradation by-products of 1,1,1 TCA are included in the other VOC category along with petroleum-related constituents that were detected in vapor samples.

All analytical laboratory reports are compiled in Appendix H (on disc).

D.2 ERH PERFORMANCE CONFIRMATORY SOIL SAMPLING

At approximately 70%, 85%, and 100% of the budgeted power use, Sanborn Head completed confirmatory sampling by collecting soil samples from multiple locations within each source zone (refer to IRM Completion Report text for detailed discussion of results and Figure 2 for confirmatory soil sampling locations) using the direct push drilling and sampling technique. Sanborn Head retained the services of Parratt-Wolff, Inc. (PWI) of Syracuse, NY to advance the direct push soil borings.

The scope of work completed by Sanborn Head during confirmatory drilling included:

- Drilling observation and documentation of the thirty-nine (39) soil borings (B57-601 through 639) by direct push drilling technique by PWI using Geoprobe® rig models 7822/6620 DT;
- Characterization and field screening of soil samples;
- Selection, preparation, and submittal of soil samples for laboratory analysis by USEPA Method 8260B;
- Containerization of all drill cuttings, excavated soils and decontamination wash water into drum containers provided by PWI; and
- Re-sampling of soils from locations and depths from which VOCs were detected above NYSDEC Soil Cleanup Objectives for Unrestricted Use, to confirm and demonstrate that Remedial Action Objectives were met.

Direct Push Drilling in the Interior CFC Area

D.2.1 Soil Logging and Sampling

Given the elevated soil temperature, five-foot stainless steel (SS) core liners were used in place of conventional acetate liners. The SS liners were transferred from the borehole to an ice bath, in order to come to ambient temperature before sampling. OBG personnel assisted in grinding and opening the SS liners for Sanborn Head to log/classify, screen, and collect soil samples.

Sanborn Head representatives observed and characterized soils according to the modified Burmeister method. Head space screening for VOCs was completed in Ziploc® bags using a MiniRAE 3000 PID with a 10.6 eV lamp and a Photovac MicroFID analyzer. Soil samples were collected from each stratum based upon field observations, including petroleum odors, staining or discoloration of soil or rock, evidence of free product, or elevated PID/FID headspace readings.

Ice bath cooling for SS Soil Cores

Soil samples were submitted to Lancaster Laboratories (Lancaster) of Lancaster, PA for analysis of VOCs by USEPA method 8260B. Duplicate samples, daily field blanks, equipment blanks and laboratory-supplied trip blanks were submitted for quality assurance/quality control analysis as described in the IRM Work Plan. All down-hole drilling equipment and reusable sampling equipment was cleaned prior to initial use and between sampling locations.

Grinding of SS Macro-cores

Detailed results for each soil sampling event are discussed in the IRM Completion Report text; presented on Figures 3(A) through 3(D); and plots of detected VOC concentrations vs. depth are provided to facilitate assessment of the subsurface distribution of VOCs (provided in Figures D.3 through D.23).

Soil sampling observations made by Sanborn Head personnel during the 70% confirmatory sampling event in June 2012 are presented in form of boring logs provided as Attachment D.3 (on disc); soil sampling observations for 85% and 100% confirmatory sampling events in July and September 2012 are presented in Tables D.3 and D.4 respectively. A summary of

VOC concentrations detected during all confirmatory soil sampling events is provided in Table D.5.

D.2.2 Investigation Derived Waste and Boring Abandonment

All soil, cuttings, decontamination/wash water, and other investigation-derived waste were contained in labeled, clean, water-tight, new, and unused steel drums provided by PWI, which were transferred to the Clark Street GTF for storage until sampling, evaluation, and ultimate appropriate disposal disposition was established. A total of 6 drums with investigation-derived waste were generated.

All interior borings were backfilled using Type II Portland cement grout from the bottom of the borehole to one foot below the floor surface; exterior borings were backfilled with cement from the bottom of the borehole to the ground surface in order to provide a proper seal and minimize vapor intrusion pathways.

Table D.1 (A)
Summary of Analytical Results - Influent Extracted Vapor
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Key VOCs in Units of Parts Per Million by Volume (ppmv)										
	Date	TCE	cDCE	Vinyl Chloride	1,1,1-TCA	CFC-113	Benzene	Ethyl Benzene	Toluene	Total Xylenes
Treatment Train 1	02/09/12	0.43	0.071	<0.0015	0.04	0.010	<0.0015	<0.0015	<0.0015	0
	02/15/12	20	8.6	1.9	0.40	6.7	<0.12	<0.12	0.32	0.12
	02/20/12	50	30	3.3	0.51	8.1	<0.18	<0.18	0.34	0
	03/05/12	56	30	2.9	0.48	6.5	<0.34	<0.35	0.45	0
	03/19/12	30	18	2.4	0.12	1.5	<0.066	<0.067	0.19	0.078
	03/27/12	8.0	5.3	0.63	0.06	0.20	<0.034	0.048	0.24	0.037
	04/02/12	17	12	1.6	0.097	0.57	<0.085	<0.085	0.14	0
		15	11	1.5	0.10	0.51	<0.088	<0.088	0.15	0
	04/09/12	8.7	6.8	1.0	0.044	0.26	<0.034	<0.032	0.11	0.035
	04/16/12	5.6	4.3	0.74	<0.057	18	<0.056	<0.058	0.17	0.097
	04/25/12	3.7	2.8	0.32	0.020	0.09	0.04	0.023	0.21	0.039
	04/30/12	4.7	3.5	0.51	0.022	0.13	0.11	0.030	0.20	0.082
	05/10/12	2.0	1.3	0.22	<0.011	0.023	0.012	0.015	0.074	0.018
	05/15/12	3.2	2.1	0.29	0.012	0.04	0.019	0.020	0.066	0.051
	05/22/12	3.2	2.2	0.33	0.017	0.09	0.019	0.025	0.160	0.069
	05/31/12	3.0	1.4	0.18	0.013	0.051	0.013	0.022	0.080	0.060
	06/04/12	3.2	1.8	0.24	0.015	0.060	0.017	0.028	0.110	0.084
	06/13/12	2.3	1.3	0.22	0.0078	0.064	0.015	0.022	0.061	0.067
	06/27/12	1.8	0.95	0.095	<0.0092	0.036	0.014	0.026	0.042	0.056
	07/03/12	2.2	0.97	0.21	<0.0090	0.026	0.022	0.025	0.033	0.080
	07/10/12	1.6	1.0	0.21	<0.0057	0.024	0.70	0.11	0.72	0.49
	07/18/12	2.2	1.0	0.24	<0.0078	0.024	0.014	0.015	0.024	0.036
	07/29/12	0.65	0.36	0.10	<0.0025	0.010	0.010	0.0077	0.010	0.018
	08/13/12	1.0	0.42	0.14	<0.0027	0.0060	0.0098	0.0089	0.011	0.023
	08/28/12	0.67	0.22	0.099	<0.0027	0.0049	0.0067	0.010	0.0049	0.033
	09/09/12	0.80	0.30	0.150	<0.0028	0.0033	0.0085	0.0053	0.0075	0.021
	09/19/12	0.30	0.14	0.066	<0.0013	0.0018	0.0044	0.0035	0.0033	0.013
Treatment Train 2	02/09/12	0.28	0.14	0.25	0.027	0.37	0.0013	0.0015	0.0024	0.012
	02/15/12	0.52	<0.40	<0.43	<0.42	103	<0.41	<0.41	0.53	0
	02/20/12	<1.8	<1.8	<1.8	<1.8	339	<1.8	<1.8	2.3	0
	03/15/12	0.71	0.54	0.26	<0.11	24	0.23	<0.12	0.14	0.14
	03/18/12	0.66	0.60	<0.51	<0.51	230	7.60	0.58	4.4	2.1
	03/19/12	1.2	0.80	<0.47	<0.48	350	7.4	0.91	4.5	3.4
	3/27/2012	0.63	0.73	0.31	<0.20	34	0.34	<0.21	0.23	0.23
	04/02/12	1.5	1.3	<1.2	<1.2	274	<1.2	<1.2	<1.2	0
		1.2	1.2	<0.86	<0.86	290	<0.85	<0.85	<0.85	0
	04/05/12	1.1	0.91	<0.59	<0.59	111	5.6	<0.58	2.2	0.60
	04/09/12	1.2	0.91	<0.63	<0.64	157	1.2	<0.64	0.93	0
	04/17/12	0.74	0.66	0.19	<0.088	26	<0.088	<0.088	0.29	0.16
	04/25/12	4.7	0.83	0.18	<0.11	23	<0.11	<0.11	0.15	0.13
	04/29/12	2.0	0.73	0.18	<0.073	39	22	1.8	11	6.4
	05/10/12	1.7	0.58	0.22	<0.066	18	0.20	<0.066	0.23	0.31
	05/15/12	0.69	0.55	0.15	<0.043	10	0.81	0.10	0.45	0.45
	05/22/12	0.97	0.5	0.16	<0.094	17	<0.094	<0.094	0.10	0.16
	05/31/12	0.56	0.35	0.12	<0.037	10	0.26	0.046	0.26	0.23
	06/04/12	0.65	0.50	0.17	0.020	5.4	1.0	0.058	0.32	0.37
	06/13/12	0.38	0.44	0.16	<0.018	11	0.026	<0.018	0.029	0.17
	06/27/12	0.35	0.31	0.15	<0.074	14	0.52	<0.074	0.33	0.33
	07/03/12	0.28	0.22	0.14	<0.037	8.7	<0.037	<0.037	0.055	0.072
	07/10/12	0.23	0.19	0.078	<0.056	14	1.4	0.084	0.91	0.32
	07/18/12	0.38	0.33	0.20	<0.035	10	<0.035	<0.035	0.087	0.094
	07/29/12	0.21	0.17	0.072	<0.009	3.6	<0.009	<0.009	0.012	0.057
	08/13/12	0.38	0.26	0.11	<0.0097	3.0	1.9	0.16	0.72	0.51
	08/28/12	0.39	0.36	0.13	0.0064	2.0	0.018	0.0067	0.016	0.043
	09/09/12	0.39	0.22	0.046	0.0055	0.85	0.012	0.0067	0.013	0.045
	09/19/12	0.17	0.21	0.071	0.0033	0.014	0.010	0.0043	0.012	0.034

Notes:
1. Vapor samples were collected in 1-Liter stainless steel Summa canisters by Sanborn Head on dates indicated.
2. Sample analysis (EPA Method TO-15) was performed by Air Toxics Limited, Folsom, California.
3. Analytical laboratory reports are provided in Appendix H (on disc).

Table D.1 (B)
Summary of Analytical Results - Header Extracted Vapor
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

	Key VOCs in units of Parts per Million by Volume (ppmv)										
		Date	**TCE**	**cDCE**	**Vinyl Chloride**	**1,1,1-TCA**	**CFC-113**	**Benzene**	**Ethyl Benzene**	**Toluene**	**Total Xylenes**
Treatment Train 1	**TCA Area**	5/11/2012	**0.55**	**0.44**	**3.2**	**0.055**	**0.32**	**0.089**	<0.10	**0.22**	<0.20
		5/21/2012	**0.54**	**0.26**	**2.1**	**0.056**	**0.21**	**0.035**	<0.10	**0.21**	<0.20
		6/4/2012	**0.7**	**0.48**	**1.7**	**0.045**	**0.22**	<0.10	<0.10	**0.12**	<0.20
	Waste Solvent Area	5/11/2012	**4.5**	**4.4**	**3.7**	**0.0071**	**0.022**	**0.11**	<0.10	<0.10	<0.20
		5/21/2012	**4.1**	**3.1**	**2.6**	**0.0081**	**0.050**	**0.075**	<0.10	<0.10	**0.12**
		6/4/2012	**2.5**	**2.8**	**2.4**	**0.0062**	**0.029**	**0.1**	**0.018**	**0.02**	<0.20
	Pre-Condenser, Combined (TCA Area & Waste Solvent Area)	5/11/2012	**3.4**	**3.6**	**3.8**	**0.023**	**0.14**	**0.12**	<0.10	**0.11**	<0.20
		5/21/2012	**2.5**	**2.3**	**1.9**	**0.025**	**0.11**	**0.073**	<0.10	**0.10**	**0.06**
		6/4/2012	**1.8**	**2**	**2.8**	**0.018**	**0.088**	**0.077**	<0.10	**0.05**	**0.06**
Treatment Train 2	**CFC Area**	5/11/2012	**0.89**	**0.31**	**1.2**	**0.018**	**180**	**0.077**	<0.10	<0.10	**0.032**
		5/21/2012	**0.28**	**0.15**	**1.1**	**0.014**	**38**	**0.032**	<0.10	<0.10	**0.065**
		6/4/2012	**0.16**	**0.098**	**0.59**	**0.0083**	**20**	**0.016**	<0.10	<0.10	<0.20
	Building57A Area	5/11/2012	**0.58**	**0.90**	**2.4**	**0.057**	**0.073**	**0.22**	**0.14**	**0.20**	**0.45**
		5/21/2012	**0.67**	**1.1**	**2.4**	**0.063**	**0.13**	**0.094**	**0.096**	**0.050**	**0.23**
		6/4/2012	**0.36**	**0.46**	<1.0	**0.025**	**0.085**	**0.67**	**0.021**	**0.20**	**0.10**
	Pre-Condenser, Combined (CFC Area & Building 57A Area)	5/11/2012	**0.56**	**0.56**	**4.4**	**0.036**	**66**	**0.14**	**0.054**	**0.10**	**0.10**
		5/21/2012	**0.50**	**0.50**	**2.1**	**0.048**	**15**	**0.072**	<0.10	**0.034**	**0.18**
		6/4/2012	**0.27**	**0.27**	<1.0	**0.018**	**5.8**	**0.4**	<0.10	**0.13**	**0.07**

Notes:
1. Vapor samples were collected in VOA vials with septum caps on the dates indicated.
2. Sample analysis was performed by Microseeps, Inc, of Pittsburgh, PA, using analytical method AM 4.02 for vapors.
3. Analytical laboratory reports are provided in Appendix H (on disc).

Table D.2
Summary of Analytical Results - Condensate
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Sample Port	Date	Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	CFC-113 (1,1,2-Trichloro-1,2,2-trifluoroethane)	Chloroform	Benzene	Toluene	Acetone	Bromodichloromethane	2-Butanone (MEK)	Dibromochloromethane	Tetrahydrofuran	Summation of Detected VOCs
		Detected VOCs in Units of Micrograms per Liter (µg/L)															
Treatment Train 1	3/5/2012	<0.5	**2.1**	<0.5	**1.9**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**100**	<0.5	**13**	<0.5	**2.4** J	119
	3/27/2012	**0.3** J	**10**	<0.5	**0.8**	<0.5	<0.5	**2.6**	<0.5	<0.5	**0.4** J	**6.7**	<0.5	<5.0	<0.5	<5.0	21
	4/9/2012	<0.5	**0.2** J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**7.3**	<0.5	<5.0	<0.5	<5.0	7.5
	4/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<5.0	<0.5	<5.0	0
	5/9/2012	<0.5	**0.3** J	<0.5	<0.5	<0.5	<0.5	<0.5	**0.1** J	<0.5	<0.5	<5.0	<0.5	<5.0	<0.5	<5.0	0
	5/22/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**4.4** J	<0.5	<5.0	<0.5	<5.0	4.4
	6/4/2012	<0.5	**0.2** J	<0.5	<0.5	<0.5	<0.5	<0.5	**0.1** J	<0.5	<0.5	**3.4** J	<0.5	**1.2** J	<0.5	**22**	27
	6/27/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.1** J	<0.5	<0.5	<5.0	<0.5	<5.0	<0.5	<5.0	0.1
	7/10/2012	<0.5	**0.2** J	<0.5	<0.5	<0.5	<0.5	<0.5	**0.3** J	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<5.0	0.5
	7/26/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**4.7** J	<0.5	<5.0	<0.5	<5.0	4.7
	8/13/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<5.0	<0.5	<5.0	0
	8/27/2012	<0.5	**0.2** J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<5.0	<5.0	<5.0	0.2
	9/11/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<5.0	<0.5	<5.0	0
	9/19/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<5.0	<0.5	<5.0	0
Treatment Train 2	3/27/2012	<0.5	**1.1**	<0.5	<0.5	<0.5	<0.5	**0.4** J	<0.5	<0.5	<0.5	**4.1** J	<0.5	<5.0	<0.5	<5.0	5.6
	4/9/2012	<0.5	**0.5**	<0.5	<0.5	<0.5	<0.5	**0.4** J	<0.5	**0.1** J	<0.5	**22**	<0.5	**2.7** J	<0.5	<5.0	26
	4/25/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**33**	<0.5	**3.7** J	<0.5	<5.0	37
	5/9/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**10**	<0.5	<5.0	<0.5	<5.0	10
	05/22/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.10** J	<0.5	<0.5	**5.3**	**0.10**	**1.0** J	**0.1** J	<5.0	6.6
	06/04/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**74**	<0.5	**7.7**	<0.5	<5.0	82
	06/27/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**3.5** J	<0.5	<5.0	<0.5	<5.0	3.5
	07/10/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**8.6**	<0.5	**1.1** J	<0.5	<5.0	9.7
	07/26/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**4.1** J	<0.5	<5.0	<0.5	<5.0	4.1
	08/13/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**21**	<0.5	**2.0** J	<0.5	<5.0	23
	08/27/12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.1** J	<0.5	<0.5	**3.3** J	**0.2** J	<5.0	**0.1** J	<5.0	3.7
	9/11/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<5.0	<0.5	<5.0	0
	9/19/2012	<0.5	<0.5	<0.5	**0.1** J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**88**	<0.5	**15**	<0.5	<5.0	103

Notes:
1) Condensate samples were collected in VOA vials by Sanborn Head on dates indicated.
2) Sample analysis (EPA Method 8260B) was performed by Lancaster Laboratories, Inc., of Lancaster, Pennsylvania.
3) 'J' qualifier indicates an estimated value.
4) Analytical laboratory reports are provided in Appendix H (on disc).

Table D.3
85% Soil Sampling Details - July 2012
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Soil Boring	Sample Name	Collection Date	Source Zone	Confirmatory Sampling Target Depth Range (ft)	Sample Depth (ft)		Modified Burmister Description	FID	PID	Target VOC(s) for Analysis Based on 70% Sampling Analytical Results
					Top	Bottom				
B57-606A	B57 - 606A/1A	7/25/2012	CFC Area	5 - 7	5	7	Black, fine to coarse sand, trace silt, trace gravels, moist, **FILL**	NM	NM	TCE
B57-611A	B57-611A/1A	7/25/2012	CFC Area	8 - 13	8	12	Gray, silt and clay with brown mottling, moist, **SILT & CLAY**	15	13	CFC-113
	B57-611A/2C		CFC Area	13 - 18	17	18	Dark gray, clayey silt, some fine to coarse sand, some gravel (fractured rock), coarse fraction - angular, moist, **TILL**	5.3	2.3	CFC-113
B57-613A	B57-613A/1	7/25/2012	B57A Area	5 - 10	8	9	Brown - Black, fine to coarse sand, some silt, trace gravels, trace concrete, very few slag particles, very slight petroleum odor, coarse fraction - subrounded, moist, **FILL**	54	48	cis-1,2 DCE
	B57-613A/2A			10 - 15	10.5	11	Dark Gray, clay and silt, moist, **SILT & CLAY**	19	9.2	cis-1,2 DCE
B57-617A	B57 - 617A/1	7/25/2012	B57A Area	10 - 15	10	15	Gray, clay and silt with brown mottling, moist, **SILT & CLAY**	19	16	cis-1,2 DCE
B57-618A	B57-618A/1	7/25/2012	B57A Area	3 - 8	3	4	Dark Brown, fine to coarse sand, some silt, little gravels, very few slag particles/brick, coarse fraction - angular to subrounded, moist, **FILL**	11	11	cis-1,2 DCE & TCE
B57-619A	B57-619A/1B	7/25/2012	B57A Area	16 - 21	18	21	Light Gray, clayey silt, some fine to coarse sand, trace gravel (rock fragments), coarse fraction - angular, dry, **TILL**	11	4.7	cis-1,2 DCE
B57-620A	B57-620A/1A	7/25/2012	B57A Area	3 - 8	3	4	Dark Brown - gray, fine to coarse sand, some silt, trace gravels, slight petroleum odor, coarse fraction - subangular to subrounded, moist, **FILL**	11	11	cis-1,2 DCE & TCE
B57-626A	B57-626A/1	7/24/2012	TCA Area	21 - 25	20	24	Light Gray, silt and clay, and gravel (fractured rock) , some fine to coarse sand, coarse fraction - angular, dry, **WEATHERED BEDROCK**	3.4	3.1	Vinyl chloride
B57-628A	B57-628A/1	7/23/2012	WSA	3 - 8	3	5	Brown Gray, clayey silt, little fine to coarse sand, trace gravels, coarse fraction - subangular to subrounded, moist, **FILL**	18	44	cis-1,2 DCE & TCE
B57-629A	B57-629A/1	7/23/2012	WSA	3 - 8	3	5	Brown, clayey silt to silt and clay, little fine to coarse sand, trace gravels, very few slag and brick particles, coarse fraction - subangular to subrounded, moist, **FILL**	8	17	TCE
	B57-629A/3			10 - 12.5	10	15	Dark gray to gray with brown mottling, clay and silt grading to silt and clay, trace fine to medium sand, moist, **CLAY & SILT TO SILT & CLAY**	7	8	cis-1,2 DCE
	B57-629A/4B			18.8 - 20	18.8	20	Grayish brown to gray, clayey and silt, some gravels, little fine to coarse sand (lower 1.2' of recovery), coarse fraction subrounded, moist	7	11	cis-1,2 DCE
B57-630A	B57-630A/1	7/24/2012	WSA	3 - 8	3	5	Brown, clay and silt, little fine to coarse sand, little gravels, coarse fraction - rounded to subangular, moist, **FILL**	14	15	TCE
	B57-630A/2D			23 - 28	26.8	28	Clayey silt, some sand, some gravel (fractured rock), coarse fraction - subangular to angular, moist	3.8	2.4	Vinyl chloride
B57-631A	B57-631A/1	7/23/2012	WSA	3 - 5	3	5	Gray-brown, silt and clay, little fine to coarse sand, trace gravels, trace brick, coarse fraction - rounded to subangular, moist, **FILL**	6	26	TCE
B57-632A	B57-632A/1B	7/24/2012	WSA	8 - 13	11.6	13	Dark gray, clay and silt, little gravels, trace fine to coarse sand, coarse fraction - subrounded to subangular, moist, **SILT & CLAY**	5	4	cis-1,2 DCE, vinyl chloride & TCE
B57-634A	B57-634A/1	7/24/2012	WSA	5 - 10	5	10	Brown, silt and clay, some fine to coarse sand, little gravels, coarse fraction - subrounded, moist, **FILL**	14	44	cis-1,2 DCE & TCE
	B57-634A/2B			10 - 15	11	15	Gray, clay and silt, moist, **SILT & CLAY**	17	34	cis-1,2 DCE, vinyl chloride & TCE
	B57-634A/3C			15 - 20	19.5	20	Gray, clay and silt, little gravels, trace sand, coarse fraction - rounded to subrounded, moist, **SILT & CLAY**	7.1	5.2	cis-1,2 DCE & TCE
	B57-634A/4B			20 - 25	23.5	25	Gray, Silt and clay, and fine to coarse sand, some gravel (fractured shale), coarse fraction - angular, moist, **TILL**	17	47	cis-1,2 DCE & vinyl chloride
B57-635A	B57-635A/1	7/24/2012	WSA	5 - 10	5	10	Gray, silt and clay, little gravels, little sand, trace wood, trace brick, coarse fraction - subrounded, moist, **FILL**	14	23	cis-1,2 DCE & TCE
	B57-635A/2			10 - 15	13	14	Gray, silt and clay with brown mottling, trace gravels at top, moist, coarse fraction - angular, **SILT & CLAY**	12	8.9	cis-1,2 DCE & vinyl chloride
	B57-635A/3B			22 - 27	24	25	Gray, clayey silt, some gravel, trace sand, coarse fraction - angular, moist, **TILL**	13	24	cis-1,2 DCE & vinyl chloride
B57-636A	B57-636A/1B	7/24/2012	WSA	20 - 24	22.5	23	Brown, silt and clay, some gravel (fractured rock), some fine to coarse sand, coarse fraction - angular, moist, **TILL**	4.8	4.6	cis-1,2 DCE, vinyl chloride & TCE
	B57-636A/2B			24 - 27.5	26.5	27.5	Gray, silt and clay, and fine to coarse sand, some gravel (fractured rock) , coarse fraction - angular, wet, **WEATHERED BEDROCK**	1.4	1.1	Vinyl chloride
B57-637A	B57-637A/1	7/24/2012	WSA	3 - 5	3	5	Brown, silt and clay, some fine to coarse sand, some gravels, trace roots, coarse angular fraction - subrounded, petroleum odor noted, moist, **FILL**	113	31	cis-1,2 DCE & TCE
	B57-637A/2			5 - 9.6	5	10	Gray-Brown, silt and clay, little gravels, little sand, trace cobbles, trace roots, trace concrete, coarse angular fraction - subrounded to subangular, moist, **FILL**	14	20	cis-1,2 DCE & TCE
	B57-637A/3			10 - 15	10	15	Gray, clay and silt, trace gravels, trace sand at top, moist, **SILT & CLAY**	15	8.8	cis-1,2 DCE
	B57-637A/5A			25 - 30	25	26	Gray, clayey silt, little gravel (fractured rock), little sand, coarse fraction - angular, moist, **TILL**	10	6.3	cis-1,2 DCE, vinyl chloride & TCE
	B57-637A/5B			25 - 30	28	29	Light gray, clayey silt, little gravel (fractured rock), little sand, coarse fraction - angular, moist, **WEATHERED BEDROCK**	18	14	cis-1,2 DCE, vinyl chloride & TCE

Notes:
1) Samples were collected by Sanborn Head on the dates indicated.
2) Samples were analyzed by Lancaster laboratories of Lancaster, Pennsylvania for analysis of volatile organic compounds (VOCs) by U.S Environmental Protection Agency (USEPA) method 8260B.
3) All interior and exterior borings were backfilled using Portland cement grout to ground surface.
4) NM indicates the field screen was not measured for that sample range.

Table D.4
100% Soil Sampling Details - September 2012
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Soil Boring	Sample Name	Collection Date	Source Zone	Confirmatory Sample Target Depth Range (ft)	Sample Depth (ft)		Modified Burmister Description	FID	PID	Target VOC(s) for Analysis Based on 85% Sampling Analytical Results
					Top	Bottom				
B57-618B	B57 - 618B/1A	9/18/2012	B57A Area	3 - 5	3	5	Dark Brown, fine to coarse sand, some gravels, some silt, coarse fraction - subrounded to angular, moist, **FILL**	1.1	0.8	cis-1,2 DCE & TCE
B57-620B	B57-620B/1A	9/18/2012	B57A Area	3 - 5	3	5	Dark Brown, fine to coarse sand, some clayey silt, some gravels, trace organic peat, coarse fraction - subrounded to angular, moist, **FILL**	6.3	5.9	cis-1,2 DCE & TCE
B57-628B	B57-628B/1	9/17/2012	WSA	3 - 5	3	5	Dark Brown, clayey silt, little fine to coarse sand, trace gravels, coarse fraction - subrounded to subangular, moist, **FILL**	5.5	1.8	cis-1,2 DCE & TCE
B57-629B	B57-629B/1	9/17/2012	WSA	3 - 5	3	5	Light Gray, silt and clay, some fine to coarse sand, trace gravels, trace brick, coarse fraction - rounded to angular, dry, FILL	1.1	0.1	TCE
B57-630B	B57-630B/2D	9/17/2012	WSA	20 - 23	21	23	Dark Brown, fine to coarse sand, some silt, some gravels, coarse fraction - subangular to angular, wet, **GRAVELLY SAND**	2.0	0.1	Vinyl chloride
B57-631B	B57-631B/1	9/17/2012	WSA	3 - 5	3	5	Gray with slight orange mottling, silt and clay, little coarse sand, trace gravels, trace concrete, coarse fraction - subrounded to angular, moist, FILL	2.5	0.5	TCE
B57-632B	B57-632B/1B	9/17/2012	WSA	11.5 - 13	11.5	13	Dark Gray, clay and silt, trace fine to coarse sand at bottom, moist, CLAY & SILT	9.6	2.3	cis-1,2 DCE & TCE
B57-634B	B57-634B/1	9/17/2012	WSA	5 - 10	5	10	Gray, fine to coarse sand and gravels, some clayey silt, coarse fraction - rounded to subangular, dry, FILL	2.4	1.5	cis-1,2 DCE & TCE
	B57-634B/2B			11 - 15	11	15	Dark Gray with slight orange mottling, clay and silt, trace slag particles, moist, **CLAY & SILT**	4.0	1.4	cis-1,2 DCE, vinyl chloride & TCE
	B57-634B/4B			22 - 24	22	24	Gray, Silt and clay, and fine to coarse sand, some fractured shale, coarse fraction - angular, moist, **TILL**	3.0	2.0	cis-1,2 DCE & vinyl chloride
B57-635B	B57-635B/3B	9/17/2012	WSA	22 - 24	23	24	Clayey silt, some gravelly weathered shale, coarse fraction - angular, moist, **SILT & GRAVEL & TILL**	1.9	0.4	cis-1,2 DCE
B57-636B	B57-636B/2B	9/17/2012	WSA	25 - 28	26.5	27.5	Light Gray, silt, some fine to coarse sand, some weathered shale, coarse fraction - subangular to angular, dry, **WEATHERED BEDROCK**	1.8	0.1	Vinyl chloride
B57-637B	B57-637B/1	9/18/2012	WSA	3 - 5	3	5	Brown-Gray, fine to coarse sand, some gravels, some silt and clay, trace bricks at top, coarse angular fraction - subrounded to angular, dry, **FILL**	0.8	0.8	cis-1,2 DCE & TCE
	B57-637B/3			10 - 15	10	15	Gray with orange mottling, silt and clay, moist, **SILT & CLAY**	1.3	0.5	cis-1,2 DCE
	B57-637B/5A			25 - 26	25	26	Gray, silt and clay, little weathered bedrock, coarse fraction - subangular to angular, moist to wet, **WEATHERED BEDROCK**	1.1	0.2	cis-1,2 DCE & TCE

Notes:
1) Samples were collected by Sanborn Head on the dates indicated.
2) Samples were analyzed by Lancaster laboratories of Lancaster, Pennsylvania for analysis of volatile organic compounds (VOCs) by U.S Environmental Protection Agency (USEPA) method 8260B.
3) All interior and exterior borings were backfilled using Portland cement grout to ground surface.
4) NM indicates the field screen was not measured for that sample range.

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-601				B57-602				B57-603				B57-604		
			B57-601/1B	B57-601/2	B57-601/3A	B57-601/3B	B57-602/1A	B57-602/1B	B57-602/2B	B57-602/4B	B57-603/1A	B57-603/1B	B57-603/3	B57-603/4B	B57-604/1C	B57-604/2A	B57-604/2B
			CFC Area														
			8.4 - 10	10 - 12.5	15.5 - 19.4	19.4 - 20	5 - 6.2	6.2 - 10	14.3 - 15	22.1 - 23	5 - 6	6 - 10	15 - 20	21 - 23	9.5 - 10	10 - 13.9	13.9 - 15
			06/19/12	06/19/12	06/19/12	06/19/12	06/18/12	06/18/12	06/18/12	06/18/12	06/18/12	06/18/12	06/18/12	06/18/12	06/18/12	06/18/12	06/18/12
VOCs																	
AVOCs																	
Benzene	60	44,000	<9	<5	**1 J**	<6	**0.6 J**	<6	<6	<4	**190 J**	<4	<5	<4	<5	<4	<4
Dichlorobenzene (1,2-)	1,100	500,000	<9 UJ	<5	<6 UJ	<6 UJ	<5	<6 UJ	<6	<4 UJ	<7 UJ	<4	<5	<4	<5	<4	<4
Dichlorobenzene (1,3-)	2,400	280,000	<9 UJ	<5	<6 UJ	<6 UJ	<5	<6 UJ	<6	<4 UJ	<7 UJ	<4	<5	<4	<5	<4	<4
Dichlorobenzene (1,4-)	1,800	130,000	<9 UJ	<5	<6 UJ	<6 UJ	<5	<6 UJ	<6	<4 UJ	<7 UJ	<4	<5	<4	<5	<4	<4
Ethylbenzene	1,000	390,000	<9	<5	<6	<6	<5	<6	<6	<4	**120 J**	<4	<5	<4	<5	<4	<4
Styrene	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Toluene	700	500,000	<9	<5	<6	<6	<5	<6	<6	<4	**780**	<4	<5	<4	<5	<4	<4
Xylene (m,p-)	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	**730**	<4	<5	<4	<5	<4	<4
Xylene (o-)	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	**400**	<4	<5	<4	<5	<4	<4
CVOCs																	
Carbon tetrachloride	760	22,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Chlorobenzene (Monochlorobenzene)	1,100	500,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Chloroethane	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Chloroform (Trichloromethane)	370	350,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Chloromethane	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Dichloroethane (1,1-)	270	240,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Dichloroethane (1,2-)	20	30,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Dichloroethene (1,1-)	330	500,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Dichloroethene (cis-1,2-)	250	500,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Dichloroethene (trans-1,2-)	190	500,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Dichloropropane (1,2-)	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Dichloropropene (cis-1,3-)	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Dichloropropene (trans-1,3-)	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Methylene Chloride (Dichloromethane)	50	500,000	**6 J**	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Tetrachloroethane (1,1,1,2-)	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Tetrachloroethane (1,1,2,2-)	NE	NE	<9 UJ	<5	<6 UJ	<6 UJ	<5	<6 UJ	<6	<4 UJ	<7 UJ	<4	<5	<4	<5	<4	<4
Tetrachloroethene (PCE)	1,300	150,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Trichloroethane (1,1,1-)	680	500,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Trichloroethane (1,1,2-)	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Trichloroethene (TCE)	470	200,000	**6 J**	<5 UJ	<6 UJ	<6 UJ	<5 UJ	<6 UJ	<6 UJ	<4 UJ	<7 UJ	<4 UJ	<5 UJ	<4 UJ	**3 J**	<4 UJ	<4 UJ
Vinyl chloride	20	13,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Other VOCs																	
Acetone	50	500,000	**99 J**	**200 J**	**46 J**	**100 J**	**24 J**	**2,000**	**150 J**	**18 J**	**1,400 J**	**760 J**	**19 J**	**23 J**	**490 J**	**91**	**92 J**
Bromodichloromethane	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Bromoform	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Bromomethane	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Butanone (2-) (MEK)	120	500,000	<17	**32**	<11	**7 J**	<10	**410**	**9 J**	<9	**91 J**	**70**	<9	<8	**36**	**19**	**8 J**
Carbon disulfide	NE	NE	**2 J**	<5	<6	<6	<5	<6	<6	<4	**6 J**	<4	<5	<4	<5	**1 J**	<4
Dibromochloromethane	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Dichlorodifluoromethane (CFC12)	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	**5 J**	<4	<5	<4	<5	<4	<4
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	**4 J**	<10	<11	<13	<10	<12	<12	<9	**2,000**	**6 J**	<9	<8	<9	<9	<9
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	**27 J**	<4	<5	<4	<5	<4	<4
Hexanone (2-)	NE	NE	<17	<10	<11	<13	<10	<12	<12	<9	<15 UJ	<8	<9	<8	<9	<9	<9
Isopropyl Alcohol (Isopropanol)	NE	NE	<170	<100	<110	<130	<100	<120	<120	<88	<150 UJ	<81	<92	<81	<95	<89	<87
Methyl-2-pentanone (4-) (MIBK)	NE	NE	<17	<10	<11	<13	<10	<12	<12	<9	<15 UJ	<8	<9	<8	<9	<9	<9
Methyl-tert Butyl Ether (MTBE)	930	500,000	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Tetrahydrofuran	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Trichlorofluoromethane	NE	NE	<9	<5	<6	<6	<5	<6	<6	<4	<7 UJ	<4	<5	<4	<5	<4	<4
Other Parameters																	
Moisture			17	14.1	7.1	3.1	7.8	20.5	13.7	5.9	11.6	10.5	8.9	9.7	9.6	21.7	11.5
Field Parameters																	
FID			0	0	0	0	3	5	2	0	4	5	1	2	0	0	0
PID			3	3	3	2	1	3	3	1	1	6	2	1	1	1	1

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives

Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-604	B57-605			B57-606					B57-607				B57-608	
			B57-604/4B	B57-605/1A	B57-605/1C	B57-605/2B	B57-606/1A	B57606A/1A	B57-606/1B	B57-606/2C	B57-606/3	B57-607/1A	B57-607/2A	B57-607/2B	B57-607/3B	B57-608/1	B57-608/2
			CFC Area														
			22.2 - 23	5 - 5.5	9 - 10	10.4 - 12	5 - 5.8	5 - 7	9 - 9.5	14.5 - 15	15 - 17	5 - 8	10 - 12	13.5 - 14	14 - 14.5	6 - 7	9 - 9.5
			06/18/12	06/18/12	06/18/12	06/18/12	06/18/12	07/25/12	06/18/12	06/18/12	06/18/12	06/18/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12
VOCs																	
AVOCs																	
Benzene	60	44,000	**2 J**	<6	<5	<4	**0.7 J**	-	<5	<4	<4	**0.9 J**	<5	<5	**0.5 J**	<5	<6
Dichlorobenzene (1,2-)	1,100	500,000	<5 UJ	<6 UJ	<5	<4	<7 UJ	-	<5	<4	<4 UJ	<6	<5	<5	<4	<5	<6
Dichlorobenzene (1,3-)	2,400	280,000	<5 UJ	<6 UJ	<5	<4	<7 UJ	-	<5	<4	<4 UJ	<6	<5	<5	<4	<5	<6
Dichlorobenzene (1,4-)	1,800	130,000	<5 UJ	<6 UJ	<5	<4	<7 UJ	-	<5	<4	<4 UJ	<6	<5	<5	<4	<5	<6
Ethylbenzene	1,000	390,000	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Styrene	NE	NE	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Toluene	700	500,000	**1 J**	<6	<5	<4	<7	-	<5	<4	<4	**3 J**	<5	<5	<4	<5	<6
Xylene (m,p-)	NE	NE	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Xylene (o-)	NE	NE	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
CVOCs																	
Carbon tetrachloride	760	22,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Chlorobenzene (Monochlorobenzene)	1,100	500,000	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Chloroethane	NE	NE	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Chloroform (Trichloromethane)	370	350,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Chloromethane	NE	NE	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Dichloroethane (1,1-)	270	240,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	**3 J**
Dichloroethane (1,2-)	20	30,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Dichloroethene (1,1-)	330	500,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	**2 J**
Dichloroethene (cis-1,2-)	250	500,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	**2 J**
Dichloroethene (trans-1,2-)	190	500,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Dichloropropane (1,2-)	NE	NE	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Dichloropropene (cis-1,3-)	NE	NE	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Dichloropropene (trans-1,3-)	NE	NE	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Methylene Chloride (Dichloromethane)	50	500,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Tetrachloroethane (1,1,1,2-)	NE	NE	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Tetrachloroethane (1,1,2,2-)	NE	NE	<5 UJ	<6 UJ	<5	<4	<7 UJ	-	<5	<4	<4 UJ	<6	<5	<5	<4	<5	<6
Tetrachloroethene (PCE)	1,300	150,000	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	**1,000**	**110 J**
Trichloroethane (1,1,1-)	680	500,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Trichloroethane (1,1,2-)	NE	NE	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Trichloroethene (TCE)	470	200,000	<5 UJ	**110 J**	<5 UJ	<4 UJ	**480 J**	<6 UJ	<5 UJ	<4 UJ	<4 UJ	<6 UJ	<5 UJ	<5 UJ	<4 UJ	<5 UJ	**1 J**
Vinyl chloride	20	13,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Other VOCs																	
Acetone	50	500,000	**14 J**	**790 J**	**280 J**	**22**	**3,700**	-	**280**	**190**	**38**	**4,000**	**540 J**	**110 J**	**26 J**	**1,300 J**	**640 J**
Bromodichloromethane	NE	NE	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Bromoform	NE	NE	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Bromomethane	NE	NE	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Butanone (2-) (MEK)	120	500,000	<10	**140**	**26**	<9	**3,800**	-	**31**	**13**	<8	**490**	**34**	**7 J**	<9	**92**	**41**
Carbon disulfide	NE	NE	**1 J**	**3 J**	<5	<4	**3 J**	-	**1 J**	<4	<4	**3 J**	**1 J**	<5	<4	**1 J**	<6
Dibromochloromethane	NE	NE	<5 UJ	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Dichlorodifluoromethane (CFC12)	NE	NE	**3 J**	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	**6**	<5	**3 J**
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	**3 J**	**18**	<10	<9	**3,400**	-	**58**	**2 J**	**25 J**	**3 J**	**5 J**	<9	**4 J**	**100**	**830**
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	**2 J**	**4 J**	<5	<4	**27**	-	<5	<4	**4 J**	**13**	<5	<5	**6**	**8**	**22**
Hexanone (2-)	NE	NE	<10 UJ	<12	<10	<9	<14	-	<10	<8	<8	<12	<10	<9	<9	<11	<11
Isopropyl Alcohol (Isopropanol)	NE	NE	<100	<120	<97	<88	**150**	-	<100	<78	<81	**520**	**100 J**	<93	<90	**370**	**72 J**
Methyl-2-pentanone (4-) (MIBK)	NE	NE	<10	<12	<10	<9	<14	-	<10	<8	<8	<12	<10	<9	<9	<11	<11
Methyl-tert Butyl Ether (MTBE)	930	500,000	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Tetrahydrofuran	NE	NE	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Trichlorofluoromethane	NE	NE	<5	<6	<5	<4	<7	-	<5	<4	<4	<6	<5	<5	<4	<5	<6
Other Parameters																	
Moisture			4.5	18.2	17.3	7.1	19.6	14.2	19.2	9.4	12.5	29.0	17	9.5	8.5	20.9	7.9
Field Parameters																	
FID			0	0.7	0	0	0	11	0	0	0	0	0.3	0	1.1	0	3.2
PID			1	5.8	4.4	2.6	1	3.9	2.6	3.9	2.4	10	0.6	0.6	2.9	8	4

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-608	B57-609				B57-610				B57-611					
			B57-608/3	B57-609/1B	B57-609/2B	B57-609/3A	B57-609/3B	B57-610/1	B57-610/2B	B57-610/2C	B57-610/3B	B57-611/1A	B57-611/1B	B57611A/1A	B57-611/2B	B57-611/3	B57611A/2C
			CFC Area														
			16 - 17	9 - 9.5	13 - 14	15 - 18.5	18.5 - 20	9.5 - 10	12.5 - 13	13 - 15	19 - 20	5.5 - 6	9.3 - 9.6	8 - 10	12.5 - 13.5	15 - 17	17 - 18
			06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	07/25/12	06/19/12	06/19/12	07/25/12
VOCs																	
AVOCs																	
Benzene	60	44,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	**0.9 J**	**0.6 J**	-	<4	**0.5 J**	-
Dichlorobenzene (1,2-)	1,100	500,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Dichlorobenzene (1,3-)	2,400	280,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Dichlorobenzene (1,4-)	1,800	130,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Ethylbenzene	1,000	390,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Styrene	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Toluene	700	500,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	**5 J**	<5	-	<4	<4	-
Xylene (m,p-)	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Xylene (o-)	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
CVOCs																	
Carbon tetrachloride	760	22,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Chlorobenzene (Monochlorobenzene)	1,100	500,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Chloroethane	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Chloroform (Trichloromethane)	370	350,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Chloromethane	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Dichloroethane (1,1-)	270	240,000	**210**	<5	<4	<4	<5 UJ	<5	<5	<4	<5	**51**	<5	-	<4	**1 J**	-
Dichloroethane (1,2-)	20	30,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Dichloroethene (1,1-)	330	500,000	**1 J**	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Dichloroethene (cis-1,2-)	250	500,000	<4	<5	**4 J**	**3 J**	<5 UJ	<5	<5	<4	<5	**7**	<5	-	<4	<4	-
Dichloroethene (trans-1,2-)	190	500,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Dichloropropane (1,2-)	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Dichloropropene (cis-1,3-)	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Dichloropropene (trans-1,3-)	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Methylene Chloride (Dichloromethane)	50	500,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Tetrachloroethane (1,1,1,2-)	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Tetrachloroethane (1,1,2,2-)	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Tetrachloroethene (PCE)	1,300	150,000	**70 J**	<5	<4	<4	<5 UJ	<5	<5	<4	<5	**1,200**	**1,000**	-	**330**	**190 J**	-
Trichloroethane (1,1,1-)	680	500,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Trichloroethane (1,1,2-)	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Trichloroethene (TCE)	470	200,000	<4 UJ	<5 UJ	**2 J**	**2 J**	<5 UJ	<5 UJ	<5 UJ	<4 UJ	<5 UJ	**2 J**	<5 UJ	-	<4 UJ	<4 UJ	-
Vinyl chloride	20	13,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Other VOCs																	
Acetone	50	500,000	**71**	**2,100 J**	**290**	**36**	**23 J**	**2,700**	**920 J**	**190 J**	**18 J**	**740 J**	**680 J**	-	**430 J**	**210 J**	-
Bromodichloromethane	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Bromoform	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Bromomethane	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Butanone (2-) (MEK)	120	500,000	**3 J**	**130**	**23**	<8	**5 J**	**130**	**52**	**20**	**33 J**	**69**	**48**	-	**21**	**24**	-
Carbon disulfide	NE	NE	<4	**1 J**	<4	<4	<5 UJ	**1 J**	<5	<4	**1 J**	**15**	**9**	-	<4	**3 J**	-
Dibromochloromethane	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Dichlorodifluoromethane (CFC12)	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	**26**	**120**	**13**	-	**53**	**740**	-
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	**2,200**	**11**	**15**	**3 J**	**41 J**	**6 J**	**56**	**18**	**150**	**4,600**	**770**	**58**	**1,000**	**17,000**	**73**
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	**1,100**	<5	**6**	<4	**50 J**	<5	<5	**2 J**	**16**	**3,400**	**100**	-	**170**	**5,500**	-
Hexanone (2-)	NE	NE	<7	<10	<9	<8	<11 UJ	<9	<10	<9	<10	<14	<10	-	<7	<9	-
Isopropyl Alcohol (Isopropanol)	NE	NE	**46 J**	**88 J**	**65 J**	<83	<110	**120**	<97	<88	<100	**1,500**	**240**	-	<72	<88	-
Methyl-2-pentanone (4-) (MIBK)	NE	NE	<7	<10	<9	<8	<11 UJ	<9	<10	<9	<10	<14	<10	-	<7	<9	-
Methyl-tert Butyl Ether (MTBE)	930	500,000	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Tetrahydrofuran	NE	NE	<4	<5	<4	<4	<5	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Trichlorofluoromethane	NE	NE	<4	<5	<4	<4	<5 UJ	<5	<5	<4	<5	<7	<5	-	<4	<4	-
Other Parameters																	
Moisture			9.7	18.1	10.2	5.4	7.6	15.3	13.9	7.3	5.7	32.3	16.7	16.2	10.4	4.7	9.9
Field Parameters																	
FID			0.8	1.2	0	0	0.2	1.7	0	0	0	8.6	3.7	14.7	13.6	35.1	5.3
PID			2.7	6.7	6.3	5.3	5.1	6.5	6.9	5.7	2	5.4	6.3	12.5	1.8	3.2	2.3

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-612			B57-613					B57-614			B57-615			B57-616
			B57-612/1	B57-612/3A	B57-612/3B	B57-613/2	B57613A/1	B57-613/3B	B57613A/2A	B57-613/3C	B57-614/2	B57-614/3A	B57-614/3B	B57-615/1	B57-615/3	B57-615/4B	B57-616/2
			B57A Area														
			3 - 5	10 - 13.6	13.6 - 15	5 - 10	8 - 9	10.2 - 14.5	10.5 - 11	14.5 - 15	5 - 10	10 - 12.5	14.2 - 15	3 - 5	10 - 12.5	15.6 - 17	5 - 10
			06/19/12	06/19/12	06/19/12	06/19/12	07/25/12	06/19/12	07/25/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12	06/19/12
VOCs																	
AVOCs																	
Benzene	60	44,000	<5	**16**	<5	**39 J**	-	**53 J**	-	**2 J**	<5	**6**	**1 J**	<5	**9**	**0.7 J**	<270
Dichlorobenzene (1,2-)	1,100	500,000	<5	<6 UJ	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	**270 J**
Dichlorobenzene (1,3-)	2,400	280,000	<5	<6 UJ	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Dichlorobenzene (1,4-)	1,800	130,000	<5	<6 UJ	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Ethylbenzene	1,000	390,000	<5	**2 J**	<5	**3,500**	-	**2,500**	-	**1 J**	<5	<6	<4	<5	<6	<4	**280**
Styrene	NE	NE	<5	**4 J**	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Toluene	700	500,000	<5	**11**	**1 J**	**1,700**	-	**630**	-	**3 J**	<5	**9**	<4	<5	**21**	<4	**73 J**
Xylene (m,p-)	NE	NE	<5	**16 J**	<5	**30,000**	-	**79,000**	-	**45**	<5	**8**	<4	<5	**2 J**	<4	**2,000**
Xylene (o-)	NE	NE	<5	**5 J**	<5	**7,700**	-	**20,000**	-	**14**	<5	**2 J**	<4	<5	<6	<4	**1,000**
CVOCs																	
Carbon tetrachloride	760	22,000	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Chlorobenzene (Monochlorobenzene)	1,100	500,000	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Chloroethane	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Chloroform (Trichloromethane)	370	350,000	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Chloromethane	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Dichloroethane (1,1-)	270	240,000	**1 J**	<6	<5	<280	-	<350	-	<7	<5	<6	<4	**5**	**4 J**	**2 J**	<270
Dichloroethane (1,2-)	20	30,000	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Dichloroethene (1,1-)	330	500,000	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	**2 J**	<6	**3 J**	<270
Dichloroethene (cis-1,2-)	250	500,000	**4 J**	**25**	<5	**400**	**6 J**	**250 J**	**13**	**12**	**8**	**3 J**	<4	**9**	**13**	**2 J**	**71 J**
Dichloroethene (trans-1,2-)	190	500,000	<5	**2 J**	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Dichloropropane (1,2-)	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Dichloropropene (cis-1,3-)	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Dichloropropene (trans-1,3-)	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Methylene Chloride (Dichloromethane)	50	500,000	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	**4 J**	<6	<4	<270
Tetrachloroethane (1,1,1,2-)	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Tetrachloroethane (1,1,2,2-)	NE	NE	<5	<6 UJ	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Tetrachloroethene (PCE)	1,300	150,000	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Trichloroethane (1,1,1-)	680	500,000	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Trichloroethane (1,1,2-)	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Trichloroethene (TCE)	470	200,000	**2 J**	**11 J**	**1 J**	**180 J**	-	**170 J**	-	**2 J**	**4 J**	<6 UJ	<4 UJ	**95 J**	**6 J**	**3 J**	**210 J**
Vinyl chloride	20	13,000	**2 J**	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Other VOCs																	
Acetone	50	500,000	<22	**3,200**	**450 J**	**1,500 J**	-	**4,200 J**	-	**590 J**	**440**	**5,200 J**	**18**	**2,000 J**	**6,300 J**	**27**	**850 J**
Bromodichloromethane	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Bromoform	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Bromomethane	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Butanone (2-) (MEK)	120	500,000	<11	**650 J**	**18**	<560	-	**940 J**	-	**56**	**69**	**830**	<8	**180**	**1,200**	<8	<540
Carbon disulfide	NE	NE	<5	**2 J**	<5	<280	-	<350	-	<7	<5	**1 J**	<4	**1 J**	<6	<4	**120 J**
Dibromochloromethane	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Dichlorodifluoromethane (CFC12)	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	<11	<12	<10	<560	-	<700	-	<13	<10	<11	<8	<9	<12	<8	<540
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Hexanone (2-)	NE	NE	<11	**20**	<10	<560	-	<700	-	<13	<10	**12**	<8	<9	**11 J**	<8	<540
Isopropyl Alcohol (Isopropanol)	NE	NE	<110	<120 UJ	<100	<5,600	-	<7,000	-	<130	<96	<110	<84	**230**	<120	<83	<5,400
Methyl-2-pentanone (4-) (MIBK)	NE	NE	<11	**15**	<10	<560	-	<700	-	<13	<10	**10 J**	<8	<9	**10 J**	<8	<540
Methyl-tert Butyl Ether (MTBE)	930	500,000	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Tetrahydrofuran	NE	NE	<5	<6 UJ	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Trichlorofluoromethane	NE	NE	<5	<6	<5	<280	-	<350	-	<7	<5	<6	<4	<5	<6	<4	<270
Other Parameters																	
Moisture			10.6	26.8	7.3	14.4	20	23.5	21.6	10.2	16.4	23.3	6.2	12	26.9	6.2	12.4
Field Parameters																	
FID			0	2	0	130	54	83	19	0	1	1	0	0	0	0	73
PID			5	28	4	705	48	266	9.2	12	8	10	6	13	10	3	190

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-616		B57-617				B57-618					B57-619			
			B57-616/3	B57-616/4B	B57-617/1	B57-617/3	B57617A/1	B57-617/4B	B57-618/1	B57618A/1A	B57618B/1A	B57-618/3	B57-618/4B	B57-619/2	B57-619/3B	B57-619/4B	B57619A/1B
			B57A Area														
			12.5 - 15	16.1 - 17.7	3 - 5	10 - 15	10 - 15	16.1 - 18.4	3 - 5	3 - 4	3 - 5	10 - 12.5	17.5 - 18.5	5 - 10	10 - 12.5	18.3 - 20	18 - 21
			06/19/12	06/19/12	06/20/12	06/20/12	07/25/12	06/20/12	06/20/12	07/25/12	09/18/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	07/25/12
VOCs																	
AVOCs																	
Benzene	60	44,000	**1 J**	**0.7 J**	**2 J**	**2 J**	-	**2 J**	**1 J**	-	-	<360	<5	<5	**0.6 J**	**2 J**	-
Dichlorobenzene (1,2-)	1,100	500,000	<5	<5	<5 UJ	<4 UJ	-	<4	<5 UJ	-	-	**220 J**	<5	<5	<6	<6	-
Dichlorobenzene (1,3-)	2,400	280,000	<5	<5	<5 UJ	<4 UJ	-	<4	<5 UJ	-	-	<360	<5	<5	<6	<6	-
Dichlorobenzene (1,4-)	1,800	130,000	<5	<5	<5 UJ	<4 UJ	-	<4	<5 UJ	-	-	<360	<5	<5	<6	<6	-
Ethylbenzene	1,000	390,000	**3 J**	<5	<5	<4	-	<4	<5	-	-	**740**	<5	<5	<6	<6	-
Styrene	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Toluene	700	500,000	**1 J**	**1 J**	**5**	<4	-	**1 J**	**2 J**	-	-	<360	**1 J**	<5	<6	**9**	-
Xylene (m,p-)	NE	NE	**32**	**2 J**	<5	<4	-	<4	**2 J**	-	-	**5,900**	<5	<5	<6	**4 J**	-
Xylene (o-)	NE	NE	**14**	**1 J**	<5	<4	-	<4	**1 J**	-	-	**920**	<5	<5	<6	**4 J**	-
CVOCs																	
Carbon tetrachloride	760	22,000	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Chlorobenzene (Monochlorobenzene)	1,100	500,000	<5	<5	<5	<4	-	<4	**2 J**	-	-	<360	<5	<5	<6	<6	-
Chloroethane	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Chloroform (Trichloromethane)	370	350,000	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Chloromethane	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Dichloroethane (1,1-)	270	240,000	<5	<5	**260 J**	<4	-	**1 J**	**150 J**	-	-	<360	<5	**1 J**	<6	<6	-
Dichloroethane (1,2-)	20	30,000	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Dichloroethene (1,1-)	330	500,000	<5	<5	**17**	<4	-	**3 J**	**2 J**	-	-	<360	<5	<5	<6	**1 J**	-
Dichloroethene (cis-1,2-)	250	500,000	**31**	**27**	**480**	**4 J**	**3 J**	**3 J**	**300**	**260 J**	<8	<360	**35**	**9 J**	**3 J**	**250**	**1,700**
Dichloroethene (trans-1,2-)	190	500,000	<5	**1 J**	<5	<4	-	<4	**2 J**	-	-	<360	<5	**1 J**	<6	**9**	-
Dichloropropane (1,2-)	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Dichloropropene (cis-1,3-)	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Dichloropropene (trans-1,3-)	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Methylene Chloride (Dichloromethane)	50	500,000	<5	<5	**43**	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Tetrachloroethane (1,1,1,2-)	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Tetrachloroethane (1,1,2,2-)	NE	NE	<5	<5	<5 UJ	<4 UJ	-	<4	<5 UJ	-	-	<360	<5	<5	<6	<6	-
Tetrachloroethene (PCE)	1,300	150,000	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Trichloroethane (1,1,1-)	680	500,000	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Trichloroethane (1,1,2-)	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Trichloroethene (TCE)	470	200,000	**6 J**	**21 J**	**300 J**	**6 J**	-	**29 J**	**2,800 J**	**3,300 J**	**3 J**	**84 J**	**6 J**	**4 J**	<6 UJ	**97 J**	-
Vinyl chloride	20	13,000	**8**	**1 J**	<5	<4	-	<4	<5	-	-	<360	**10**	<5	<6	**8**	-
Other VOCs																	
Acetone	50	500,000	**1,200 J**	**140**	**5,000 J**	**960 J**	-	**60 J**	**120**	-	-	**5,500 J**	**42**	**110 J**	**430 J**	**250 J**	-
Bromodichloromethane	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Bromoform	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Bromomethane	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Butanone (2-) (MEK)	120	500,000	**290**	**12**	**840 J**	**100**	-	<9	**14**	-	-	**1,100**	<11	**13**	**110 J**	**24 J**	-
Carbon disulfide	NE	NE	<5	<5	<5	**2 J**	-	**2 J**	**2 J**	-	-	<360	<5	**6 J**	<6	<6	-
Dibromochloromethane	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Dichlorodifluoromethane (CFC12)	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	<11	<9	<9	<9	-	<9	<10	-	-	<710	<11	<11	<11	<11	-
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	<5	<5	<5	<4	-	<4	**3 J**	-	-	<360	<5	<5	<6	<6	-
Hexanone (2-)	NE	NE	<11	<9	<9	<9	-	<9	<10	-	-	<710	<11	<11	<11 UJ	<11 UJ	-
Isopropyl Alcohol (Isopropanol)	NE	NE	<110	<92	<90 UJ	**280**	-	<89	**100 J**	-	-	<7,100	<110	<110	<110	<110	-
Methyl-2-pentanone (4-) (MIBK)	NE	NE	<11	<9	<9	<9	-	<9	<10	-	-	<710	<11	<11	<11 UJ	<11 UJ	-
Methyl-tert Butyl Ether (MTBE)	930	500,000	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Tetrahydrofuran	NE	NE	<5	<5	<5 UJ	**5**	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Trichlorofluoromethane	NE	NE	<5	<5	<5	<4	-	<4	<5	-	-	<360	<5	<5	<6	<6	-
Other Parameters																	
Moisture			15.6	6.3	10.4	18	22.8	11.1	10.5	7.5	8.1	22.6	8	11.6	15.9	9.2	7.1
Field Parameters																	
FID			14	0	48	2	19.1		12	11	1.1	27	2	56	2	2	10.5
PID			84	6	101	4	15.8		38	10.6	0.8	55	3	107	6	10	4.7

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-620					B57-621		B57-622				B57-623			B57-624
			B57-620/1	B57620A/1A	B57620B/1A	B57-620/3B	B57-620/4B	B57-621/2	B57-621/3	B57-622/2	B57-622/3A	B57-622/4B	B57-622/5	B57-623/2B	B57-623/3A	B57-623/4B	B57-624/2B
			B57A Area							*TCA Area*							
			3 - 5	3 - 4	3 - 5	10 - 12.5	17 - 18.5	5 - 10	10 - 12.5	5 - 10	10 - 13	15.8 - 19	20 - 25	8.5 - 9.2	10 - 11.5	16 - 18.5	7.5 - 9
			06/20/12	07/25/12	09/18/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/19/12
VOCs																	
AVOCs																	
Benzene	60	44,000	<5	-	-	**4 J**	<5	<290	**2 J**	<6	**2 J**	<5	<4	<8	<5	<6	**1 J**
Dichlorobenzene (1,2-)	1,100	500,000	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4 UJ	<8	<5	<6	<6 UJ
Dichlorobenzene (1,3-)	2,400	280,000	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4 UJ	<8	<5	<6	<6 UJ
Dichlorobenzene (1,4-)	1,800	130,000	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4 UJ	<8	<5	<6	<6 UJ
Ethylbenzene	1,000	390,000	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Styrene	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Toluene	700	500,000	<5	-	-	**2 J**	<5	<290	**1 J**	**1 J**	<5	<5	<4	<8	<5	<6	**4 J**
Xylene (m,p-)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Xylene (o-)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
CVOCs																	
Carbon tetrachloride	760	22,000	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Chlorobenzene (Monochlorobenzene)	1,100	500,000	**100 J**	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Chloroethane	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Chloroform (Trichloromethane)	370	350,000	**1 J**	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Chloromethane	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Dichloroethane (1,1-)	270	240,000	**1 J**	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Dichloroethane (1,2-)	20	30,000	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Dichloroethene (1,1-)	330	500,000	**2 J**	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Dichloroethene (cis-1,2-)	250	500,000	**310**	**740**	**20**	**18**	**5**	**180 J**	**2 J**	<6	<5	**1 J**	<4	<8	<5	**2 J**	<6
Dichloroethene (trans-1,2-)	190	500,000	**4 J**	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Dichloropropane (1,2-)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Dichloropropene (cis-1,3-)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Dichloropropene (trans-1,3-)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Methylene Chloride (Dichloromethane)	50	500,000	<5	-	-	<6	<5	<290	<6	<6	<5	**4 J**	<4	<8	<5	<6	**23**
Tetrachloroethane (1,1,1,2-)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Tetrachloroethane (1,1,2,2-)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4 UJ	<8	<5	<6	<6 UJ
Tetrachloroethene (PCE)	1,300	150,000	**1 J**	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Trichloroethane (1,1,1-)	680	500,000	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Trichloroethane (1,1,2-)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Trichloroethene (TCE)	470	200,000	**8,800 J**	**6,100 J**	**87 J**	**4 J**	**1 J**	**370 J**	<6 UJ	<6 UJ	<5 UJ	<5 UJ	<4 UJ	<8 UJ	<5 UJ	<6 UJ	<6 UJ
Vinyl chloride	20	13,000	<5	-	-	<6	**1 J**	<290	<6	<6	<5	<5	**1 J**	<8	<5	<6	<6
Other VOCs																	
Acetone	50	500,000	**14 J**	-	-	**5,200**	**83**	<1,200	**4,900**	**400**	**4,200 J**	**260**	**33**	**70 J**	**1,700 J**	**37**	**1,500 J**
Bromodichloromethane	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Bromoform	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Bromomethane	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Butanone (2-) (MEK)	120	500,000	<9	-	-	**1,200**	**10**	<580	**1,100**	**54**	**1,200**	**41**	<9	**15 J**	**200**	<12	**360**
Carbon disulfide	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	**18**	<5	**2 J**	**3 J**
Dibromochloromethane	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Dichlorodifluoromethane (CFC12)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	<9	-	-	<12	<10	<580	<12	<12	<11	<10	<9	<16	<9	<12	<13
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Hexanone (2-)	NE	NE	<9	-	-	**4 J**	<10	<580	<12	<12	<11	<10	<9	<16 UJ	<9	<12	<13
Isopropyl Alcohol (Isopropanol)	NE	NE	<92	-	-	<120	<98	<5,800	<120	<120	**300**	<100	<86	<160	**69 J**	<120	<130
Methyl-2-pentanone (4-) (MIBK)	NE	NE	<9	-	-	**6 J**	<10	<580	**4 J**	<12	**5 J**	<10	<9	<16 UJ	<9	<12	<13
Methyl-tert Butyl Ether (MTBE)	930	500,000	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Tetrahydrofuran	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Trichlorofluoromethane	NE	NE	<5	-	-	<6	<5	<290	<6	<6	<5	<5	<4	<8	<5	<6	<6
Other Parameters																	
Moisture			11.5	8.8	9.2	25.8	14.5	11.5	27.4	8.3	24.3	10.1	8	22.9	18.6	2.8	23.4
Field Parameters																	
FID			13	11	6.3	5	0	2	9	2.1	18.1	4.8	0.7	2.5	6.2	3.3	0
PID			53	11.3	5.9	12	4	4	14	5.2	33.1	7	4.9	14.3	11.5	17.4	0.2

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	**B57-624**			**B57-625**				**B57-626**					**B57-627**		
			B57-624/3A	B57-624/4A	B57-624/4B	B57-625/2	B57-625/3A	B57-625/4B	B57-625/5B	B57-626/1	B57-626/3B	B57-626/4B	B57-626/5	B57626A/1	B57-627/1	B57-627/3A	B57-627/5
			TCA Area														
			10 - 12.5	15 - 16.5	16.5 - 20	5 - 10	10 - 12.5	17.5 - 20	22 - 25	3 - 5	13.8 - 15	19.2 - 20	21 - 25	21 - 22	3 - 5	10 - 12.8	20 - 25
			06/19/12	06/19/12	06/19/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	06/20/12	07/24/12	06/20/12	06/20/12	06/20/12
VOCs																	
AVOCs																	
Benzene	60	44,000	<5	<5	**0.6 J**	<6	<5	<5	<5	<5	<5	<6	<5	-	**0.8 J**	**1 J**	<4
Dichlorobenzene (1,2-)	1,100	500,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5 UJ	<4
Dichlorobenzene (1,3-)	2,400	280,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5 UJ	<4
Dichlorobenzene (1,4-)	1,800	130,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5 UJ	<4
Ethylbenzene	1,000	390,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
Styrene	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
Toluene	700	500,000	<5	<5	<5	<6	<5	<5	<5	**25**	<5	**8**	<5 UJ	-	**7**	<5	**7**
Xylene (m,p-)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
Xylene (o-)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
CVOCs																	
Carbon tetrachloride	760	22,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Chlorobenzene (Monochlorobenzene)	1,100	500,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
Chloroethane	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Chloroform (Trichloromethane)	370	350,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Chloromethane	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Dichloroethane (1,1-)	270	240,000	<5	<5	<5	<6	<5	<5	<5	**4 J**	<5	<6	<5	-	**12**	<5	<4
Dichloroethane (1,2-)	20	30,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Dichloroethene (1,1-)	330	500,000	<5	<5	<5	<6	<5	<5	<5	**13**	<5	<6	<5	-	**3 J**	<5	<4
Dichloroethene (cis-1,2-)	250	500,000	<5	<5	<5	<6	<5	<5	<5	**2 J**	<5	<6	**12**	-	**6**	<5	<4
Dichloroethene (trans-1,2-)	190	500,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Dichloropropane (1,2-)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Dichloropropene (cis-1,3-)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Dichloropropene (trans-1,3-)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
Methylene Chloride (Dichloromethane)	50	500,000	<5	<5	<5	<6	<5	<5	<5	**29**	<5	<6	<5	-	**130**	**2 J**	<4
Tetrachloroethane (1,1,1,2-)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
Tetrachloroethane (1,1,2,2-)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5 UJ	<4
Tetrachloroethene (PCE)	1,300	150,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	**1 J**	<5	<4
Trichloroethane (1,1,1-)	680	500,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Trichloroethane (1,1,2-)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
Trichloroethene (TCE)	470	200,000	<5 UJ	<5 UJ	<5 UJ	<6 UJ	<5 UJ	<5 UJ	<5 UJ	**1 J**	<5 UJ	<6 UJ	<5 UJ	-	**47 J**	<5 UJ	<4 UJ
Vinyl chloride	20	13,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	**3 J**	**43**	<6	<5	<5	<4
Other VOCs																	
Acetone	50	500,000	**330**	**100**	**19**	**49 J**	**360 J**	**33**	**10 J**	**1,700**	**86**	**200**	**28**	-	**6,900 J**	**430**	**39**
Bromodichloromethane	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Bromoform	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
Bromomethane	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Butanone (2-) (MEK)	120	500,000	**47**	**8 J**	<10	**19 J**	**84 J**	<11	<9	**150**	**14**	**30**	<10	-	**590 J**	**120**	**5 J**
Carbon disulfide	NE	NE	<5	<5	<5	**1 J**	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Dibromochloromethane	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5 UJ	-	<5	<5	<4
Dichlorodifluoromethane (CFC12)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	<10	<9	<10	<11	<10	<11	<9	<10	<9	<11	<10	-	<10	<11	<9
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Hexanone (2-)	NE	NE	<10	<9	<10	<11 UJ	<10 UJ	<11	<9	<10	<9	<11	<10 UJ	-	<10	<11	<9
Isopropyl Alcohol (Isopropanol)	NE	NE	<97	<92	<96	<110	<99	<110	<92	**73 J**	<92	<110	<100	-	**1,000**	<110	<85
Methyl-2-pentanone (4-) (MIBK)	NE	NE	<10	<9	<10	<11 UJ	<10 UJ	<11	<9	<10	<9	<11	<10	-	<10	<11	<9
Methyl-tert Butyl Ether (MTBE)	930	500,000	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Tetrahydrofuran	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Trichlorofluoromethane	NE	NE	<5	<5	<5	<6	<5	<5	<5	<5	<5	<6	<5	-	<5	<5	<4
Other Parameters																	
Moisture			17.6	14.2	8.1	10	19.2	2.6	6.9	12	15.3	22	9.4	10.2	12.4	25.1	5.6
Field Parameters																	
FID			0	0	0	2.8	1.1	1.1	1.1	5	0	0	0.8	3.4	17.1	1.9	0
PID			6.7	1	1.5	17.2	11.2	12.2	15.4	18.4	8	6.9	2.5	3.1	45.1	8.5	6.3

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
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Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-628						B57-629							B57-630	
			B57-628/1	B57-628A/1	B57628B/1	B57-628/3	B57-628/4B	B57-628/5B	B57-629/1	B57-629A/1	B57629B/1	B57-629/3	B57-629A/2	B57-629/4B	B57-629A/4A	B57-630/1	B57630A/1
			WSA														
			3 - 5	3 - 5	3 - 5	10 - 15	18.6 - 20	24.1 - 25	3 - 5	3 - 5	3 - 5	10 - 12.5	10 - 12.5	18.8 - 20	17 - 20	3 - 5	3 - 5
			06/21/12	07/23/12	09/17/12	06/21/12	06/21/12	06/21/12	06/21/12	07/23/12	09/17/12	06/21/12	07/23/12	06/21/12	07/23/12	06/21/12	07/24/12
VOCs																	
AVOCs																	
Benzene	60	44,000	**4 J**	-	-	**0.9 J**	<4	<5	**0.6 J**	-	-	**5 J**	-	**3 J**	-	<5	-
Dichlorobenzene (1,2-)	1,100	500,000	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Dichlorobenzene (1,3-)	2,400	280,000	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Dichlorobenzene (1,4-)	1,800	130,000	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Ethylbenzene	1,000	390,000	**2 J**	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Styrene	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Toluene	700	500,000	**4 J**	-	-	<6	<4	<5	<5	-	-	**2 J**	-	**2 J**	-	**1 J**	-
Xylene (m,p-)	NE	NE	**4 J**	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Xylene (o-)	NE	NE	**2 J**	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
CVOCs																	
Carbon tetrachloride	760	22,000	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Chlorobenzene (Monochlorobenzene)	1,100	500,000	**11**	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Chloroethane	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Chloroform (Trichloromethane)	370	350,000	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	**1 J**	-
Chloromethane	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Dichloroethane (1,1-)	270	240,000	**37**	-	-	<6	<4	<5	<5	-	-	<6	-	**3 J**	-	<5	-
Dichloroethane (1,2-)	20	30,000	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Dichloroethene (1,1-)	330	500,000	**16**	-	-	<6	<4	<5	<5	-	-	<6	-	**0.9 J**	-	**4 J**	-
Dichloroethene (cis-1,2-)	250	500,000	**490**	**590**	**54**	<6	<4	<5	**120 J**	-	-	**640**	**27**	**770**	<5	**9**	-
Dichloroethene (trans-1,2-)	190	500,000	**15**	-	-	<6	<4	<5	**2 J**	-	-	**6 J**	-	**3 J**	-	**3 J**	-
Dichloropropane (1,2-)	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Dichloropropene (cis-1,3-)	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Dichloropropene (trans-1,3-)	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Methylene Chloride (Dichloromethane)	50	500,000	**5 J**	-	-	<6	<4	<5	**4 J**	-	-	<6	-	<4	-	<5	-
Tetrachloroethane (1,1,1,2-)	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Tetrachloroethane (1,1,2,2-)	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Tetrachloroethene (PCE)	1,300	150,000	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Trichloroethane (1,1,1-)	680	500,000	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Trichloroethane (1,1,2-)	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Trichloroethene (TCE)	470	200,000	**10,000 J**	**15,000 J**	**390 J**	<6 UJ	**1 J**	<5 UJ	**3,900 J**	**4,000 J**	**1 J**	**230 J**	-	**210 J**	-	**7,100 J**	**41 J**
Vinyl chloride	20	13,000	**3 J**	-	-	<6	<4	<5	<5	-	-	**1 J**	-	**17**	-	<5	-
Other VOCs																	
Acetone	50	500,000	**350 J**	-	-	**3,700 J**	**70 J**	**48 J**	**1,000 J**	-	-	**6,600 J**	-	**1,300 J**	-	**45 J**	-
Bromodichloromethane	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Bromoform	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Bromomethane	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Butanone (2-) (MEK)	120	500,000	**52 J**	-	-	**380**	**16 J**	<10	**120 J**	-	-	**1,600**	-	**320**	-	<10	-
Carbon disulfide	NE	NE	**1 J**	-	-	<6	<4	<5	<5	-	-	<6	-	**2 J**	-	<5	-
Dibromochloromethane	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Dichlorodifluoromethane (CFC12)	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	**11 J**	-	-	<12	<8	<10	<9	-	-	<13	-	<9	-	**17**	-
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	**10**	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Hexanone (2-)	NE	NE	<11	-	-	<12	<8	<10	<9	-	-	**13 J**	-	**3 J**	-	<10	-
Isopropyl Alcohol (Isopropanol)	NE	NE	<110	-	-	<120	<83	<98	<91	-	-	<130	-	<90.	-	<99	-
Methyl-2-pentanone (4-) (MIBK)	NE	NE	**7 J**	-	-	<12	<8	<10	<9	-	-	**19 J**	-	<9	-	<10	-
Methyl-tert Butyl Ether (MTBE)	930	500,000	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Tetrahydrofuran	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	**5**	-	<5	-
Trichlorofluoromethane	NE	NE	<6	-	-	<6	<4	<5	<5	-	-	<6	-	<4	-	<5	-
Other Parameters																	
Moisture			12.3	11.9	11.4	24.4	12.1	11.5	13.3	13.8	5.1	25.7	16.5	13.1	13.2	14.3	12.6
Field Parameters																	
FID			21	18	5.5	12	4	1	8	2.3	1.1	7	0	7	0	0	14.4
PID			76	43.8	1.8	10	6	2	17	26.4	0.1	8	5.8	11	7.6	5	14.8

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-630					B57-631						B57-632			
			B57-630/3	B57-630/4B	B57-630/6	B57630A/2D	B57630B/2D	B57-631/1	B57631A/1	B57631B/1	B57-631/3B	B57-631/4B	B57-631/6	B57-632/1	B57-632/3	B57632A/1B	B57632B/1B
			WSA														
			10 - 12.5	19.1 - 20	25 - 26	26.8 - 28	21 - 23	3 - 5	3 - 5	3 - 5	10 - 12.5	18.8 - 20	25 - 26	3 - 5	10 - 12.5	11.5 - 13	11.5 - 13
			06/21/12	06/21/12	06/21/12	07/24/12	09/17/12	06/21/12	07/23/12	09/17/12	06/21/12	06/21/12	06/21/12	06/21/12	06/21/12	07/24/12	09/17/12
VOCs																	
AVOCs																	
Benzene	60	44,000	**8**	<4	<4	-	-	**0.8 J**	-	-	**3 J**	<6	<320	<5	**5 J**	-	-
Dichlorobenzene (1,2-)	1,100	500,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Dichlorobenzene (1,3-)	2,400	280,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Dichlorobenzene (1,4-)	1,800	130,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Ethylbenzene	1,000	390,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Styrene	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Toluene	700	500,000	**3 J**	**1 J**	**2 J**	-	-	<5	-	-	**3 J**	<6	<320	<5	**11**	-	-
Xylene (m,p-)	NE	NE	**2 J**	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	**2 J**	-	-
Xylene (o-)	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
CVOCs																	
Carbon tetrachloride	760	22,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Chlorobenzene (Monochlorobenzene)	1,100	500,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Chloroethane	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Chloroform (Trichloromethane)	370	350,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Chloromethane	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Dichloroethane (1,1-)	270	240,000	<6	<4	**190**	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Dichloroethane (1,2-)	20	30,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Dichloroethene (1,1-)	330	500,000	<6	<4	**18**	-	-	**1 J**	-	-	<6	<6	<320	<5	**2 J**	-	-
Dichloroethene (cis-1,2-)	250	500,000	**11**	**150**	**88**	-	-	**110**	-	-	**230**	**6**	**170 J**	<5	**25,000**	**4,500**	**6 J**
Dichloroethene (trans-1,2-)	190	500,000	<6	**1 J**	**7**	-	-	**3 J**	-	-	**5 J**	<6	<320	<5	**540**	-	-
Dichloropropane (1,2-)	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Dichloropropene (cis-1,3-)	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Dichloropropene (trans-1,3-)	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Methylene Chloride (Dichloromethane)	50	500,000	<6	<4	<4	-	-	**3 J**	-	-	<6	<6	<320	<5	<5	-	-
Tetrachloroethane (1,1,1,2-)	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Tetrachloroethane (1,1,2,2-)	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Tetrachloroethene (PCE)	1,300	150,000	<6	<4	<4	-	-	**2 J**	-	-	<6	<6	<320	<5	**2 J**	-	-
Trichloroethane (1,1,1-)	680	500,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Trichloroethane (1,1,2-)	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Trichloroethene (TCE)	470	200,000	**2 J**	**9 J**	**2 J**	-	-	**1,700 J**	**4,500 J**	**13 J**	**93 J**	**1 J**	**70 J**	**5 J**	**3,800 J**	**520 J**	<5 UJ
Vinyl chloride	20	13,000	<6	**3 J**	**63**	**54**	<5	<5	-	-	**9**	<6	<320	<5	**28**	**5**	-
Other VOCs																	
Acetone	50	500,000	**6,700 J**	**310 J**	**60 J**	-	-	**6,100 J**	-	-	**5,700 J**	**73 J**	<1,300	**12 J**	**6,400 J**	-	-
Bromodichloromethane	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Bromoform	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Bromomethane	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Butanone (2-) (MEK)	120	500,000	**1,700**	**65**	**7 J**	-	-	**410**	-	-	**1,200**	**12**	<640	<10	**1,800**	-	-
Carbon disulfide	NE	NE	<6	<4	**0.9 J**	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Dibromochloromethane	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Dichlorodifluoromethane (CFC12)	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	<12	<9	<8	-	-	<10	-	-	<12	<11	<640	<10	<11	-	-
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	<6	<4	**4 J**	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Hexanone (2-)	NE	NE	**13**	<9	<8	-	-	<10	-	-	<12	<11	<640	<10	**11 J**	-	-
Isopropyl Alcohol (Isopropanol)	NE	NE	<120	<89	<78	-	-	**420**	-	-	<120	<110	<6,400	<100	<110	-	-
Methyl-2-pentanone (4-) (MIBK)	NE	NE	**27**	<9	<8	-	-	<10	-	-	**15**	<11	<640	<10	**26 J**	-	-
Methyl-tert Butyl Ether (MTBE)	930	500,000	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Tetrahydrofuran	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Trichlorofluoromethane	NE	NE	<6	<4	<4	-	-	<5	-	-	<6	<6	<320	<5	<5	-	-
Other Parameters																	
Moisture			26.6	13.6	9.7	9.3	12.9	15	15.3	13.9	26.1	14.7	15.5	3.2	22.7	14.9	16.1
Field Parameters																	
FID			19	5	8	3.8	2	8	6	2.5	10	0	2	6	30	5	9.6
PID			28	9	11	2.4	0.1	17	25.8	0.5	8	1	7	9	22	4	2.3

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-632	B57-633			B57-634										
			B57-632/4B	B57-633/2	B57-633/3B	B57-633/5	B57-634/2	B57634A/1	B57634B/1	B57-634/3	B57634A/2B	B57634B/2B	B57-634/4B	B57634A/3C	B57-634/5	B57634A/4B	B57634B/4B
							WSA										
			19 - 20	5 - 10	10.3 - 15	20 - 25	5 - 10	5 - 10	5 - 10	10 - 15	11 - 15	11 - 15	19 - 20	19.5 - 20	20 - 25	23.5 - 25	22 - 24
			06/21/12	06/20/12	06/20/12	06/20/12	06/21/12	07/24/12	09/17/12	06/21/12	07/24/12	09/17/12	06/21/12	07/24/12	06/21/12	07/24/12	09/17/12
VOCs																	
AVOCs																	
Benzene	60	44,000	<5	<5	**8**	**0.8 J**	<260	-	-	**8**	-	-	<350	-	<4	-	-
Dichlorobenzene (1,2-)	1,100	500,000	<5	<5	<6	<5 UJ	<260	-	-	<6	-	-	<350	-	<4	-	-
Dichlorobenzene (1,3-)	2,400	280,000	<5	<5	<6	<5 UJ	<260	-	-	<6	-	-	<350	-	<4	-	-
Dichlorobenzene (1,4-)	1,800	130,000	<5	<5	<6	<5 UJ	<260	-	-	<6	-	-	<350	-	<4	-	-
Ethylbenzene	1,000	390,000	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Styrene	NE	NE	<5	<5	**1 J**	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Toluene	700	500,000	**1 J**	<5	**7**	<5	<260	-	-	**17**	-	-	<350	-	<4	-	-
Xylene (m,p-)	NE	NE	<5	<5	**2 J**	<5	<260	-	-	<6	-	-	**75 J**	-	<4	-	-
Xylene (o-)	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
CVOCs																	
Carbon tetrachloride	760	22,000	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Chlorobenzene (Monochlorobenzene)	1,100	500,000	<5	<5	<6	<5	**64 J**	-	-	<6	-	-	<350	-	<4	-	-
Chloroethane	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Chloroform (Trichloromethane)	370	350,000	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Chloromethane	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Dichloroethane (1,1-)	270	240,000	**5 J**	<5	<6	**5 J**	<260	-	-	**7**	-	-	<350	-	**3 J**	-	-
Dichloroethane (1,2-)	20	30,000	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Dichloroethene (1,1-)	330	500,000	<5	<5	<6	<5	<260	-	-	**5 J**	-	-	<350	-	<4	-	-
Dichloroethene (cis-1,2-)	250	500,000	**99**	<5	**8**	**100**	**3,300**	**3,300**	**2 J**	**11,000**	**8,700**	**23**	**2,200**	**30**	**140**	**8,300**	**130**
Dichloroethene (trans-1,2-)	190	500,000	<5	<5	<6	**2 J**	<260	-	-	**510**	-	-	<350	-	**1 J**	-	-
Dichloropropane (1,2-)	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Dichloropropene (cis-1,3-)	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Dichloropropene (trans-1,3-)	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Methylene Chloride (Dichloromethane)	50	500,000	<5	<5	<6	<5	<260	-	-	**3 J**	-	-	<350	-	<4	-	-
Tetrachloroethane (1,1,1,2-)	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Tetrachloroethane (1,1,2,2-)	NE	NE	<5	<5	<6	<5 UJ	<260	-	-	<6	-	-	<350	-	<4	-	-
Tetrachloroethene (PCE)	1,300	150,000	<5	<5	<6	<5	<260	-	-	<6	-	-	**780**	-	<4	-	-
Trichloroethane (1,1,1-)	680	500,000	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Trichloroethane (1,1,2-)	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Trichloroethene (TCE)	470	200,000	**7 J**	<5 UJ	<6 UJ	**3 J**	**29,000 J**	**16,000 J**	**4 J**	**1,900 J**	**2,000 J**	**7 J**	**27,000 J**	**17 J**	**25 J**	-	-
Vinyl chloride	20	13,000	**18**	<5	<6	**9**	<260	-	-	**1,200 J**	**520**	**2 J**	<350	-	**94**	**68 J**	**8**
Other VOCs																	
Acetone	50	500,000	**73 J**	**35**	**3,500**	**55**	<1,000	-	-	**2,300 J**	-	-	<1,400	-	**13 J**	-	-
Bromodichloromethane	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Bromoform	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Bromomethane	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Butanone (2-) (MEK)	120	500,000	**14**	<9	**710 J**	<11	<510	-	-	**410 J**	-	-	<700	-	<8	-	-
Carbon disulfide	NE	NE	<5	<5	<6	<5	<260	-	-	**2 J**	-	-	<350	-	<4	-	-
Dibromochloromethane	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Dichlorodifluoromethane (CFC12)	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	<10	<9	<11	<11	<510	-	-	<12	-	-	<700	-	<8	-	-
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	<5	<5	<6	<5	<260	-	-	**5 J**	-	-	<350	-	<4	-	-
Hexanone (2-)	NE	NE	<10	<9	**10 J**	<11	<510	-	-	<12 UJ	-	-	<700	-	<8	-	-
Isopropyl Alcohol (Isopropanol)	NE	NE	<97	<91	<110	<110	<5,100	-	-	<120	-	-	<7,000	-	<79	-	-
Methyl-2-pentanone (4-) (MIBK)	NE	NE	<10	<9	**9 J**	<11	<510	-	-	<12 UJ	-	-	<700	-	<8	-	-
Methyl-tert Butyl Ether (MTBE)	930	500,000	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Tetrahydrofuran	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Trichlorofluoromethane	NE	NE	<5	<5	<6	<5	<260	-	-	<6	-	-	<350	-	<4	-	-
Other Parameters																	
Moisture			13.1	8.2	24	6.9	13.9	13.9	5.7	25.1	26.8	22.3	11.6	13.9	10.1	6.5	8.4
Field Parameters																	
FID			6	2	4	1	19.1	14.4	2.4	14.8	17.3	4	4.1	7.1	2.6	16.8	3
PID			10	6	14	3	53.5	43.8	1.5	44.8	34	1.4	345.7	5.2	8.6	46.6	2

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-635								B57-636						
			B57-635/2	B57635A/1	B57-635/3A	B57635A/2	B57-635/4B	B57-635/5B	B57635A/3B	B57635B/3B	B57-636/1	B57-636/3B	B57-636/4B	B57-636/5A	B57636A/1B	B57-636/6	B57636A/2B
			WSA														
			5 - 10	5 - 10	10 - 13.8	13 - 14	18.7 - 20	24 - 25	24 - 25	23 - 24	3 - 5	12 - 15	19 - 20	20 - 23	22.5 - 23	25 - 29	26.5 - 27.5
			06/21/12	07/24/12	06/21/12	07/24/12	06/21/12	06/21/12	07/24/12	09/17/12	06/21/12	06/21/12	06/21/12	06/21/12	07/24/12	06/21/12	07/24/12
VOCs																	
AVOCs																	
Benzene	60	44,000	**2 J**	-	**7**	-	<5	<4	-	-	**0.4 J**	<5	<5	<5	-	<4	-
Dichlorobenzene (1,2-)	1,100	500,000	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4 UJ	-
Dichlorobenzene (1,3-)	2,400	280,000	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4 UJ	-
Dichlorobenzene (1,4-)	1,800	130,000	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4 UJ	-
Ethylbenzene	1,000	390,000	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Styrene	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Toluene	700	500,000	**3 J**	-	**12**	-	<5	<4	-	-	**1 J**	<5	**2 J**	**510**	-	<4	-
Xylene (m,p-)	NE	NE	**2 J**	-	**2 J**	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Xylene (o-)	NE	NE	**1 J**	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
CVOCs																	
Carbon tetrachloride	760	22,000	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Chlorobenzene (Monochlorobenzene)	1,100	500,000	**4 J**	-	**1 J**	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Chloroethane	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Chloroform (Trichloromethane)	370	350,000	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Chloromethane	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Dichloroethane (1,1-)	270	240,000	**1 J**	-	**2 J**	-	<5	<4	-	-	**1 J**	<5	**5**	**270**	-	**8**	-
Dichloroethane (1,2-)	20	30,000	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Dichloroethene (1,1-)	330	500,000	**2 J**	-	**2 J**	-	<5	<4	-	-	<4	<5	**3 J**	**180 J**	-	<4	-
Dichloroethene (cis-1,2-)	250	500,000	**2,000**	**230**	**17,000**	**3 J**	**40**	**6,600**	**2,800**	**160**	**18**	**3 J**	**55**	**4,800**	**9**	**14 J**	-
Dichloroethene (trans-1,2-)	190	500,000	**14**	-	**370 J**	-	<5	**1 J**	-	-	<4	<5	<5	**44 J**	-	<4	-
Dichloropropane (1,2-)	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Dichloropropene (cis-1,3-)	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Dichloropropene (trans-1,3-)	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Methylene Chloride (Dichloromethane)	50	500,000	**26**	-	<6	-	<5	<4	-	-	**2 J**	<5	**3 J**	**6**	-	<4	-
Tetrachloroethane (1,1,1,2-)	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Tetrachloroethane (1,1,2,2-)	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4 UJ	-
Tetrachloroethene (PCE)	1,300	150,000	**12**	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Trichloroethane (1,1,1-)	680	500,000	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Trichloroethane (1,1,2-)	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Trichloroethene (TCE)	470	200,000	**3,400 J**	**40 J**	**220 J**	-	**14 J**	**180 J**	-	-	**310 J**	<5 UJ	**9 J**	**8,800 J**	**5 J**	<4 UJ	-
Vinyl chloride	20	13,000	**7**	-	**480**	<5	**12**	**95 J**	**14**	-	<4	<5	**7**	**61**	<5	**870 J**	**21**
Other VOCs																	
Acetone	50	500,000	**7,400 J**	-	**4,500 J**	-	**180 J**	**13 J**	-	-	**2,600 J**	**300 J**	**170 J**	**120 J**	-	**12 J**	-
Bromodichloromethane	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Bromoform	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Bromomethane	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Butanone (2-) (MEK)	120	500,000	**990**	-	**800 J**	-	**16 J**	<9 UJ	-	-	**240**	**32 J**	**21 J**	**10 J**	-	<9	-
Carbon disulfide	NE	NE	**2 J**	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Dibromochloromethane	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Dichlorodifluoromethane (CFC12)	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	<9	-	<12	-	<11	<9	-	-	<9	<10	<10	<9	-	<9	-
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Hexanone (2-)	NE	NE	<9 UJ	-	<12	-	<11 UJ	<9 UJ	-	-	<9	<10	<10	<9	-	<9	-
Isopropyl Alcohol (Isopropanol)	NE	NE	**1,100**	-	<120	-	<110	<87	-	-	**150**	<100	<100	<91	-	<86	-
Methyl-2-pentanone (4-) (MIBK)	NE	NE	**5 J**	-	**7 J**	-	<11 UJ	<9 UJ	-	-	<9	<10	<10	<9	-	<9	-
Methyl-tert Butyl Ether (MTBE)	930	500,000	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Tetrahydrofuran	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Trichlorofluoromethane	NE	NE	<5	-	<6	-	<5	<4	-	-	<4	<5	<5	<5	-	<4	-
Other Parameters																	
Moisture			16.7	16	28.8	17.4	11.9	10.7	8.4	6.9	13.4	15.6	15.6	10.4	6.1	9.3	8.4
Field Parameters																	
FID			21.5	14	15.6	12	2	4.1	12.8	1.9	8.3	2.5	3.9	14.4	4.8	22.5	1.4
PID			32.2	23.4	32.3	8.9	8.3	10	24	0.4	12.9	4.6	8.2	47.2	4.6	6.8	1.1

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-636	B57-637													
			B57636B/2B	B57-637/1	B57637A/1	B57637B/1	B57-637/2A	B57637A/2	B57-637/3	B57637A/3	B57637B/3	B57-637/4B	B57-637/5B	B57637A/5A	B57637B/5A	B57-637/6	B57637A/5B
			WSA														
			26.5 - 27.5	3 - 5	3 - 5	3 - 5	5 - 9.6	5 - 10	12 - 13.5	10 - 15	10 - 15	18.8 - 20	24 - 25	25 - 26	25 - 26	25 - 29	28 - 29
			09/17/12	06/21/12	07/24/12	09/18/12	06/21/12	07/24/12	06/21/12	07/24/12	09/18/12	06/21/12	06/21/12	07/24/12	09/18/12	06/21/12	07/24/12
VOCs																	
AVOCs																	
Benzene	60	44,000	-	<290	-	-	<290	-	**3 J**	-	-	<4	<5	-	-	<4	-
Dichlorobenzene (1,2-)	1,100	500,000	-	<290	-	-	<290	-	<7	-	-	<4	<5 UJ	-	-	<4 UJ	-
Dichlorobenzene (1,3-)	2,400	280,000	-	<290	-	-	<290	-	<7	-	-	<4	<5 UJ	-	-	<4 UJ	-
Dichlorobenzene (1,4-)	1,800	130,000	-	<290	-	-	<290	-	<7	-	-	<4	<5 UJ	-	-	<4 UJ	-
Ethylbenzene	1,000	390,000	-	**590**	-	-	**800**	-	**390**	-	-	<4	**170 J**	-	-	<4	-
Styrene	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Toluene	700	500,000	-	<290	-	-	<290	-	**20**	-	-	<4	**140 J**	-	-	**140 J**	-
Xylene (m,p-)	NE	NE	-	**2,300**	-	-	**2,900**	-	**900**	-	-	<4	**240 J**	-	-	<4	-
Xylene (o-)	NE	NE	-	**760**	-	-	**850**	-	**400**	-	-	<4	**99 J**	-	-	<4	-
CVOCs																	
Carbon tetrachloride	760	22,000	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Chlorobenzene (Monochlorobenzene)	1,100	500,000	-	**2,800 J**	-	-	**2,300**	-	**730**	-	-	<4	**460**	-	-	**85 J**	-
Chloroethane	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Chloroform (Trichloromethane)	370	350,000	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Chloromethane	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Dichloroethane (1,1-)	270	240,000	-	<290	-	-	<290	-	**9**	-	-	<4	**2 J**	-	-	**150 J**	-
Dichloroethane (1,2-)	20	30,000	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Dichloroethene (1,1-)	330	500,000	-	<290	-	-	<290	-	**2 J**	-	-	<4	**74 J**	-	-	**66 J**	-
Dichloroethene (cis-1,2-)	250	500,000	-	**1,500 J**	**2,600**	<5	**1,200**	<250	**740 J**	**540**	**4 J**	**32**	**4,200**	**4,600**	**12**	**5,200**	**14,000**
Dichloroethene (trans-1,2-)	190	500,000	-	<290	-	-	<290	-	**15**	-	-	<4	**11**	-	-	**98 J**	-
Dichloropropane (1,2-)	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Dichloropropene (cis-1,3-)	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Dichloropropene (trans-1,3-)	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Methylene Chloride (Dichloromethane)	50	500,000	-	<290	-	-	<290	-	**6 J**	-	-	<4	<5	-	-	<4	-
Tetrachloroethane (1,1,1,2-)	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Tetrachloroethane (1,1,2,2-)	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5 UJ	-	-	<4 UJ	-
Tetrachloroethene (PCE)	1,300	150,000	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Trichloroethane (1,1,1-)	680	500,000	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Trichloroethane (1,1,2-)	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Trichloroethene (TCE)	470	200,000	-	**2,400 J**	**32,000 J**	**2 J**	**810 J**	**120 J**	**74 J**	-	-	**6 J**	**7,200 J**	**5,900 J**	**2 J**	**10,000 J**	**8,100 J**
Vinyl chloride	20	13,000	<5	<290	-	-	<290	-	**13**	-	-	**9**	**71 J**	<280	-	**120 J**	**240 J**
Other VOCs																	
Acetone	50	500,000	-	**1,600 J**	-	-	**2,200 J**	-	**6,000 J**	-	-	**69 J**	**30 J**	-	-	**21 J**	-
Bromodichloromethane	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Bromoform	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Bromomethane	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Butanone (2-) (MEK)	120	500,000	-	**440 J**	-	-	**700**	-	**1,400**	-	-	**10**	<9	-	-	<8	-
Carbon disulfide	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Dibromochloromethane	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Dichlorodifluoromethane (CFC12)	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	-	<590	-	-	<580	-	<14	-	-	<8	<9	-	-	<8	-
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Hexanone (2-)	NE	NE	-	<590	-	-	<580	-	<14	-	-	<8	<9	-	-	<8	-
Isopropyl Alcohol (Isopropanol)	NE	NE	-	<5,900	-	-	<5,800	-	**570**	-	-	<80	<91	-	-	<79	-
Methyl-2-pentanone (4-) (MIBK)	NE	NE	-	<590	-	-	<580	-	**59**	-	-	<8	<9	-	-	<8	-
Methyl-tert Butyl Ether (MTBE)	930	500,000	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Tetrahydrofuran	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Trichlorofluoromethane	NE	NE	-	<290	-	-	<290	-	<7	-	-	<4	<5	-	-	<4	-
Other Parameters																	
Moisture			0.59	15.2	10.3	9.3	16.2	13.9	26.2	16.9	16.8	11.4	9.9	7.3	8.4	9.4	7.9
Field Parameters																	
FID			1.8	11.5	31	0.8	81	14	15	15	1.3	2.1	3	10	1.1	4.1	14
PID			0.1	22.5	112.9	0.8	155	19.8	45	8.8	0.5	8.1	12.5	6.3	0.2	8.3	18

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Table D.5
Summary of Confirmatory Soil Sampling Validated Data
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Analyte	NYSDEC Unrestricted Use SCOs (µg/kg)	NYSDEC Commercial Use SCOs (µg/kg)	B57-638				B57-639		
			B57-638/1A	B57-638/2	B57-638/3B	B57-638/4	B57-639/1A	B57-639/2A	B57-639/4B
			WSA						
			5 - 8.5	10 - 15	18.6 - 20	20 - 25	5 - 9	10 - 13	24 - 25
			07/23/12	07/23/12	07/23/12	07/23/12	07/23/12	07/23/12	07/23/12
VOCs									
AVOCs									
Benzene	60	44,000	<5	<5	**0.8 J**	<6	<5	<5	<4
Dichlorobenzene (1,2-)	1,100	500,000	<5	<5	<5	<6	<5	<5	<4 UJ
Dichlorobenzene (1,3-)	2,400	280,000	<5	<5	<5	<6	<5	<5	<4 UJ
Dichlorobenzene (1,4-)	1,800	130,000	<5	<5	<5	<6	<5	<5	<4 UJ
Ethylbenzene	1,000	390,000	<5	<5	<5	<6	<5	<5	<4
Styrene	NE	NE	<5	<5	<5	<6	<5	<5	<4
Toluene	700	500,000	<5	<5	**1 J**	<6	<5	<5	<4
Xylene (m,p-)	NE	NE	<5	<5	<5	<6	<5	<5	<4
Xylene (o-)	NE	NE	<5	<5	<5	<6	<5	<5	<4
CVOCs									
Carbon tetrachloride	760	22,000	<5	<5	<5	<6	<5	<5	<4
Chlorobenzene (Monochlorobenzene)	1,100	500,000	<5	<5	<5	<6	<5	<5	<4
Chloroethane	NE	NE	<5	<5	<5	<6	<5	<5	<4
Chloroform (Trichloromethane)	370	350,000	<5	<5	<5	<6	<5	<5	<4
Chloromethane	NE	NE	<5	<5	<5	<6	<5	<5	<4
Dichloroethane (1,1-)	270	240,000	<5	<5	<5	<6	<5	<5	<4
Dichloroethane (1,2-)	20	30,000	<5	<5	<5	**2 J**	<5	<5	<4
Dichloroethene (1,1-)	330	500,000	<5	<5	<5	<6	<5	<5	<4
Dichloroethene (cis-1,2-)	250	500,000	<5	<5	<5	**1 J**	<5	**2 J**	**2 J**
Dichloroethene (trans-1,2-)	190	500,000	<5	<5	<5	<6	<5	<5	<4
Dichloropropane (1,2-)	NE	NE	<5	<5	<5	<6	<5	<5	<4
Dichloropropene (cis-1,3-)	NE	NE	<5	<5	<5	<6	<5	<5	<4
Dichloropropene (trans-1,3-)	NE	NE	<5	<5	<5	<6	<5	<5	<4
Methylene Chloride (Dichloromethane)	50	500,000	<5	<5	<5	<6	<5	<5	<4
Tetrachloroethane (1,1,1,2-)	NE	NE	<5	<5	<5	<6	<5	<5	<4
Tetrachloroethane (1,1,2,2-)	NE	NE	<5	<5	<5	<6	<5	<5	<4 UJ
Tetrachloroethene (PCE)	1,300	150,000	<5	<5	<5	<6	<5	<5	<4
Trichloroethane (1,1,1-)	680	500,000	<5	<5	<5	<6	<5	<5	<4
Trichloroethane (1,1,2-)	NE	NE	<5	<5	<5	<6	<5	<5	<4
Trichloroethene (TCE)	470	200,000	<5	<5	<5	<6	**2 J**	<5	**30**
Vinyl chloride	20	13,000	<5	<5	<5	<6	<5	<5	<4
Other VOCs									
Acetone	50	500,000	**35**	**150 J**	**33**	**20 J**	**34**	**340 J**	**16 J**
Bromodichloromethane	NE	NE	<5	<5	<5	<6	<5	<5	<4
Bromoform	NE	NE	<5	<5	<5	<6	<5	<5	<4
Bromomethane	NE	NE	<5	<5	<5	<6	<5	<5	<4
Butanone (2-) (MEK)	120	500,000	**8 J**	**39 J**	**7 J**	<11	**7**	**100 J**	<9
Carbon disulfide	NE	NE	<5	<5	**1 J**	<6	<5	<5	<4
Dibromochloromethane	NE	NE	<5	<5	<5	<6	<5	<5	<4
Dichlorodifluoromethane (CFC12)	NE	NE	<5	<5	<5	<6	<5	<5	<4
Ethane, 1,1,2-trichloro-1,2,2-trifluoro- (CFC113)	6,000	NE	<9	<11	<10	<11	<10	<10	<9
Ethane, 1,2-dichloro-1,1,2-trifluoro- (CFC123a)	NE	NE	<5	<5	<5	<6	<5	<5	<4
Hexanone (2-)	NE	NE	<9	<11	<10	<11	<10	<10 UJ	<9
Isopropyl Alcohol (Isopropanol)	NE	NE	<93	<110	<100	<110	<99	<100 UJ	<90
Methyl-2-pentanone (4-) (MIBK)	NE	NE	<9	<11	<10	<11	<10	<10 UJ	<9
Methyl-tert Butyl Ether (MTBE)	930	500,000	<5	<5	<5	<6	<5	<5	<4
Tetrahydrofuran	NE	NE	<5	<5	<5	<6	<5	<5 UJ	<4
Trichlorofluoromethane	NE	NE	<5	<5	<5	<6	<5	<5	<4
Other Parameters									
Moisture			8.9	6.5	11.7	5.2	14.1	11.8	6.7
Field Parameters									
FID			2.3	1.6	1.8	1.8	0.7	0.5	1
PID			2.7	2.3	3.1	5.6	2.7	8.1	1.9

Indicates value exceeds NYSDEC Unrestricted Use Soil Cleanup Objectives
Refer to Notes for details

Notes:

1. This table is subject to Limitations as provided in Appendix A.

2. Samples were collected at confirmatory sampling locations indicated on Figure 4 by Sanborn Head during the course of three confirmatory soil events completed in June, July and September, 2012. Samples were analyzed by Lancaster Laboratories, Inc., of Lancaster, Pennsylvania for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260B. Refer to the report text and Appendix D for additional details. Analytical laboratory reports are provided in Appendix H (on disc).

3. Sample Naming Scheme for Borings retested for confirming the Remedial Action Objectives (RAOs) is as below:
June 2012 Confirmatory Sampling Event - B57618
July 2012 Confirmatory Sampling Event - B57618A
September 2012 Confirmatory Sampling Event - B57618B

4. As reported in the IRM Work Plan, RAOs were established for key site-specific VOCs targeted for electrical resistive heating (ERH): Trichloroethene (TCE), cis-1,2 dichloroethene (cDCE), 1,1,1-trichloroethane (111 TCA), vinyl chloride (VC) and CFC-113. Confirmatory soil samples collected during 70% sampling were analyzed for the full site-specific list of VOCs established in the IRM Work Plan. Follow-up confirmatory samples (85% and 100%) were analyzed only for those key VOCs that had been detected above RAOs in earlier sampling.

5. Data validation was completed by New Environmental Horizons, Inc. (NEH) of Arlington, MA. Data validation reports are provided in Appendix H.

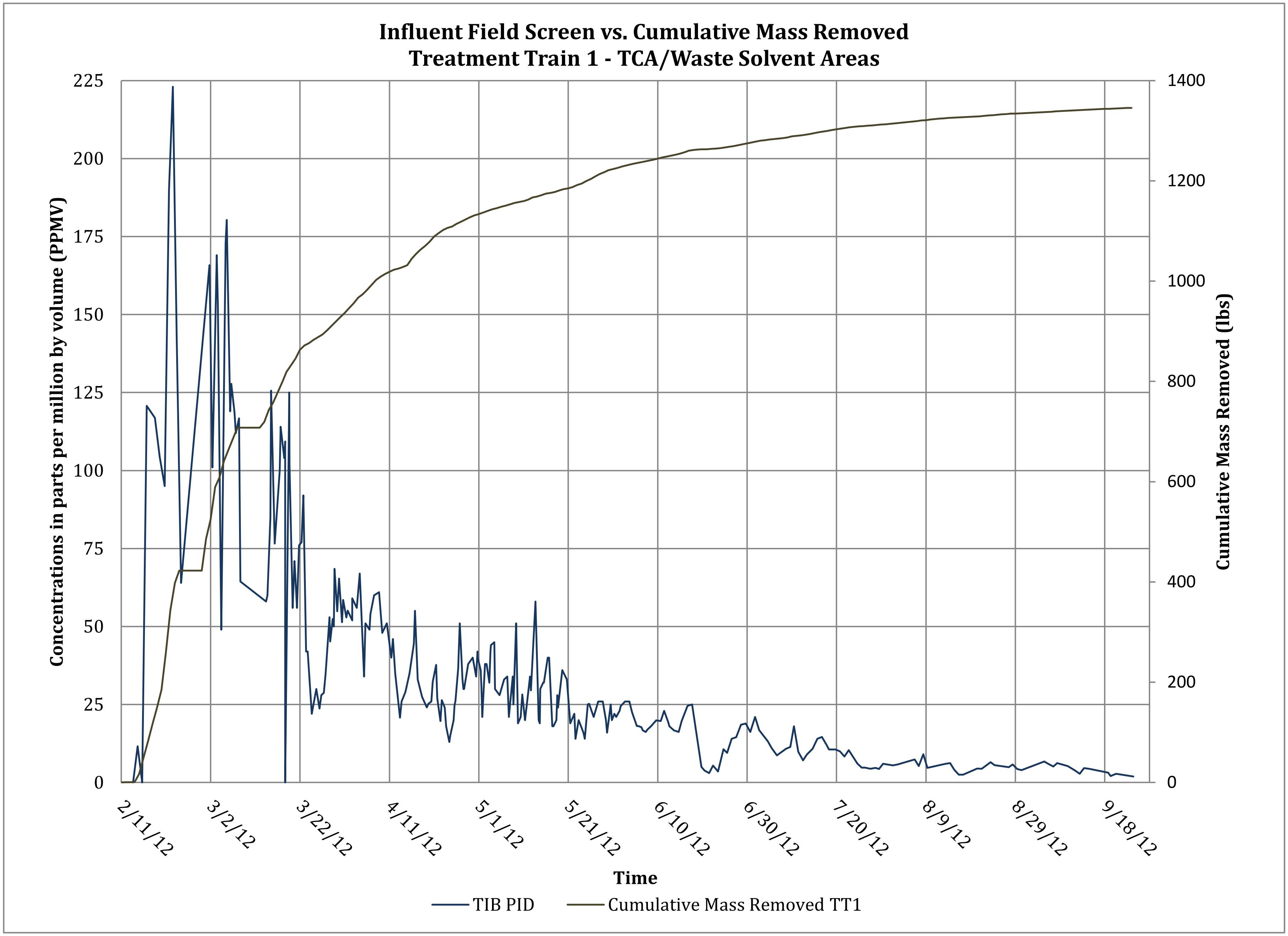
6. The data are presented in units of micrograms per kilogram (µg/kg) equivalent to units of parts per billion (ppb).

7. Bold values indicate the presence of the analyte at concentrations greater than or equal to the method detection limit.

8. Soil Cleanup Objectives (SCOs) established by the New York State Department of Environmental Conservation (NYSDEC) are presented in *6 NYCRR Table 375-6.8(a).* SCOs for CFC-113 were taken from supplemental SCO (SSCO) provided in the CP-51-Soil Cleanup Guidance was used as a cleanup objective.

9. "-" indicates the sample was not analyzed for the particular analyte.
"<" indicates the result is less that the method detection limit.
"J" qualifier indicates that the result is less than the method quantification limit but greater than or equal to the sample detection limit and the concentration is an approximate value.
"UJ" qualifier indicates the non-detect result is an estimated value.
"NE" indicates the SCO has not been established for this analyte.

Figure D.1 (A)



Influent Field Screen vs. Cumulative Mass Removed
Treatment Train 1 - TCA/Waste Solvent Areas
Concentrations in parts per million by volume (PPMV)
Cumulative Mass Removed (lbs)
225
200
175
150
125
100
75
50
25
0
1400
1200
1000
800
600
400
200
0
2/11/12
3/2/12
3/22/12
4/11/12
5/1/12
5/21/12
6/10/12
6/30/12
7/20/12
8/9/12
8/29/12
9/18/12
Time
TIB PID
Cumulative Mass Removed TT1

Figure D.1 (B)

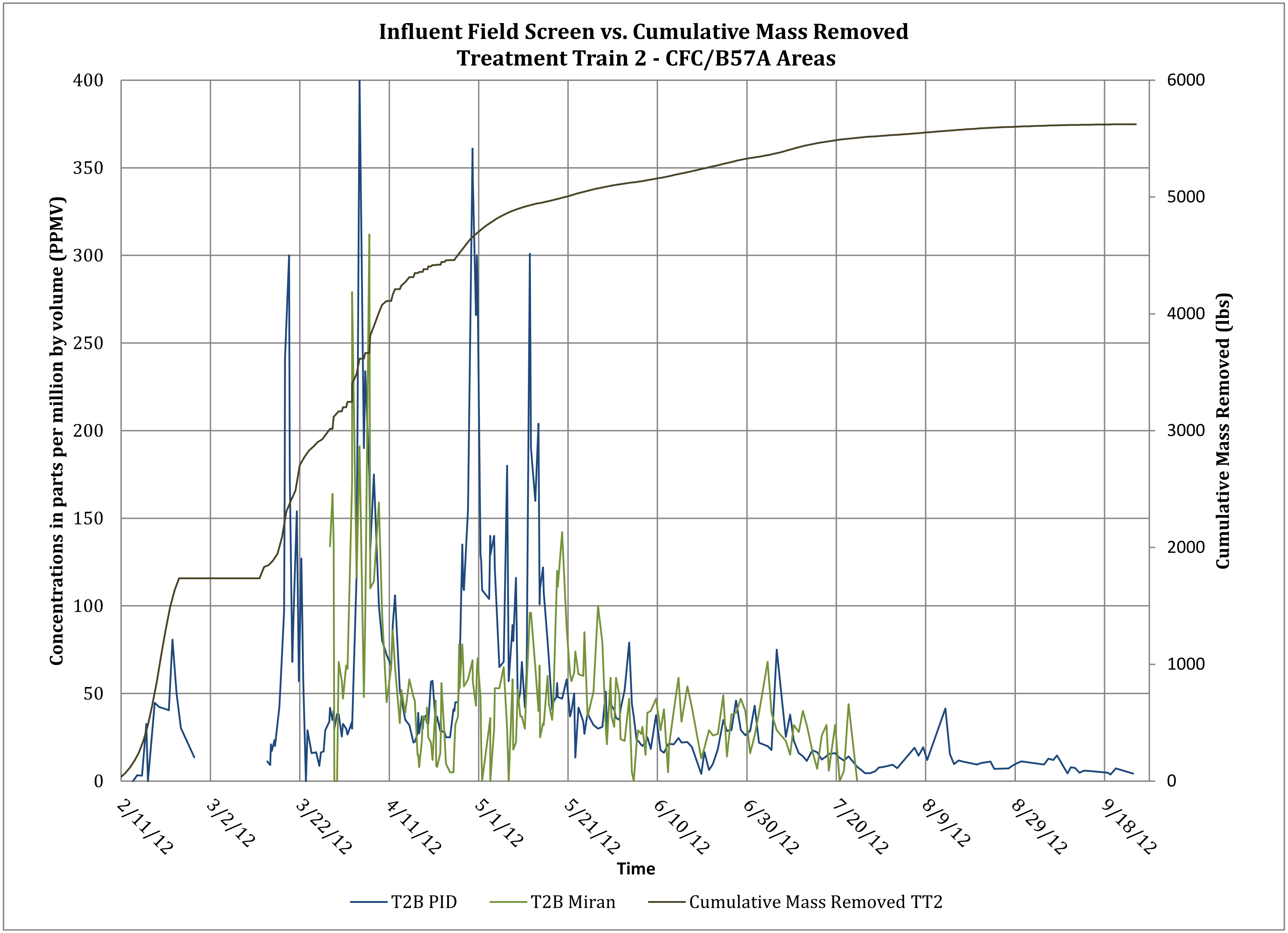

Influent Field Screen vs. Cumulative Mass Removed
Treatment Train 2 - CFC/B57A Areas
Concentrations in parts per million by volume (PPMV)
0
50
100
150
200
250
300
350
400
Cumulative Mass Removed (lbs)
0
1000
2000
3000
4000
5000
6000
2/11/12
3/2/12
3/22/12
4/11/12
5/1/12
5/21/12
6/10/12
6/30/12
7/20/12
8/9/12
8/29/12
9/18/12
Time
T2B PID
T2B Miran
Cumulative Mass Removed TT2

Figure D.2 (A)

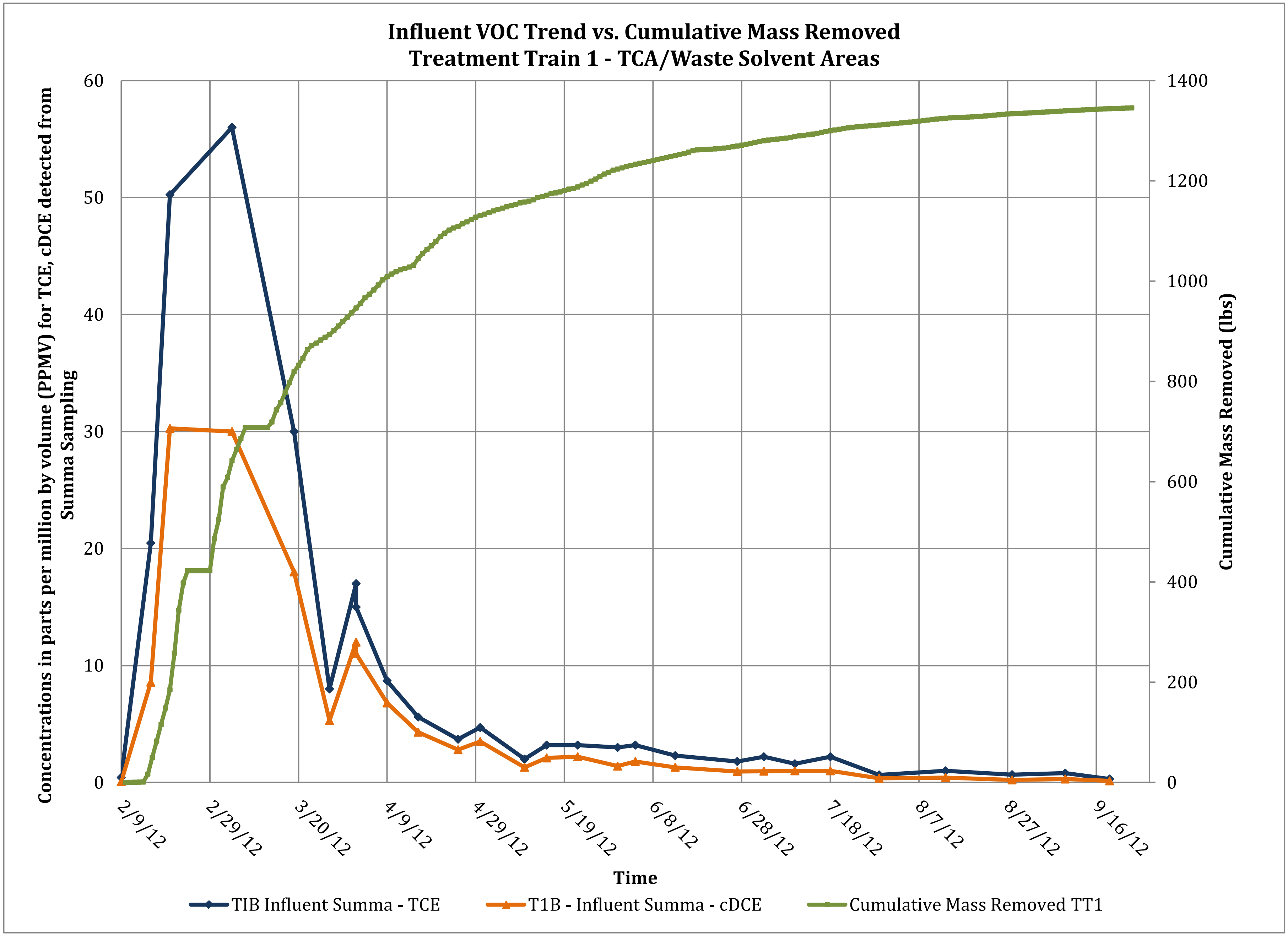
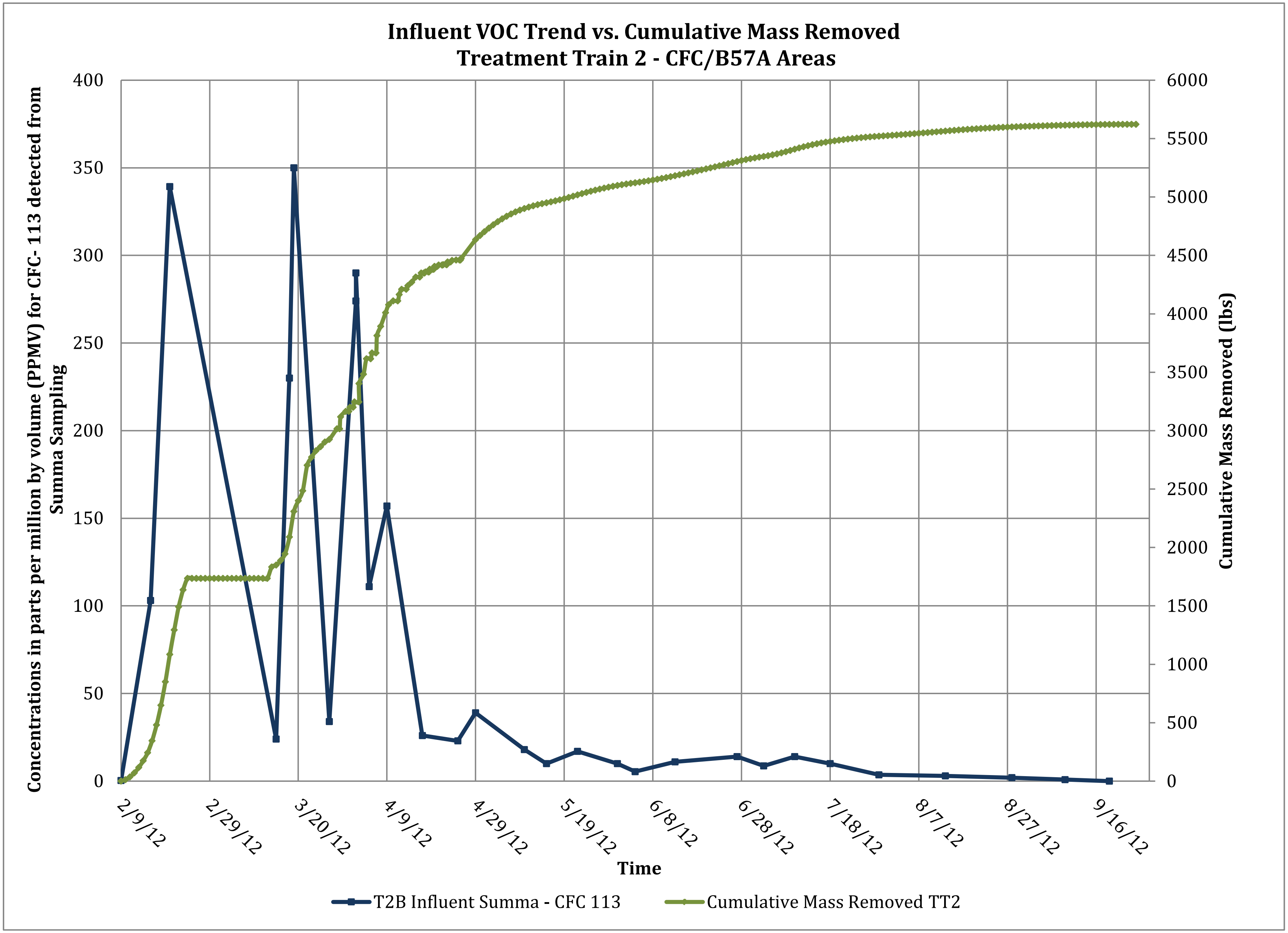

Influent VOC Trend vs. Cumulative Mass Removed
Treatment Train 1 - TCA/Waste Solvent Areas
Concentrations in parts per million by volume (PPMV) for TCE, cDCE detected from Summa Sampling
Cumulative Mass Removed (lbs)
0
10
20
30
40
50
60
0
200
400
600
800
1000
1200
1400
2/9/12
2/29/12
3/20/12
4/9/12
4/29/12
5/19/12
6/8/12
6/28/12
7/18/12
8/7/12
8/27/12
9/16/12
Time
TIB Influent Summa - TCE
T1B - Influent Summa - cDCE
Cumulative Mass Removed TT1

Figure D.2 (B)



Influent VOC Trend vs. Cumulative Mass Removed
Treatment Train 2 - CFC/B57A Areas
Concentrations in parts per million by volume (PPMV) for CFC- 113 detected from Summa Sampling
400
350
300
250
200
150
100
50
0
Cumulative Mass Removed (lbs)
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
2/9/12
2/29/12
3/20/12
4/9/12
4/29/12
5/19/12
6/8/12
6/28/12
7/18/12
8/7/12
8/27/12
9/16/12
Time
T2B Influent Summa - CFC 113
Cumulative Mass Removed TT2

Figure D. 3

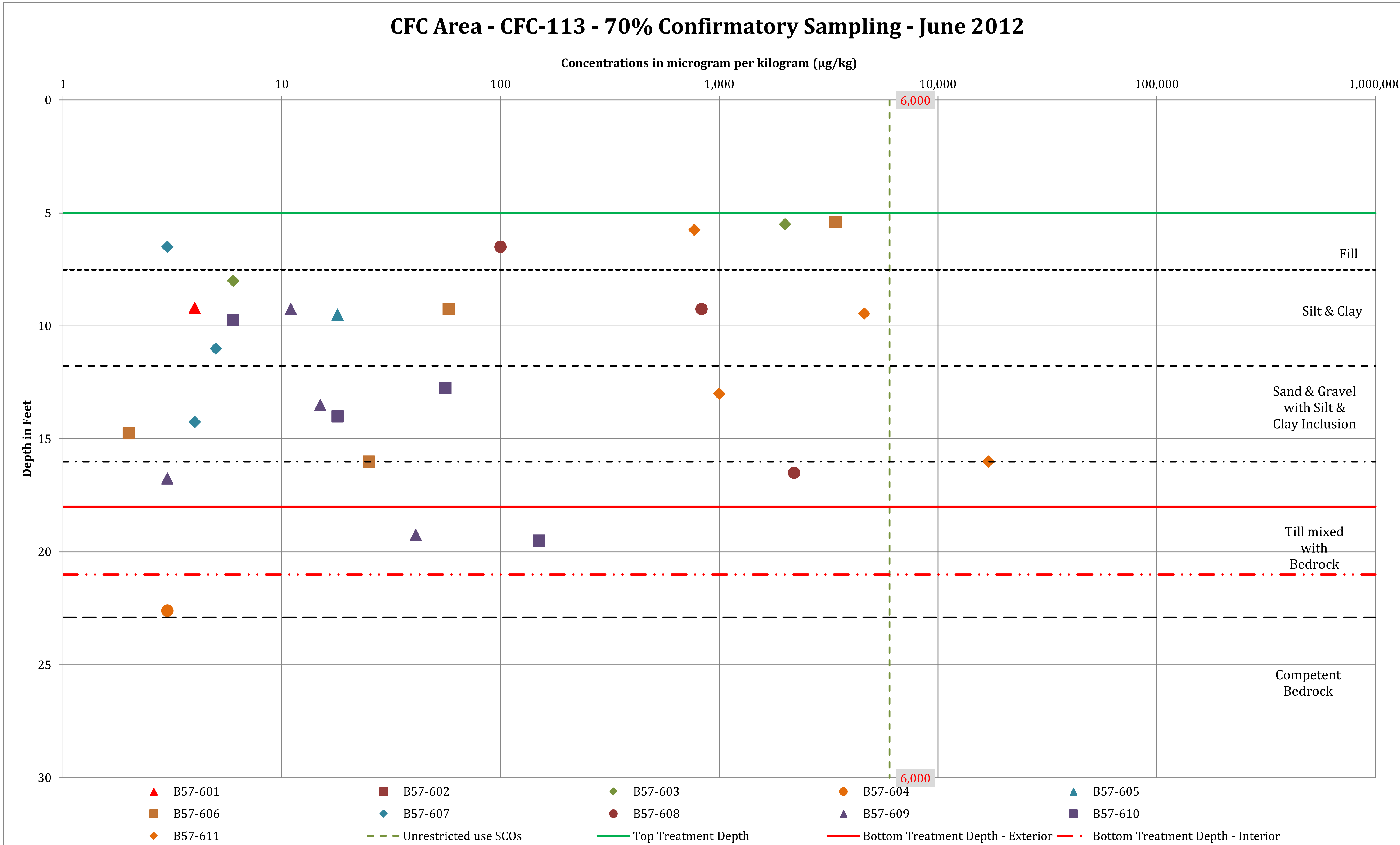

CFC Area - CFC-113 - 70% Confirmatory Sampling - June 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
6,000
6,000
Fill
Silt & Clay
Sand & Gravel with Silt & Clay Inclusion
Till mixed with Bedrock
Competent Bedrock
B57-601
B57-602
B57-603
B57-604
B57-605
B57-606
B57-607
B57-608
B57-609
B57-610
B57-611
Unrestricted use SCOs
Top Treatment Depth
Bottom Treatment Depth - Exterior
Bottom Treatment Depth - Interior

Figure D. 4

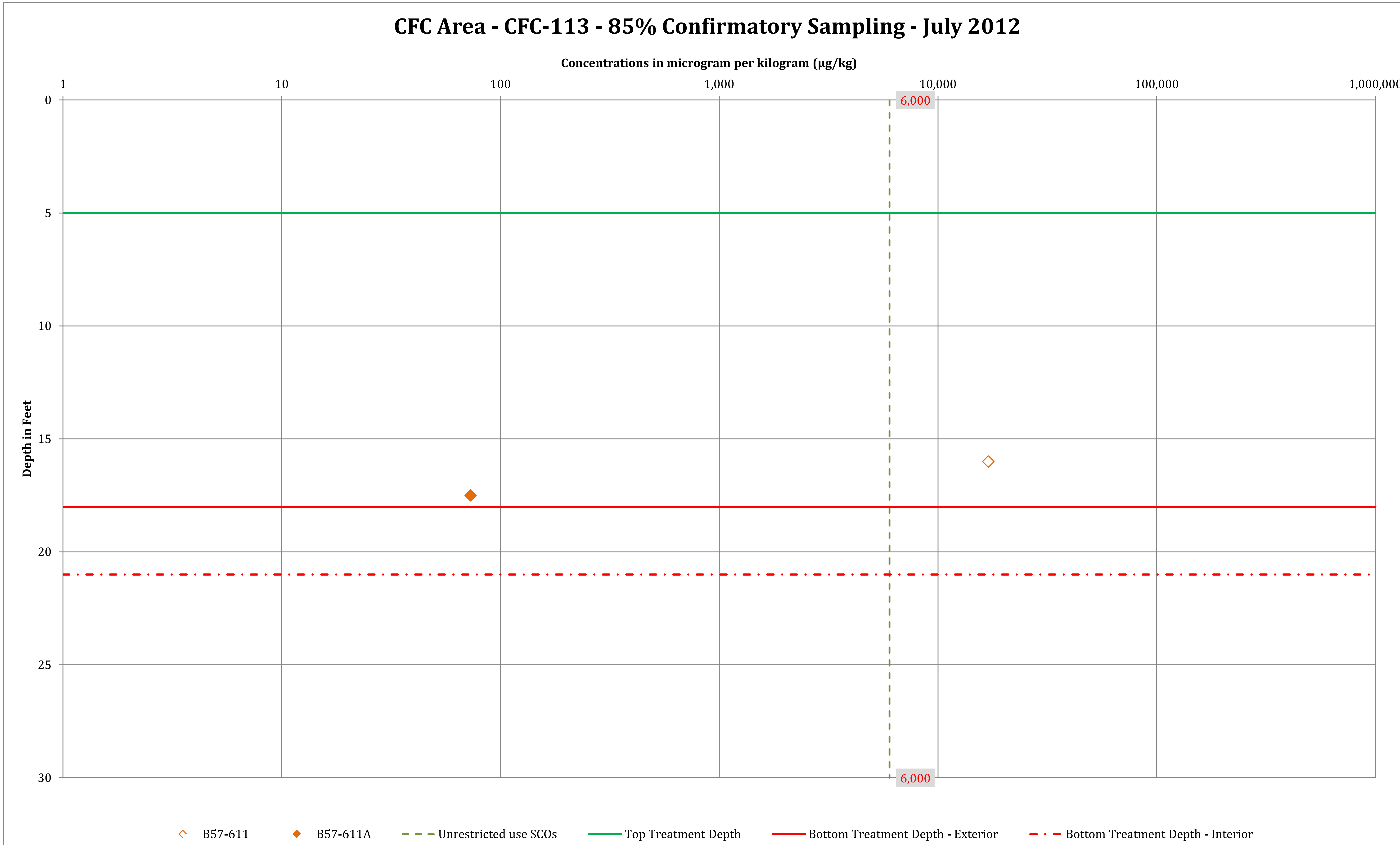

CFC Area - CFC-113 - 85% Confirmatory Sampling - July 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
6,000
6,000
B57-611
B57-611A
Unrestricted use SCOs
Top Treatment Depth
Bottom Treatment Depth - Exterior
Bottom Treatment Depth - Interior

Figure D. 5

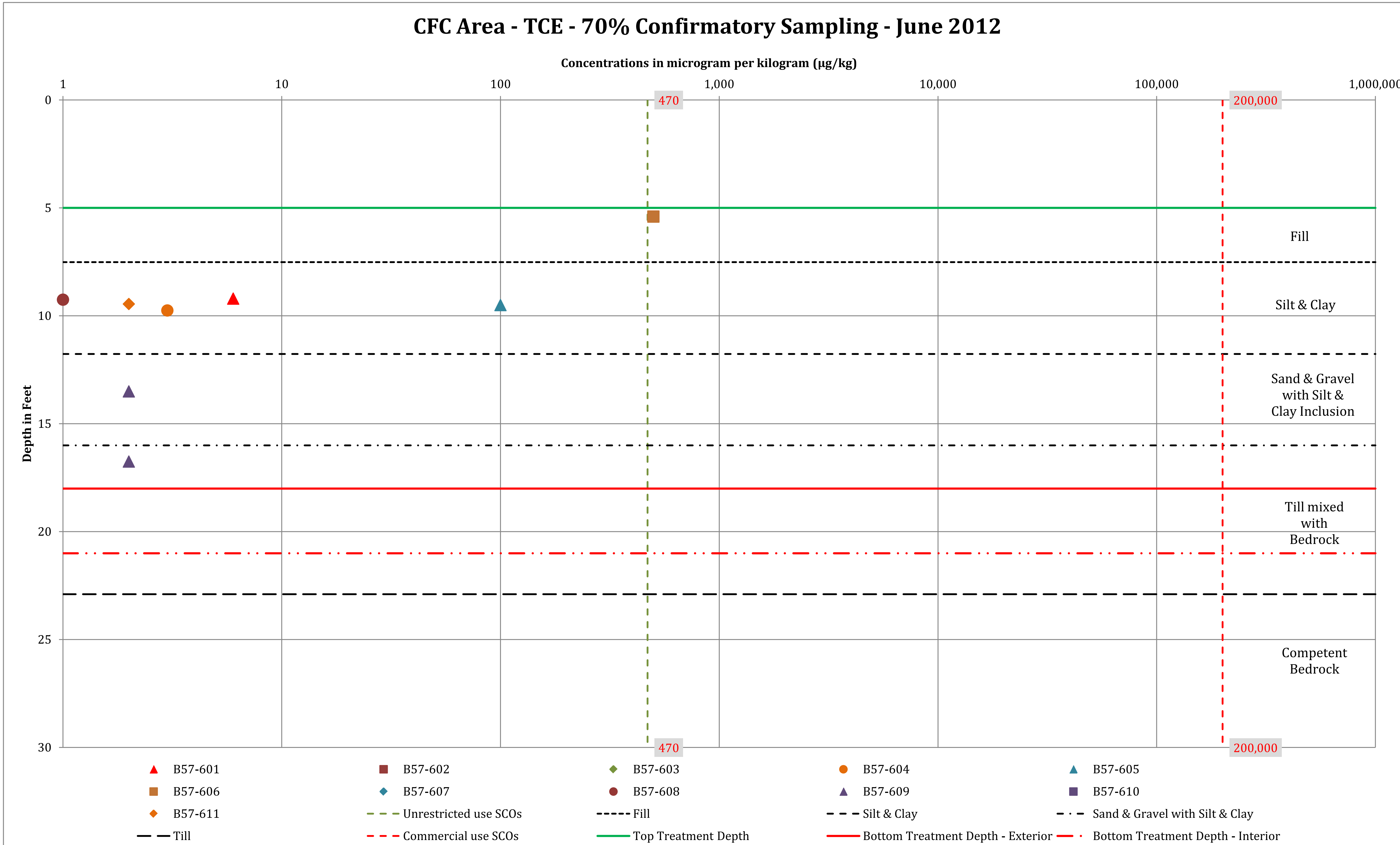

CFC Area - TCE - 70% Confirmatory Sampling - June 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
470
200,000
470
200,000
Fill
Silt & Clay
Sand & Gravel with Silt & Clay Inclusion
Till mixed with Bedrock
Competent Bedrock
B57-601
B57-602
B57-603
B57-604
B57-605
B57-606
B57-607
B57-608
B57-609
B57-610
B57-611
Unrestricted use SCOs
Fill
Silt & Clay
Sand & Gravel with Silt & Clay
Till
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth - Exterior
Bottom Treatment Depth - Interior

Figure D. 6

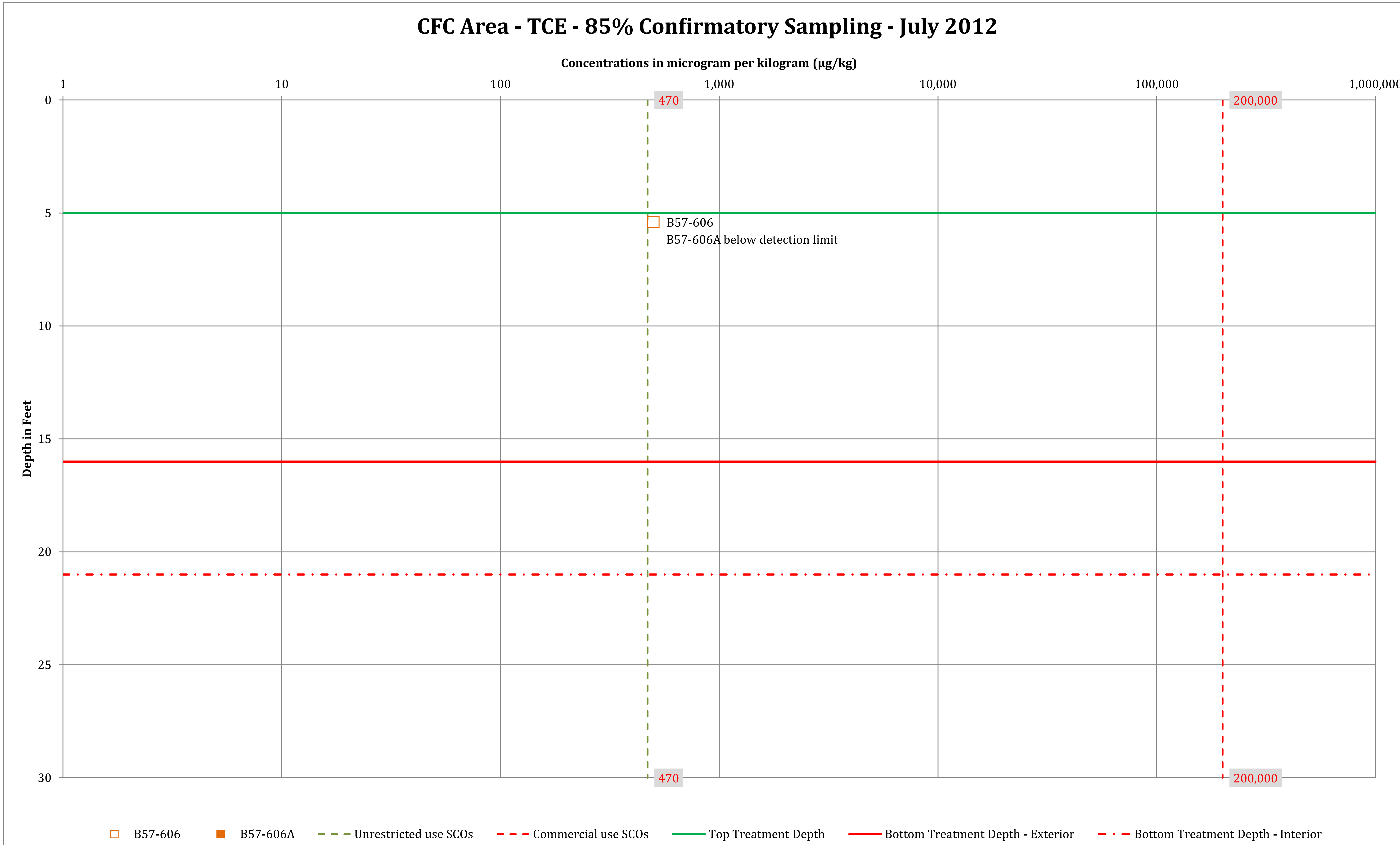
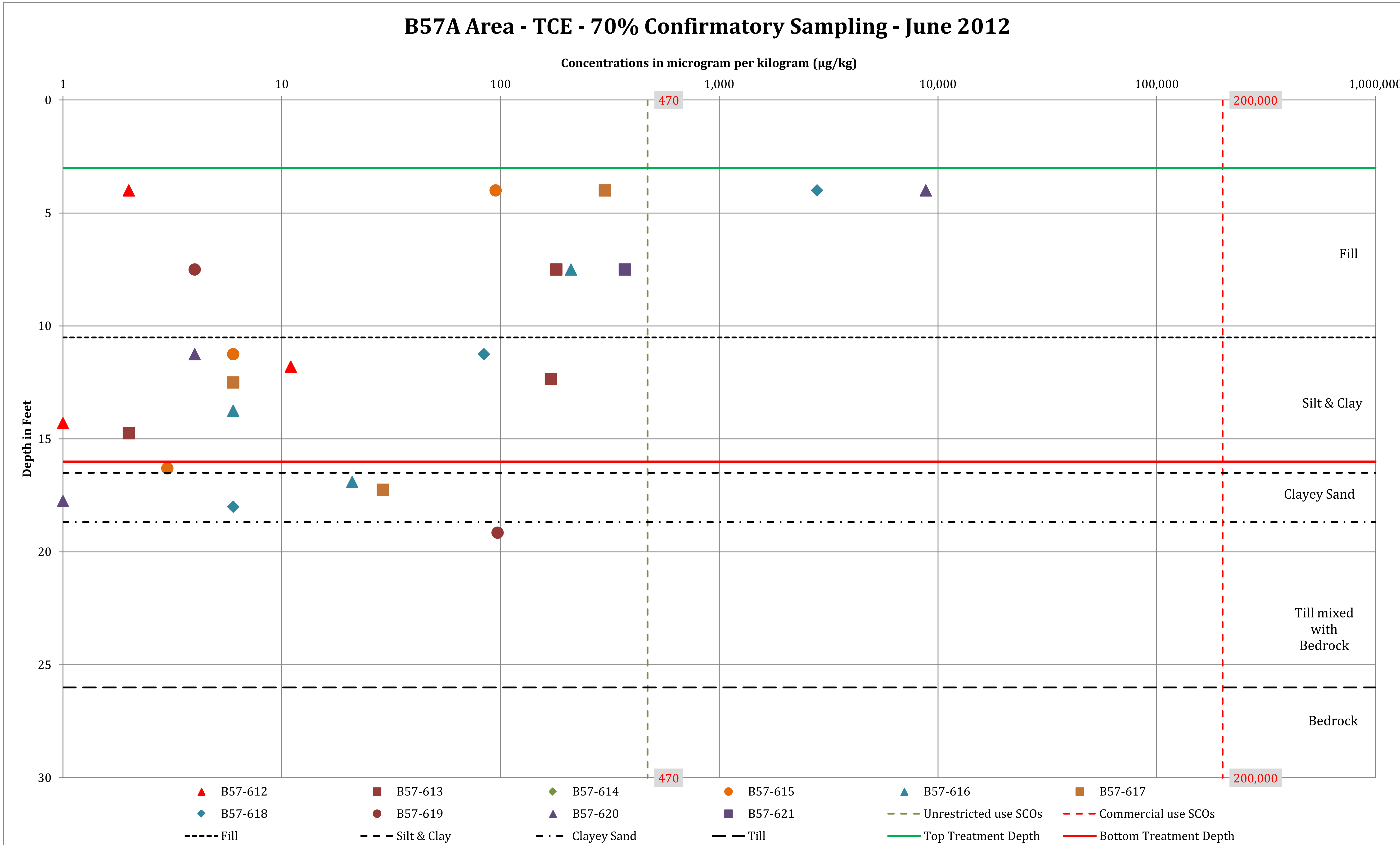
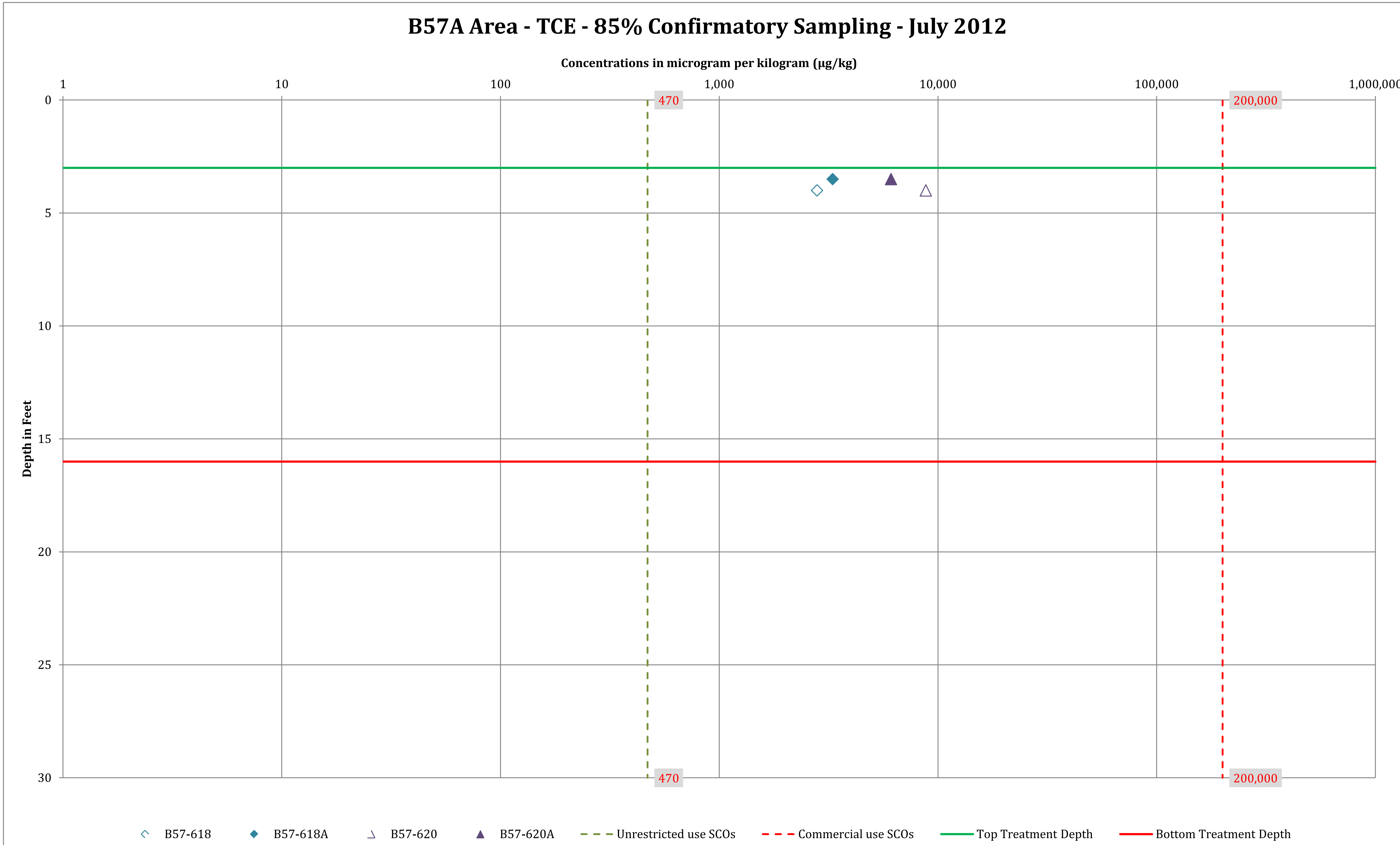

CFC Area - TCE - 85% Confirmatory Sampling - July 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
470
200,000
B57-606
B57-606A below detection limit
470
200,000
B57-606
B57-606A
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth - Exterior
Bottom Treatment Depth - Interior

Figure D. 7



B57A Area - TCE - 70% Confirmatory Sampling - June 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
470
200,000
Fill
Silt & Clay
Clayey Sand
Till mixed with Bedrock
Bedrock
B57-612
B57-613
B57-614
B57-615
B57-616
B57-617
B57-618
B57-619
B57-620
B57-621
Unrestricted use SCOs
Commercial use SCOs
Fill
Silt & Clay
Clayey Sand
Till
Top Treatment Depth
Bottom Treatment Depth

Figure D. 8



B57A Area - TCE - 85% Confirmatory Sampling - July 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
470
470
200,000
200,000
B57-618
B57-618A
B57-620
B57-620A
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

Figure D. 9

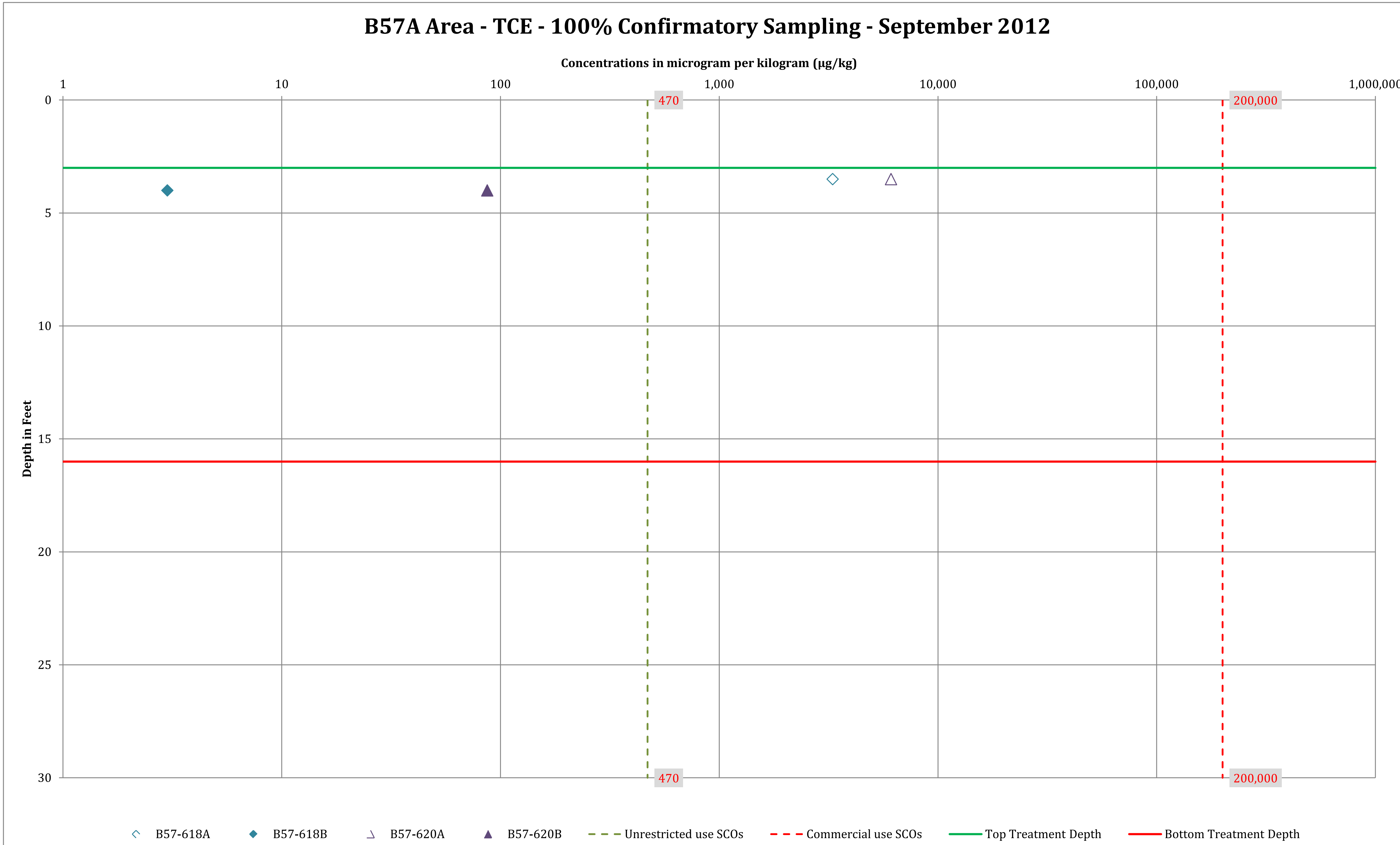

B57A Area - TCE - 100% Confirmatory Sampling - September 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
470
470
200,000
200,000
B57-618A
B57-618B
B57-620A
B57-620B
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

Figure D. 10

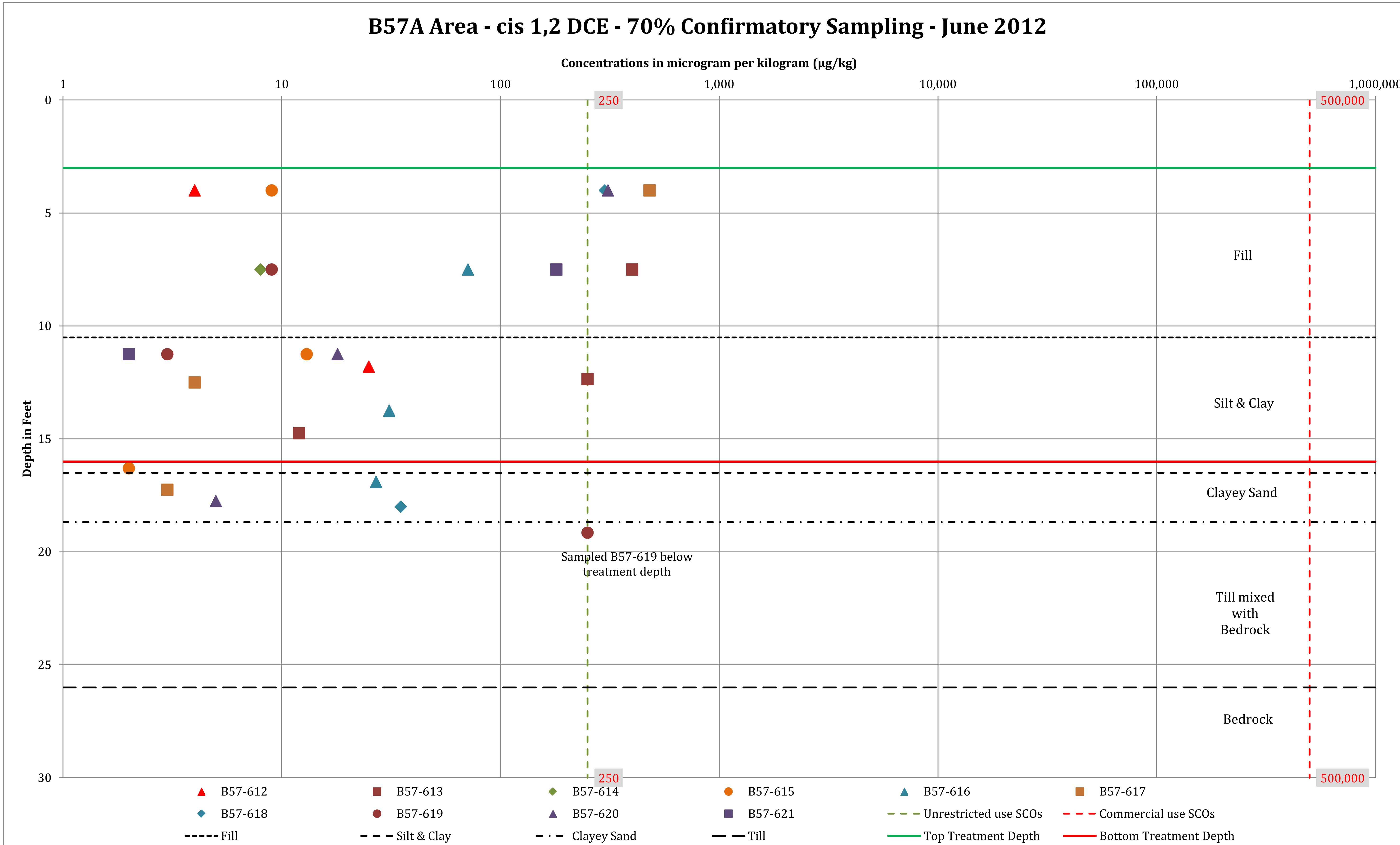

B57A Area - cis 1,2 DCE - 70% Confirmatory Sampling - June 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
Depth in Feet
0
5
10
15
20
25
30
250
500,000
Fill
Silt & Clay
Clayey Sand
Till mixed with Bedrock
Bedrock
Sampled B57-619 below treatment depth
B57-612
B57-613
B57-614
B57-615
B57-616
B57-617
B57-618
B57-619
B57-620
B57-621
Unrestricted use SCOs
Commercial use SCOs
Fill
Silt & Clay
Clayey Sand
Till
Top Treatment Depth
Bottom Treatment Depth

Figure D. 11

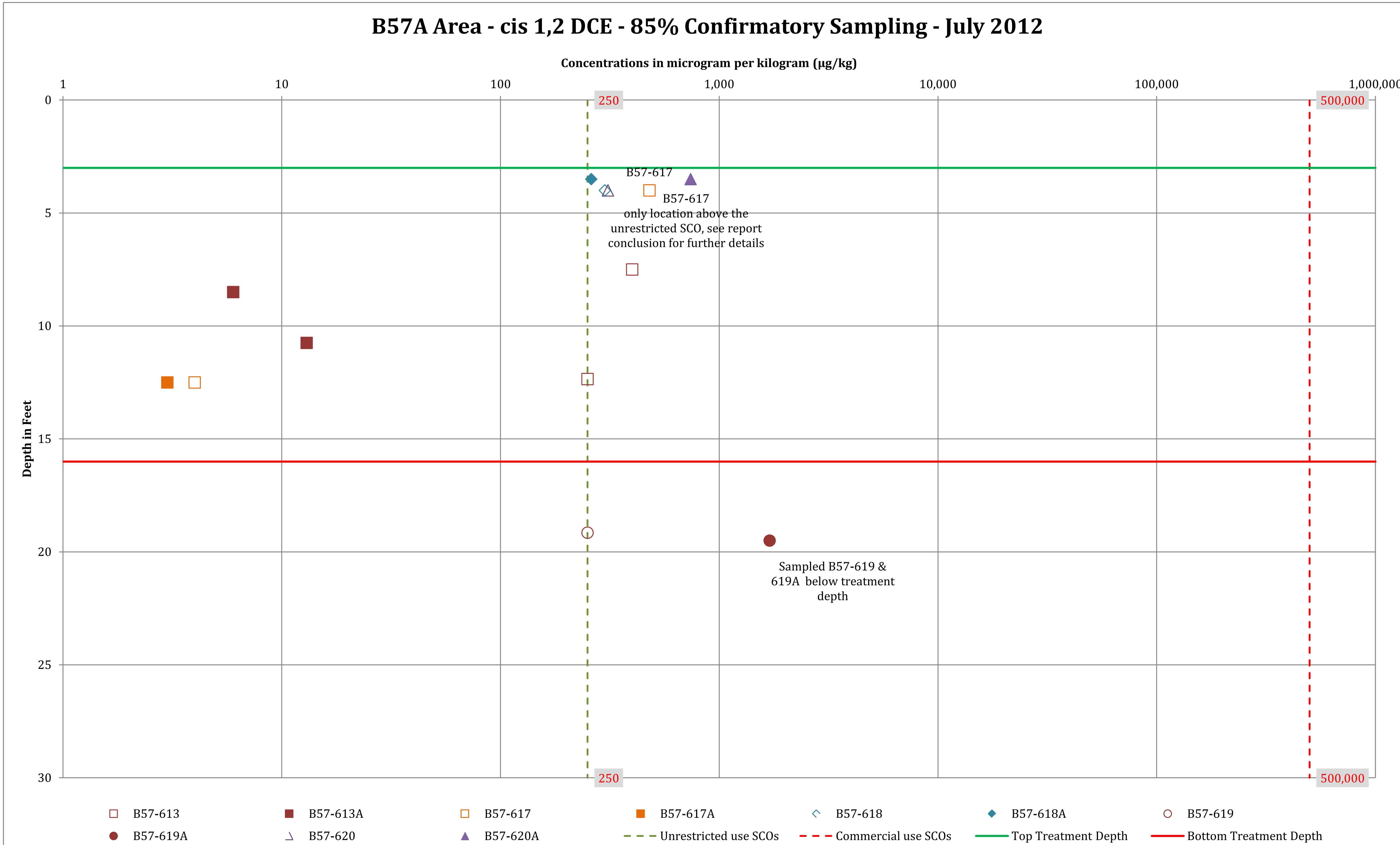

B57A Area - cis 1,2 DCE - 85% Confirmatory Sampling - July 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
Depth in Feet
0
5
10
15
20
25
30
250
500,000
B57-617
B57-617
only location above the
unrestricted SCO, see report
conclusion for further details
Sampled B57-619 &
619A below treatment
depth
B57-613
B57-613A
B57-617
B57-617A
B57-618
B57-618A
B57-619
B57-619A
B57-620
B57-620A
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

Figure D. 12

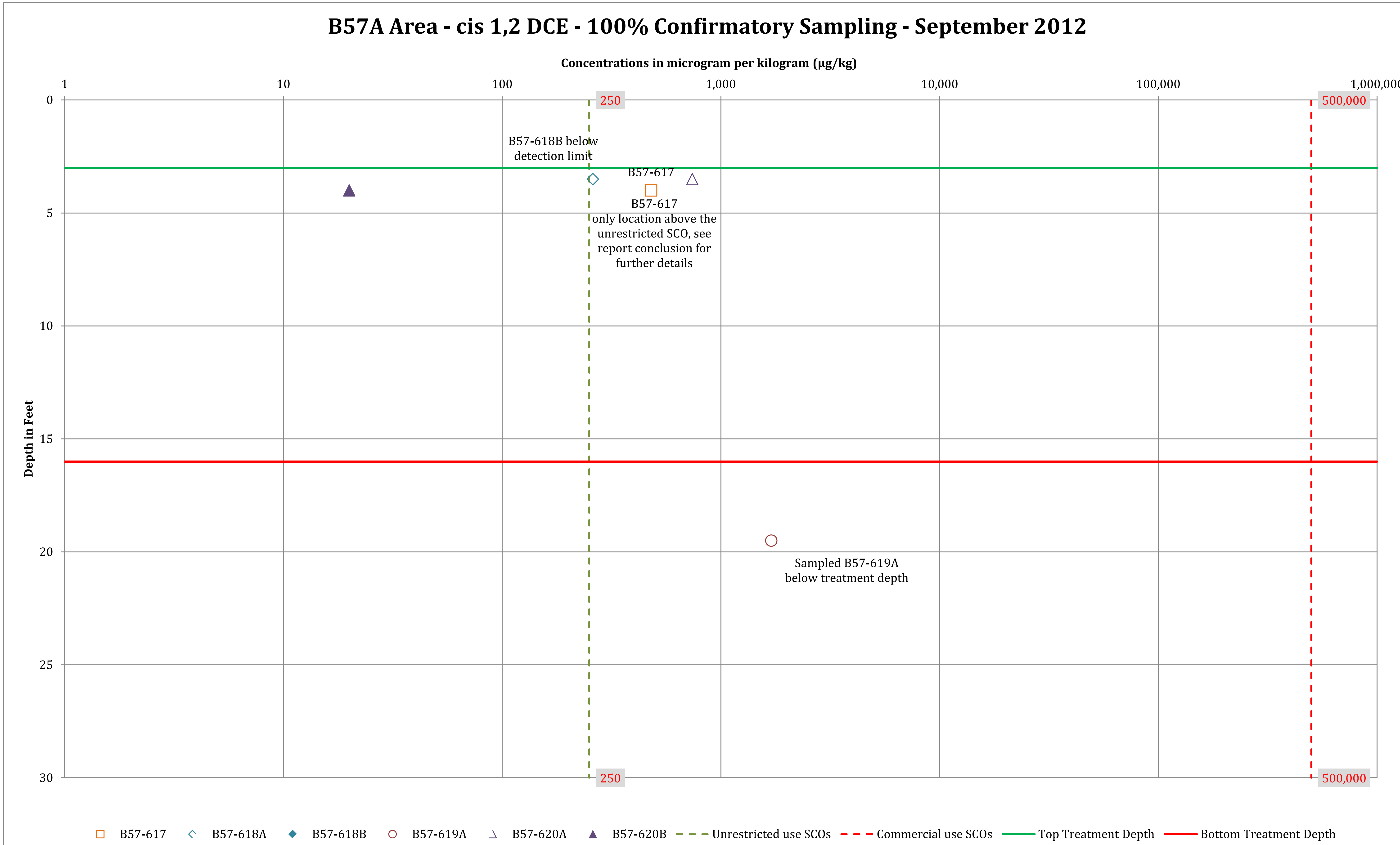
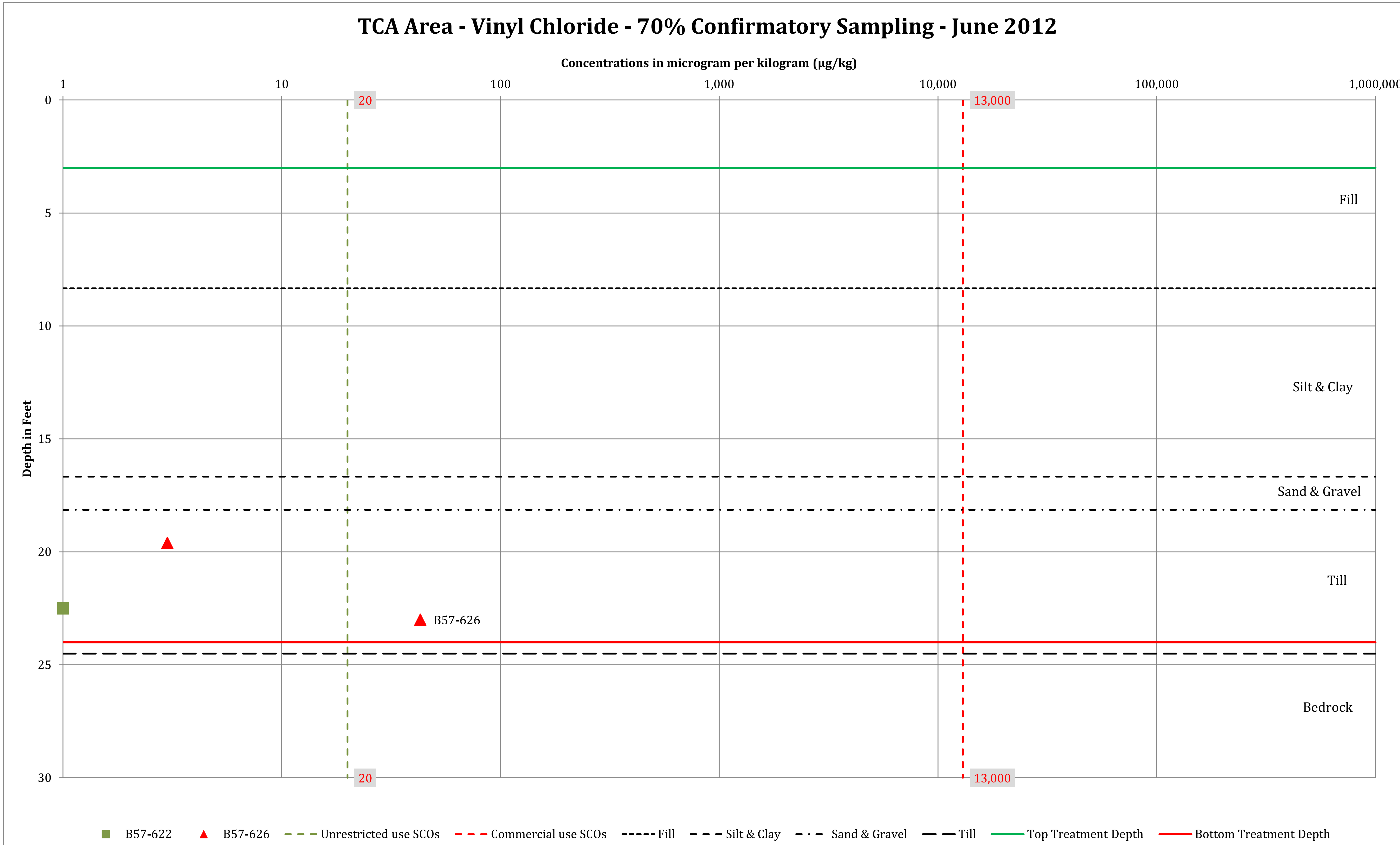

B57A Area - cis 1,2 DCE - 100% Confirmatory Sampling - September 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
250
500,000
B57-618B below detection limit
B57-617
B57-617 only location above the unrestricted SCO, see report conclusion for further details
Sampled B57-619A below treatment depth
B57-617
B57-618A
B57-618B
B57-619A
B57-620A
B57-620B
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

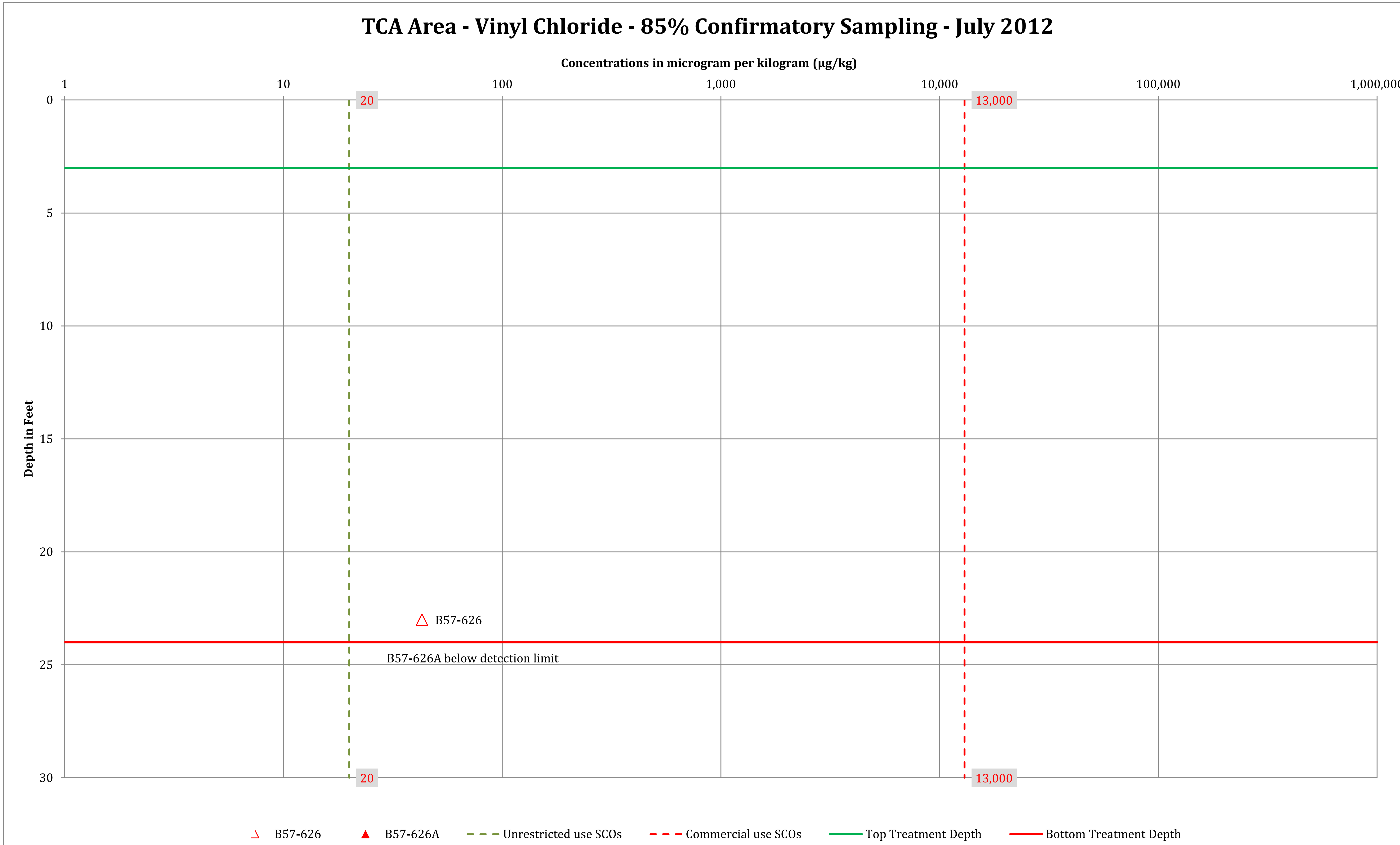
Figure D. 13



\\CONSERV1\datashare\DATA\CONDATA\2400s\2466.02\Source Files\2012 IRM Completion Report\Appendix D - ERH Performance Data Report\Figures\20121115 Detected VOCs vs. Depth Plots.xlsx

Sanborn, Head & Associates, Inc.

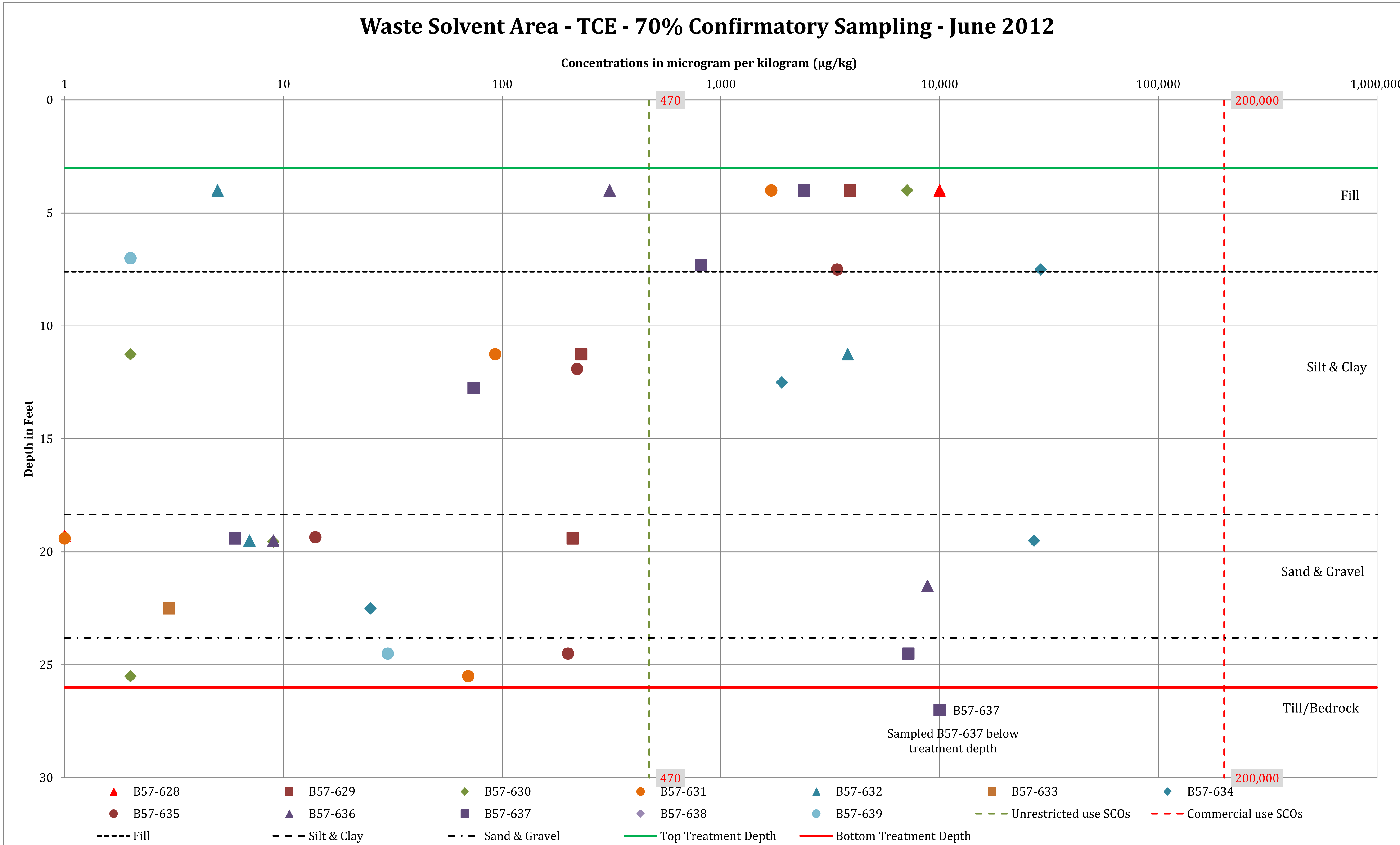
Figure D. 14



\\CONSERV1\datashare\DATA\CONDATA\2400s\2466.02\Source Files\2012 IRM Completion Report\Appendix D - ERH Performance Data Report\Figures\20121115 Detected VOCs vs. Depth Plots.xlsx

Sanborn, Head & Associates, Inc.

Figure D. 15



Waste Solvent Area - TCE - 70% Confirmatory Sampling - June 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
470
200,000
Fill
Silt & Clay
Sand & Gravel
Till/Bedrock
B57-637
Sampled B57-637 below treatment depth
B57-628
B57-629
B57-630
B57-631
B57-632
B57-633
B57-634
B57-635
B57-636
B57-637
B57-638
B57-639
Unrestricted use SCOs
Commercial use SCOs
Fill
Silt & Clay
Sand & Gravel
Top Treatment Depth
Bottom Treatment Depth

Figure D. 16

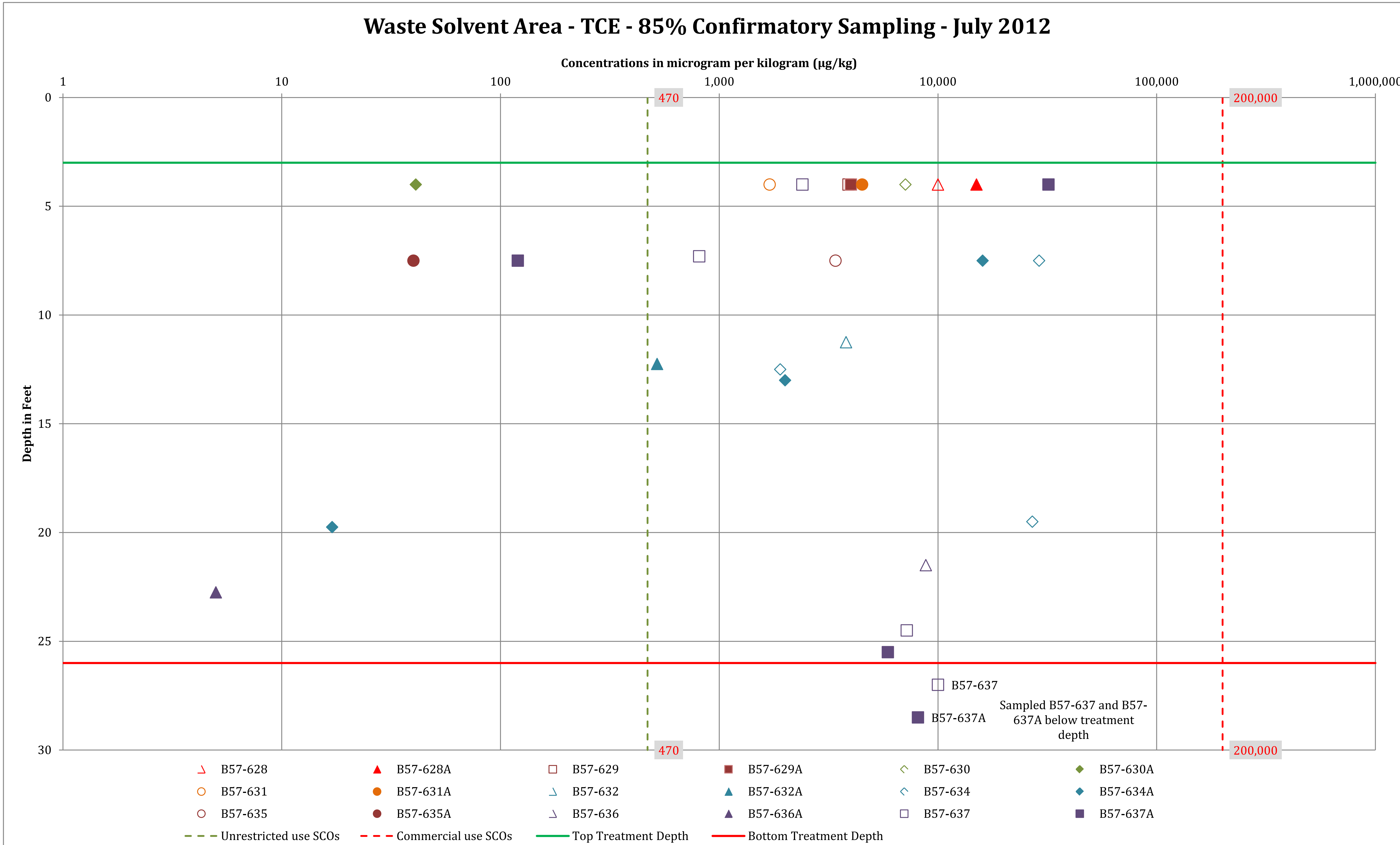
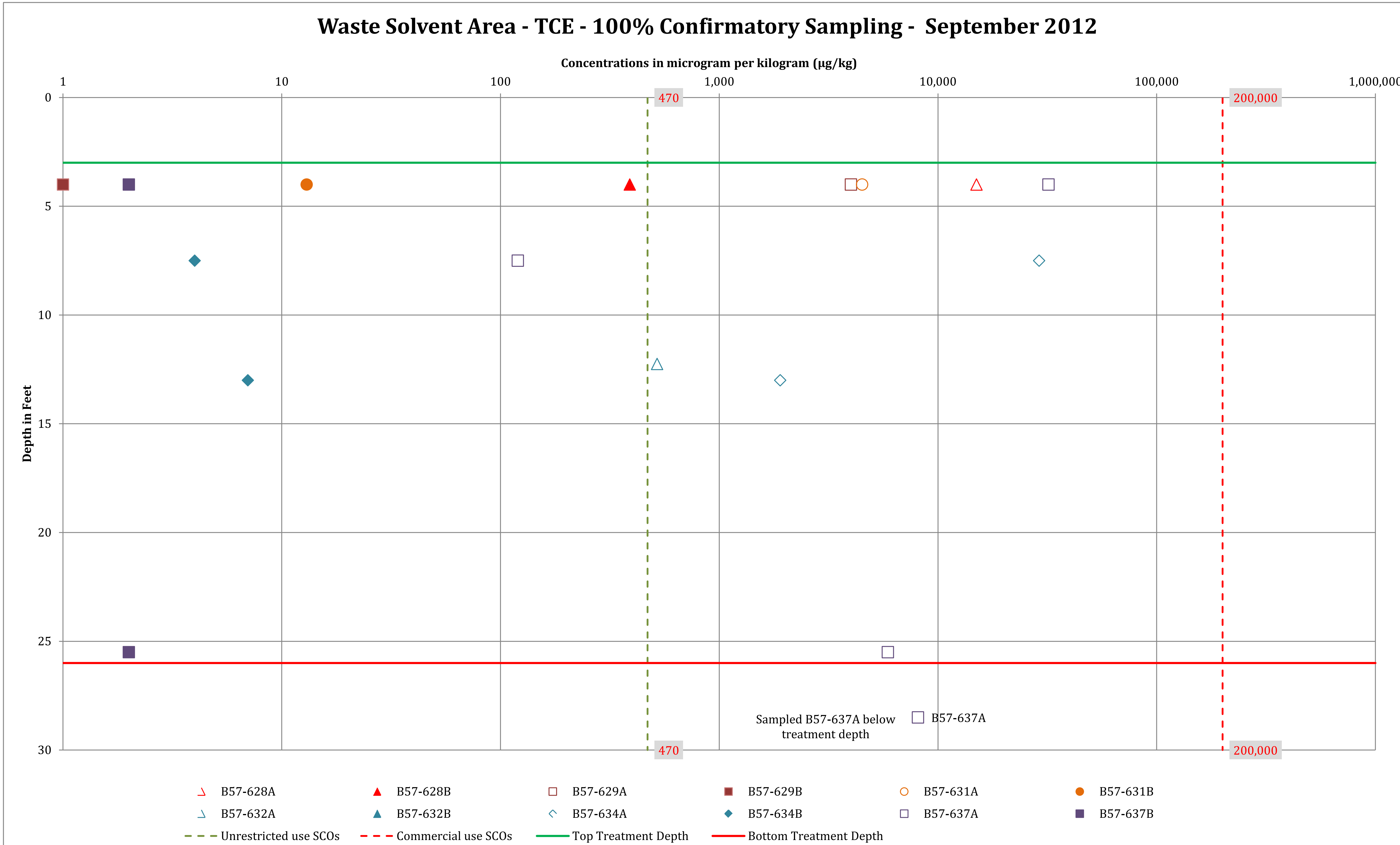
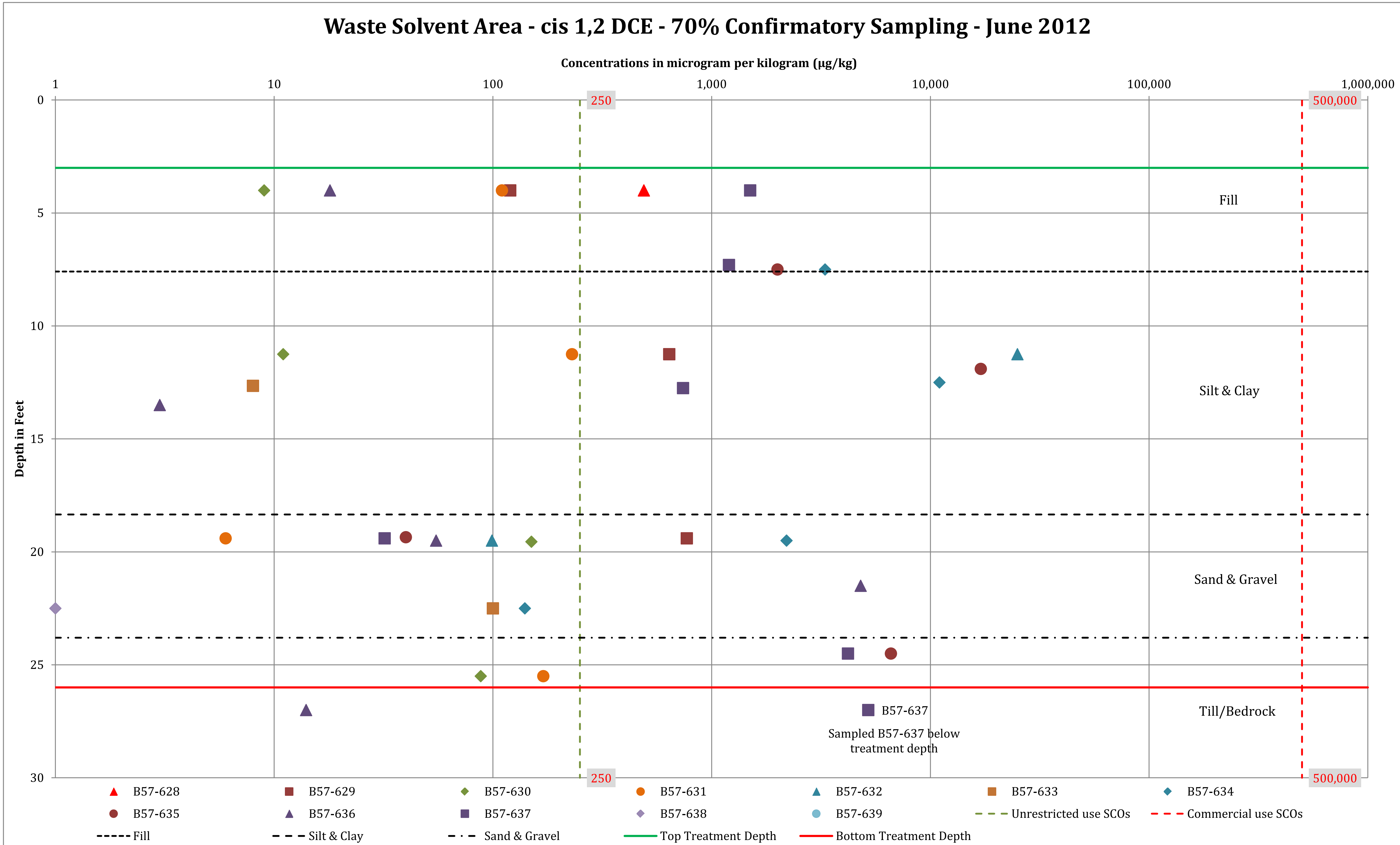

Waste Solvent Area - TCE - 85% Confirmatory Sampling - July 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
470
470
200,000
200,000
B57-637
B57-637A
Sampled B57-637 and B57-637A below treatment depth
B57-628
B57-628A
B57-629
B57-629A
B57-630
B57-630A
B57-631
B57-631A
B57-632
B57-632A
B57-634
B57-634A
B57-635
B57-635A
B57-636
B57-636A
B57-637
B57-637A
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

Figure D. 17



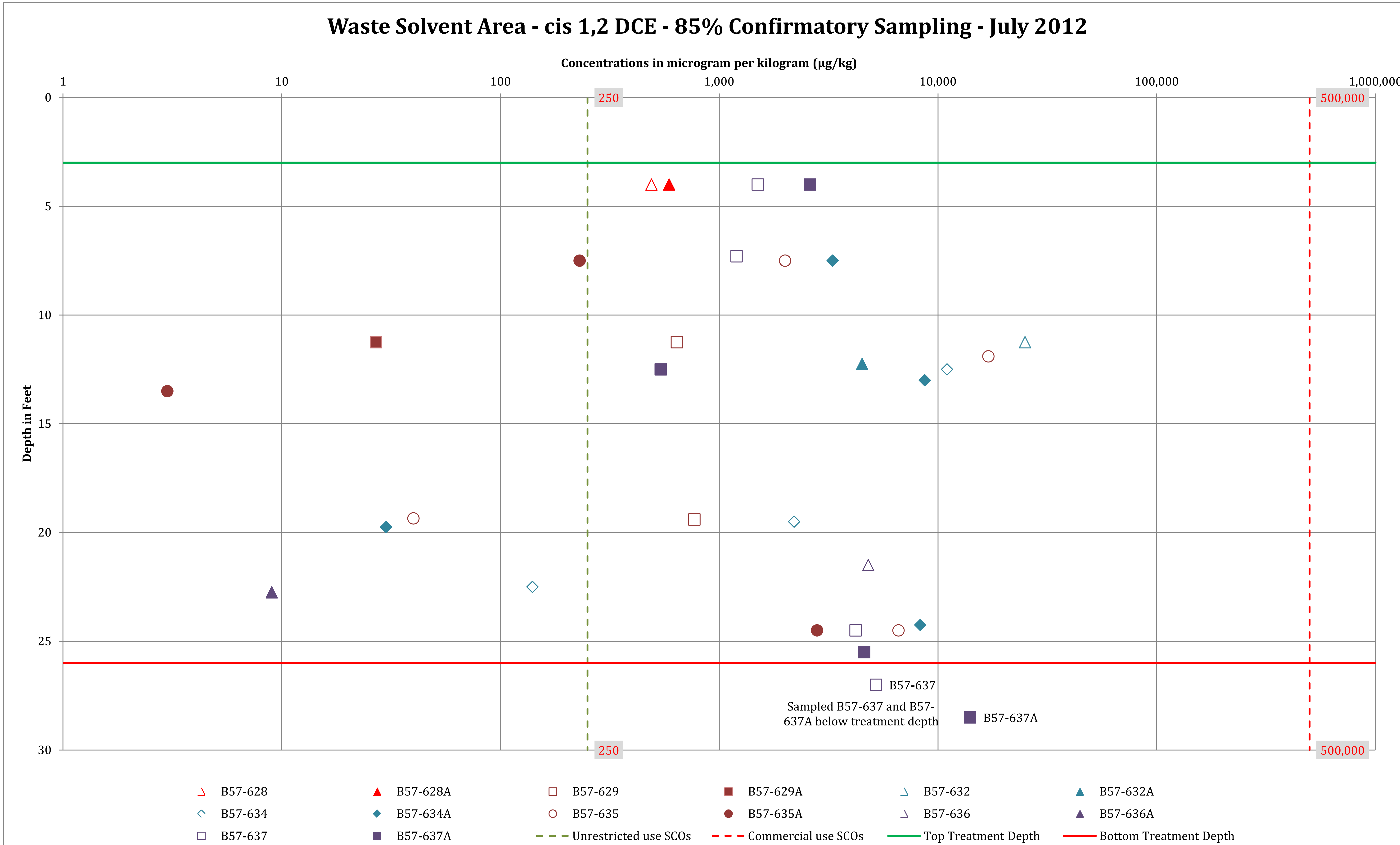
Waste Solvent Area - TCE - 100% Confirmatory Sampling - September 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
470
200,000
470
200,000
Sampled B57-637A below treatment depth
B57-637A
B57-628A
B57-628B
B57-629A
B57-629B
B57-631A
B57-631B
B57-632A
B57-632B
B57-634A
B57-634B
B57-637A
B57-637B
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

Figure D. 18



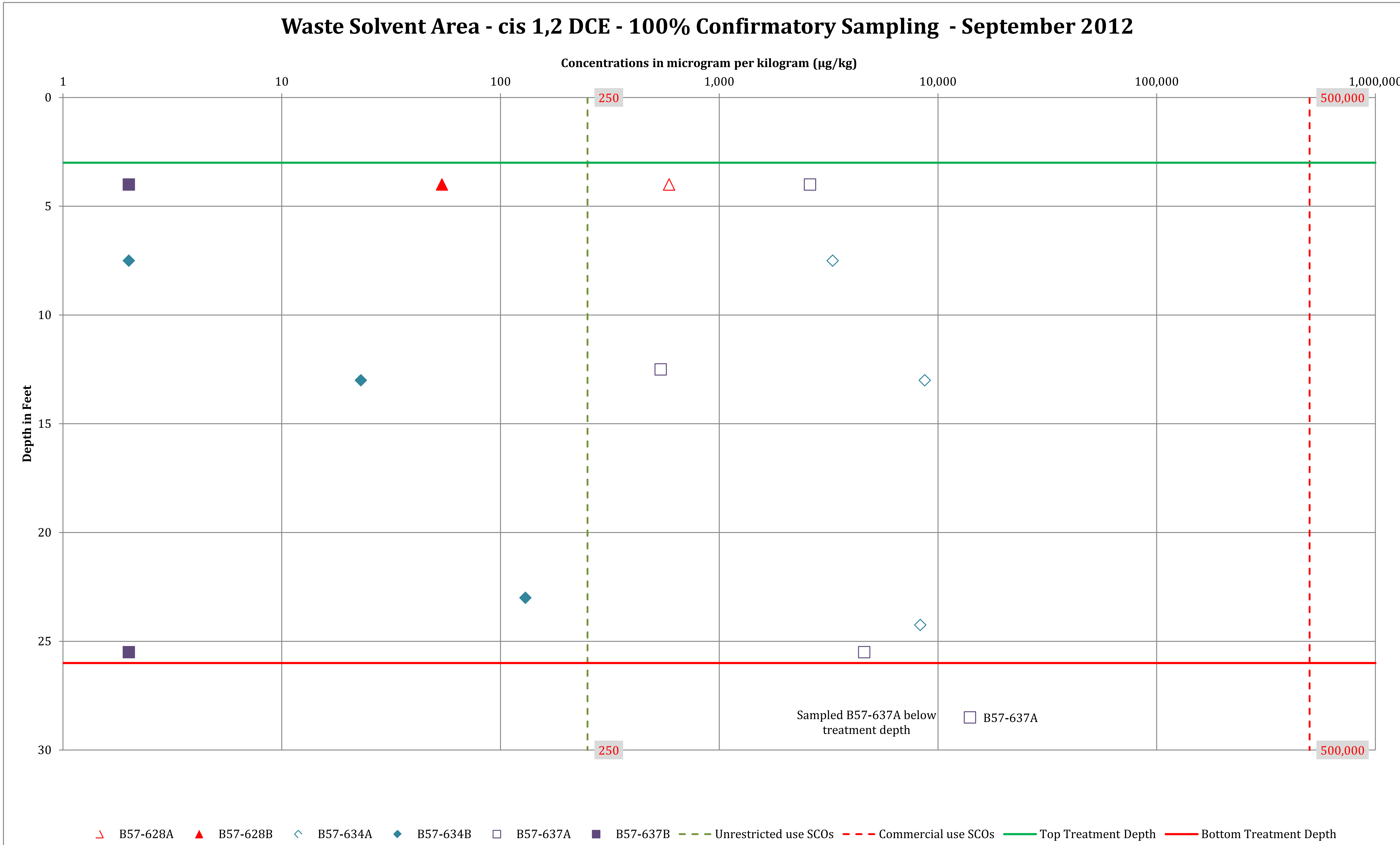
Waste Solvent Area - cis 1,2 DCE - 70% Confirmatory Sampling - June 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
250
500,000
Fill
Silt & Clay
Sand & Gravel
Till/Bedrock
B57-637
Sampled B57-637 below treatment depth
B57-628
B57-629
B57-630
B57-631
B57-632
B57-633
B57-634
B57-635
B57-636
B57-637
B57-638
B57-639
Unrestricted use SCOs
Commercial use SCOs
Fill
Silt & Clay
Sand & Gravel
Top Treatment Depth
Bottom Treatment Depth

Figure D. 19



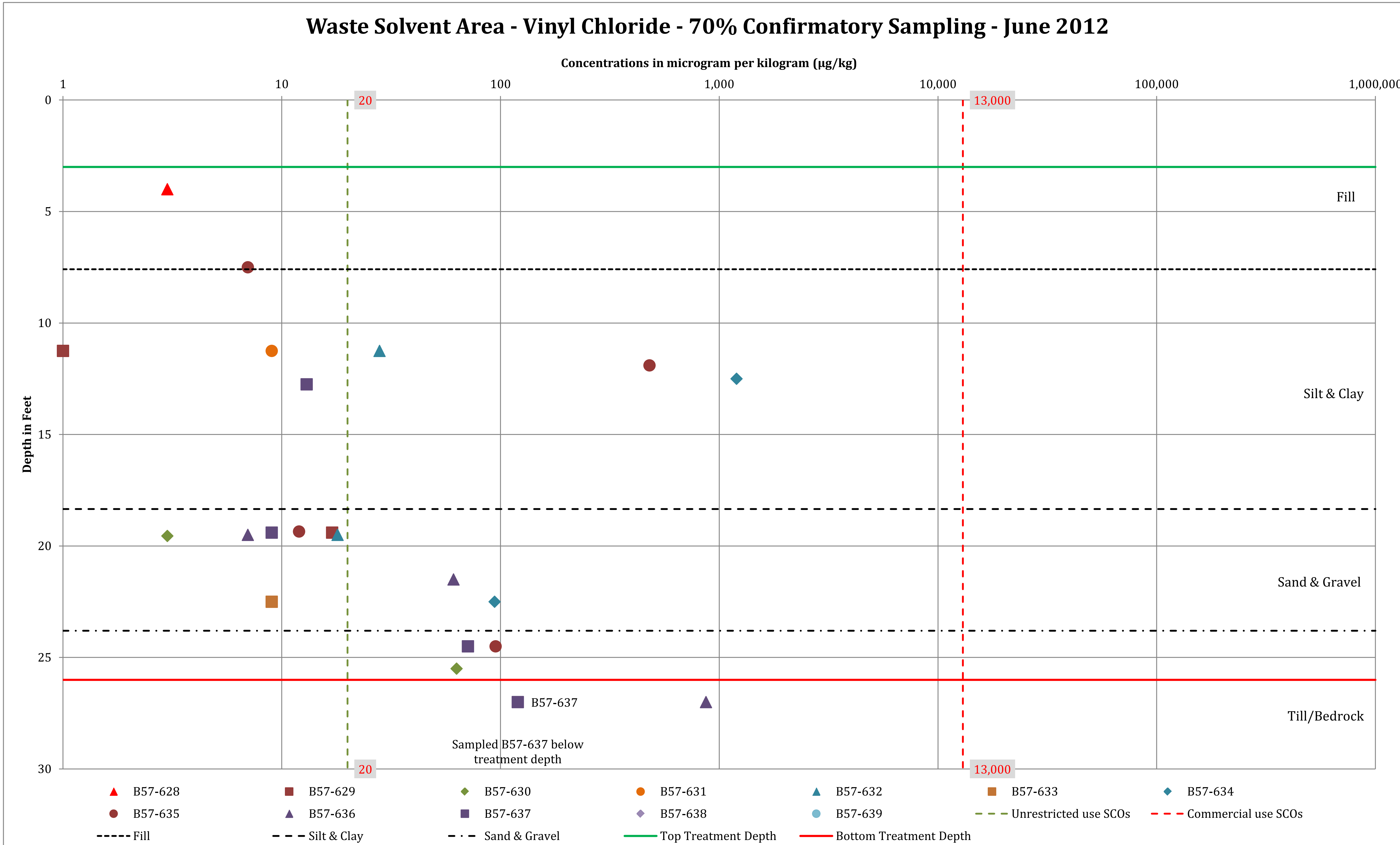
Waste Solvent Area - cis 1,2 DCE - 85% Confirmatory Sampling - July 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
250
500,000
B57-637
Sampled B57-637 and B57-637A below treatment depth
B57-637A
B57-628
B57-628A
B57-629
B57-629A
B57-632
B57-632A
B57-634
B57-634A
B57-635
B57-635A
B57-636
B57-636A
B57-637
B57-637A
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

Figure D. 20



Waste Solvent Area - cis 1,2 DCE - 100% Confirmatory Sampling - September 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
250
500,000
Sampled B57-637A below treatment depth
B57-637A
B57-628A
B57-628B
B57-634A
B57-634B
B57-637A
B57-637B
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

Figure D. 21



Waste Solvent Area - Vinyl Chloride - 70% Confirmatory Sampling - June 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
Depth in Feet
0
5
10
15
20
25
30
20
13,000
Fill
Silt & Clay
Sand & Gravel
Till/Bedrock
B57-637
Sampled B57-637 below treatment depth
B57-628
B57-629
B57-630
B57-631
B57-632
B57-633
B57-634
B57-635
B57-636
B57-637
B57-638
B57-639
Unrestricted use SCOs
Commercial use SCOs
Fill
Silt & Clay
Sand & Gravel
Top Treatment Depth
Bottom Treatment Depth

Figure D. 22

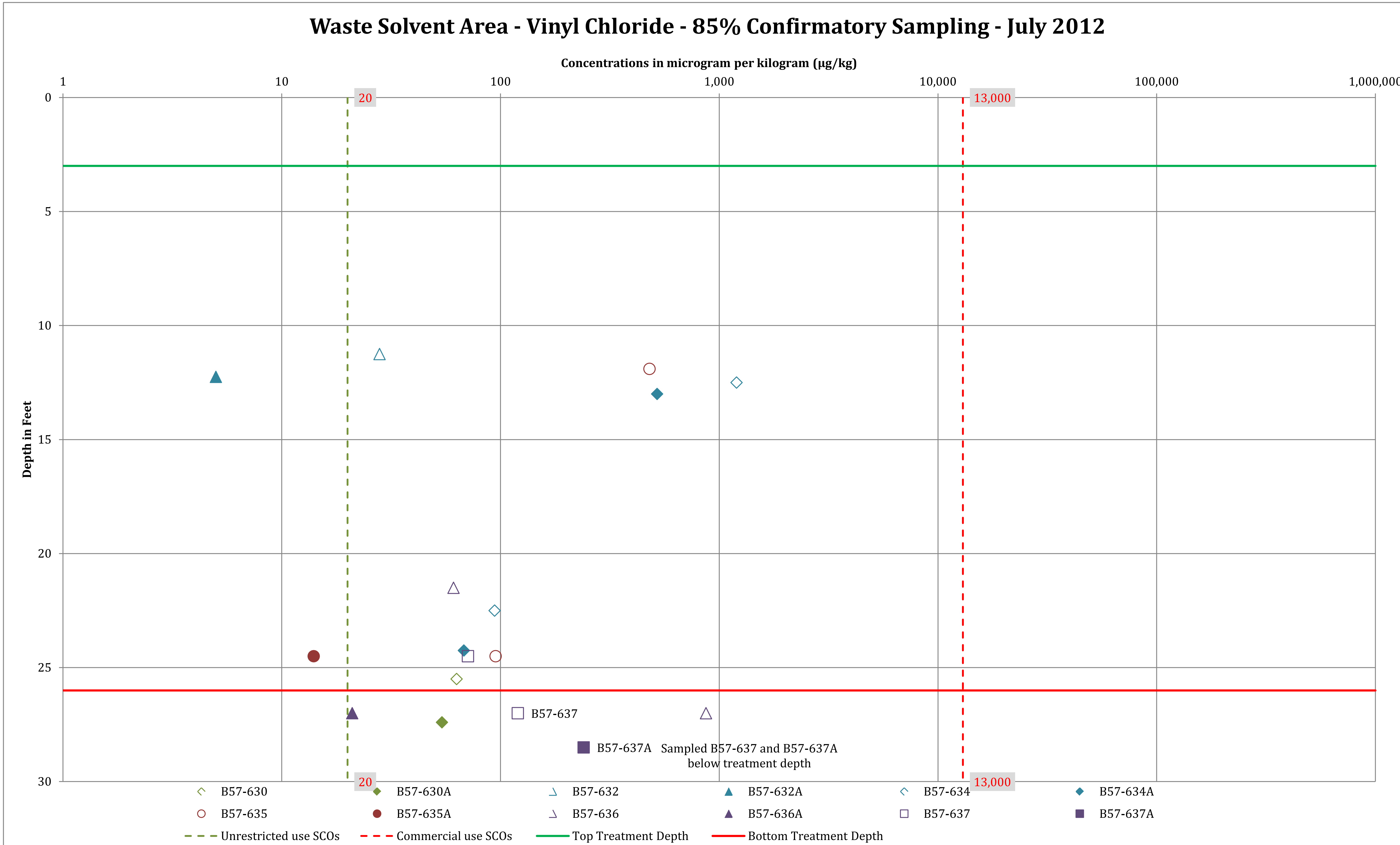
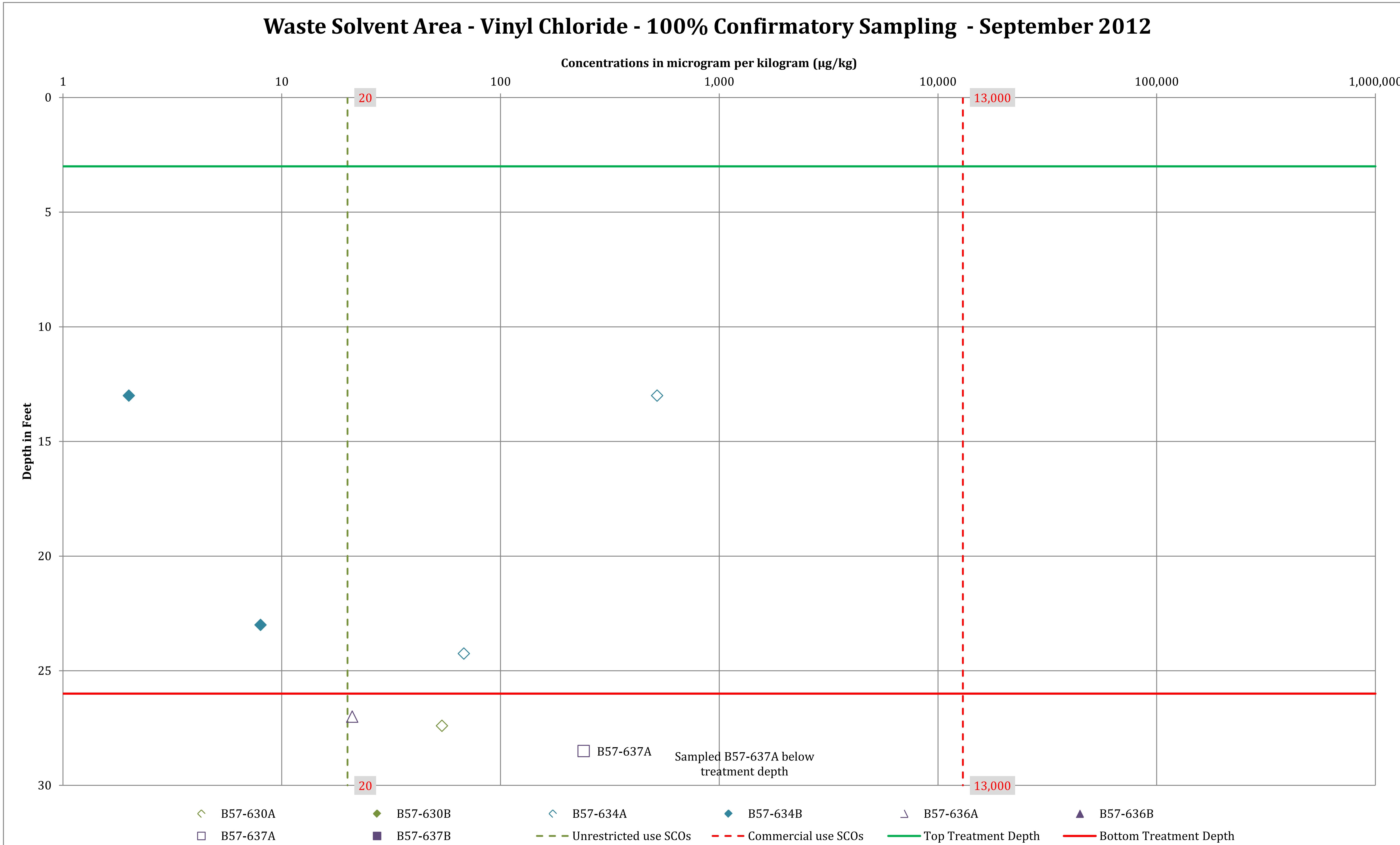

Waste Solvent Area - Vinyl Chloride - 85% Confirmatory Sampling - July 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
20
13,000
B57-637
B57-637A
Sampled B57-637 and B57-637A below treatment depth
B57-630
B57-630A
B57-632
B57-632A
B57-634
B57-634A
B57-635
B57-635A
B57-636
B57-636A
B57-637
B57-637A
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

Figure D. 23



Waste Solvent Area - Vinyl Chloride - 100% Confirmatory Sampling - September 2012
Concentrations in microgram per kilogram (µg/kg)
1
10
100
1,000
10,000
100,000
1,000,000
0
5
10
15
20
25
30
Depth in Feet
20
13,000
B57-637A
Sampled B57-637A below treatment depth
B57-630A
B57-630B
B57-634A
B57-634B
B57-636A
B57-636B
B57-637A
B57-637B
Unrestricted use SCOs
Commercial use SCOs
Top Treatment Depth
Bottom Treatment Depth

Notes:

1) The concentration profiles presented in Figures D.3 through D.23 summarize soil concentrations versus depth in the 39 direct push boring confirmatory sampling locations, B57-601 through B57-639.

2) Soil samples were analyzed for volatile organic compounds (VOCs) by Lancaster Laboratories of Lancaster, PA. Analytical laboratory reports are included in Appendix H (on disc).

3) Concentrations are presented in units of micrograms per kilogram (µg/kg), which is equivalent to parts per billion (ppb).

4) Sample names for the 70% - June 2012 confirmatory sampling are indicated as B57-601, B57-602 and so forth, sample names for 85% - July 2012 confirmatory sampling are indicated as B57-601A, B57-602A and so forth, and sample names for 100% - September 2012 confirmatory sampling are presented as B57-601B, B57-602B and so forth. Initial sampling at B57-638 and B57-639 locations in the Waste Solvent Area was completed during 85% confirmatory sampling instead of 70% due to access constraints. These data are included in the 70% plots to indicate they are initial sampling data.

5) In treatment zones where follow-up confirmatory sampling was conducted, preceding sample results are shown on the concentration profiles for comparison, represented with hollow symbols (e.g., 70% - June 2012 results are shown by hollow symbols on 85% - July 2012 concentration profiles).

6) Non-detect values are not presented on the logarithmic scale.

7) Stratigraphy provided in these figures represents the generalized average stratigraphy observed for each treatment zone; variations may exist at actual locations. Refer to the IRM report text and appendices for additional details.

8) The treatment depth indicated for each source zone is a generalized average representing a depth 2' above the bottom of bored and sheet pile electrodes.

9) Refer to Appendix D and IRM Completion Report text for further discussion.

Attachment D.1 (A)
Carbon Management Summary
Treatment Train # 1
Building 57, Operable Unit # 5
Union Endicott, NY

Date for Carbon Change	Lead	Lag	Polish (HS-600)	Notes	Cumulative carbon handling and procurement costs (both trains)			Disposition	
	Carbon Use (lbs)	Carbon Use (lbs)	Carbon Use (lbs)		Effective date	Amount ($)		Required Disposal Date	Disposal Date
2/10/2012	-	-	-	System Start	-	-		-	-
2/23/2012	1,800	-	-	Lag to Lead	2/15/2012	$ 28,102		5/23/2012	4/19/2012
2/29/2012	1,800	1,800	3,000	Lead-Lag-Polish Change	2/29/2012	$ 38,258		5/29/2012	4/18/12 vessels,4/19/12-Carbon, 5/1/12 for HS-600
3/12/2012	1,800	1,800	-	Lead-Lag Change	3/7/2012	$ 42,410		6/10/2012	4/19/2012
3/16/2012	-	-	3,000	Polish Change	3/14/2012	$ 43,434		Not Available	5/1/2012
3/21/2012	1,800	-	-	Lag to Lead	3/21/2012	$ 76,095		6/19/2012	4/19/2012
4/2/2012	1,800	-	-	Lag to Lead	3/28/2012	$ 76,095		7/1/2012	4/19/2012
4/4/2012	1,800	1,800	-	Lead-Lag Change	4/4/2012	$ 89,477		7/3/2012	4/19/2012
4/5/2012	-	-	3,000	Polish Removed	4/11/2012	$ 91,043		Not Available	5/1/2012
4/17/2012	1,800	-	-	Lag to Lead	4/18/2012	$ 92,303		7/16/2012	6/25/2012
-	-	-	-	-	4/25/2012	$ 96,214		-	-
5/4/2012	1,800	-	-	Lag to Lead	5/4/2012	$ 187,500		8/2/2012	6/25/2012
-	-	-	-	-	5/11/2012	$ 187,850		-	-
-	-	-	-	-	5/21/2012	$ 188,415		-	-
-	-	-	-	-	5/30/2012	$ 193,240		-	-
-	-	-	-	-	6/5/2012	$ 193,367		-	-
-	-	-	-	-	6/13/2012	$ 212,652		-	-
-	-	-	-	-	6/19/2012	$ 212,652		-	-
6/21/2012	1,800	1,800	-	Lead-Lag Change	6/27/2012	$ 226,965		9/19/2012	6/25/2012
-	-	-	-	-	7/10/2012	$ 268,362		-	-
-	-	-	-	-	7/17- 8/3/2012, no change in $	$ 272,909		-	-

TT1 Carbon Use (lbs)	32,400
TT2 Carbon Use (lbs)	44,100
Total Carbon Use (lbs)	**76,500**

Note:
Based on carbon samples collected, Treatment Train 1 was considered as a Hazardous waste train and had a 90 day disposal duration requirement from the removal date of the vessel/carbon from Treatment Train.

Attachment D.1 (B)
Carbon Management Summary
Treatment Train # 2
Building 57, Operable Unit # 5
Union Endicott, NY

Date for Carbon Change	Lead Carbon Use (lbs)	Lag Carbon Use (lbs)	Polish (HS-600) Carbon Use (lbs)	Notes	Cumulative carbon handling and procurement costs (both trains): Effective date	Cumulative carbon handling and procurement costs (both trains): Amount ($)		Disposition: Required Disposal Date	Disposal Date
2/10/2012	-	-	-	System Start	-	-		-	-
2/23/2012	1,800	-	-	Lag to Lead	2/15/2012	$ 28,102		Not Available	4/18/2012
2/28/2012	-	-	-	Removed Polish	2/29/2012	$ 38,258		-	-
3/14/2012	1,800	-	-	Lead-Lag Change	3/7/2012	$ 42,410		Not Available	4/18/2012
3/18/2012	2,250	-	-	Lag to Lead	3/14/2012	$ 43,434		Not Available	4/16/2012
3/21/2012	2,250	-	-	Lead-Lag Change (lag reused)	3/21/2012	$ 76,095		Not Available	4/16/2012
3/30/2012	2,250	-	-	Lag to Lead	3/28/2012	$ 76,095		Not Available	4/16/2012
4/2/2012	2,250	-	-	Lag to Lead	4/4/2012	$ 85,253		Not Available	4/16/2012
4/4/2012	2,250	2,250	-	Lead-Lag Change (lead not fresh)	4/4/2012	$ 89,477		Not Available	4/16/2012
4/5/2012	2,250	2,250	-	Lead-Lag Change	-	-		Not Available	4/16/2012
4/7/2012	2,250	-	-	Lag to Lead	-	-		Not Available	4/16/2012
4/9/2012	2,250	2,250	-	Lead-Lag Change	-	-		Not Available	4/23/2012
4/12/2012	2,250	2,250	-	Lead-Lag Change	4/11/2012	$ 91,043		Not Available	4/23/2012
4/16/2012	2,250	-	-	Lag to Lead	4/18/2012	$ 92,303		Not Available	4/23/2012
4/20/2012	2,250	-	-	Lag to Lead	4/25/2012	$ 96,214		Not Available	4/23/2012
4/29/2012	2,250	2,250	-	Lead-Lag Change	5/4/2012	$ 187,500		Not Available	5/7/2012
-	-	-	-	-	5/11/2012	$ 187,850		-	-
5/17/2012	2,250	-	-	Lag to Lead	-	-		Not Available	7/23/2012
-	-	-	-	-	5/21/2012	$ 188,415		-	-
-	-	-	-	-	5/30/2012	$ 193,240		-	-
-	-	-	-	-	6/5/2012	$ 193,367		-	-
-	-	-	-	-	6/13/2012	$ 212,652		-	-
-	-	-	-	-	6/19/2012	$ 212,652		-	-
-	-	-	-	-	6/27/2012	$ 226,965		-	-
-	-	-	-	-	7/10/2012	$ 268,362		-	-
-	-	-	-	-	7/17- 8/3/2012, no change in $	$ 272,909		-	-

TT2 Carbon Use (lbs)	44,100
TT1 Carbon Use (lbs)	32,400
Total Carbon Use (lbs)	**76,500**

Note:
Based on carbon samples collected, Treatment Train 2 was a non-hazardous waste train and didn't require a 90-day disposal duration requirement from the removal date of the vessel/carbon from Treatment Train.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: February 9, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O_2 / CH_4 / CO_2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: N/A	Collector(s): A. Khandekar, R. Welch
Other: N/A	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T2E**	**TIE**	**TID**	**TIC**	**TIA**	**T2A**
Sample ID	T2E	TIE	TID	TIC	TIA	T2A
Sample Date	02/09/12	02/09/12	02/09/12	02/09/12	02/09/12	02/09/12
Canister Serial No.	35651	33409	36517	36386	3320	34652
Start Time	0853	0914	0937	1030	1050	1445
Start Pressure (inches Hg)	-26.0	-27.0	-25.0	-26.0	-27.0	-27.0
Stop Time	Grab	Grab	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-5.0	-6.0	-5.0	-4.5	-6.0	-6.5
Ambient Air Temp (°F)	22°F	30°F	35°F	35°F	35°F	45°F
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
PID reading (ppmv)	-	-	-	-	-	-
FID reading (ppmv)	-	1.6	1.3	2	1.2	-
Comment No.	1	-	-	2	-	3

COMMENTS

1. TRS experiencing blower issues; had to turn off blower, No FID reading.
2. First sample canister used (Can #37359) without any vacuum.
3. First sample canister used (Can #9321) without any vacuum.
4. Very low vacuum in canister; sampling time ~<3 seconds.
5. Very low vacuum in canister; sampling time ~<3 seconds

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: February 9, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O_2 / CH_4 / CO_2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: N/A	Collector(s): A. Khandekar, R. Welch	
Other: N/A	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2D**	**T2C**	**Sample Port F**	**-**	**-**	**-**
Sample ID	T2D	T2C		**-**	**-**	**-**
Sample Date	02/09/12	02/09/12	02/09/12	-	-	-
Canister Serial No.	1366	36388	1600	-	-	-
Start Time	1520	1540	1600	-	-	-
Start Pressure (inches Hg)	-20.0	-25.0	-20.0	-	-	-
Stop Time	Grab	Grab	Grab	-	-	-
Stop Pressure (inches Hg)	-4.0	-6.0	-5.0	-	-	-
Ambient Air Temp (°F)	45°F	45°F	45°F	-	-	-
Weather Conditions	Sunny	Sunny	Sunny	-	-	-
PID reading (ppmv)	-	-	-	-	-	-
FID reading (ppmv)	-	-	-	-	-	-
Comment No.	4	-	5	-	-	-

COMMENTS

1. TRS experiencing blower issues; had to turn off blower, No FID reading.
2. First sample canister used (Can #37359) without any vacuum.
3. First sample canister used (Can #9321) without any vacuum.
4. Very low vacuum in canister; sampling time ~<3 seconds.
5. Very low vacuum in canister; sampling time ~<3 seconds

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: February 15, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O_2 / CH_4 / CO_2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: N/A	Collector(s): A. Khandekar
Other: N/A	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1A**	**T1C**	**TID**	**TIE**	**Sample Port F**	**TIB**
Sample ID	T1A	T1C	TID	TIE		-
Sample Date	02/15/12	02/15/12	02/15/12	02/15/12	02/15/12	02/15/12
Canister Serial No.	34129	34116	3043	31755	2640	-
Start Time	1608	1605	1645	1350	1650	-
Start Pressure (inches Hg)	-30.0	-29.0	-28.0	-29.0	-29.5	-
Stop Time	Grab	Grab	Grab	Grab	Grab	-
Stop Pressure (inches Hg)	-6.0	-7.0	-6.0	-7.0	-6.5	-
Ambient Air Temp (°F)	45°F	45°F	45°F	40°F	45°F	-
Weather Conditions	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	-
O_2 Reading (%)	-	21.6	21.8	21.5	21.5	21.6
CH_4 Reading (%)	-	0.00	0.00	0.00	0.00	0.00
CO_2 Reading (%)	-	0.10	0.10	0.10	0.10	0.10
PID reading (ppmv)	-	0.68	0.71	0.80	0.76	-
FID reading (ppmv)	-	39	34	36	37	82
Comment No.	-	2	2,3	1,2	2	-

COMMENTS

1. Sampling time for canister ~<4 seconds.
2. PID readings measured with an EVM-7 monitor.
3. Canister 34660 used first; had initial vacuum pressure of -15 inches Hg. Resampled using canister 3043 at 1645.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: February 15, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O_2 / CH_4 / CO_2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: N/A	Collector(s): A. Khandekar
Other: N/A	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T2A**	**T2C**	**T2D**	**T2E**	**T2B**	**-**
Sample ID	T2A	T2C	T2D	T2E	-	-
Sample Date	02/15/12	02/15/12	02/15/12	02/15/12	02/15/12	-
Canister Serial No.	33729	1044	8035	14515	-	-
Start Time	1610	1345	1333	1339	-	-
Start Pressure (inches Hg)	-29.0	-27.5	-28.5	-28.5	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-6.0	-7.0	-6.5	-6.5	-	-
Ambient Air Temp (°F)	45°F	40°F	40°F	40°F	-	-
Weather Conditions	Cloudy	Cloudy	Cloudy	Cloudy	-	-
O_2 Reading (%)	-	21.5	21.2	21.4	21.6	-
CH_4 Reading (%)	-	0.00	0.00	0.00	0.00	-
CO_2 Reading (%)	-	0.30	0.30	0.30	0.20	-
PID reading (ppmv)	-	1.1	1.0	0.7	3.1	-
FID reading (ppmv)	-	40	43	40	136	-
Comment No.	-	2	2	-	-	-

COMMENTS

1. Sampling time for canister ~<4 seconds.
2. PID readings measured with an EVM-7 monitor.
3. Canister 34660 used first; had initial vacuum pressure of -15 inches Hg. Resampled using canister 3043 at 1645.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: February 20, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: N/A	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2A**	**T2B**	**T2C**	**T2D**	**T2E**	**Sample Port F**
Sample ID	T2A	-	T2C	T2D	T2E	
Sample Date	02/20/12	-	02/20/12	02/20/12	02/20/12	02/20/12
Canister Serial No.	3361	-	12365	3456	30811	2184
Start Time	1640	-	1505	1500	1455	1625
Start Pressure (inches Hg)	-28.0	-	-29.0	-29.5	-29.5	-29.0
Stop Time	Grab	-	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-9.0	-	-7.0	-7.0	-7.0	-7.5
Ambient Air Temp (°F)	45	-	45	45	45	45
Weather Conditions	Sunny	-	Sunny	Sunny	Sunny	Sunny
PID reading (ppmv)	11	41	2.8	2.0	1.2	1.6
FID reading (ppmv)	337	412	350	419	397	97
Comment No.	2	-	-	.	-	-

COMMENTS

1. Canister #2210 used first didn't have sufficient vacuum (-10 in. Hg). replaced canister #2210 and used Canister #2133 for sampling.

2. Initial vacuum appeared to be -28.0; opening canister vacuum dropped abruptly to -25.0.

3. Initial vacuum appeared to be -29.5; opening canister vacuum dropped abruptly to -25.0.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: February 20, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: N/A	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1A**	**T1B**	**T1C**	**T1D**	**T1E**	**TIC**
Sample ID	T1A	-	T1C	T1D	T1E	DUP1
Sample Date	02/20/12	-	02/20/12	02/20/12	02/20/12	02/20/12
Canister Serial No.	2191	-	3303	2133	3374	9448
Start Time	1645	-	1525	1630	1515	1525
Start Pressure (inches Hg)	-29.5	-	-28.0	-29.5	-29.5	-14.0
Stop Time	Grab	-	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-8.0	-	-7.0	-9.0	-8.0	-7.0
Ambient Air Temp (°F)	45	-	45	45	45	45
Weather Conditions	Sunny	-	Sunny	Sunny	Sunny	Sunny
PID reading (ppmv)	75	95	23	3.2	6.1	-
FID reading (ppmv)	162	80	47	39	69	-
Comment No.	-	-	-	1	-	-

COMMENTS

1. Canister #2210 used first didn't have sufficient vacuum (-10 in. Hg). replaced canister #2210 and used Canister #2133 for sampling.

2. Initial vacuum appeared to be -28.0; opening canister vacuum dropped abruptly to -25.0.

3. Initial vacuum appeared to be -29.5; opening canister vacuum dropped abruptly to -25.0.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: March 5, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: N/A	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1A**	**T1B**	**T1C**	**T1D**	**T1E**	**Sample Port F**
Sample ID	T1A	-	T1C	T1D	-	
Sample Date	03/05/12	03/05/12	03/05/12	03/05/12	03/05/12	03/05/12
Canister Serial No.	3048	-	3301	8003	-	3359
Start Time	1215	-	1255	1217	-	1545
Start Pressure (inches Hg)	-29.0	-	-28.5	-29.0	-	-27.0
Stop Time	Grab	-	Grab	Grab	-	Grab
Stop Pressure (inches Hg)	-6.0	-	-8.0	-7.0	-	-6.0
Ambient Air Temp (°F)	30	30	30	30	30	30
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Velocity, Fpm	4450	6990	4330	5350	5160	1700
Pressure, in H_2O	42	71	48	18	1	0
PID reading (ppmv)	175	180	29	2.7	0.7	0.7
FID reading (ppmv)	112	105	45	39	38	366
Temperature (°F)	64	125	108	95	88	86
Comment No.	-	-	-	-	-	1

COMMENTS

1. First sample collected (canister #8010) had water from sample port entering canister due to high vacuum exerted by canister. Sample port removed and dried prior to taking next sample.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: March 15, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: N/A	Collector(s): A. Khandekar	
Other: MiniRAE 3000	FID Meter Used: TVA 1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2A**	**T2C**	**T2B**	**T2D**	**-**	**-**
Sample ID	T2A	T2C	-	-	-	-
Sample Date	03/15/12	03/15/12	-	-	-	-
Canister Serial No.	2510	12030	-	-	-	-
Start Time	1605	1600	-	-	-	-
Start Pressure (inches Hg)	-29.0	-29.5	-	-	-	-
Stop Time	Grab	Grab	-	-	-	-
Stop Pressure (inches Hg)	-6.0	-7.0	-	-	-	-
Ambient Air Temp (°F)	55	55	-	-	-	-
Weather Conditions	Sunny	Sunny	-	-	-	-
PID reading (ppmv)	5.7	1.6	17	8.3	-	-
FID reading (ppmv)	91	75	117	70	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: March 18, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other:	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2A**	**T2C**	**T2D**	**Sample Port F**	**-**	**-**
Sample ID	T2A	T2C	T2D		-	-
Sample Date	03/18/12	03/18/12	03/18/12	03/18/12	-	-
Canister Serial No.	12807	33735	34085	35595	-	-
Start Time	1625	1630	1634	1635	-	-
Start Pressure (inches Hg)	-29.0	-29.5	-26.0	-28.5	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-7.0	-7.0	-5.0	-7.0	-	-
Ambient Air Temp (°F)	65	65	65	65	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
PID reading (ppmv)	241	35	15	4.1	-	-
FID reading (ppmv)	1091	430	485	127	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: March 19, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other:	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1A**	**T1C**	**T1D**	**T1E**	**Sample Port F**	**T1A**
Sample ID	T1A	T1C	T1D	T1E		Dup 2
Sample Date	03/19/12	03/19/12	03/19/12	03/19/12	03/19/12	03/19/12
Canister Serial No.	3331	35607	3328	3825	3352	3022
Start Time	1637	1640	1644	1645	1648	1635
Start Pressure (inches Hg)	-29.0	-29.0	-29.5	-29.0	-31.0	-27.0
Stop Time	Grab	Grab	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-8.0	-6.5	-7.0	-7.5	-7.0	-7.0
Ambient Air Temp (°F)	65	65	65	65	65	65
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
PID reading (ppmv)	102	45	6.0	1.9	12	-
FID reading (ppmv)	67	46	39	36	105	-
Comment No.	-	-	-	1	-	2

COMMENTS

1. Canister went down very slowly; approximately >1 minute to sample.
2. Dup 2 was collected at T1A.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: March 27, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other:	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T1E**	**Sample Port F**	**-**
Sample ID	T1B	T1C	T1D	T1E		-
Sample Date	03/27/12	03/27/12	03/27/12	03/27/12	03/27/12	-
Canister Serial No.	2044	8024	3302	21028	3336	-
Start Time	1619	1623	1625	1627	1629	-
Start Pressure (inches Hg)	-31.0	-28.5	-27.5	-28.5	-28.5	-
Stop Time	Grab	Grab	Grab	Grab	Grab	-
Stop Pressure (inches Hg)	-8.0	-7.0	-5.5	-6.0	-7.0	-
Ambient Air Temp (°F)	65	65	65	65	65	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	-
PID reading (ppmv)	35	18	1.5	1.2	2.2	-
FID reading (ppmv)	28	26	17	15	43	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: March 27, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other:	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**-**	**-**	**-**
Sample ID	T2B	T2C	T2D	-	-	-
Sample Date	03/27/12	03/27/12	03/27/12	-	-	-
Canister Serial No.	12033	37307	3371	-	-	-
Start Time	1650	1640	1633	-	-	-
Start Pressure (inches Hg)	-29.5	-29.0	-27.5	-	-	-
Stop Time	Grab	Grab	Grab	-	-	-
Stop Pressure (inches Hg)	-6.5	-6.5	-7.0	-	-	-
Ambient Air Temp (°F)	65	65	65	-	-	-
Weather Conditions	Sunny	Sunny	Sunny	-	-	-
PID reading (ppmv)	29	3.8	2.0	-	-	-
FID reading (ppmv)	83	135	136	-	-	-
Comment No.	1	-	-	-	-	-

COMMENTS

1. Canister #3300 used had a very low vacuum. Canister #12033 used to recollect sample.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: April 5, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	-	-	-	-
Sample ID	T2B	T2C	-	-	-	-
Sample Date	04/05/12	04/05/12	-	-	-	-
Canister Serial No.	37312	37322	-	-	-	-
Start Time	1710	1712	-	-	-	-
Start Pressure (inches Hg)	-28.0	-25.5	-	-	-	-
Stop Time	Grab	Grab	-	-	-	-
Stop Pressure (inches Hg)	-6.0	-7.0	-	-	-	-
Ambient Air Temp (°F)	65	65	-	-	-	-
Weather Conditions	Sunny	Sunny	-	-	-	-
PID reading (ppmv)	185	27	-	-	-	-
FID reading (ppmv)	513	482	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.03	Date: April 9, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: Miran Sapphire (TCE Specific)	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1B**	**T1C**	**T1D**	-	-
Sample ID	T1B	DUP3	T1C	T1D	-	-
Sample Date	04/09/12	04/09/12	04/09/12	04/09/12	-	-
Canister Serial No.	34617	33722	3830	31789	-	-
Start Time	1400	1408	1412	1414	-	-
Start Pressure (inches Hg)	-28.5	-29.0	-28.5	-28.0	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-6.0	-5.5	-6.0	-6.0	-	-
Ambient Air Temp (°F)	70	70	70	70	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
PID reading (ppmv)	58	-	2.2	1.9	-	-
FID reading (ppmv)	46	-	26	22	-	-
Miran Sapphire - TCE (ppmv)	14	-	6.0	4	-	-
Comment No.	-	1	-	-	-	-

COMMENTS

1. DUP3 was sampled at location T1B.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.03	Date: April 9, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandakar	
Other: Miran Sapphire (Freon 113 Specific)	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**Sample Port F**	-	-
Sample ID	T2B	T2C	T2D		-	-
Sample Date	04/09/12	04/09/12	04/09/12	04/09/12	-	-
Canister Serial No.	35620	37435	2140	34658	-	-
Start Time	0855	0900	0856	0858	-	-
Start Pressure (inches Hg)	-31.0	-27.0	-29.5	-28.5	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-6.0	-6.0	-6.0	-6.0	-	-
Ambient Air Temp (°F)	70	70	70	70	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
PID reading (ppmv)	80	7.7	9.5	3.7	-	-
FID reading (ppmv)	319	299	144	55	-	-
Miran Sapphire - Freon 113 (ppmv	96	117	64	11	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.03	Date: 4/16/2012, 4/17/2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRae 3000B	Collector(s): A. Khandekar
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T2B**	**T2C**	**T2D**
Sample ID	T1B	T1C	T1D	T2B	T2C	T2D
Sample Date	04/16/12	04/16/12	04/16/12	04/17/12	04/17/12	04/17/12
Canister Serial No.	3831	35678	34189	36489	35608	8012
Start Time	1039	1040	1041	1600	1604	1602
Start Pressure (inches Hg)	-29.0	-29.0	-31.0	-29.5	-31.0	-27.5
Stop Time	Grab	Grab	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-6.0	-6.0	-6.0	-6.0	-6.5	-6.0
Ambient Air Temp (°F)	70	70	70	70	70	70
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
PID reading (ppmv)	45	32	1.6	27	2.8	1.9
FID reading (ppmv)	39	38	23	71	18	17
Miran Sapphire - Freon 113 (ppmv)	0	0	0	8	0	0
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: April 25, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1B**	**T1C**	**T1D**	**T1B**	-
Sample ID	T1B	DUP4	T1C	T1D	T1B	-
Sample Date	04/25/12	04/25/12	04/25/12	04/25/12	04/25/12	-
Canister Serial No.	3348	3370	33716	3362	-	-
Start Time	1616	1616	1316	1317	1310	-
Start Pressure (inches Hg)	-30.0	-28.5	-22.0	-27.5	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-5.0	-5.0	-7.0	-6.0	-	-
Ambient Air Temp (°F)	65	65	65	65	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
PID reading (ppmv)	25	-	2.7	0.9	25	-
FID reading (ppmv)	20	-	14.5	14	24	-
Miran Sapphire (ppmv)	0	-	0	0	0	-
Comment No.	2	1, 2	-	-	-	-

COMMENTS

1. DUP4 was collected at T1B location.
2. Canister #37673 & Canister #33747 perviously used to collect samples at T1B location; issue noted with dial gauge on Canister #37673, which during sampling was observed to have zero vacuum. New samples collected at 1616 using canister #'s 3348 & 3370.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: April 25, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**Sample Port F**	-	-
Sample ID	T2B	T2C	T2D		-	-
Sample Date	04/25/12	04/25/12	04/25/12	04/25/12	-	-
Canister Serial No.	3351	21018	33399	37359	-	-
Start Time	1320	1330	1321	1323	-	-
Start Pressure (inches Hg)	-28.0	-28.0	-28.0	-20.5	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-7.0	-6.0	-7.0	-7.0	-	-
Ambient Air Temp (°F)	65	65	65	65	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
PID reading (ppmv)	40	4.3	2.4	1.3	-	-
FID reading (ppmv)	65	131	19	15	-	-
Miran Sapphire - Freon 113 (pp	19	95	5.0	0	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: April 25, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1B**	**T1C**	**T1D**	**T1B**	-
Sample ID	T1B	DUP4	T1C	T1D	T1B	-
Sample Date	04/25/12	04/25/12	04/25/12	04/25/12	04/25/12	-
Canister Serial No.	3348	3370	33716	3362	-	-
Start Time	1616	1616	1316	1317	1310	-
Start Pressure (inches Hg)	-30.0	-28.5	-22.0	-27.5	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-5.0	-5.0	-7.0	-6.0	-	-
Ambient Air Temp (°F)	65	65	65	65	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
PID reading (ppmv)	25	-	2.7	0.9	25	-
FID reading (ppmv)	20	-	14.5	14	24	-
Miran Sapphire (ppmv)	0	-	0	0	0	-
Comment No.	2	1, 2	-	-	-	-

COMMENTS

1. DUP4 was collected at T1B location.
2. Canister #37673 & Canister #33747 perviously used to collect samples at T1B location; issue noted with dial gauge on Canister #37673, which during sampling was observed to have zero vacuum. New samples collected at 1616 using canister #'s 3348 & 3370.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: April 25, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**Sample Port F**	-	-
Sample ID	T2B	T2C	T2D		-	-
Sample Date	04/25/12	04/25/12	04/25/12	04/25/12	-	-
Canister Serial No.	3351	21018	33399	37359	-	-
Start Time	1320	1330	1321	1323	-	-
Start Pressure (inches Hg)	-28.0	-28.0	-28.0	-20.5	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-7.0	-6.0	-7.0	-7.0	-	-
Ambient Air Temp (°F)	65	65	65	65	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
PID reading (ppmv)	40	4.3	2.4	1.3	-	-
FID reading (ppmv)	65	131	19	15	-	-
Miran Sapphire - Freon 113 (pp	19	95	5.0	0	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: 4/29-4/30/2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: Miran Sapphire (Freon-113 Specific)	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T2B**	**T2C**	**T2D**
Sample ID	T1B	T1C	T1D	T2B	T2C	T2D
Sample Date	04/30/12	04/30/12	04/30/12	04/29/12	04/29/12	04/29/12
Canister Serial No.	3339	3327	3322	8025	3341	3302
Start Time	1624	1625	1626	1619	1620	1621
Start Pressure (inches Hg)	-29.0	-28.0	-28.5	-30.0	-28.5	-30.0
Stop Time	Grab	Grab	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0
Ambient Air Temp (°F)	65	65	65	65	65	65
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Pressure, in H_2O	52.0	30.0	4.0	-	-	-
PID reading (ppmv)	42	29	4.2	345	104	73
FID reading (ppmv)	49	46	36	1100	880	833
Miran Sapphire (ppmv)	0	0	0	57	77	77
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: May 10, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire (Freon-113 specific)	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**Sample Port F**	-	-
Sample ID	T2B	T2C	T2D		-	-
Sample Date	05/10/12	05/10/12	05/10/12	05/10/12	-	-
Canister Serial No.	3321	3457	3299	3337	-	-
Start Time	1540	1541	1542	1543	-	-
Start Pressure (inches Hg)	-27.0	-30.0	-27.0	-28.0	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-7.0	-7.0	-6.0	-7.0	-	-
Ambient Air Temp (°F)	60	60	60	60	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
Pressure, in H_2O	24	20	5.0	5.0	-	-
PID reading (ppmv)	68	23	12	4.3	-	-
FID reading (ppmv)	72	58	73	31	-	-
Miran Sapphire (ppmv)	37	22	29	12	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: May 10, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire (Tuned to CFC-113)	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T1B**	-	-
Sample ID	T1B	T1C	T1D	DUP 5	-	-
Sample Date	05/10/12	05/10/12	05/10/12	05/10/12	-	-
Canister Serial No.	3371	3331	3456	3297	-	-
Start Time	1020	1026	1028	1024	-	-
Start Pressure (inches Hg)	-29.0	-30.0	-29.0	-29.0	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-7.0	-6.0	-7.0	-6.0	-	-
Ambient Air Temp (°F)	60	60	60	60	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
Pressure, in H_2O	28	8.0	5.0	-	-	-
PID reading (ppmv)	21	10	1.3	-	-	-
FID reading (ppmv)	21	15	15	-	-	-
Miran Sapphire (ppmv)	0	0	0	-	-	-
Comment No.	2	3	-	1	-	-

COMMENTS

1. DUP 5 was collected at T1B.
2. Canister #3368 used initially was low on vacuum (~-15).
3. Canister #3343 used at T1C had broken threads which caused can to sample ambient air instead of vapor.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: May 11, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: N/A	FID Meter Used: TVA-1000B Analyzer

POST-CONDENSOR HEADER SOIL VAPOR SAMPLE RECORD

Location No.	**T1A**	**T2A**	-	-	-	-
Sample ID	T1A	T2A	-	-	-	-
Sample Date	05/11/12	05/11/12	-	-	-	-
Start Time	1025	1040	-	-	-	-
Stop Time	Grab	Grab	-	-	-	-
Ambient Air Temp (°F)	65	65	-	-	-	-
Weather Conditions	Sunny	Sunny	-	-	-	-
Pressure, in H_2O at Location	-63	-54	-	-	-	-
Temperature (°F) at Location	76	96	-	-	-	-
Flow in FPM at Location	6000	5900	-	-	-	-
Time of Reading at Port B	1025	1040	-	-	-	-
PID reading at Port B (ppmv)	21	60	-	-	-	-
FID reading at Port B (ppmv)	24	100	-	-	-	-
PID reading at Location (ppmv	11	20	-	-	-	-
FID reading at Location (ppmv	22	80	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: May 11, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: N/A	FID Meter Used: TVA-1000B Analyzer

PER-CONDENSOR HEADER SOIL VAPOR SAMPLE RECORD

Location No.	**T1TCA**	**T1WSA**	**T1 TCA/WSA**	**T2CFC**	**T2B57A**	**T2 CFC/B57A**
Sample ID	T1TCA	T1WSA		T2CFC	T2B57A	
Sample Date	05/11/12	05/11/12	05/11/12	05/11/12	05/11/12	05/11/12
Start Time	1519	1530	1500	1435	1420	1400
Stop Time	Grab	Grab	Grab	Grab	Grab	Grab
Ambient Air Temp (°F)	65	65	65	65	65	65
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Pressure, in H_2O	-26.0	-26.0	-30.8	-35.8	-35.0	-40.0
Temperature (°F) at Location	138	152	138	138	135	149
Flow in FPM at Location	275	2700	900-1300	400	900	12000-15000
Time of Reading at Port B	920	945	1000	900	1105	1015
PID reading at Port B (ppmv)	20	20	20	60	61	60
FID reading at Port B (ppmv)	25	23	23	89	104	101
PID reading at Location (ppmv	3.5	6.7	11	10	23	17
FID reading at Location (ppmv	22	18	22	58	55	66
Comment No.	1	1	1	1	1	1

COMMENTS

1. Samples collected using Septa-Syringe into vials and analyzed by Microseeps, Inc. of Pittsburgh, PA by method AM4:02 .

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: May 15, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T2B**	**T2C**	**T2D**
Sample ID	T1B	T1C	T1D	T2B	T2C	T2D
Sample Date	05/15/12	05/15/12	05/15/12	05/15/12	05/15/12	05/15/12
Canister Serial No.	2117	3459	1742	34137	14526	3366
Start Time	1320	1321	1322	1310	1312	1314
Start Pressure (inches Hg)	-29.0	-28.5	-28.0	-30.5	-28.5	-28.0
Stop Time	-6.5	-6.5	-6.0	-6.5	-6.5	-6.0
Stop Pressure (inches Hg)	Grab	Grab	Grab	Grab	Grab	Grab
Ambient Air Temp (°F)	65	65	65	65	65	65
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Pressure, in H_2O	30.0	8.0	5.0	24.0	20.0	5.0
PID reading (ppmv)	32.0	20.5	5.1	108.0	74.0	28.0
FID reading (ppmv)	20.5	20.8	16.5	74	101	128
Miran Sapphire (ppmv)	50	52	46	32	69	77
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: May 21, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other:	FID Meter Used: TVA-1000B Analyzer

PRE-CONDENSOR HEADER SOIL VAPOR SAMPLE RECORD

Location No.	**T1TCA**	**T1WSA**	**T1TCA/WSA**	**T2CFC**	**T2B57A**	**T2CFC/B57A**
Sample ID	T1TCA	T1WSA	T1TCA/WSA	T2CFC	T2B57A	T2CFC/B57A
Sample Date	05/21/12	05/21/12	05/21/12	05/21/12	05/21/12	05/21/12
Start Time	1620	1605	1630	1530	1540	1550
Ambient Air Temp (°F)	65	65	65	65	65	65
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Pressure, in H_2O	-23.0	-23.0	-27.4	-37.0	-37.8	-41.7
Temp (°F)	155	140	151	137	138	117
Velocity (FPM)	1,500	1,000	7,000	400	3,000	550
PID reading (ppmv) @1300	14	22	18	5.2	18	9.0
FID reading (ppmv) @1300	32	27	31	48	25	36
Comment No.	1	1	1	1	1	1

COMMENTS

1. Samples collected using Septa-Syringe into vials and analyzed by Microseeps, Inc. of Pittsburgh, PA by method AM4:02 .

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: May 22, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T1B**	-	-
Sample ID	T1B	T1C	T1D	DUP 6	-	-
Sample Date	05/22/12	05/22/12	05/22/12	05/22/12	-	-
Canister Serial No.	2199	3323	37720	35610	-	-
Start Time	1400	1402	1404	1406	-	-
Start Pressure (inches Hg)	-27.5	-30.0	-28.5	-27.5	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-6.5	-6.5	-6.0	-6.0	-	-
Ambient Air Temp (°F)	70	70	70	70	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
Pressure, in H_2O	40	>30	5.0	-	-	-
PID reading (ppmv)	14	10	7.5	-	-	-
FID reading (ppmv)	32	27	27	-	-	-
Miran Sapphire (ppmv)	54	41	53	-	-	-
Comment No.	-	1	-	2	-	-

COMMENTS

1. Backpressure issue with the lead vessel effluent, pressure readings >30 (inches H_2O).
2. DUP 6 was collected at location T1B.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: May 22, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandakar
Other: Miran Sapphire (Freon 113 Specific)	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**Sample Port F**	-	-
Sample ID	T2B	T2C	T2D		-	-
Sample Date	05/22/12	05/22/12	05/22/12	05/22/12	-	-
Canister Serial No.	2180	1367	34606	35617	-	-
Start Time	1352	1354	1356	1419	-	-
Start Pressure (inches Hg)	-27.0	-29.0	-27.0	-27.0	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-6.0	-6.5	-6.0	-6.5	-	-
Ambient Air Temp (°F)	70	70	70	70	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
Pressure, in H_2O	30	20	5.0	1.8	-	-
PID reading (ppmv)	14	4.0	3.2	7.5	-	-
FID reading (ppmv)	87	81	54	33	-	-
Miran Sapphire (ppmv)	74	94	69	64	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

1. Backpressure issue with the lead vessel effluent, pressure readings >30 (inches H_2O).
2. DUP 6 was collected at locatio T1B.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: May 31, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandakar	
Other: Miran Sapphire (CFC-113 Specific)	FID Meter Used: MicroFID Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T2B**	**T2C**	**T2D**
Sample ID	T1B	T1C	T1D	T2B	T2C	T2D
Sample Date	05/31/12	05/31/12	05/31/12	05/31/12	05/31/12	05/31/12
Canister Serial No.	1448	11427	14578	21029	23830	3300
Start Time	0828	0829	0830	0820	0822	824
Start Pressure (inches Hg)	-28.0	-28.0	-27.0	-25.5	-28.5	-28.0
Stop Time	Grab	Grab	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-6.0	-7.0	-6.0	-6.0	-6.0	-7.0
Ambient Air Temp (°F)	65	65	65	65	65	65
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Pressure, in H_2O	35	>60	5.0	30	20	5.0
PID reading (ppmv)	22	5.6	4.1	41	14	7.3
FID reading (ppmv)	20	18	16	34	29	31
Miran Sapphire (ppmv)	25	25	18	31	31	25
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: June 4, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire (CFC-113 Specific)	FID Meter Used: MicroFID Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**-**	**-**	**-**
Sample ID	T1B	T1C	T1D	-	-	-
Sample Date	06/04/12	06/04/12	06/04/12	-	-	-
Canister Serial No.	3354	3339	3363	-	-	-
Start Time	0835	0838	0840	-	-	-
Start Pressure (inches Hg)	-28.5	-28.0	-30.0	-	-	-
Stop Time	Grab	Grab	Grab	-	-	-
Stop Pressure (inches Hg)	-6.0	-6.5	-6.0	-	-	-
Ambient Air Temp (°F)	50	50	50	-	-	-
Weather Conditions	Rain	Rain	Rain	-	-	-
Pressure, in H_2O	40	>60	45	-	-	-
PID reading (ppmv)	22.5	7.5	5.2	-	-	-
FID reading (ppmv)	24.1	24.7	22.1	-	-	-
Miran Sapphire (ppmv)	0	0	0	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: June 4, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire (CFC-113 Specific)	FID Meter Used: MicroFID Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**Sample Port F**	-	-
Sample ID	T2B	T2C	T2D		-	-
Sample Date	06/04/12	06/04/12	06/04/12	06/04/12	-	-
Canister Serial No.	3362	3360	3374	9353	-	-
Start Time	0822	0824	0826	0843	-	-
Start Pressure (inches Hg)	-28	-25	-28	-22	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-6.5	-6.5	-6.5	-7.0	-	-
Ambient Air Temp (°F)	50	50	50	50	-	-
Weather Conditions	Rain	Rain	Rain	Rain	-	-
Pressure, in H_2O	10	19	4.5	1.8	-	-
PID reading (ppmv)	44	9.9	8.9	5.8	-	-
FID reading (ppmv)	45.4	42.1	43.1	28	-	-
Miran Sapphire (ppmv)	5	3	3	0	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: June 4, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: Miran Sapphire (CFC-113 Specific)	FID Meter Used: MicroFID Analyzer	

PRE-CONDENSOR HEADER SOIL VAPOR SAMPLE RECORD

Location No.	**T1WSA**	**T1TCA**	**T2CFC**	**T2B57A**	**T1WSA/TCA**	**T2CFC/B57A**
Sample Date	06/04/12	06/04/12	06/04/12	06/04/12	06/04/12	06/04/12
Collection Time	1110	1055	1015	1000	1120	1030
Sample port Air Temp (°F)	138.3	155.4	119	129.8	158.1	140.2
Velocity in Feet Per Minute (FPM)	430	1350	300	600-2400	10000->15000	6000 - >15000
Ambient Air Temp (°F)	50	50	50	50	50	50
Weather Conditions	Rain	Rain	Rain	Rain	Rain	Rain
Pressure, in H_2O	-26.6	-26.4	-36.0	-35.8	-32.0	-43.2
PID reading (ppmv)	15	8.0	4.0	20	12	23
FID reading (ppmv)	26	36	20	54	25	44
Comment No.	-	-	-	-	-	-

COMMENTS

1. Samples collected using Septa-Syringe into vials and analyzed by Microseeps, Inc. of Pittsburgh, PA by method AM4:02 .

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: June 4, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire (CFC-113 Specific)	FID Meter Used: MicroFID Analyzer

POST-CONDENSOR HEADER SOIL VAPOR SAMPLE RECORD

Location No.	**T1A**	**T2A**	**T1B**	**T2B**	-	-
	Pre-Blower	Pre-Blower	Post-Blower	Post-Blower	-	-
Sample Date	06/04/12	06/04/12	06/04/12	06/04/12	-	-
Collection Time	-	-	-	-	-	-
Sample port Air Temp (°F)	77.6	90.6	-	-	-	-
Velocity in Feet Per Minute (FPM)	3100	5000	-	-	-	-
Ambient Air Temp (°F)	50	50	-	-	-	-
Weather Conditions	Rain	Rain	-	-	-	-
Pressure, in H_2O	-53.4	-66.3	-	-	-	-
PID reading (ppmv)	14	30	23	44	-	-
FID reading (ppmv)	12	41	24	45	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.03	Date: June 13, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire (CFC-113 Specific)	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T1B**	**-**	**-**
Sample ID	T1B	T1C	T1D	DUP7	-	-
Sample Date	06/13/12	06/13/12	06/13/12	06/13/12	-	-
Canister Serial No.	3334	3321	3326	3357	-	-
Start Time	1610	1612	1614	1617	-	-
Start Pressure (inches Hg)	-27.5	-29.5	-29.5	-29.0	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-7.0	-6.5	-7.0	-5.0	-	-
Ambient Air Temp (°F)	85°F	85°F	85°F	85°F	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
PID reading (ppmv)	16.7	16.0	6.8	-	-	-
FID reading (ppmv)	25	24.5	20	-	-	-
Miran Sapphire (ppmv)	28	24	32	-	-	-
Comment No.	-	-	-	1	-	-

COMMENTS

1. DUP 7 was collected at T1B.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: June 13, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire (CFC-113 Specific)	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**-**	**-**	**-**
Sample ID	T2B	T2C	T2D	-	-	-
Sample Date	06/13/12	06/13/12	06/13/12	-	-	-
Canister Serial No.	3350	21022	34111	-	-	-
Start Time	1600	1602	1604	-	-	-
Start Pressure (inches Hg)	-29.5	-28.0	-28.0	-	-	-
Stop Time	Grab	Grab	Grab	-	-	-
Stop Pressure (inches Hg)	-8.0	-7.0	-6.5	-	-	-
Ambient Air Temp (°F)	85°F	85°F	85°F	-	-	-
Weather Conditions	Sunny	Sunny	Sunny	-	-	-
PID reading (ppmv)	21	15	7.3	-	-	-
FID reading (ppmv)	38	40	37	-	-	-
Miran Sapphire (ppmv)	40	36	39	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: June 27, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T2B**	**T2C**	**-**
Sample ID	T1B	T1C	T1D	T2B	T2C	-
Sample Date	06/27/12	06/27/12	06/27/12	06/27/12	06/27/12	-
Canister Serial No.	3457	3330	3365	3459	3456	-
Start Time	1500	1504	1510	1451	1453	-
Start Pressure (inches Hg)	-30.0	-29.0	-27.5	-28.5	-28.0	-
Stop Time	Grab	Grab	Grab	Grab	Grab	-
Stop Pressure (inches Hg)	-7.0	-6.5	-7.0	-6.5	-7.0	-
Ambient Air Temp (°F)	90	90	90	90	90	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	-
Pressure, in H_2O	55	31	4.5	32	18	-
PID reading (ppmv)	15	0.5	1.6	46	20	-
FID reading (ppmv)	23	17	18	84	89	-
Miran Sapphire (ppmv)	-	-	-	39	51	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN ||| HEAD	Project No.: 2466.02	Date: July 3, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T2B**	**T2C**	**T2D**
Sample ID	T1B	T1C	T1D	T2B	T2C	T2D
Sample Date	07/03/12	07/03/12	07/03/12	07/03/12	07/03/12	07/03/12
Canister Serial No.	37674	3296	3451	3347	3320	3452
Start Time	1345	1347	1350	1333	1337	1339
Start Pressure (inches Hg)	-29.5	-28.0	-31.0	-30.0	-28.0	-27.5
Stop Time	Grab	Grab	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-6.5	-8.0	-8.0	-7.0	-7.0	-5.5
Ambient Air Temp (°F)	85	85	85	85	85	85
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Pressure, in H_2O	55	30	4.5	33	20	4.5
PID reading (ppmv)	-	-	-	-	-	-
FID reading (ppmv)	-	-	-	-	-	-
Miran Sapphire (ppmv)	-	-	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: July 10, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T2B**	**T2C**	**T2D**
Sample ID	T1B	T1C	T1D	T2B	T2C	T2D
Sample Date	07/10/12	07/10/12	07/10/12	07/10/12	07/10/12	07/10/12
Canister Serial No.	3343	3363	3331	8026	3349	3339
Start Time	1004	1005	1006	1016	1018	1019
Start Pressure (inches Hg)	-31.0	-28.5	-16.0	-28.5	-29.0	-30.0
Stop Time	Grab	Grab	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
Ambient Air Temp (°F)	90	90	90	90	90	90
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Pressure, in H_2O	55	30	4.5	33	20	4.5
PID reading (ppmv)	26	17	24	27	24	26
FID reading (ppmv)	18	4.2	2.1	23	16	9.7
Miran Sapphire (ppmv)	-	-	-	32	19	20
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: July 10, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**Sample Port F**	-	-	-	-
Sample ID	DUP8		-	-	-	-
Sample Date	07/10/12	07/10/12	-	-	-	-
Canister Serial No.	3341	3360	-	-	-	-
Start Time	1009	1021	-	-	-	-
Start Pressure (inches Hg)	-30.0	-28.0	-	-	-	-
Stop Time	Grab	Grab	-	-	-	-
Stop Pressure (inches Hg)	-6.0	-6.0	-	-	-	-
Ambient Air Temp (°F)	90	90	-	-	-	-
Weather Conditions	Sunny	Sunny	-	-	-	-
Pressure, in H_2O	-	-	-	-	-	-
PID reading (ppmv)	-	26	-	-	-	-
FID reading (ppmv)	-	4.6	-	-	-	-
Miran Sapphire (ppmv)	-	63	-	-	-	-
Comment No.	1	-	-	-	-	-

COMMENTS

1. DUP8 was collected at T1B.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: July 18, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other: Miran Sapphire	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T2B**	**T2C**	**T2D**
Sample ID	T1B	T1C	T1D	T2B	T2C	T2D
Sample Date	07/18/12	07/18/12	07/18/12	07/18/12	07/18/12	07/18/12
Canister Serial No.	1108	3458	3359	3302	3299	3366
Start Time	0804	0805	0806	0747	0749	0751
Start Pressure (inches Hg)	-28.5	-30.0	-29.0	-29.0	-27.5	-27.5
Stop Time	Grab	Grab	Grab	Grab	Grab	Grab
Stop Pressure (inches Hg)	-8.0	-7.0	-7.0	-6.5	-6.5	-6.5
Ambient Air Temp (°F)	90	90	90	90	90	90
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Pressure, in H_2O	55	30	4.5	33	20	4.5
PID reading (ppmv)	11	3.8	1.8	16	7.4	5.8
FID reading (ppmv)	23	20	18	39	33	30
Miran Sapphire (ppmv)	-	-	-	6	0	0
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: August 13, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other:	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T1B**	**-**	**-**
Sample ID	T1B	T1C	T1D	DUP9	-	-
Sample Date	08/13/12	08/13/12	08/13/12	08/13/12	-	-
Canister Serial No.	15758	35691	6165	3341	-	-
Start Time	1201	1203	1204	1206	-	-
Start Pressure (inches Hg)	-28	-28	-26.5	-29	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-7.5	-7.5	-6	-7	-	-
Ambient Air Temp (°F)	75°F	75°F	75°F	75°F	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
Pressure, in H_2O	55	30	4.5	2	-	-
PID reading (ppmv)	6	2.1	1.7	-	-	-
FID reading (ppmv)	47	49	50	-	-	-
Miran Sapphire (ppmv)	-	-	-	-	-	-
Comment No.	-	-	-	1	-	-

COMMENTS

1. DUP9 was collected at T1B.

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.03	Date: August 13, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRae 3000	Collector(s): A Khandakar	
Other:	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**Sample**	**-**	**-**
Sample ID	T2B	T2C	T2D	Port F	-	-
Sample Date	08/13/12	08/13/12	08/13/12	08/13/12	-	-
Canister Serial No.	3329	3337	3325	3360	-	-
Start Time	1150	1152	1154	1238	-	-
Start Pressure (inches Hg)	-30	-28.5	-28.5	-27	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-7.5	-7	-7	-6	-	-
Ambient Air Temp (°F)	75°F	75°F	75°F	75°F	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
Pressure, in H_2O	-	-	-	-	-	-
PID reading (ppmv)	41.5	34.0	16.0	4.8	-	-
FID reading (ppmv)	125	128	117	62	-	-
Miran Sapphire (ppmv)	-	-	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: August 28, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other:	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**Sample Port F**	**-**	**-**
Sample ID	T1B	T1C	T1D		-	-
Sample Date	08/28/12	08/28/12	08/28/12	08/28/12	-	-
Canister Serial No.	9461	34161	34125	23838	-	-
Start Time	0904	0905	0907	0855	-	-
Start Pressure (inches Hg)	-28.0	-28.0	-27.5	-30.0	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-6.5	-6.5	-6.5	-6.0	-	-
Ambient Air Temp (°F)	85	85	85	85	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
Pressure, in H_2O	55	30	4.5	-	-	-
PID reading (ppmv)	5.8	5.4	2.2	3.4	-	-
FID reading (ppmv)	36	40	40	36	-	-
Miran Sapphire (ppmv)	-	-	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN ‖ HEAD	Project No.: 2466.02	Date: August 28, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other:	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**-**	**-**	**-**
Sample ID	T2-B	T2-C	T2-D	-	-	-
Sample Date	08/28/12	08/28/12	08/28/12	-	-	-
Canister Serial No.	34549	35598	31763	-	-	-
Start Time	0850	0851	0852	-	-	-
Start Pressure (inches Hg)	-28	-26	-29.0	-	-	-
Stop Time	Grab	Grab	Grab	-	-	-
Stop Pressure (inches Hg)	-6.5	-7	-6	-	-	-
Ambient Air Temp (°F)	85°F	85°F	85°F	-	-	-
Weather Conditions	Sunny	Sunny	Sunny	-	-	-
Pressure, in H_2O	33	20	4.5	-	-	-
PID reading (ppmv)	8.8	12	7	-	-	-
FID reading (ppmv)	36	45	40	-	-	-
Miran Sapphire (ppmv)	-	-	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: September 9, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A		Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000		Collector(s): A. Khandekar
Other:		FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**Sample Port F**	**-**	**-**
Sample ID	T1B	T1C	T1D		-	-
Sample Date	09/09/12	09/09/12	09/09/12	09/09/12	-	-
Canister Serial No.	3349	3020	3060	3458	-	-
Start Time	1713	1714	1715	1716	-	-
Start Pressure (inches Hg)	-28.5	-26.0	-30.0	-29.5	-	-
Stop Time	Grab	Grab	Grab	Grab	-	-
Stop Pressure (inches Hg)	-7.0	-7.0	-7.0	-6.0	-	-
Ambient Air Temp (°F)	75 - 85	75 - 85	75 - 85	75 - 85	-	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	-	-
Pressure, in H_2O	-	-	-	-	-	-
PID reading (ppmv)	5.3	3.9	1.7	1.8	-	-
FID reading (ppmv)	63	57	58	53	-	-
Miran Sapphire (ppmv)	-	-	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: September 9, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	

O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar
Other:	FID Meter Used: TVA-1000B Analyzer

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**-**	**-**	**-**
Sample ID	T2B	T2C	T2D	-	-	-
Sample Date	09/09/12	09/09/12	09/09/12	-	-	-
Canister Serial No.	7997	3344	3339	-	-	-
Start Time	1656	1658	1701	-	-	-
Start Pressure (inches Hg)	-28.5	-28	-29	-	-	-
Stop Time	Grab	Grab	Grab	-	-	-
Stop Pressure (inches Hg)	-6.5	-7.0	-7.0	-	-	-
Ambient Air Temp (°F)	75 - 85	75 - 85	75 - 85	-	-	-
Weather Conditions	Sunny	Sunny	Sunny	-	-	-
Pressure, in H_2O	-	-	-	-	-	-
PID reading (ppmv)	4.4	9.8	3.9	-	-	-
FID reading (ppmv)	48	46	47	-	-	-
Miran Sapphire (ppmv)	-	-	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: September 19, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other:	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T1B**	**T1C**	**T1D**	**T1B**	**Sample Port F**	**-**
Sample ID	T1B	T1C	T1D	DUP10		-
Sample Date	09/19/12	09/19/12	09/19/12	09/19/12	09/19/12	-
Canister Serial No.	3361	3352	3321	3348	3338	-
Start Time	0741	0744	0745	0742	0735	-
Start Pressure (inches Hg)	-28.0	-29.5	-29.5	-28.5	-26.5	-
Stop Time	Grab	Grab	Grab	Grab	Grab	-
Stop Pressure (inches Hg)	-6.5	-7.0	-6.5	-6.0	-6.0	-
Ambient Air Temp (°F)	75	75	75	75	75	-
Weather Conditions	Sunny	Sunny	Sunny	Sunny	Sunny	-
Pressure, in H_2O	-	-	-	-	-	-
PID reading (ppmv)	2.1	1.3	0.6	-	0.8	-
FID reading (ppmv)	21	22	23	-	22	-
Miran Sapphire (ppmv)	-	-	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

Soil Vapor Field Sampling Summary

SANBORN HEAD	Project No.: 2466.02	Date: September 19, 2012
	Project Name: Building 57 Thermal Remediation	
	Location: Endicott, New York (OU #5)	
O2 / CH4 / CO2 Meter Used: N/A	Project Manager: L. Jacob	
PID Meter Used: MiniRAE 3000	Collector(s): A. Khandekar	
Other:	FID Meter Used: TVA-1000B Analyzer	

SOIL VAPOR SAMPLE RECORD

Location No.	**T2B**	**T2C**	**T2D**	**-**	**-**	**-**
Sample ID	T2B	T2C	T2D	-	-	-
Sample Date	09/19/12	09/19/12	09/19/12	-	-	-
Canister Serial No.	8002	3328	3375	-	-	-
Start Time	0729	0731	0734	-	-	-
Start Pressure (inches Hg)	-29.0	-29.0	-29.0	-	-	-
Stop Time	Grab	Grab	Grab	-	-	-
Stop Pressure (inches Hg)	-6.5	-6.5	-6.0	-	-	-
Ambient Air Temp (°F)	75	75	75	-	-	-
Weather Conditions	Sunny	Sunny	Sunny	-	-	-
Pressure, in H_2O	-	-	-	-	-	-
PID reading (ppmv)	3.7	4.1	2.3	-	-	-
FID reading (ppmv)	22	18	20	-	-	-
Miran Sapphire (ppmv)	-	-	-	-	-	-
Comment No.	-	-	-	-	-	-

COMMENTS

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-601

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"

Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.

Foreman: M. Evans, M. Wilson, E. Perigard

Date Started: 06/19/12 Date Finished: 06/19/12

Logged By: M. Stein Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 - 8'): Concrete. No sampling 0.8 - 5' (closed piston to 5').	
5	S-1	5 - 10	5.0/ 3.1	PID: 2 ppmv FID: ND	-----5'----- FILL	S-1A (5 to 8.4'): Brown, fine to coarse SAND, some Silt, trace Gravel. Coarse fraction subrounded. Dry. FILL.	
8.4				PID: 3 ppmv FID: ND		S-1B (8.4 to 10'): Very dark brown to black, fine, SAND to gravel-sized Slag debris. Lower 1.6' of recovery. Coarse fraction angular. Moist. FILL.	
10	S-2	10 - 15	5.0/ 4.8	PID: 3 ppmv FID: ND PID: 2 ppmv FID: ND	-----10'----- CLAY & SILT	S-2 (10 to 15'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
15	S-3	15 - 20	5.0/ 3.5	PID: 2 ppmv FID: ND		S-3A (15 to 15.5'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
15.5				PID: 3 ppmv FID: ND	-----15.5'----- SILT & CLAY	S-3B (15.5 to 19.4'): Dark tan, SILT & CLAY, some Sand to gravel-sized Sediment Rock. Coarse fraction angular. Moist. TILL.	
19.4				PID: 2 ppmv FID: ND	-----19.4'----- BEDROCK	S-3C (19.4 to 20'): Gray, fractured to pulverized Sediment Rock. Coarse fraction angular. Dry.	
20	S-4	20 - 23	3.0/ 3.0	PID: 1 ppmv FID: ND		S-4 (20 to 23'): Gray, fractured to pulverized Sediment Rock. Coarse fraction angular. Dry.	
23					-----23'-----	Boring terminated at 23 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

BORING LOG C:\USERS\AREICHENBACH\DESKTOP\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 11/30/12

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-602

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/18/12 **Date Finished: 06/18/12**
Logged By: M. Stein **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 to 0.7'): Concrete. No soils collected 0.7 - 5' (closed piston to 5' bg).	
5	S-1	5 - 10	5.0/ 2.2	PID: 1 ppmv FID: 3 ppmv	-----5'----- FILL -----6.2'-----	S-1A (5 to 6.2'): Brown, fine to coarse SAND, some Silt, trace Gravel, Upper 1.2' recovered. Coarse fraction subrounded. Moist. FILL.	
				PID: 3 ppmv FID: 5 ppmv		S-1B (6.2 to 10'): Dark gray, CLAY & SILT, Lower 1' recovered. Moist.	
10	S-2	10 - 15	5.0/ 3.4	PID: 2 ppmv FID: 4 ppmv	CLAY & SILT	S-2A (10 to 14.3'): Dark gray with orange mottling, CLAY & SILT. Moist.	
14.3				PID: 3 ppmv FID: 2 ppmv	-----14.3'-----	S-2B (14.3 to 15'): Dark tan, SILT & CLAY, some Sand to gravel-sized Sediment Rock. Coarse fraction angular. Moist. TILL.	
15	S-3	15 - 20	5.0/ 4.4	PID: 2 ppmv FID: ND	SILT & CLAY	S-3 (15 to 20'): Dark tan, SILT & CLAY, some Sand to gravel-sized Sediment Rock. Fractured Gravel bottom 0.3' of recovery. Coarse fraction angular. Moist. TILL.	
20	S-4	20 - 23	3.0/ 3.0	PID: 1 ppmv FID: ND		S-4A (20 to 22.1'): Dark tan, SILT & CLAY, some Sand to gravel-sized Sediment Rock. Coarse fraction angular. Moist. TILL.	
22.1				PID: 1 ppmv FID: ND	-----22.1'----- BEDROCK -----23'-----	S-4B (22.1 to 23'): Dark gray, fractured Sediment Rock, some Silt & Clay. Coarse fraction angular. Dry.	
23						Boring terminated at 23 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-603

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/18/12 **Date Finished: 06/18/12**
Logged By: M. Stein **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0		0.6 - 5	4.4/		-----0'-----	(O - 0.6'): Concrete. No soils collected 0.6 - 5' (closed piston to 5' bg).	
5	S-1	5 - 10	5.0/ 1.7	PID: 1 ppmv FID: 4 ppmv PID: 6 ppmv FID: 5 ppmv	-----5'----- FILL	S-1A (5 to 6'): Brown to dark brown, fine SAND, to gravel-sized Slag FILL, trace, fine to coarse Sand. Upper 1.0' of recovery. Coarse fraction angular. Moist. FILL. S-1B (6 to 10'): Gray, SILT & CLAY, trace Gravel, Lower 0.3' CLAY & SILT. Lower 1.7' of recovery. Moist.	
10	S-2	10 - 15	5.0/ 5.0	PID: 14 ppmv FID: 11 ppmv PID: 4 ppmv FID: 4 ppmv	-----10'----- CLAY & SILT	S-2 (10 to 15'): Gray with orange mottling, CLAY & SILT. Moist.	
15	S-3	15 - 20	5.0/ 3.1	PID: 2 ppmv FID: 1 ppmv	-----15.5'----- SILT & CLAY	S-3 (15 to 20'): Dark tan, SILT & CLAY, littleSand to gravel-sized Sediment Rock. Coarse fraction angular. Moist. TILL.	
20	S-4	20 - 23	3.0/ 3.0	PID: 1 ppmv FID: 3 ppmv PID: 1 ppmv FID: 2 ppmv	-----21'----- BEDROCK -----23'-----	S-4A (20 to 21'): Dark gray, SILT & CLAY, littleSand to gravel-sized Sediment Rock. Coarse fraction angular. Moist. TILL. S-4B (21 to 23'): Dark gray, fractured Sediment Rock, some Silt & Clay. Coarse fraction angular. Moist. BR.	

Boring terminated at 23 feet.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-604

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/18/12 **Date Finished:** 06/18/12
Logged By: M. Stein **Checked By:** AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(O - 0.7'): Concrete. No soils collected 0.7 - 5' (closed piston to 5' bg).	
5	S-1	5 - 10	5.0/ 2.5		-----5'----- FILL	S-1A (5 to 6.8'): Light gray, Concrete debris - upper 1.8'. Coarse fraction angular. Moist. FILL. S-1B (6.8 to 9.5'): Black, fine to coarse, sand-sized Slag FILL. Coarse fraction angular. Moist. FILL. S-1C (9.5 to 10'): Brown, fine to coarse SAND, some Silt, trace , Slag, Glass - lower 0.5'. Coarse fraction angular. Moist. FILL.	
10	S-2	10 - 15	5.0/ 3.5	PID: 1 ppmv FID: ND PID: 1 ppmv FID: ND	-----10'-----	S-2A (10 to 13.9'): Dark gray, CLAY & SILT. Moist.	
14				PID: 1 ppmv FID: ND		S-2B (13.9 to 15'): Grayish tan, CLAY & SILT, some Sand to Gravel Rock fragments. Lower 1.1' of recovery. Coarse fraction angular to subrounded. Moist. TILL.	
15	S-3	15 - 20	5.0/ 3.6	PID: 1 ppmv FID: ND	CLAY & SILT	S-3 (15 to 20'): Dark tan, CLAY & SILT, some Sand to Gravel Rock fragments. Fractured Gravel layer at 18.3 - 18.9'. Coarse fraction angular. Moist. TILL.	
20	S-4	20 - 23	3.0/ 3.0	PID: 1 ppmv FID: ND		S-4A (20 to 22.2'): Dark tan, CLAY & SILT, some Sand to Gravel Rock fragments.	
22.2				PID: 1 ppmv FID: ND	-----22.2'----- BEDROCK -----23'-----	S-4B (22.2 to 23'): Gray, fractured to pulervised Sediment Rock. Coarse fraction angular. Moist to Dry.	
23						Boring terminated at 23 feet.	

Depth scale (ft): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

BORING LOG C:\USERS\AREICHENBACH\DESKTOP\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 11/30/12

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-605

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT 2.125" OD x 1.5" ID

Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/18/12 **Date Finished:** 06/18/12
Logged By: J. Prellwitz **Checked By:** AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. Not described. FILL.	
5	S-1	5 - 10	5.0/ 4.0	PID: 5.8 ppmv FID: 0.7 ppmv	-----5'----- FILL -----5.5'-----	S-1A (5 to 5.5'): Black, fine to coarse SAND, some Silt, little Gravel. Coarse fraction angular to subangular Wet. FILL.	
				PID: 2.8 ppmv FID: ND	SILT & CLAY	S-1B (5.5 to 9'): Gray, SILT & CLAY. Wet 5.5 - 6.0; Moist.	
				PID: 4.4 ppmv FID: ND		S-1C (9 to 10'): Gray, SILT & CLAY, trace , Gravel (fractured Rock). Brown mottling. Moist.	
10	S-2	10 - 15	5.0/ 5.0	PID: 3.4 ppmv FID: ND		S-2A (10 to 10.4'): Dark gray, SILT & CLAY, trace Gravel. Brown mottling. Moist.	
				PID: 2.6 ppmv FID: ND	-----12'----- ROCK -----13'-----	S-2B (10.4 to 12'): Olive brown, SILT & CLAY, some fine to coarse Sand, little Gravel (fractured Shale). Coarse fraction angular. Dry. TILL.	
				PID: NM FID: NM		S-2C (12 to 12.4'): White, pulverized Rocks. Coarse fraction angular. Dry.	
				PID: 2.5 ppmv FID: ND	SILT & CLAY	S-2D (12.4 to 15'): Olive brown, pulverized Rocks. Coarse fraction angular. Dry. TILL.	
15	S-3	15 - 20	5.0/	PID: 3.5 ppmv FID: ND	-----17.5'-----	S-3A (15 to 17.5'): Gray, SILT & CLAY, little Gravel. Coarse fraction angular. Moist. TILL. Parratt Wolff forgot a steel liner; hense they pounded the core barrel out in a line onto plastic sheeting. Difficult to tell recovery (Augered 15 - 15.5 through Cobble).	
				PID: 2.5 ppmv FID: ND	CLAYEY SILT -----20'-----	S-3B (17.5 to 20'): Gray, Clayey SILT, some Gravel, trace fine to coarse Sand. Coarse fraction angular. Dry. TILL.	
20						Boring terminated at 20 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-606

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/18/12 **Date Finished: 06/18/12**
Logged By: J. Prellwitz **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
5	S-1	5 - 10	5.0/ 4.5	PID: 1 ppmv FID: ND	-----5'----- FILL	S-1A (5 to 5.8'): Black, fine to coarse SAND, trace Silt, trace Gravel. Coarse fraction subrounded. Wet. FILL.	
5.8				PID: 2.6 ppmv FID: ND	-----5.8'----- SILT & CLAY	S-1B (5.8 to 10'): Gray, SILT & CLAY. Brown mottling. Moist.	
10	S-2	10 - 15	5.0/ 4.8	PID: 3.5 ppmv FID: ND		S-2A (10 to 13'): Gray - olive brown, SILT & CLAY, little Gravel. Brown mottling. Moist.	
13				PID: NA FID: NM	-----13'----- ROCK	S-2B (13 to 13.5'): White, pulverized Rock (Possible Siltstone). Dry.	
13.5				PID: 3.9 ppmv FID: ND	-----13.5'----- SAND and SILT	S-2C (13.5 to 15'): Dark brown, fine SAND and Silt, some Gravel, trace medium Sand. Coarse fraction rounded. Moist.	
15	S-3	15 - 17	2.0/ 2.0	PID: 2.4 ppmv FID: ND	-----15'----- SILT & CLAY	S-3 (15 to 17'): Gray, SILT & CLAY, some Gravel (fractured Shale/Siltstone). Wet. TILL.	
17	S-4	17 - 20	3.0/ 0.5		-----17'----- GRAVEL	S-4 (17 to 20'): Gray, GRAVEL (Slop). No real recovery. Wet.	
20					-----20'-----	Boring terminated at 20 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-607

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/18/12 Date Finished: 06/19/12
Logged By: J. Prellwitz Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0						-----0'-----	Asphalt. No description. FILL.	
5	S-1	5 - 10	5.0/ 3.5	PID: 10 ppmv FID: ND		-----5'----- CLAY & SILT	S-1A (5 to 8'): Gray, CLAY & SILT. Moist.	
8				PID: 6.5 ppmv FID: ND		-----8'----- SILT & CLAY	S-1B (8 to 10'): Gray, SILT & CLAY. Brown mottling. Moist.	
10	S-2	10 - 12	5.0/ 4.5	PID: 0.6 ppmv FID: 0.3 ppmv		-----10'----- CLAY & SILT	S-2A (10 to 12'): Gray-brown, CLAY & SILT. Brown mottling. Moist.	
12				PID: 0.6 ppmv FID: ND		-----12'----- SILT & CLAY	S-2B (12 to 15'): Gray-brown, SILT & CLAY, some Gravel (fractured Shale), little fine to coarse Sand. Brown mottling. Coarse fraction angular. Moist. TILL. (Wet at 14.5').	
15	S-3	15 - 17	2.0/ 2.0	PID: 3.1 ppmv FID: 0.8 ppmv			S-3A (15 to 15.5'): Gray-brown, SILT & CLAY, little Gravel, trace Sand. Coarse fraction angular. Moist. TILL.	
15.5				PID: 2.9 ppmv FID: 1.1 ppmv		-----15.5'----- WEATHERED BEDROCK -----17'-----	S-3B (15.5 to 17'): Light gray, SILT, some Gravel (fractured Shale), trace Sand. Coarse fraction angular. Moist.	
17							Boring terminated at 17 feet. Roller Bit refusal.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

Depth scale (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-608

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/19/12 **Date Finished:** 06/19/12
Logged By: J. Prellwitz **Checked By:** AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
5	S-1	5 - 10	5.0/ 5.0	PID: 7.4 ppmv FID: ND	-----5'-----	S-1 (5 to 10'): Gray, SILT & CLAY. Brown mottling. Moist.	
10	S-2	10 - 15	5.0/ 3.4	PID: 8 ppmv FID: ND PID: 4 ppmv FID: 3.2 ppmv	SILT & CLAY	S-2 (10 to 15'): Gray brown, SILT & CLAY, with Gravel inclusions. Brown mottling. Coarse fraction rounded. Moist.	
15	S-3	15 - 20	5.0/ 3.4	PID: 2.7 ppmv FID: 0.8 ppmv PID: 5.8 ppmv FID: 4.8 ppmv		S-3 (15 to 20'): Gray, SILT & CLAY and Gravel (fractured Shale), little fine to coarse Sand. Brown mottling. Coarse fraction angular. Moist. TILL.	
20					-----20'-----	Boring terminated at 20 feet. No refusal encountered.	

Depth scale (ft): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

BORING LOG C:\USERS\AREICHENBACH\DESKTOP\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 11/30/12

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-609

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/19/12 Date Finished: 06/19/12
Logged By: J. Prellwitz Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
5	S-1	5 - 10	5.0/ 4.0	PID: 3.4 ppmv FID: 1.2 ppmv	-----5'----- CLAY & SILT	S-1A (5 to 7'): Dark gray, CLAY & SILT. Moist.	
7				PID: 6.7 ppmv FID: 1.2 ppmv	-----7'----- SILT & CLAY	S-1B (7 to 10'): Gray, SILT & CLAY. Brown mottling. Moist.	
10	S-2	10 - 15	5.0/ 4.0	PID: 9.3 ppmv FID: ND		S-2A (10 to 13'): Gray brown, SILT & CLAY, trace fine Sand. Moist.	
13				PID: 6.3 ppmv FID: ND	-----13'----- SILT -----14'-----	S-2B (13 to 14'): Olive brown, SILT, some Gravel, some fine to coarse Sand. Coarse fraction rounded. Wet.	
14				PID: 7.2 ppmv FID: ND	CLAYEY SILT	S-2C (14 to 15'): Gray, Clayey SILT, some Gravel (fractured Rock), trace Sand. Coarse fraction angular. Moist. TILL.	
15	S-3	15 - 20	5.0/ 3.5	PID: 5.3 ppmv FID: ND		S-3A (15 to 18.5'): Olive brown - gray, Clayey SILT, some Gravel, some fine to coarse Sand. Coarse fraction angular. Moist. TILL.	
18.5				PID: 5.1 ppmv FID: 0.2 ppmv	-----18.5'----- WEATHERED BEDROCK -----20'-----	S-3B (18.5 to 20'): Light gray, Clayey SILT and Gravel, some Sand. Coarse fraction angular. Dry to Moist.	
20						Boring terminated at 20 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-610

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/19/12 **Date Finished:** 06/19/12
Logged By: J. Prellwitz **Checked By:** AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Remarks
0						-----0'-----	Asphalt. No description. FILL.	
5	S-1	5 - 10	5.0/ 3.5	PID: 8.9 ppmv FID: 8 ppmv		-----5'----- SILT & CLAY	S-1 (5 to 10'): Gray, SILT & CLAY, trace Peat at top. Trace fine Sand at bottom. Brown mottling. Moist.	
10	S-2	10 - 15	5.0/ 3.8	PID: 6.5 ppmv FID: 1.7 ppmv PID: 5.7 ppmv FID: 1.6 ppmv PID: 6.9 ppmv FID: ND			S-2A (10 to 12.5'): Gray, SILT & CLAY, trace fine Sand. Brown mottling. Moist. S-2B (12.5 to 13'): Gray brown, SILT & CLAY, some Gravel, little fine to coarse Sand. Brown mottling. Coarse fraction rounded. Moist.	
13						-----13'----- CLAYEY SILT	S-2C (13 to 15'): Olive brown - gray, Clayey SILT, some Gravel (fractured Rock), little fine to coarse Sand. Coarse fraction angular. Moist. Wet from 13 - 13.5'.	
15	S-3	15 - 20	---	PID: 5.7 ppmv FID: ND PID: 2.7 ppmv FID: ND			S-3A (15 to 19'): Gray, Clayey SILT, some Gravel, little Sand (fractured Rock). Brown mottling. Coarse fraction angular. Moist to Dry. TILL.	
19				PID: 2 ppmv FID: ND		-----19'----- WEATHERED BEDROCK -----20'-----	S-3B (19 to 20'): Light gray, Clayey SILT, and Gravel (fractured Rock), some fine to coarse Sand. Coarse fraction angular. Dry.	
20							Boring terminated at 20 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-611

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/19/12 Date Finished: 06/19/12
Logged By: J. Prellwitz Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0						-----0'-----	Asphalt. No description. FILL.	
5	S-1	5 - 10	5.0/ 4.4	PID: 5.4 ppmv FID: 8.6 ppmv		-----5'----- CLAY & SILT	S-1A (5 to 7'): Dark gray, CLAY & SILT. Black staining. Moist.	
7				PID: 6.3 ppmv FID: 3.7 ppmv		-----7'----- SILT & CLAY	S-1B (7 to 10'): Gray, SILT & CLAY. Brown mottling. Moist.	
10	S-2	10 - 15	5.0/ 2.8	PID: 2.8 ppmv FID: 7.4 ppmv			S-2A (10 to 12.5'): Gray - brown, SILT & CLAY, trace Gravel. Brown mottling. Moist.	
12.5				PID: 1.8 ppmv FID: 14 ppmv		-----12.5'----- CLAYEY SILT	S-2B (12.5 to 13.5'): Dark gray - brown, Clayey SILT, some fine Sand, little Gravel. Coarse fraction rounded. Moist.	
13.5				PID: 1.8 ppmv FID: 14 ppmv		-----13.5'----- SILT and GRAVEL	S-2C (13.5 to 15'): Gray, SILT and Gravel (fractured Shale), some fine to coarse Sand. Coarse fraction angular. Wet. TILL.	
15	S-3	15 - 17	2.0/ 2.0	PID: 3.2 ppmv FID: 35 ppmv		-----15'----- CLAYEY SILT -----17'-----	S-3 (15 to 17'): Gray, Clayey SILT, some fine to coarse Sand, some Gravel (fractured Shale). Coarse fraction angular. Moist. TILL.	
18							Boring terminated at 18 feet. Roller Bit refusal 17 - 18 and stopped.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

Depth scale (ft): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

BORING LOG C:\USERS\AREICHENBACH\DESKTOP\2466.01_LOGS.GPJ 2010 SANBORN HEAD V1.GLB 2010 SANBORN HEAD V1.GDT 11/30/12

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-612

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/19/12 Date Finished: 06/19/12
Logged By: M. Stein Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 - 0.8'): Concrete. No sampling 0.8 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.7	PID: 5 ppmv FID: ND	-----3'----- FILL	S-1 (3 to 5'): Dark gray to brown, fine to coarse SAND, some Silt, Slag particles and fragments common. Coarse fraction subrounded to angular. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.1	PID: 6 ppmv FID: ND	FILL	S-2 (5 to 10'): Dark brown, fine to coarse SAND, some Silt, few Slag particles and fragments. Coarse fraction subrounded to angular. Moist. FILL.	
10	S-3	10 - 15	5.0/ 4.0	PID: 28 ppmv FID: 2 ppmv	-----10'----- CLAY & SILT	S-3A (10 to 13.6'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
13.6				PID: 4 ppmv FID: ND	-----13.6'----- CLAYEY SILT	S-3B (13.6 to 15'): Dark tan to brown, Clayey SILT, and Sand to Gravel Sediment Rock fragments. Lower 1.4'. Coarse fraction angular. Moist. TILL.	
15	S-4	15 - 17.6	2.6/	PID: 1 ppmv FID: ND	-----15'----- SILT & CLAY	S-4 (15 to 17.6'): Dark tan, SILT & CLAY, some Sand to Gravel Sediment Rock fragments. Coarse fraction subangular to subrounded. Moist. TILL.	
17.6					-----17.6'-----	Boring terminated at 17.6 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-613

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/19/12 **Date Finished: 06/19/12**
Logged By: M. Stein **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 - 0.7'): Concrete. No sampling 0.7 - 3' (closed piston to 3').	
3	S-1	3 - 5	3.0/ 1.7	PID: 17 ppmv FID: ND	-----3'----- FILL	S-1 (3 to 5'): Brown to very dark brown, fine to coarse SAND, some Silt, few particles and fragments Slag. Wood in tip. Coarse fraction angular to subangular. Moist. FILL.	
5		5 - 10	5.0/ 2.1	PID: 705 ppmv FID: 130 ppmv		S-2 (5 to 10'): Dark brown grading to dark gray, fine to coarse SAND, some Silt, few particles and fragments Slag grading to a Silty artifical Fill material (possible Slag). Coarse fraction angular to subangular. Moist. FILL. Strong petroleum/solvent odor in upper 0.2'.	
10	S-2	10 - 15	5.0/	PID: 24 ppmv FID: 8 ppmv PID: 270 ppmv FID: 83 ppmv	-----10.2'----- CLAY & SILT	S-3A (10 to 10.2'): Dark brown, fine SAND and Silt, artificial Fill material. Moist. FILL. S-3B (10.2 to 14.5'): Dark gray, CLAY & SILT. Moist.	
14.5				PID: 12 ppmv FID: ND	-----14.5'----- SILT & CLAY	S-3C (14.5 to 15'): Brown with orange mottling, SILT & CLAY, little fine to coarse Sand to Gravel Rock fragments. Moist.	
15	S-3	15 - 17.6	2.6/ 2.6	PID: 2 ppmv FID: ND	-----15'----- CLAYEY SILT	S-4 (15 to 17.6'): Dark tan to brown, Clayey SILT, and Sand to Gravel Rock fragments. Coarse fraction angular. Moist. TILL.	
17.6					-----17.6'-----	Boring terminated at 17.6 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-614

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/19/12 **Date Finished: 06/19/12**
Logged By: M. Stein **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Remarks
0						-----0'-----	(0 to 0.8'): Concrete. No sampling 0.8 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.5	PID: 10 ppmv FID: ND		-----3'----- FILL	S-1 (3 to 5'): Dark brown, fine to coarse SAND and Silt, little Gravel, very few Brick and Slag particles. Coarse fraction subangular to subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.0	PID: 8 ppmv FID: 1 ppmv			S-2 (5 to 10'): Brown, fine to medium SAND, some Silt, trace Gravel. Coarse fraction subrounded. Moist. FILL.	
10	S-3	10 - 15	---	PID: 10 ppmv FID: 1 ppmv		-----10'----- CLAY & SILT	S-3A (10 to 14.2'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
14.2				PID: 6 ppmv FID: ND		-----14.2'----- SILT & CLAY	S-3B (14.2 to 15'): Grayish brown, SILT & CLAY, little Sand to Gravel. Coarse fraction rounded. Moist. TILL.	
15	S-4	15 - 17	2.0/ 1.4	PID: 3 ppmv FID: ND			S-4 (15 to 17'): Dark tan, SILT & CLAY, and Sand to Gravel fractured Rock. Coarse fraction angular. Moist.	
17						-----17'-----	Boring terminated at 17 feet.	

Depth scale (ft): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-615

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/19/12 **Date Finished: 06/19/12**
Logged By: M. Stein **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 to 0.7'): Concrete. No sampling 0.7 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.2	PID: 13 ppmv FID: ND	-----3'----- FILL	S-1 (3 to 5'): Dark brown to brown, Clayey SILT, some fine to coarse Sand, little Gravel. Coarse fraction angular to subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 1.8	PID: 2 ppmv FID: ND		S-2 (5 to 10'): Dark brown to brown, Clayey SILT, some fine to coarse Sand, little Gravel. Coarse fraction angular to subrounded. Moist. FILL. Gray, Bottom 0.3' is intermixed.	
10	S-3	10 - 15	5.0/ 4.7	PID: 10 ppmv FID: ND	-----10'----- CLAY & SILT	S-3 (10 to 15'): Dark gray interlayered with gray with orange mottling, CLAY & SILT. Moist.	
15	S-4	15 - 17	2.0/	PID: 3 ppmv FID: ND PID: 3 ppmv FID: ND	-----17'-----	S-4A (15 to 15.6'): Brown to gray with orange mottling, CLAY & SILT. Moist. S-4B (15.6 to 17'): Dark tan to brown, Clayey SILT, some Sand to Gravel Rock fragments. Moist. TILL.	
17						Boring terminated at 17 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-616

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"

Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.

Foreman: M. Evans, M. Wilson, E. Perigard

Date Started: 06/19/12 Date Finished: 06/19/12

Logged By: M. Stein Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 - 0.8'): Concrete. No sampling 0.8 - 3' (closed piston to 3').	
3	S-1	3 - 5	3.0/ 1.4	PID: 96 ppmv FID: 8 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown to dark brown, fine to coarse SAND, some Gravel, little Silt, few particles Slag and artifical Fill material. Coarse fraction subangular to subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.1	PID: 190 ppmv FID: 73 ppmv		S-2 (5 to 10'): Brown to dark brown, fine to coarse SAND, some Silt, little Gravel, few Slag particles to fragments. Petro/solvent odor noted. Coarse fraction subangular to subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/	PID: 24 ppmv FID: 3 ppmv	-----10'----- CLAY & SILT	S-3A (10 to 12.5'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
12.5				PID: 84 ppmv FID: 14 ppmv		S-3B (12.5 to 15'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
15	S-4	15 - 17.7	---	PID: 47 ppmv FID: 3 ppmv	-----15'----- CLAYEY SILT	S-4A (15 to 16.1'): Dark tan, Clayey SILT, and sand to gravel-sized Rock fragments. Coarse fraction angular. Moist. TILL.	
16.1				PID: 6 ppmv FID: ND	-----16.1'----- CLAY & SILT -----17.7'-----	S-4B (16.1 to 17.4'): Dark tan, CLAY & SILT, and sand to gravel-sized Rock fragments. Coarse fraction angular. Moist. TILL.	
						Boring terminated at 17.7 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-617

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/20/12 **Date Finished: 06/20/12**
Logged By: M. Stein **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 - 0.7') Concrete. No sampling 0.7 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.5	PID: 101 ppmv FID: 48 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown to black, fine to coarse SAND, some Silt, trace Gravel, few particles and fragments Slag/Brick/Glass. Coarse fraction angular to subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 1.4	PID: 6 ppmv FID: 4 ppmv		S-2 (5 to 9.8'): Dark brown to dark gray, fine to coarse SAND, some Silt, trace Gravel, very few particles and fragments Slag. At 9.8' intermixed with Clay & Silt. Coarse fraction angular to subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 1.7	PID: 4 ppmv FID: 2 ppmv	-----10'----- CLAY & SILT	S-3 (10 to 15'): Gray with orange mottling, CLAY & SILT. Moist.	
15	S-4	15 - 18.4	3.4/ 3.0	PID: 2 ppmv FID: ND		S-4A (15 to 18.1'): Gray with orange mottling, CLAY & SILT. Moist.	
18.1					-----18.1'----- CLAYEY SILT -----18.4'-----	S-4B (18.1 to 18.4'): Dark tan, Clayey SILT, little fine sand to gravel Rock fragments. Coarse fraction angular. Moist. TILL.	

Boring terminated at 18.4 feet.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-618

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/20/12 Date Finished: 06/20/12
Logged By: M. Stein Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Remarks
0						-----0'-----	(0 - 0.7'): Concrete. No samples collected 0.7 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.7	PID: 38 ppmv FID: 12 ppmv		-----3'----- FILL	S-1 (3 to 5'): Dark brown, fine to coarse SAND, some Silt, little Gravel, very few slag particles. Coarse fraction angular to subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.7	PID: 17 ppmv FID: 12 ppmv			S-2 (5 to 10'): Black to gray to brown, fine to coarse SAND, some Silt, little Gravel, slag particles common. Bottom 0.5' brown Clayey Silt, some fine to coarse Sand. Coarse fraction angular to subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 3.7	PID: 55 ppmv FID: 27 ppmv		-----10'----- CLAY & SILT	S-3A (10 to 12.5'): Dark gray, CLAY & SILT. Moist.	
12.5				PID: 12 ppmv FID: 12 ppmv			S-3B (12.5 to 15'): Dark gray, CLAY & SILT. Moist.	
15	S-4	15 - 18.5	3.5/ 3.5	PID: 15 ppmv FID: 6 ppmv			S-4A (15 to 17.5'): Dark gray, CLAY & SILT. Moist.	
17.5				PID: 3 ppmv FID: 2 ppmv		-----17.5'----- CLAYEY SILT -----18.5'-----	S-4B (17.5 to 18.5'): Dark tan, Clayey SILT, little fine to coarse Sand. Moist. TILL.	

Depth scale (ft): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

Boring terminated at 18.5 feet.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-619

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/20/12 **Date Finished:** 06/20/12
Logged By: M. Stein **Checked By:** AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 - 0.7'): Concrete. No sampling 0.7 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.8	PID: 5 ppmv FID: 8 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown to dark brown, fine to coarse SAND, some Silt, little Gravel, few particles Slag. Coarse fraction subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 1.0	PID: 107 ppmv FID: 56 ppmv	FILL	S-2 (5 to 10'): Brown, fine SAND and GRAVEL, little Silt, very few particles Slag. Coarse fraction subangular to subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 3.4	PID: 5 ppmv FID: 1 ppmv		S-3A (10 to 10.2'): Brown, fine SAND and GRAVEL, little Silt, very few particles Slag. Coarse fraction subangular to subrounded. Moist. FILL.	
10.2				PID: 6 ppmv FID: 3 ppmv	-----10.2'----- CLAY & SILT	S-3B (10.2 to 12.5'): Dark gray, CLAY & SILT. Moist.	
12.5				PID: 6 ppmv FID: 2 ppmv		S-3C (12.5 to 15'): Dark gray, CLAY & SILT. Moist.	
15	S-4	15 - 20	5.0/ 3.8	PID: 11 ppmv FID: 6 ppmv		S-4A (15 to 18.3'): Gray with orange mottling, CLAY & SILT. Moist.	
18.3				PID: 10 ppmv FID: 2 ppmv	-----18.3'----- CLAYEY SILT -----20'-----	S-4B (18.3 to 20'): Dark tan to brown, Clayey SILT, some fine to coarse Sand, Rock fragments. (Lower 17' of recovery). Coarse fraction angular. Moist. TILL.	

Boring terminated at 20 feet.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-620

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/20/12 **Date Finished: 06/20/12**
Logged By: M. Stein **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 - 0.7'): Concrete. No sampling 0.7 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.4	PID: 53 ppmv FID: 13 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown to dark brown, fine to coarse SAND, some Silt, trace Gravel, few Slag particles to fragment Concrete debris at 4.7 - 4.9. Coarse fraction subangular to subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.9	PID: 3 ppmv FID: 1 ppmv		S-2 (5 to 10'): Brown to dark brown, fine to coarse SAND, some Silt, trace Gravel, Brown, fine to coarse . trace Silt at 8.8 - 9'. Few Slag/Brick particles. Coarse fraction subangular to subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 3.9	PID: 2 ppmv FID: 2 ppmv	-----10.3'-----	S-3A (10 to 10.3'): Brown to dark brown, fine to coarse SAND, some Silt, trace Gravel. Coarse fraction subangular to subrounded. Moist. FILL.	
				PID: 12 ppmv FID: 5 ppmv	CLAY & SILT	S-3B (10.3 to 15'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
15	S-4	15 - 18.5	---	PID: 7 ppmv FID: 3 ppmv		S-4A (15 to 17'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
17				PID: 4 ppmv FID: ND	-----18.5'-----	S-4B (17 to 18.5'): Grayish brown to brown, CLAY & SILT, some Sand to Gravel Rock fragments. Coarse fraction angular to subrounded. Moist. TILL.	
18.5						Boring terminated at 18.5 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

Depth scale (ft): 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-621

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/20/12 Date Finished: 06/20/12
Logged By: M. Stein Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Remarks
0						-----0'-----	(0 to 0.7'): Concrete. No sampling 0.7 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.3	PID: 4 ppmv FID: 2 ppmv		-----3'----- FILL	S-1 (3 to 5'): Brown to dark brown, fine to coarse SAND, some Silt, little Gravel, Clayey Silt 0.1' seam at 4.7', very few Slag particles. Coarse fraction angular. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.0	PID: 4 ppmv FID: 2 ppmv			S-2 (5 to 10'): Dark brown, fine to coarse SAND, some Silt, little Gravel, Woody fragment bottom 0.4' of recovery. Coarse fraction angular. Moist. FILL.	
10	S-3	10 - 15	5.0/ 4.0	PID: 20 ppmv FID: 9 ppmv		-----10'----- CLAY & SILT	S-3A (10 to 12.5'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
12.5				PID: 14 ppmv FID: 9 ppmv			S-3B (12.5 to 15'): Dark gray grading to gray with orange mottling, CLAY & SILT. Moist.	
15	S-4	15 - 18.5	3.5/	PID: 7 ppmv FID: 2 ppmv			S-4 (15 to 18.5'): Gray with orange mottling, CLAY & SILT, grading to Silt & Clay, trace fine Sand. Moist.	
18.5						-----18.5'-----	Boring terminated at 18.5 feet.	

Depth scale: 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-622

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/20/12 | **Date Finished: 06/20/12**
Logged By: J. Prellwitz | **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
3	S-1	3 - 5	2.0/ 0.8	PID: 4.7 ppmv FID: 0.7 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown, Clayey SILT. fine to coarse Sand, little Gravel. Coarse fraction rounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.0	PID: 5.2 ppmv FID: 2.1 ppmv		S-2 (5 to 10'): Dark brown, fine to coarse SAND, some Silt, some Gravel. Coarse fraction rounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 4.6	PID: 33 ppmv FID: 18 ppmv	-----10'----- SILTY CLAY	S-3A (10 to 13'): Gray, Silty CLAY, trace Roots. Moist.	
13				PID: 22 ppmv FID: 9.7 ppmv	-----13'----- SILT & CLAY	S-3B (13 to 15'): Gray, SILT & CLAY, brown mottling, trace staining. Moist.	
15	S-4	15 - 20	5.0/ 4.5	PID: 6.1 ppmv FID: 2.7 ppmv		S-4A (15 to 15.8'): Gray, SILT & CLAY, brown mottling, trace staining. Moist.	
15.8				PID: 7 ppmv FID: 4.8 ppmv		S-4B (15.8 to 19'): Dark gray, SILT & CLAY, some Gravel, some fine to coarse Sand. Coarse fraction rounded. Wet.	
19				PID: 6.1 ppmv	-----19'----- CLAYEY SILT	S-4C (19 to 20'): Olive brown, Clayey SILT, little Gravel, little Sand. Coarse fraction angular. Dry. TILL.	
20	S-5	20 - 25	5.0/ 3.0	FID: 0.1 ppmv PID: 4.9 ppmv FID: 0.7 ppmv	-----20'----- SILT & CLAY	S-5 (20 to 25'): Gray, SILT & CLAY, some fine Sand, some Gravel (fractured Shale). Coarse fraction angular. Moist to wet. TILL.	
25					-----25'-----	Boring terminated at 25 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-623

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/20/12 **Date Finished:** 06/20/12
Logged By: J. Prellwitz **Checked By:** AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
3	S-1	3 - 5	2.0/ 1.0	PID: 5 ppmv FID: 1.8 ppmv	-----3'----- FILL	S-1 (3 to 5'): Dark brown, Clayey SILT, some fine to coarse Sand, trace Gravel. Coarse fraction rounded to subangular. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.0	PID: 10 ppmv FID: 3.5 ppmv	FILL	S-2A (5 to 8.5'): Dark brown, fine to coarse SAND, some Silt, little Gravel. Coarse fraction rounded to subangular. Moist. FILL.	
8.5				PID: 14 ppmv FID: 2.5 ppmv	-----9.2'-----	S-2B (8.5 to 9.2'): Black, fine to coarse SAND, little Silt, slight odor. Wet. FILL.	
9.2					CLAY & SILT	S-2C (9.2 to 10'): Dark gray, CLAY & SILT. Moist.	
10	S-3	10 - 15	5.0/ 4.5	PID: 28 ppmv FID: 5.2 ppmv	CLAY & SILT -----11.5'-----	S-3A (10 to 11.5'): Dark gray, CLAY & SILT. Moist.	
11.5				PID: 12 ppmv FID: 6.2 ppmv	SILT & CLAY	S-3B (11.5 to 14.6'): Gray, SILT & CLAY, brown mottling. Moist.	
14.6					-----15'-----	S-3C (14.6 to 15'): Gray, SILT & CLAY, trace Gravel (fractured Shale), brown mottling. Moist. TILL.	
15	S-4	15 - 20	5.0/ 3.5	PID: 10 ppmv FID: 5.2 ppmv	CLAY & SILT -----16'-----	S-4A (15 to 16'): Gray, CLAY & SILT, trace Gravel, trace Sand. Coarse fraction rounded. TILL.	
16				PID: 18 ppmv FID: 9.8 ppmv	CLAYEY SILT -----18.5'-----	S-4B (16 to 18.5'): Olive brown - gray, Clayey SILT, little Gravel (fractured Shale), trace Sand. Coarse fraction angular. Dry. TILL.	
18.5				PID: 16 ppmv FID: 4.3 ppmv	-----20'-----	S-4C (18.5 to 20'): No recovery.	
20	S-5	20 - 25	5.0/ 5.0	PID: 17 ppmv FID: 3.3 ppmv PID: 12 ppmv FID: 2.9 ppmv	SILT -----25'-----	S-5 (20 to 25'): Light gray, SILT, little Gravel, little Sand. Coarse fraction angular to subrounded. Dry to Moist. TILL/possible Weathered BEDROCK.	
25						Boring terminated at 25 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-624

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/19/12 Date Finished: 06/19/12
Logged By: J. Prellwitz Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
3	S-1	3 - 5	2.0/	PID: 5.2 ppmv FID: ND	-----3'----- FILL	S-1 (3 to 5'): Brown, fine to coarse SAND, some Silt, trace Gravel. Coarse fraction subangular to subrounded. Dry. FILL.	
5	S-2	5 - 10	5.0/ 2.5	PID: 5.3 ppmv FID: ND		S-2A (5 to 7.5'): Dark brown, fine to coarse SAND, some Gravel, little Silt. Moist. FILL.	
7.5				PID: 0.2 ppmv FID: ND	-----7.5'----- CLAY	S-2B (7.5 to 9'): Black, CLAY, trace fine to medium Sand, trace , Roots/Organics. Slight odor. Moist. PEAT.	
9				PID: ND FID: ND	-----9'----- SILT & CLAY	S-2C (9 to 10'): Gray, SILT & CLAY, Brown mottling. Moist.	
10	S-3	10 - 15	5.0/ 5.0	PID: 6.7 ppmv FID: ND	-----10'----- CLAY & SILT	S-3A (10 to 12.5'): Gray, CLAY & SILT. Moist.	
12.5				PID: 7.7 ppmv FID: ND	-----12.5'----- SILT & CLAY	S-3B (12.5 to 14.5'): Gray, SILT & CLAY, trace fine Sand, Brown mottling. Moist.	
14.5				PID: 5 ppmv FID: ND		S-3C (14.5 to 15'): Gray, SILT & CLAY, little Gravel, trace Sand. Coarse fraction rounded. Moist.	
15	S-4	15 - 20	5.0/ 5.0	PID: 1 ppmv FID: ND	-----15'----- SAND & GRAVEL	S-4A (15 to 16.5'): Dark brown, fine to coarse SAND & GRAVEL, some Silt. Coarse fraction rounded. Wet.	
16.5				PID: 1.5 ppmv FID: ND	-----16.5'----- CLAYEY SILT	S-4B (16.5 to 20'): Gray-tan, Clayey SILT and Gravel (fractured Shale), some fine to coarse Sand. Coarse fraction angular. Moist. TILL.	
20	S-5	20 - 23	3.0/ 2.0	PID: 0.8 ppmv FID: ND	-----20'----- SAND & SILT	S-5 (20 to 23'): Gray, fine to coarse SAND and Silt, some Gravel, trace Cobbles (fractured). Coarse fraction angular. Moist. TILL.	
23	S-6	23 - 25	2.0/ 3.0	PID: 6 ppmv FID: ND	-----23'----- SILT & CLAY & GRAVEL	S-6 (23 to 25'): Gray, SILT & CLAY & GRAVEL (fractured Shale), some Sand. Coarse fraction angular. Moist. TILL.	
25					-----25'-----	Boring terminated at 25 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-625

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/20/12 **Date Finished:** 06/20/12
Logged By: J. Prellwitz **Checked By:** AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
3	S-1	3 - 5	2.0/ 0.5	PID: 16 ppmv FID: 5 ppmv	-----3'----- FILL	S-1 (3 to 5'): Dark brown, SILT & CLAY, some Sand, trace Gravel. Coarse fraction rounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 1.5	PID: 17 ppmv FID: 2.8 ppmv		S-2 (5 to 10'): Dark brown to black, fine to medium SAND, some Silt, trace Gravel, trace coarse Sand. Coarse fraction rounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 5.0	PID: 11 ppmv FID: 1.1 ppmv	-----10'----- CLAY & SILT	S-3A (10 to 11.5'): Dark gray, CLAY & SILT. Moist.	
12.5				PID: 6.6 ppmv FID: 0.4 ppmv	-----12.5'----- SILT & CLAY	S-3B (12.5 to 15'): Gray, SILT & CLAY, brown mottling. Moist.	
15	S-4	15 - 20	5.0/ 5.0	PID: 8.2 ppmv FID: 0.6 ppmv		S-4A (15 to 17.5'): Dark gray, SILT & CLAY, some Gravel, little fine to medium Sand. Coarse fraction rounded. Wet.	
17.5				PID: 12 ppmv FID: 1.1 ppmv	-----17.5'----- SILT	S-4B (17.5 to 20'): Light gray to brown, SILT and fine to medium Sand, little , Gravel (fractured Rock). Coarse fraction angular. Dry. TILL.	
20	S-5	20 - 25	5.0/ 3.4	PID: 8.2 ppmv FID: 0.1 ppmv	-----20'----- SILT & CLAY	S-5A (20 to 22'): Light gray, SILT, little Gravel, little Sand. Coarse fraction angular to subrounded. Dry to Moist. TILL/Weathered BEDROCK.	
22				PID: 15 ppmv FID: 1.1 ppmv	-----22'----- WEATHERED BEDROCK	S-5B (22 to 25'): Light gray, Clayey SILT, some , Gravel (fractured Rock), some Sand. Coarse fraction angular. Dry.	
25					-----25'-----	Boring terminated at 25 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN | HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-626

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/20/12 **Date Finished: 06/20/12**
Logged By: J. Prellwitz **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
3	S-1	3 - 5	2.0/ 1.5	PID: 18 ppmv FID: 5 ppmv	-----3'----- FILL	S-1 (3 to 5'): Olive brown, SILT & CLAY, trace Sand, trace Gravel. Moist. FILL.	
5	S-2	5 - 10	5.0/ 1.0	PID: 5.1 ppmv FID: ND		S-2 (5 to 10'): Dark brown, fine to coarse SAND, some Silt, little Gravel. Coarse fraction rounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 4.4	PID: 5.4 ppmv FID: 3.2 ppmv	-----10'----- CLAY & SILT	S-3A (10 to 13.8'): Dark gray, CLAY & SILT. Moist.	
13.8				PID: 8 ppmv FID: ND	-----13.8'----- SILT & CLAY	S-3B (13.8 to 15'): Gray, SILT & CLAY, brown mottling. Moist.	
15	S-4	15 - 20	5.0/ 1.6	PID: 11 ppmv FID: 2.4 ppmv		S-4A (15 to 19.2'): Gray, SILT & CLAY, trace Gravel. Coarse fraction rounded. Moist.	
19.2				PID: 6.9 ppmv FID: ND	-----19.2'----- SAND	S-4B (19.2 to 20'): Gray to brown, fine to medium SAND, trace Gravel, trace Silt. Moist. SAND.	
20					-----20'-----	Roller bit, no recovery.	
21	S-5	21 - 25	4.0/ 2.0	PID: 2.5 ppmv FID: 0.8 ppmv	-----21'----- WEATHERED BEDROCK	S-5 (21 to 25'): Light gray, SILT & CLAY and , Gravel (fractured Rock), some fine to coarse Sand. Coarse fraction angular. Moist.	
25					-----25'-----	Boring terminated at 25 feet. No refusal encountered.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-627

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"

Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.

Foreman: M. Evans, M. Wilson, E. Perigard

Date Started: 06/20/12 **Date Finished: 06/20/12**

Logged By: J. Prellwitz **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
3	S-1	3 - 5	2.0/ 1.0	PID: 45 ppmv FID: 17 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown, SILT & CLAY, some Sand, little Gravel. Coarse fraction rounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.0	PID: 20 ppmv FID: 4.8 ppmv PID: 5.9 ppmv FID: 1.3 ppmv		S-2A (5 to 6'): SILT & CLAY, trace Gravel, Coarse fraction rounded. Brown mottling. Moist. FILL (Rounded Native Soil). S-2B (6 to 10'): Dark brown, fine to coarse SAND and SILT, some Gravel, trace Ash, trace Glass. Coarse fraction rounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 3.6	PID: 8.5 ppmv FID: 1.9 ppmv	-----10'----- CLAY & SILT	S-3A (10 to 12.8'): Gray, CLAY & SILT. Moist.	
12.8				PID: 4.8 ppmv FID: 0.7 ppmv	-----12.8'----- SILT & CLAY	S-3B (12.8 to 15'): Gray, SILT & CLAY, brown mottling. Moist.	
15	S-4	15 - 20	5.0/ 3.0	PID: 6.5 ppmv FID: 0.8 ppmv		S-4A (15 to 18'): Gray, SILT & CLAY, little Gravel, (becoming Wet and more Gravelly with depth). Coarse fraction rounded. Moist to wet.	
18				PID: 6 ppmv FID: ND		S-4B (18 to 20'): Dark gray, SILT & CLAY, some Gravel (fractured Shale), trace Sand. Coarse fraction angular. Wet. TILL.	
20	S-5	20 - 25	5.0/ 2.5	PID: 6.3 ppmv FID: ND		S-5 (20 to 25'): Gray, SILT & CLAY and Gravel (fractured Shale), some Sand. Coarse fraction angular. Moist. TILL to Weathered BEDROCK.	
25					-----25'-----	Boring terminated at 25 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-628

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, E. Perigard
Date Started: 06/21/12 **Date Finished:** 06/21/12
Logged By: M. Stein **Checked By:** AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No sampling 0 - 3'. Closed piston to 3' bg.	
3	S-1	3 - 5	2.0/1.3	PID: 76 ppmv FID: 21 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown, Clayey SILT, little fine to coarse Sand, trace Gravel. Coarse fraction subangular to subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/3.4	PID: 17 ppmv FID: 17 ppmv	FILL	S-2 (5 to 10'): Brown, Clayey SILT, little fine to coarse Sand, trace Gravel, dark gray sheen at 9.5 - 9.7' of CLAY & SILT (PID/FID 12/11). Coarse fraction subangular to subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/3.0	PID: 10 ppmv FID: 12 ppmv	-----10'----- CLAY & SILT	S-3 (10 to 15'): Dark gray with brown mottling, CLAY & SILT. Moist.	
15	S-4	15 - 20	---	PID: 17 ppmv FID: 11 ppmv	CLAY & SILT	S-4A (15 to 18.6'): Dark gray with brown mottling grading to gray, CLAY & SILT. Moist.	
18.6				PID: 6 ppmv FID: 4 ppmv	-----18.6'----- SAND & GRAVEL	S-4B (18.6 to 20'): Brown, fine to coarse SAND & GRAVEL, some Clay & Silt. Coarse fraction subrounded. Moist.	
20	S-5	20 - 25	5.0/2.2	PID: 2 ppmv FID: 1 ppmv	SAND & GRAVEL	S-5A (20 to 24.1'): Brown, fine to coarse SAND & GRAVEL, little Silt. Coarse fraction angular. Wet.	
24.1				PID: 2 ppmv FID: 1 ppmv	-----24.1'----- CLAYEY SILT -----25'-----	S-5B (24.1 to 25'): Grayish tan, Clayey SILT, some sand to gravel Rock fragments (lower 0.9' of recovery). Coarse fraction angular. Moist. TILL.	
25	S-6	25 - 26	1.0/		-----26'-----	S-6 (25 to 26'): No recovery.	

Boring terminated at 26 feet.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring backfilled with bentonite chips to ~1.5 bg. Cement to grade.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-629

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, E. Perigard
Date Started: 06/21/12 | Date Finished: 06/21/12
Logged By: M. Stein | Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No sampling 0 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.8	PID: 17 ppmv FID: 8 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown, Clayey SILT to SILT & CLAY, little fine to coarse Sand, trace Gravel, very few Slag & Brick particles. Coarse fraction subangular to subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.1	PID: 4.0 ppmv FID: 3 ppmv		S-2 (5 to 10'): Brown to grayish brown, SILT & CLAY, little fine to coarse Sand, few Slag & Brick fragments, pulverized Concrete from 8.8 to 9.3'. Coarse fraction subangular to subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 3.8	PID: 8 ppmv FID: 7 ppmv	-----10'----- CLAY & SILT	S-3 (10 to 15'): Dark gray to gray with brown mottling, CLAY & SILT grading to SILT & CLAY, trace, fine to medium Sand. Moist. CLAY & SILT to SILT & CLAY.	
15	S-4	15 - 20	5.0/	PID: 12 ppmv FID: 7 ppmv		S-4A (15 to 18.8'): Grayish brown to gray, CLAY & SILT. Moist.	
18.8				PID: 11 ppmv FID: 7 ppmv		S-4B (18.8 to 20'): Grayish brown to gray, CLAY & SILT, some Gravel, little fine to coarse Sand, (lower 1.2' of recovery). Coarse fraction subrounded. Moist.	
20	S-5	20 - 25	5.0/ 0.3		-----20'----- GRAVEL	S-5 (20 to 25'): Dark brown, GRAVEL, some fine to coarse Sand, little Silt. Coarse fraction subrounded. Wet.	
25	S-6	25 - 26	1.0/ 0.5	PID: 6 ppmv FID: 8 ppmv	-----25'----- SAND -----26'-----	Dark brown, fine to coarse SAND and GRAVEL, little Silt. Coarse fraction subrounded. Wet.	

Boring terminated at 26 feet.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-630

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, E. Perigard
Date Started: 06/21/12 Date Finished: 06/21/12
Logged By: M. Stein Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No sampling 0 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.3	PID: 5 ppmv FID: ND	-----3'----- FILL	S-1 (3 to 5'): Brown to dark brown, Clayey SILT to CLAY & SILT, little fine to coarse Sand, trace Gravel. Coarse fraction subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.2	PID: 5 ppmv FID: 3 ppmv		S-2 (5 to 10'): Brown to dark brown, Clayey SILT to CLAY & SILT, little, fine to coarse Sand, trace Gravel, very few Brick particles to fragments. Coarse fraction subangular to subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 4.2	PID: 28 ppmv FID: 19 ppmv	-----10'----- CLAY & SILT	S-3A (10 to 12.5'): Dark gray to gray with brown mottling., CLAY & SILT. Moist.	
12.5				PID: 21 ppmv FID: 8 ppmv		S-3B (12.5 to 15'): Dark gray to gray with brown mottling., CLAY & SILT. Moist.	
15	S-4	15 - 20	5.0/ 4.0	PID: 19 ppmv FID: 10 ppmv		S-4A (15 to 19.1'): Gray to brown, CLAY & SILT. Moist.	
19.1				PID: 9 ppmv FID: 5 ppmv		S-4B (19.1 to 20'): Dark gray, CLAY & SILT, some Gravel, little fine to coarse Sand. Coarse fraction subrounded to subangular. Moist to wet.	
20	S-5	20 - 25	5.0/ 0.5	PID: 12 ppmv FID: 4 ppmv	-----20'----- SAND	S-5 (20 to 25'): Dark brown, fine to coarse SAND, some Gravel, little Silt. Coarse fraction subrounded. Wet.	
25	S-6	25 - 26	1.0/ 0.3	PID: 11 ppmv FID: 8 ppmv	-----25'----- CLAYEY SILT -----26'-----	S-6 (25 to 26'): Gray, Clayey SILT, some sand to gravel sediment Rock fragments. Coarse fraction angular. Moist. TILL.	
26						Boring terminated at 26 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

SANBORN ||| HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-631

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, E. Perigard
Date Started: 06/21/12 Date Finished: 06/21/12
Logged By: M. Stein Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No sampling 0 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.6	PID: 17 ppmv FID: 8 ppmv	-----3'-----	S-1 (3 to 5'): Brown, SILT & CLAY, little fine to coarse Sand, trace Gravel. Coarse fraction subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 1.5	PID: 4 ppmv FID: 2 ppmv	FILL	S-2 (5 to 10'): Brown, SILT & CLAY, little fine to coarse Sand, trace Gravel, Sand & Gravel seam at 9.5 - 9.7'. Coarse fraction subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 4.0	PID: 8 ppmv FID: 10 ppmv	-----10.1'-----	S-3A (10 to 10.1'): Brown, SILT & CLAY, little fine to coarse Sand, trace Gravel. Coarse fraction subrounded. Moist. FILL.	
						S-3B (10.1 to 12.5'): Dark gray to gray with brown mottling, CLAY & SILT, trace fine to medium Sand. Moist.	
				PID: 2 ppmv FID: 2 ppmv	CLAY & SILT	S-3C (12.5 to 15'): Dark gray to gray with brown mottling, CLAY & SILT, trace, fine to medium Sand towards the bottom of recovery. Moist.	
15	S-4	15 - 20	5.0/ 4.8	PID: 3 ppmv FID: 1 ppmv		S-4A (15 to 18.8'): Grayish brown, fine to coarse SAND and GRAVEL, little Clay & Silt. Coarse fraction subrounded. Moist.	
18.8				PID: 1 ppmv FID: ND	-----18.8'-----	S-4B (18.8 to 20'): Grayish brown, fine to coarse SAND and GRAVEL, little Clay & Silt. Coarse fraction subrounded. Moist.	
20	S-5	20 - 25	5.0/ 0.2	PID: 1 ppmv FID: 1 ppmv	SAND	S-5 (20 to 25'): Brown, fine to coarse SAND and GRAVEL, little Silt. Coarse fraction subrounded to subangular. Wet.	
25	S-6	25 - 26	1.0/ 1.0	PID: 7 ppmv FID: 2 ppmv	-----26'-----	S-6 (25 to 26'): Dark brown, fine to medium SAND, little Silt. Moist. TILL unit not encountered.	

Boring terminated at 26 feet.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-632

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, E. Perigard
Date Started: 06/21/12 **Date Finished: 06/21/12**
Logged By: M. Stein **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No sampling 0 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/ 1.4	PID: 9 ppmv FID: 6 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown, fine to coarse SAND, some Silt, little Gravel. Coarse fraction subrounded to subangular. Dry. FILL.	
5	S-2	5 - 10	5.0/ 2.2	PID: 5 ppmv FID: 6 ppmv		S-2 (5 to 10'): Grayish brown, SILT & CLAY, little fine to coarse Sand, trace Gravel, very few Brick & Slag fragments. Coarse fraction subangular. Moist. FILL.	
10	S-3	10 - 15	5.0/ 3.9	PID: 22 ppmv FID: 30 ppmv	-----10'----- CLAY & SILT	S-3A (10 to 12.5'): Dark gray, CLAY & SILT. Moist.	
12.5				PID: 14 ppmv FID: 16 ppmv		S-3B (12.5 to 15'): Dark gray, CLAY & SILT. Moist.	
15	S-4	15 - 20	5.0/ 4.0	PID: 4 ppmv FID: 5 ppmv		S-4A (15 to 19'): Dark gray to dark brown to gray with orange mottling, CLAY & SILT. Moist.	
19				PID: 10 ppmv FID: 6 ppmv		S-4B (19 to 20'): Dark gray, CLAY & SILT and Gravel, little fine to coarse Sand. Coarse fraction subrounded. Moist.	
20	S-5	20 - 24.9	4.9/ 0.3	PID: 7 ppmv	-----20'----- SAND & GRAVEL	S-5 (20 to 24.9'): Brown, fine to coarse SAND & GRAVEL, little Silt. Coarse fraction subrounded to subangular. Wet.	
24.9					-----24.9'-----	Boring terminated at 24.9 feet due to MacroCore refusal.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-633

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 7822 DT Track-Mounted, Direct Push, 1 3/4 x 1 5/8"
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans, M. Wilson, E. Perigard
Date Started: 06/20/12 Date Finished: 06/20/12
Logged By: M. Stein Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 - 0.8'): Concrete. No sampling 0.8 - 4' (closed piston to 4').	
4	S-1	4 - 5	1.0/ 0.2	PID: 1 ppmv FID: ND	-----4'----- FILL	S-1 (4 to 5'): Brown, fine to coarse SAND and GRAVEL, little Silt. Coarse fraction subangular to subrounded. Moist. FILL.	
	S-2	5 - 10	5.0/ 3.5	PID: 6 ppmv FID: 2 ppmv		S-2 (5 to 10'): Brown, fine to coarse SAND, some Gravel, fractured Concrete debris towards bottom at 9.2 - 9.9'. Coarse fraction subangular to subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 3.0	PID: 11 ppmv FID: 3 ppmv PID: 14 ppmv FID: 4 ppmv	-----10.3'----- CLAY & SILT	S-3A (10 to 10.3'): Brown, fine to coarse SAND, upper 0.3' of recovery. Coarse fraction subangular to subrounded. Moist. FILL. S-3B (10.3 to 15'): Dark gray with brown mottling towards bottom of recovery, CLAY & SILT. Moist.	
15	S-4	15 - 20	5.0/ 3.1	PID: 4 ppmv FID: 1 ppmv		S-4A (15 to 19.8'): Gray with brown mottling grading to gray with orange mottling, CLAY & SILT. Moist.	
20	S-5	20 - 25	5.0/ 1.5	PID: 4 ppmv FID: ND PID: 3 ppmv FID: 1 ppmv	-----20'----- SILT & CLAY	S-4B (19.8 to 20'): Dark gray, fine to coarse SAND and Gravel, some Clay & Silt. Coarse fraction subrounded. Moist. TILL. S-5 (20 to 25'): Gray to dark tan, SILT & CLAY and fine to coarse , sand & gravel sediment Rock. Coarse fraction angular. Moist. TILL.	
25					-----25'-----	Boring terminated at 25 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring backfilled with Portland Cement Grout.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-634

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/21/12 Date Finished: 06/21/12
Logged By: J. Prellwitz Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	(0 - 0.8'): Asphalt. No sampling 0.8 - 3' (closed piston to 3').	
3	S-1	3 - 5	2.0/	PID: 5.8 ppmv FID: 5.2 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown to dark brown, fine to coarse SAND, some Gravel, little Silt, few particles Slag and xxx Fill material. Coarse fraction subangular to subrounded Moist. FILL.	
5	S-2	5 - 10	5.0/ 4.0	PID: 54 ppmv FID: 19 ppmv	FILL	S-2 (5 to 10'): Brown, SILT & CLAY, some fine to coarse Sand, little Gravel, trace Bricks. Transitioning to gray, SILT & CLAY at base. Coarse fraction rounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 4.0	PID: 45 ppmv FID: 15 ppmv	-----10'----- CLAY & SILT	S-3A (10 to 12.5'): Gray, CLAY & SILT, trace , Gravel (at top). Moist.	
12.5				PID: 35 ppmv FID: 5.8 ppmv	CLAY & SILT	S-3B (12.5 to 15'): Gray, CLAY & SILT, brown mottling (at bottom). Moist.	
15	S-4	15 - 20	5.0/ 3.5	PID: 70 ppmv FID: 16 ppmv	-----15'----- SILT & CLAY	S-4A (15 to 19'): Gray, SILT & CLAY, little Gravel, trace Sand, brown mottling. Moist.	
19				PID: 350 ppmv FID: 41 ppmv	SILT & CLAY	S-4B (19 to 20'): Gray, SILT & CLAY and Gravel, some fine to coarse Sand. Coarse fraction rounded. Wet.	
20	S-5	20 - 25	5.0/ 1.5	PID: 8.6 ppmv FID: 2.6 ppmv	SILT & CLAY	S-5 (20 to 25'): Gray, SILT & CLAY, some , Gravel (fractured Rock), little, fine to coarse Sand. Coarse fraction angular. Moist. TILL.	
25	S-6	25 - 26	1.0/ 1.3	PID: 11 ppmv FID: ND	-----25'----- CLAY & SILT -----26'-----	S-6 (25 to 26'): Brown, CLAY & SILT, some fine to coarse Sand, some Gravel. Coarse fraction subrounded to angular Wet.	

Boring terminated at 26 feet.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-635

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/21/12 **Date Finished: 06/21/12**
Logged By: J. Prellwitz **Checked By: AVK/LJJ**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
3	S-1	3 - 5	2.0/ 1.0	PID: 5 ppmv FID: 3 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown, Clayey SILT, little fine to coarse Sand, little Gravel. Coarse fraction subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 2.5	PID: 32 ppmv FID: 22 ppmv	FILL	S-2 (5 to 10'): Dark brown, SILT & CLAY, little Gravel, little Sand, trace Organics (Wood), trace Brick. Coarse fraction subrounded. Moist. FILL.	
10	S-3	10 - 15	5.0/ 4.5	PID: 32 ppmv FID: 16 ppmv	-----10'----- CLAY & SILT	S-3A (10 to 13.8'): Gray, CLAY & SILT, trace Roots. Moist.	
13.8				PID: 11 ppmv FID: 5.4 ppmv	-----13.8'----- SILT & CLAY	S-3B (13.8 to 15'): Gray, SILT & CLAY, brown mottling. Moist.	
15	S-4	15 - 20	5.0/ 4.0	PID: 8.8 ppmv FID: 4.2 ppmv	SILT & CLAY	S-4A (15 to 18.7'): Gray, SILT & CLAY, trace Gravel, brown mottling. Coarse fraction rounded. Moist.	
18.7				PID: 8.3 ppmv FID: 2 ppmv	-----18.7'----- SAND & GRAVEL	S-4B (18.7 to 20'): Olive brown, SILT & CLAY and Gravel, little fine to coarse Sand, brown mottling. Coarse fraction rounded. Wet.	
20	S-5	20 - 25	5.0/ 2.5	PID: 9.3 ppmv FID: 7 ppmv	SAND & GRAVEL	S-5A (20 to 24'): Brown, GRAVEL, some Silt, little fine to coarse Sand. Coarse fraction angular. Wet.	
24				PID: 10 ppmv FID: 4.1 ppmv	-----24'----- CLAYEY SILT	S-5B (24 to 25'): Gray, Clayey SILT - SILT & CLAY, some Gravel (fractured Shale), trace Sand. Coarse fraction angular. Moist. TILL.	
25	S-6	25 - 26	1.0/ 1.5	PID: 3.4 ppmv FID: 1.7 ppmv	-----25'----- CLAY & SILT -----26'-----	6 (25 to 26'): Gray, CLAY & SILT, some Gravel (fractured Shale), little Sand. Coarse fraction angular. Wet. TILL.	

Boring terminated at 26 feet.

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

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SANBORN ||| HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-636

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/21/12 Date Finished: 06/21/12
Logged By: J. Prellwitz Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Log	Stratum Description	Geologic Description	Remarks
0						-----0'-----	Asphalt. No description. FILL.	
3	S-1	3 - 5	2.0/ 1.0	PID: 13 ppmv FID: 8.3 ppmv		-----3'-----	S-1 (3 to 5'): Dark brown, SILT & CLAY, little fine to coarse Sand, trace Gravel. Coarse fraction rounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 3.0	PID: 5.9 ppmv FID: 6.2 ppmv		SILT & CLAY	S-2A (5 to 9.6'): Dark brown, SILT & CLAY, little fine to coarse Sand, trace Gravel. Coarse fraction rounded. Moist. FILL.	
9.6							S-2B (9.6 to 10'): Gray, SILT & CLAY, brown mottling. Moist.	
10	S-3	10 - 15	5.0/ 4.5	PID: 3.4 ppmv FID: 1.7 ppmv PID: 4.6 ppmv FID: 1.7 ppmv		-----10'----- CLAY & SILT	S-3A (10 to 12'): Dark gray, CLAY & SILT, trace Sand and Gravel (at top). Coarse fraction rounded. Moist.	
12						-----12'-----	S-3B (12 to 15'): Gray, SILT & CLAY, brown mottling. Moist.	
15	S-4	15 - 20	5.0/ 3.0	PID: 4.6 ppmv FID: 2.5 ppmv PID: 9.6 ppmv FID: 2.5 ppmv		SILT & CLAY	S-4A (15 to 19'): Gray, SILT & CLAY, brown mottling. Moist.	
19				PID: 8.2 ppmv		-----19'----- SAND and SILT	S-4B (19 to 20'): Dark gray, fine to coarse SAND and SILT, some Gravel. Coarse fraction rounded. Wet.	
20	S-5	20 - 25	5.0/ 3.0	FID: 3.9 ppmv PID: 47 ppmv FID: 14 ppmv		-----20'----- SILT & CLAY	S-5A (20 to 23'): Brown to gray, SILT & CLAY and fine Sand, some Gravel (fractured Shale). Coarse fraction angular. Wet. TILL.	
23				PID: 18 ppmv FID: 6.3 ppmv		-----23'----- CLAY & SILT	S-5B (23 to 25'): Gray, CLAY & SILT, some Gravel (fractured Shale), little fine to coarse Sand. Coarse fraction angular. Moist. TILL.	
25	S-6	25 - 29	4.0/ 5.0	PID: 6.8 ppmv FID: 23 ppmv		-----25'----- WEATHERED BEDROCK	S-6 (25 to 29'): Light gray, Clayey SILT, and gravelly fractured Rock, some fine to coarse Sand. Coarse fraction angular. Moist.	
29						-----29'-----	Boring terminated at 29 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-637

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, Direct Push, 2.125" OD x 1.5" ID; Hollow Stem Auger 4 1/4" ID; 0 - 5 Solid Stem
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: D. Richmond
Date Started: 06/21/12 Date Finished: 06/21/12
Logged By: J. Prellwitz Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No description. FILL.	
3	S-1	3 - 5	2.0/ 1.5	PID: 23 ppmv FID: 12 ppmv	-----3'----- FILL	S-1 (3 to 5'): Brown, CLAY & SILT, some Sand, trace Gravel, trace Brick. Coarse fraction subrounded. Moist. FILL.	
5	S-2	5 - 10	5.0/ 4.0	PID: 155 ppmv FID: 81 ppmv		S-2A (5 to 9.6'): Olive brown - gray, SILT & CLAY, trace Gravel, trace Sand, trace Brick, trace Organics. Coarse fraction subrounded. Moist. FILL.	
9.6					-----9.6'----- CLAY & SILT	S-2B (9.6 to 10'): Black - gray, CLAY & SILT, little Organics, slight odor, black staining. Moist.	
10	S-3	10 - 15	5.0/	PID: 39 ppmv FID: 16 ppmv PID: 45 ppmv FID: 15 ppmv		S-3A (10 to 13.5'): Gray, CLAY & SILT, trace Sand, trace Gravel (top only). Brown mottling. Moist.	
13.5				PID: 8.2 ppmv FID: 1.5 ppmv		S-3B (13.5 to 15'): Gray, CLAY & SILT, Brown mottling. Moist.	
15	S-4	15 - 20	5.0/ 4.5	PID: 2.3 ppmv FID: 1.9 ppmv	-----15'----- SILT & CLAY	S-4A (15 to 18.8'): Gray, SILT & CLAY, brown mottling. Moist.	
18.8				PID: 8.1 ppmv	-----18.8'----- CLAYEY SILT	S-4B (18.8 to 20'): Dark gray, Clayey SILT, some fine to coarse Sand, little Gravel. Coarse fraction rounded to subrounded Wet.	
20	S-5	20 - 25	5.0/ 3.0	FID: 2.1 ppmv PID: 12 ppmv FID: 6.1 ppmv	-----20'----- SAND & GRAVEL	S-5A (20 to 25'): Dark brown, fine to coarse SAND & GRAVEL, some Silt. Coarse fraction rounded to subrounded Wet.	
24				PID: 13 ppmv FID: 3 ppmv	-----24'----- CLAYEY SILT	S-5B (24 to 25'): Gray, Clayey SILT, little Gravel (fractured Rock), little Sand. Coarse fraction angular. Moist. TILL.	
25	S-6	25 - 29	4.0/ 3.0	PID: 8.3 ppmv FID: 4.1 ppmv	-----25'----- WEATHERED BEDROCK	S-6 (25 to 29'): Light gray, Clayey SILT, and Gravel (fractured Rock), little, fine to coarse Sand. Coarse fraction angular. Moist.	
29					-----29'-----	Boring terminated at 29 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

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SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-638

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, 2.125" OD x 1.5" ID
Sampling Method: 5' long Stainless Steel MacroCore® Sampler
Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans
Date Started: 07/23/12 **Date Finished:** 07/23/12
Logged By: J. Prellwitz **Checked By:** AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Depth (ft)	Pen/Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No sampling. Closed piston 0-5' bgs.	
5	S-1	5 - 10	5.0/ 3.5	PID: 2.7 ppmv FID: 2.3 ppmv	-----5'----- FILL	S-1A (5 to 8.5'): Gray-brown, SILT & CLAY, trace Gravel, trace Sand, trace Roots. Coarse fraction rounded. Moist. FILL.	
8.5				PID: 5 ppmv FID: 3.1 ppmv	-----8.5'----- CLAYEY SILT	S-1B (8.5 to 10'): Gray, Clayey SILT. Moist.	
10	S-2	10 - 15	5.0/ 4.0	PID: 6.2 ppmv FID: 2.4 ppmv	-----10'----- SILT & CLAY	S-2 (10 to 15'): Gray, SILT & CLAY, brown mottling. Dry. Moist at bottom 4".	
15	S-3	15 - 20	5.0/ 2.5	PID: 2.3 ppmv FID: 1.6 ppmv PID: 1.8 ppmv FID: 1.7 ppmv		S-3A (15 to 18.6'): Dark gray, SILT & CLAY, little Gravel, trace Sand, brown mottling. Coarse fraction rounded. Moist.	
18.6				PID: 3.1 ppmv FID: 1.8 ppmv	-----18.6'----- CLAYEY SILT	S-3B (18.6 to 20'): Dark gray, Clayey SILT and fine to coarse Sand, some Gravel. Coarse fraction rounded. Wet.	
20	S-4	20 - 25	5.0/ 2.5	PID: 5.6 ppmv FID: 1.8 ppmv	-----20'----- SAND & GRAVEL	S-4 (20 to 25'): Gray-brown, fine to coarse (mostly fine) SAND & GRAVEL, some Silt. Coarse fraction rounded to subrounded Moist.	
25					-----25'-----	Boring terminated at 25 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.
2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.
3. Boring was backfilled using Cement grout.

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: Building 57
Location: Endicott, NY
Project No.: 2466.03

Log of Boring B57-639

Ground Elevation: Not Surveyed

Drilling Method: Geoprobe® 6620DT Track-Mounted, 2.125" OD x 1.5" ID
Sampling Method: 5' long Stainless Steel MacroCore® Sampler

Drilling Company: Parratt Wolff, Inc.
Foreman: M. Evans
Date Started: 07/23/12 Date Finished: 07/23/12
Logged By: J. Prellwitz Checked By: AVK/LJJ

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time

Depth (ft)	Sample No.	Sample Depth (ft)	Pen/ Rec (ft)	Field Testing Data	Stratum Description	Geologic Description	Remarks
0					-----0'-----	Asphalt. No sampling. Closed piston 0-5' bgs.	
5	S-1	5 - 10	5.0/ 3.0	PID: 2.7 ppmv FID: 0.7 ppmv	-----5'----- FILL	S-1A (5 to 8.8'): Gray-brown, SILT & CLAY, some fine to coarse Sand, some Gravel, trace Roots, trace Concrete. Coarse fraction rounded to subrounded Moist. FILL.	
9				PID: 2.4 ppmv FID: 1.1 ppmv	-----9'----- CLAY & SILT	S-1B (9 to 10'): Gray, CLAY & SILT. Moist.	
10	S-2	10 - 15	5.0/ 5.0	PID: 8.1 ppmv FID: 0.5 ppmv	-----10'----- SILT & CLAY	S-2A (10 to 13'): Gray, SILT & CLAY, brown mottling. Moist.	
13				PID: 3.5 ppmv FID: ND	-----13'----- CLAY & SILT	S-2C (14 to 15'): Gray, CLAY & SILT, little Gravel, trace Sand. Coarse fraction rounded. Moist.	
15	S-3	15 - 20	5.0/ 3.0	PID: 2.8 ppmv FID: 0.2 ppmv	-----15'----- GRAVEL	S-3 (15 to 20'): Gray, GRAVEL, some fine to coarse Sand, little Silt. Coarse fraction rounded. Wet.	
20	S-4	20 - 25	5.0/ 3.5			S-4A (20 to 24'): Gray, GRAVEL. Coarse fraction rounded. Wet. All water and Gravel. Unable to collect enough soil to sample.	
24				PID: 1.9 ppmv FID: 1 ppmv	-----24'----- SAND & GRAVEL -----25'-----	S-4B (24 to 25'): Gray-brown, fine to coarse SAND & GRAVEL, little Silt. Coarse fraction rounded to subrounded Moist.	
25						Boring terminated at 25 feet.	

NOTES:

1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. They were also screened for VOCs using a MicroFID hand-held Flame Ionization Detector (FID) calibrated to a 100 ppmv methane-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID and FID measure relative levels of VOCs. Although PID and FID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs.

2. Soil samples collected were submitted to Lancaster Laboratories of Lancaster, Pennsylvania for analysis of VOCs by USEPA 8260B.

3. Boring was backfilled using Cement grout.

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APPENDIX E

COMMUNITY AIR MONITORING PROGRAM

APPENDIX E
COMMUNITY AIR MONITORING PROGRAM
OPERABLE UNIT #5/BUILDING 57 AREA, UNION AND ENDICOTT, NY

This appendix summarizes the Community Air Monitoring Program (CAMP) performed by Sanborn Head & Associates, Inc. (Sanborn Head) at Building 57 (Site) located in IBM Operable Unit # 5, Union and Endicott, NY as a part of Electrical Resistance Heating (ERH) thermal treatment system installation and operation at Building 57 (Site) located in IBM Operable Unit # 5, Union and Endicott, NY. The work described herein was performed in accordance with the Agency-approved Interim Remedial Measure (IRM) Work Plan[1] and February 2, 2012 CAMP Addendum[2]. This appendix is subject to limitations as described in Appendix A.

Instrumentation, monitoring parameters, and action limits for potential air emissions are summarized in Exhibit 1 below.

Exhibit 1: CAMP Details

Instrument	Parameter	Action Limits		Monitoring Mode
		Interior	Exterior	
RAEguard Photoionization detector (PID)	Volatile Organic Compounds (VOCs)	3.8 ppmv (Intermediate Response Level); 100 ppmv (Shutdown Action Level)	3.8 ppmv (Shutdown Action Level for downwind)	Continuous during ERH operation
Haloguard-I Monitor	CFC-113	50 ppmv (Intermediate Response Level); 500 ppmv (Shutdown Action Level)	NM	Continuous during ERH operation in interior CFC Area
Dustrack DRX Monitors	Particulate Matter	100 μg/m³ above background (employ dust suppression) 150 μg/m³ above background (suspend work activities)		Continuous during excavation activities
MiniRAE 3000 PID	VOCs	3.8 ppmv for interior and 148 ppmv for exterior locations		Continuous during excavation activities
Miran SapphIRe	CFC-113	800 ppmv for interior locations		Continuous during excavation activities

E.1 CAMP-Excavation Activities

Sanborn Head conducted air monitoring for the presence of VOCs (using a ppb RAE 3000 meter), particulates (using Dusttrak Aerosol Monitor 8520 and Dusttrak II Desktop Monitor 8530), and CFC-113 (using a Miran SapphIRe) at downwind locations in accordance with the Agency-approved CAMP during excavation work. Only PID and particulate monitoring was conducted during exterior excavation activities. The meters were calibrated daily and calibration checks were performed at the end of each day.

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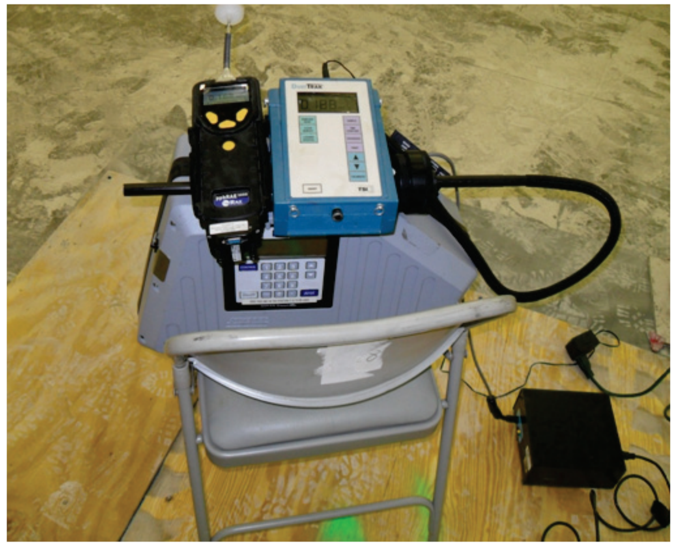
1 Sanborn, Head Engineering, P.C., June 24, 2011, "In Situ Thermal Treatment IRM Work Plan, Operable Unit #5/ Building 57, Former IBM Facility, Union and Endicott, New York, AOC Index No. A7-0502-0104, NYSDEC Site No. 7-04-014".

2 Sanborn, Head & Associates, Inc., February 2, 2012, "Appendix E – Revised Community Air Monitoring Plan, Operable Unit #5/Building 57, Former IBM Facility, Union and Endicott, New York".



CAMP inside Building 57A during Sheet Pile Installation

During excavation activities, PID readings remained consistently below the action levels of 3.8 parts per million (ppmv) and 148 ppmv above background for exterior and interior locations respectively. CFC-113 readings remained consistently below the action level of 800ppm during interior excavation activities.

The action level for particulates in air was 100 micrograms per cubic meter ($\mu g/m^3$) above the established background concentration. Although very little visible dust was generated during excavations, there were episodes of action level exceedance noted for particulate concentrations above the action levels. These episodes were mainly associated with concrete floor saw cut dust and backfill pea gravel dust, lifted by movement of equipment traffic inside the building. Project team members conducted periodic cleaning of interior locations to mitigate these exceedances.

CAMP data recorded during installation of the ERH system are retained and available upon request.

E.2 CAMP-ISTT ERH Operation

Interior CFC Area CAMP during ISTT-ERH Operation

Community air monitoring data for the duration of ERH treatment are summarized on Figures E.1 through E.3. These figures present the monitoring data for the interior loading dock treatment area between Buildings 57 and 57A (Figures E.1 and E.2) and the downwind exterior monitoring location (Figure E.3). During ERH treatment, CAMP data were reported weekly to the Agencies and bi-weekly to the Site owner for communication with building tenants.

VOC and CFC-113 concentrations became elevated above the Response Levels within the loading dock area between 1:00 AM and 7:30 AM on March 19, 2012. Within this time period, CFC-113 concentrations rose in the loading dock area above the Shutdown Action Level and for a short duration exceeded the Permissible Exposure Limit (PEL) established by the Occupational Safety and Health Administration (OSHA). This condition was caused by the failure of the Treatment Train 2 blower drive belt, which interrupted vapor extraction from the CFC and B57A Areas and cause the failure of the auto-dialer system to notify project team personnel. Once the situation was identified, communication and notification, checks of the monitoring equipment, and venting of the interior treatment area were performed according to the CAMP, and Agency personnel were notified. Several key modifications and safety interlocks were introduced in response to this episode, as described in the ERH System Components section of IRM Completion Report.

There were instances where CFC-113 measurements in the interior loading dock area intermittently exceeded the response level threshold. These exceedances were mainly due to the sensitivity of the instrument to changes in temperature and humidity in ambient air, and reaction to VOCs from painting activities within the loading dock area by the building tenant. The auto dialer system provided notification to project team personnel who responded to check on-site conditions and did not find indications that response was due to indoor air quality conditions.

Exterior downwind VOC meter experienced intermittent loss of connectivity with the data logger during severe weather events. Intermittent data continued to be recorded by the data logger during these events. The auto dialer system provided notification of interruption to project team personnel who responded to check on-site conditions and the instrumentation. If site conditions indicated that the response was due to severe weather and not due to indoor air quality conditions, the instrument was allowed to by-pass the Shutdown Action Level for uninterrupted operations of System.

The Shutdown Action Level was exceeded in the exterior downwind monitoring location at times during ERH treatment, as shown on Figure E.3. No more than five consecutive readings were recorded above the action level at any time during ERH operation. Other exceedances included three of four consecutive readings, and three single readings above the action level between April and September. In each case, project personnel responded to check the monitoring instrument and site conditions, and detected concentrations returned quickly to below the action level. These instances were reported to the Agencies in weekly CAMP submittals.

CAMP data recorded during operation of the ERH system are retained and available upon further request.

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Figure E.1

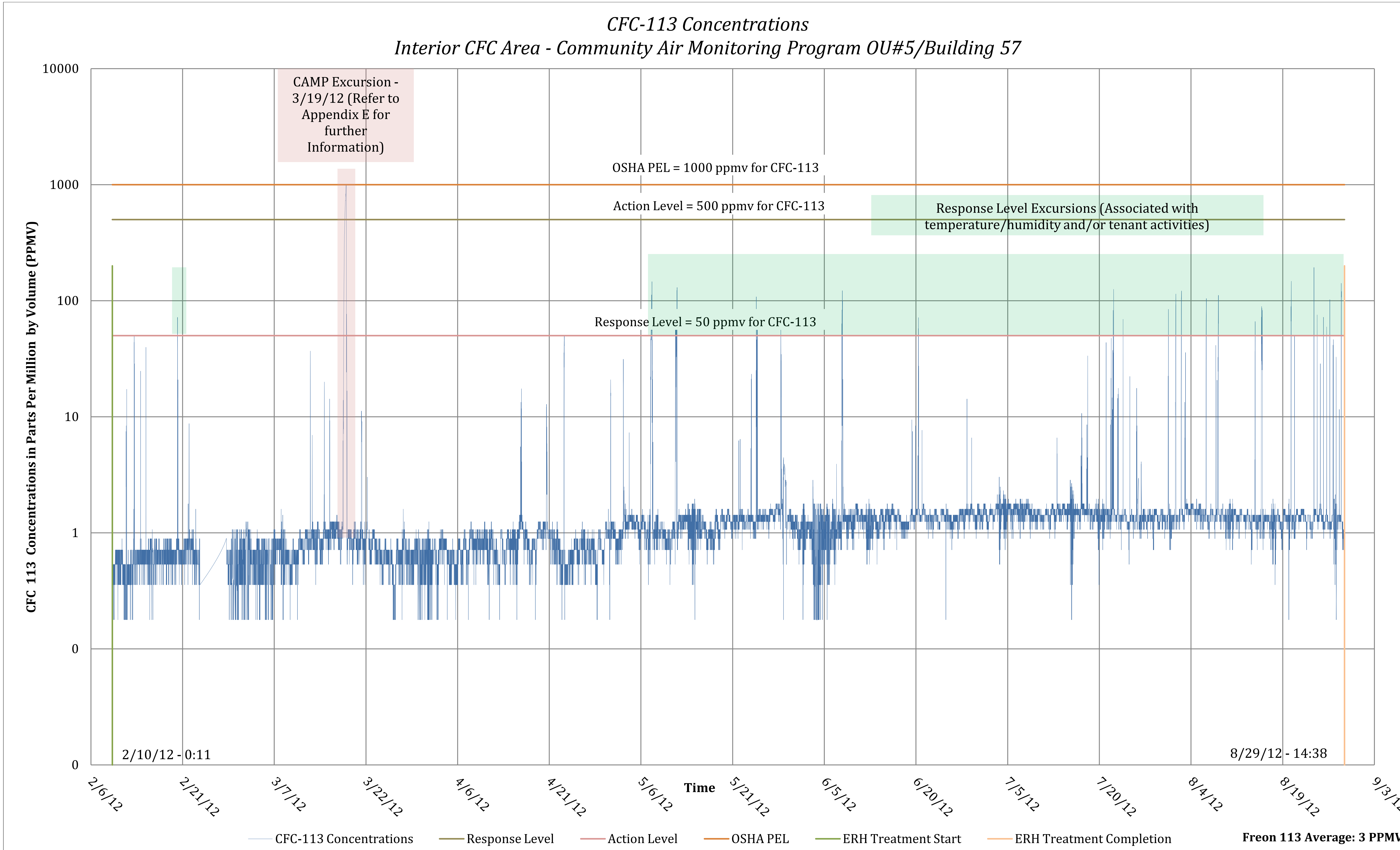
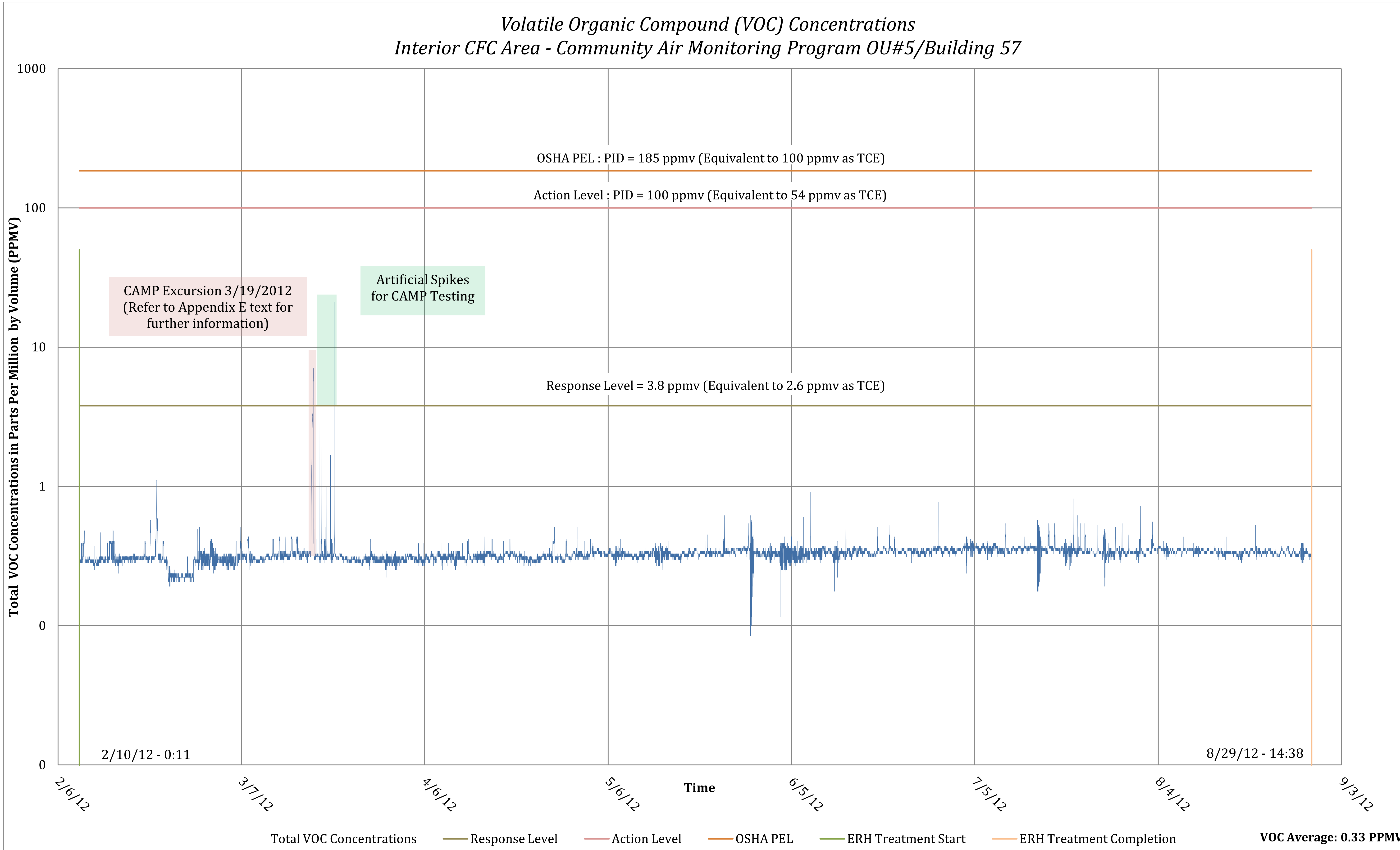
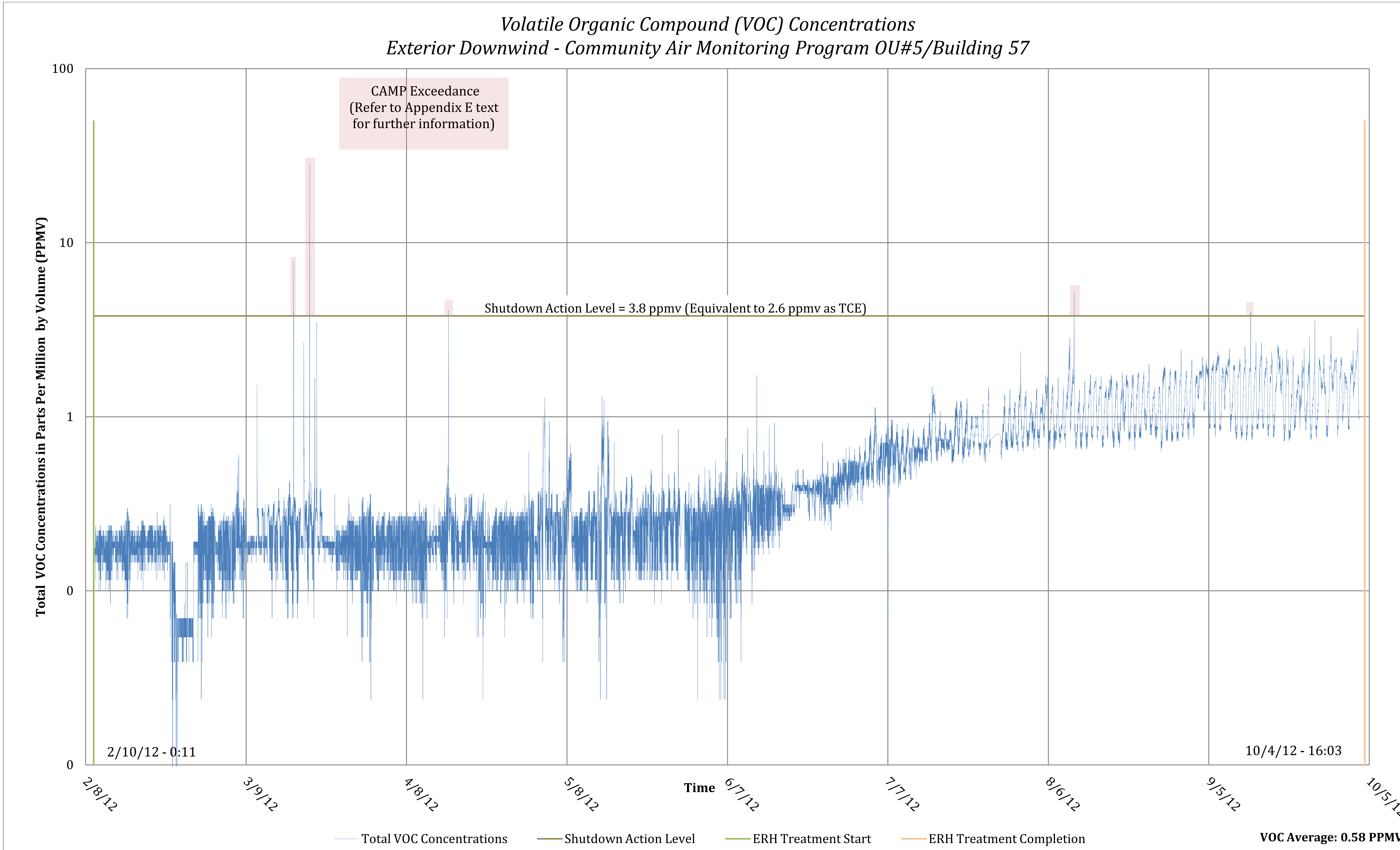

CFC-113 Concentrations
Interior CFC Area - Community Air Monitoring Program OU#5/Building 57
CAMP Excursion - 3/19/12 (Refer to Appendix E for further Information)
OSHA PEL = 1000 ppmv for CFC-113
Action Level = 500 ppmv for CFC-113
Response Level Excursions (Associated with temperature/humidity and/or tenant activities)
Response Level = 50 ppmv for CFC-113
CFC 113 Concentrations in Parts Per Million by Volume (PPMV)
10000
1000
100
10
1
0
0
2/10/12 - 0:11
8/29/12 - 14:38
2/6/12
2/21/12
3/7/12
3/22/12
4/6/12
4/21/12
5/6/12
5/21/12
6/5/12
6/20/12
7/5/12
7/20/12
8/4/12
8/19/12
9/3/12
Time
CFC-113 Concentrations
Response Level
Action Level
OSHA PEL
ERH Treatment Start
ERH Treatment Completion
Freon 113 Average: 3 PPMV

Figure E.2



Volatile Organic Compound (VOC) Concentrations
Interior CFC Area - Community Air Monitoring Program OU#5/Building 57
1000
100
10
1
0
0
Total VOC Concentrations in Parts Per Million by Volume (PPMV)
OSHA PEL : PID = 185 ppmv (Equivalent to 100 ppmv as TCE)
Action Level : PID = 100 ppmv (Equivalent to 54 ppmv as TCE)
CAMP Excursion 3/19/2012 (Refer to Appendix E text for further information)
Artificial Spikes for CAMP Testing
Response Level = 3.8 ppmv (Equivalent to 2.6 ppmv as TCE)
2/10/12 - 0:11
8/29/12 - 14:38
2/6/12
3/7/12
4/6/12
5/6/12
Time
6/5/12
7/5/12
8/4/12
9/3/12
Total VOC Concentrations
Response Level
Action Level
OSHA PEL
ERH Treatment Start
ERH Treatment Completion
VOC Average: 0.33 PPMV

Figure E.3



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APPENDIX F

TRACER MONITORING

APPENDIX F
TRACER MONITORING
OPERABLE UNIT #5/BUILDING 57 AREA, UNION AND ENDICOTT, NY

This appendix summarizes the tracer monitoring performed by Sanborn Head & Associates, Inc. (Sanborn Head) from October 10, 2011 through September 19, 2012 at Building 57 (Site) located in IBM Operable Unit # 5, Union and Endicott, NY. The work described herein was performed in accordance with the agency approved Interim Remedial Measure (IRM) Work Plan[1] and Proposed Sodium Bromide Tracer Test Letter[2]. The report and this appendix are subject to limitations as described in Appendix A.

The objective of tracer monitoring was to help refine the site conceptual model for groundwater transport and groundwater flux at the Site, and to support the observations of hydraulic confinement upon the implementation of in-situ thermal treatment with Electrical Resistive Heating (ERH) thermal treatment system.

Bromide (Br^-) concentrations, temperature and specific conductance were monitored on a regular basis with a field probe prior to and following injection at "sentinel" monitoring wells located down gradient of the Site. Exhibit 1 below indicates the tracer injection wells and sentinel monitoring wells for tracer monitoring during ERH implementation. Well locations are shown on Figure 2.

Exhibit 1: Injection and Sentinel Monitoring Wells

Tracer Injection / Monitoring Wells	Sentinel Monitoring Wells
EN-623	EN-651
EN-624	EN-694
EN-710	EN-696
	EN-698
	EN-700
	EN-702
	DEC-MW-034D

F.1 SCOPE OF WORK

The scope of work completed by Sanborn Head from October 10, 2011 through September 19, 2012 included:

- Collection of background readings from injection and sentinel monitoring wells, including samples collected for laboratory analysis of Br^-, completed on October 10, 2011;

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1 Sanborn, Head Engineering, P.C., June 24, 2011 "In Situ Thermal Treatment IRM Work Plan – Operable Unit #5, Building 57, Former IBM Facility, Union and Endicott, New York, AOC Index No. A7-0502-0104, NYSDEC Site No. 7-04-014".

2 Sanborn, Head & Associates, Inc., October 14, 2011 "Proposed Sodium Bromide Tracer Test – OU #5, Building 57, Order on Consent Index No. A7-0502-0104, Union and Endicott, New York".

- Obtaining an injection permit for sodium bromide (NaBr) from New York State Department of Environmental Conservation (NYSDEC), completed on October 24, 2011;

- Shutdown of the groundwater extraction wells EN-623, EN-624, and EN-710, completed on October 14, 2011;

- NaBr tracer injection completed on November 1, 2011 and collection of confirmatory samples for laboratory analysis of Br^-;

- Subsequent monitoring of injection monitoring wells (prior to implementation of ERH) and sentinel monitoring wells (prior to and throughout ERH implementation) using a Br^- ion specific Oaklon electrode probe and a YSI 556 MPS multi-meter for temperature and specific conductance monitoring; and

- Collection of confirmatory laboratory samples for Br^- from sentinel monitoring wells on a roughly bi-monthly basis during ERH operation.

Samples were collected using dedicated bailers. Approximately one well volume of water was purged prior to sample collection. Confirmatory groundwater samples were submitted for analysis of Br^- to Microseeps, Inc., of Pittsburgh, Pennsylvania using method SW-846-9056.

A summary of our observations based on the review of tracer monitoring data is presented in the IRM Completion Report text. Tracer monitoring data are summarized in Table F.1, All analytical data reports are provided in Appendix H (on disc).

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Table F.1
Tracer Monitoring Data
OU#5/Building 57 Area
Union and Endicott, NY

Monitoring Locations		Monitoring Parameters	10/10/2011	11/1/2011	11/2/2011	11/11 & 11/12/2011	12/8/2011	1/10/2012	2/9/2012	2/10/2012	2/17/2012	3/8/2012	3/13/2012	3/23/2012	3/29/2012	4/1/2012
Injection Wells (within ERH treatment areas)	EN-623	Temperature (°C)	17.75	16.43	18.16	13.41	13.72	11.48	14.21	-	-	-	-	-	-	-
		Specific Conductance (µs/cm)	1210	3144	1575	917	835	805	718	-	-	-	-	-	-	-
		Bromide Field (ppmv)	5.5	71	260	29	12	-	5.3	-	-	-	-	-	-	-
		Bromide Laboratory (ppmv)	<1.0	**160**	-	-	**1.1**	**0.68 J**	-	-	-	-	-	-	-	-
	EN-624	Temperature (°C)	16.19	15.83	16.01	14.03	11.35	9.49	12.72	-	-	-	-	-	-	-
		Specific Conductance (µs/cm)	441	3145	3177	1067	925	702	719	-	-	-	-	-	-	-
		Bromide Field (ppmv)	4.7	75	270	86	8.3	-	11	-	-	-	-	-	-	-
		Bromide Laboratory (ppmv)	-	**54**	-	**76**	**1.8**	**4**	-	-	-	-	-	-	-	-
	EN-710	Temperature (°C)	15.66	16.20	17.65	15.39	13.74	10.97	12.68	-	-	-	-	-	-	-
		Specific Conductance (µs/cm)	1106	3301	763	624	628	595	699	-	-	-	-	-	-	-
		Bromide Field (ppmv)	4.2	210	15	9.2	9.40	-	3.1	-	-	-	-	-	-	-
		Bromide Laboratory (ppmv)	-	**440**	-	**2.4**	**21**	**0.31 J**	-	-	-	-	-	-	-	-
Sentinel Monitoring Wells	DEC-MW-034D	Temperature (°C)	13.33	13.52	13.78	11.81	10.62	9.37	-	8.58	10.06	10.76	12.05	12.55	9.42	9.54
		Specific Conductance (µs/cm)	889	911	871	869	1002	901	-	970	1008	1162	1212	1143	1136	956
		Bromide Field (ppmv)	4.8	10	3.1	10	12	-	-	3.3	15	16	16	9.1	13	13
		Bromide Laboratory (ppmv)	-	-	-	-	<1.0	**0.21 J**	-	-	-	-	-	-	-	-
	EN-651	Temperature (°C)	16.72	15.32	15.49	14.31	11.58	10.37	-	9.23	9.01	9.97	11.65	11.26	9.04	-
		Specific Conductance (µs/cm)	460	473	466	646	603	545	-	551	544	649	660	626	589	-
		Bromide Field (ppmv)	3.9	3.8	1.6	19	7	-	-	1.7	7.9	16	11	6.5	17	-
		Bromide Laboratory (ppmv)	<1.0	-	-	-	<1.0	**0.097 J**	-	-	-	-	-	-	-	-
	EN-694	Temperature (°C)	16.95	14.83	14.3	14.93	9.89	10	-	9.84	9.41	-	12.28	10.7	9.26	9.34
		Specific Conductance (µs/cm)	344	76	79	304	333	382	-	769	547	-	1334	717	727	760
		Bromide Field (ppmv)	3.8	1.8	1.5	13	7.1	-	-	2.7	7.2	-	14	8.2	15	15
		Bromide Laboratory (ppmv)	<1.0	-	-	-	<1.0	**0.099 J**	-	-	-	-	-	-	-	-
	EN-696	Temperature (°C)	17.64	15.49	14.66	14.68	11.81	9.49	-	10.12	9.98	10.37	12.5	11.6	9.46	9.08
		Specific Conductance (µs/cm)	499	492	495	573	532	477	-	468	476	606	635	604	536	524
		Bromide Field (ppmv)	3.8	3.5	1.4	12	6.5	-	-	1.3	8.2	14	8.8	9.1	11	11
		Bromide Laboratory (ppmv)	-	-	-	-	<1.0	**0.15 J**	-	-	-	-	-	-	-	-
	EN-698	Temperature (°C)	16.46	15.14	15.11	14.6	12.39	10.07	-	10.7	10.61	11.55	13.89	12.66	9.95	9.65
		Specific Conductance (µs/cm)	821	818	797	813	779	581	-	580	547	738	746	727	673	623
		Bromide Field (ppmv)	4.6	3.8	3.3	12	6.7	-	-	1.9	10	11	11	3.8	17	17
		Bromide Laboratory (ppmv)	-	-	-	-	<1.0	**0.13 J**	-	-	-	-	-	-	-	-
	EN-700	Temperature (°C)	15.14	14.51	13.36	13.91	11.12	10.59	-	9.87	11.35	11.62	12.99	13.21	10.2	10.41
		Specific Conductance (µs/cm)	606	593	605	600	621	500	-	535	541	688	720	707	650	639
		Bromide Field (ppmv)	3.2	2.3	2.3	8.1	7.6	-	-	1.7	9.9	10	11	4.1	14	14
		Bromide Laboratory (ppmv)	-	-	-	-	<1.0	**0.61 J**	-	-	-	-	-	-	-	-
	EN-702	Temperature (°C)	16.58	13.87	13.2	12.96	9.96	10.29	-	8.9	10.89	9.88	11.77	11.05	9.45	9.73
		Specific Conductance (µs/cm)	511	520	531	1130	731	707	-	634	617	786	773	739	714	661
		Bromide Field (ppmv)	3.2	3.8	2.7	60	7.9	-	-	1.3	13	15	9.1	6.7	15	15
		Bromide Laboratory (ppmv)	-	-	-	-	<1.0	**0.084 J**	-	-	-	-	-	-	-	-

Indicates Background Data

Notes:
1) Bromide, temperature, and specific conductance monitoring was performed by Sanborn Head on the dates indicated using YSI 556 MPS and Oaklon Bromide field meters.
2) Sodium Bromide tracer injection was completed on November 1, 2011; the duration of Electrical Resistive Heating (ERH) Treatment was from February 10, 2012 to September 24, 2012.
3) Laboratory samples were analyzed for bromide by Microseeps, Inc. of Pittsburgh, PA by method SW-846-9056; Analytical laboratory reports are provided in Appendix H (on disc).
4) Bold value for laboratory measurement indicates the presence of the bromide at concentrations greater than or equal to the method detection limit.
5) "-" indicates the sample was not collected at the sample location.
6) "<" indicates a non-detect value.
7) "J" flag indicates an estimated value.

Table F.1
Tracer Monitoring Data
OU#5/Building 57 Area
Union and Endicott, NY

Monitoring Locations		Monitoring Parameters	4/6/2012	4/13/2012	4/20/2012	4/27/2012	5/2/2012	5/18/2012	5/25/2012	5/31/2012	6/15/2012	6/29/2012	7/26/2012	8/17/2012	8/28/2012	9/19/2012
Injection Wells (within ERH treatment areas)	EN-623	Temperature (°C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Specific Conductance (µs/cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Bromide Field (ppmv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Bromide Laboratory (ppmv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	EN-624	Temperature (°C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Specific Conductance (µs/cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Bromide Field (ppmv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Bromide Laboratory (ppmv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	EN-710	Temperature (°C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Specific Conductance (µs/cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Bromide Field (ppmv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Bromide Laboratory (ppmv)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sentinel Monitoring Wells	DEC-MW-034D	Temperature (°C)	10.51	11.95	13.63	8.64	12.24	11.12	11.37	11.78	12.08	12.24	15.03	13.72	15.78	13.7
		Specific Conductance (µs/cm)	954	895	1133	1040	1035	1031	1088	1041	998	962	839	1053	1061	920
		Bromide Field (ppmv)	17	17	79	5.2	3.5	-	-	-	-	-	11.9	-	2.6	-
		Bromide Laboratory (ppmv)	-	-	-	-	**0.18 J**	-	-	-	-	-	**0.2 J**	-	**0.17 J**	**0.19 J**
	EN-651	Temperature (°C)	10.51	12.14	14.57	8.58	13.05	10.79	11.8	14.49	13.49	-	16.19	16.34	18.12	16.02
		Specific Conductance (µs/cm)	517	641	618	588	538	475	525	483	438	-	397	424	420	372
		Bromide Field (ppmv)	16	13	40	4.3	2.4	-	-	-	-	-	6.5	-	2.3	-
		Bromide Laboratory (ppmv)	-	-	-	-	**0.088 J**	-	-	-	-	-	**0.065 J**	-	**0.07 J**	<1.0
	EN-694	Temperature (°C)	-	-	15.66	10.31	12.73	12.63	-	13.7	14.24	17.2	-	18.18	19.93	16.72
		Specific Conductance (µs/cm)	-	-	365	156	179	190	-	236	242	118	-	145	81	188
		Bromide Field (ppmv)	-	-	41	5.4	3.4	-	-	-	-	-	-	-	1.8	-
		Bromide Laboratory (ppmv)	-	-	-	-	<1.0	-	-	-	-	-	-	-	<1.0	<1.0
	EN-696	Temperature (°C)	10.79	11.56	14.89	9.51	11.56	12.01	12.88	12.57	13.13	13.31	16.84	16.74	19.21	16.41
		Specific Conductance (µs/cm)	461	406	530	435	485	489	544	534	500	468	420	406	474	410
		Bromide Field (ppmv)	16	16	35	2.4	2.6	-	-	-	-	-	4.8	-	1.6	-
		Bromide Laboratory (ppmv)	-	-	-	-	**0.11 J**	-	-	-	-	-	**0.087 J**	-	**0.063 J**	<1.0
	EN-698	Temperature (°C)	11.16	12.3	15.21	9.74	12.15	12.06	12.49	12.24	12.64	12.55	16.4	15.06	16.93	15.75
		Specific Conductance (µs/cm)	569	516	700	574	661	649	746	732	718	689	585	625	725	632
		Bromide Field (ppmv)	11	10	39	4.7	2.4	-	-	-	-	-	10.4	-	1.9	-
		Bromide Laboratory (ppmv)	-	-	-	-	**0.088 J**	-	-	-	-	-	**0.13 J**	-	**0.21 J**	<1.0
	EN-700	Temperature (°C)	11.52	13.06	14.53	9.79	12.66	12.39	12.15	12.46	12.58	12.54	15.7	14.72	16.5	15.02
		Specific Conductance (µs/cm)	597	548	748	721	688	657	735	729	695	633	553	544	658	591
		Bromide Field (ppmv)	12	15	39	5.8	3.4	-	-	-	-	-	9.8	-	1.6	-
		Bromide Laboratory (ppmv)	-	-	-	-	**0.11 J**	-	-	-	-	-	**0.07 J**	-	**0.078 J**	<1.0
	EN-702	Temperature (°C)	10.29	12.12	13.64	9.12	12.09	12.58	12.13	12.2	13.46	14.39	18.26	-	19.71	17.49
		Specific Conductance (µs/cm)	598	561	766	767	712	700	800	727	607	567	545	-	28	410
		Bromide Field (ppmv)	12	12	41	4.9	3.4	-	-	-	-	-	7.2	-	1.4	-
		Bromide Laboratory (ppmv)	-	-	-	-	**0.2 J**	-	-	-	-	-	**0.32 J**	-	<1.0	**0.19 J**

Notes:
1) Bromide, temperature, and specific conductance monitoring was performed by Sanborn Head on the dates indicated using YSI 556 MPS and Oaklon Bromide field meters.
2) Sodium Bromide tracer injection was completed on November 1, 2011; the duration of Electrical Resistive Heating (ERH) Treatment was from February 10, 2012 to September 24, 2012.
3) Laboratory samples were analyzed for bromide by Microseeps, Inc. of Pittsburgh, PA by method SW-846-9056; Analytical laboratory reports are provided in Appendix H (on disc).
4) Bold value for laboratory measurement indicates the presence of the bromide at concentrations greater than or equal to the method detection limit.
5) "-" indicates the sample was not collected at the sample location.
6) "<" indicates a non-detect value.
7) "J" flag indicates an estimated value.

APPENDIX G

QUALITY ASSURANCE/QUALITY CONTROL DATA REVIEW

APPENDIX G
QUALITY ASSURANCE/QUALITY CONTROL DATA REVIEW
OPERABLE UNIT #5/BUILDING 57 AREA, UNION AND ENDICOTT, NY

This appendix summarizes analysis of project-specific data quality objectives (DQOs) for data collected by Sanborn Head & Associates, Inc. (Sanborn Head) as part of the performance monitoring of Electrical Resistance Heating (ERH) thermal treatment system operation at Building 57 (Site) located in IBM Operable Unit # 5, Union and Endicott, NY.

DQOs were developed by Sanborn Head as outlined in the Quality Assurance Project Plan (QAPP) described in the Agency-approved Interim Remedial Measure (IRM) Work Plan[1]. Sanborn Head reviewed the results of quality assurance/quality control (QA/QC) sampling in comparison with DQOs for vapor and condensate performance monitoring. DQOs for soil confirmatory sampling were reviewed by a third party consultant to Sanborn Head, as outlined in sections below. This appendix is subject to limitations as described in Appendix A.

G.1 QA/QC REVIEW OF EXTRACTED VAPOR

Sanborn Head completed a review of analytical data reports for Summa® samples (Summa) collected from treatment process trains 1 and 2 (refer to Exhibit 1 below for treatment train sampling locations), as prescribed in the IRM Work Plan. A total of 206 Summa samples were collected by Sanborn Head and were analyzed by Air Toxics Ltd. (ATL) of Folsom, California for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method TO-15 (modified) using the gas chromatograph/mass spectrometer in the full scan mode. 10 duplicate samples were collected in accordance with the QA/QC criteria prescribed in the QAPP.

Sanborn Head completed a relative percent difference (RPD) analysis of detected concentrations of key VOCs (Trichloroethene [TCE], cis-1,2 dichloroethene [cDCE], 1,1,1 Trichloroethane [1,1,1 TCA], vinyl chloride [VC] and CFC-113) in field and duplicate sample pairs which are presented in Table G.1. The acceptance criteria of ≤ 30% was met for all air field/duplicate sample pairs with the exception of samples collected on February 20, 2012 from port C of Treatment Train 1. Larger percent differences were observed for cDCE and VC (38 and 50%, respectively) in this sample, with relatively low absolute VOC concentrations.

RPDs of key VOCs in field and Laboratory Duplicate (LD; i.e., aliquot of field sample analyzed with original sample) sample pairs are presented in Table G.2. All RPDs were within the acceptable range of ≤ 25 % as prescribed in the QAPP, except for CFC-113 concentrations from samples collected at port B of Treatment Train 1 on September 9, 2012, for which a low absolute concentration resulted in a higher RPD.

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[1] Sanborn, Head Engineering, P.C., June 24, 2011 "In situ Thermal Treatment IRM Work plan – OU #5, Building 57, Former IBM Facility, Endicott, New York, AOC Index No. A7-0502-0104, NYSDEC Site No. 7-04-014".

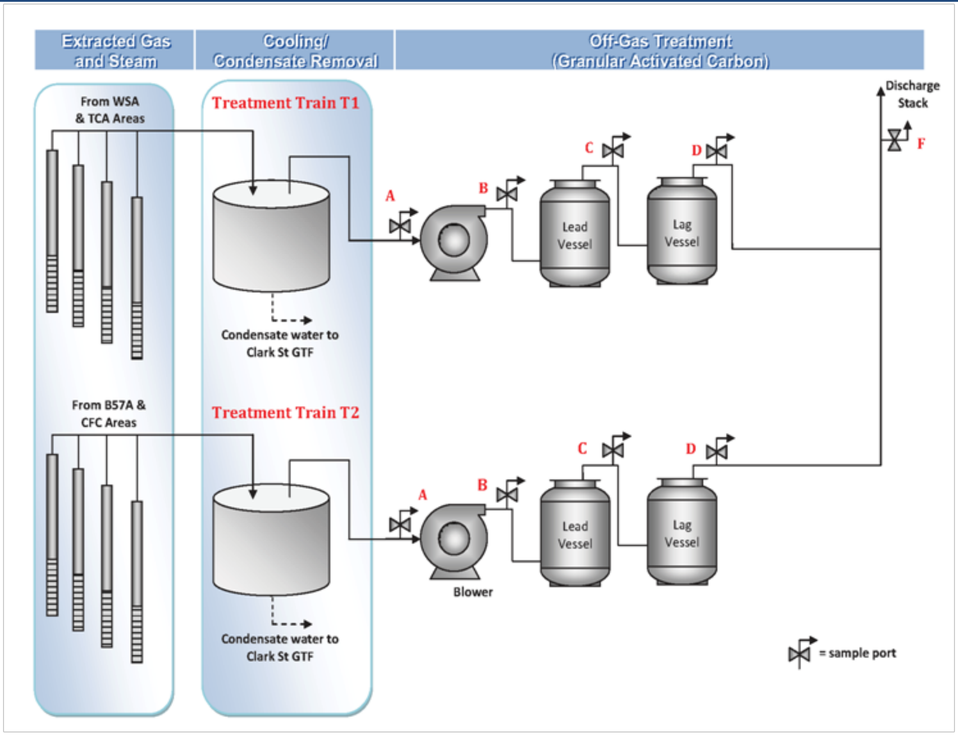

Exhibit 1 – Process Treatment Train Schematic

Additional QC performed by the laboratory included calculation of percent recoveries on Laboratory Control Samples (LCS) and Surrogates. Refer to analytical laboratory reports provided in Appendix H (on disc) for additional details regarding these analyses.

G.2 QA/QC REVIEW FOR CONDENSATE SAMPLE DATA

Sanborn Head collected 28 condensate samples from treatment process trains 1 & 2 in accordance with the IRM Work Plan. The samples were analyzed by Lancaster Laboratories (Lancaster) of Lancaster, Pennsylvania for VOCs by USEPA method 8260B. One duplicate Summa sample was collected as per the QA/QC criteria prescribed in the IRM Work Plan. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) samples were not collected, since these samples were used primarily for screening and readiness for treatment, rather than project and/or risk management decisions.

RPD analysis for key VOCs for the single field/duplicate sample pair collected on August 13, 2012 is shown in Table G.3. All key VOCs were non-detect at laboratory reporting limits in both the field and duplicate sample; therefore, RPD for this sample pair is considered within the acceptable range of ≤ 30%.

Analysis of laboratory trip blank results indicated that common lab contaminant methylene chloride (CH_2Cl_2) was detected in laboratory trip blank samples submitted with treatment process train samples between March 3 and April 22, 2012, at concentrations varying from 2.4 to 3.1 micrograms per liter (ug/L), as shown in Table G.4; however, CH_2Cl_2 was not detected in any treatment process train samples above laboratory reporting limits. A review conducted by Lancaster confirmed that the distilled water lots used to create the trip blanks did not contain measurable concentrations of CH_2Cl_2. Based on the information provided by Lancaster, CH_2Cl_2 is commonly used outside the laboratory setting in paint strippers, degreasers, and aerosol spray propellants. As there is no indication of the presence of similar sources within the treatment zones or storage areas for sampling containers, the source of $MeCL_2$ in laboratory trip blanks is unknown.

Additional QC was performed by the laboratory, and included calculation of percent recoveries on Laboratory Control Samples (LCS), LCS Duplicate (LCSD) and Surrogates. Refer to analytical laboratory reports provided in Appendix H (on disc) for additional details regarding these analyses.

G.3 CONFIRMATORY SOIL DATA VALIDATION AND USABILITY ASSESSMENT

Confirmatory soil sampling data reported by Lancaster for the project specific list of VOCs was validated by New Environmental Horizons, Inc. (NEH) of Arlington, Massachusetts in order to confirm usability for decision-making in support of IRM evaluation.

The data validation and usability assessment was performed according to procedures and protocols outlined in the QAPP. All data validation reports are provided in Appendix H (on disc).

Validation actions were taken based on instrument calibration and other quality control factors (accuracy, precision, sensitivity and reporting limits), and professional judgment was used to select between/among valid results in certain cases where more than one trial was reported for a given sample. All results were deemed valid and usable for project decisions. Refer to individual validation reports for additional information.

S:\CONDATA\2400s\2466.02\Source Files\2012 IRM Completion Report\Appendix G - Quality Assurance Project Plan\20121130 Appendix G Quality Assurance-Quality Control Data Review.docx

Table G.1
RPD - Summa Field/Duplicate Pairs
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Sample Location	Collection Date	TCE	cis 1,2 DCE	1,1,1 TCA	Vinyl Chloride	Freon 113
		Concentration in units of parts per million by volume (ppmv)				
T1C	2/20/2012	<0.053	12	<0.053	2.6	<0.053
DUP1		<0.017	5.4	<0.017	0.86	<0.017
RPD		-	38	-	50	-
T1A	3/19/2012	30	18	0.12	2.4	1.5
DUP2		34	20	0.15	2.8	1.1
RPD		6.3	5.3	11.1	7.7	15.4
T1B	4/9/2012	8.7	6.8	0.044	0.98	0.26
DUP3		11	8.3	0.052	1.2	0.32
RPD		11.7	9.9	8.3	10.1	10.3
T1B	4/25/2012	3.7	2.8	0.021	0.32	0.093
DUP4		3.6	2.7	0.021	0.3	0.12
RPD		1.4	1.8	0.0	3.2	12.7
T1B	5/10/2012	2.1	1.2	<0.011	0.21	0.024
DUP5		2.6	1.6	0.011	0.25	0.036
RPD		10.6	14.3	-	8.7	20.0
T1B	5/22/2012	3.2	2.2	0.017	0.33	0.085
DUP6		3.6	2.1	0.018	0.32	0.073
RPD		5.9	2.3	2.9	1.5	7.6
T1B	6/13/2012	2.3	1.3	0.0078	0.22	0.064
DUP7		2.3	1.4	0.007	0.21	0.051
RPD		0.0	3.7	5.4	2.3	11.3
T1B	7/10/2012	1.6	1	<0.057	0.21	0.024
DUP8		1.5	0.98	<0.043	0.2	0.024
RPD		3.2	1.0	-	2.4	0.0
T1B	8/13/2012	1	0.42	<0.027	0.14	0.006
DUP9		1.1	0.4	<0.058	0.15	0.0087
RPD		4.8	2.4	-	3.4	18.4
T1B	9/19/2012	0.3	0.14	<0.0013	0.066	0.0018
DUP10		0.3	0.13	<0.0013	0.069	0.0019
RPD		0.0	3.7	-	2.2	2.7

Shading indicates RPD greater than 30%.

Notes:

1. % RPD is the relative percent difference, calculated by the formula:

   | Result1 - Result2 | / ((Result1 + Result2) / 2) * 100

2. "–" indicates the RPD can not be calculated because one or both of the results are non-detect.

3. Refer to Appendix F of the ISTT IRM Work Plan for Site-Specific Quality Assurance Project Plan for further details on data quality and data usability.

Table G.2
RPD - Summa Field/Laboratory Duplicate Pairs
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Sample Location	Collection Date	TCE	cis 1,2 DCE	1,1,1 TCA	Vinyl Chloride	Freon 113
		Concentration in units of parts per million by volume (ppmv)				
T2C	2/9/2012	<0.00084	<0.00084	<0.00084	0.14	<0.00084
T2C Lab Dup		<0.0011	<0.0011	<0.0011	0.14	<0.0011
RPD		-	-	-	0	-
T2A	2/15/2012	0.52	<0.42	<0.42	<0.42	100
T2A Lab Dup		1.1	<0.83	<0.83	<0.83	100
RPD		35.8	-	-	-	0
T2C	2/20/2012	<0.15	<0.15	<0.15	<0.15	230
T2C Lab Dup		<0.15	<0.15	<0.15	<0.15	250
RPD		-	-	-	-	4.2
T1A	2/20/2012	50	30	0.51	3.3	8.1
T1A Lab Dup		50	30	0.48	3.5	8.1
RPD		0	0	3.0	2.9	0
Sample Port F	3/5/2012	<0.0052	<0.0052	<0.0052	1.5	<0.0052
Sample Port F DUP		<0.0052	<0.0052	<0.0052	1.5	0.0072
RPD		-	-	-	0	-
T2A	3/15/2012	0.71	0.54	<0.11	0.26	24
T2A Lab Dup		0.66	0.53	<0.11	0.23	24
RPD		3.6	0.9	-	6.1	0
T2A	3/19/2012	1.2	0.8	<0.49	<0.49	350
T2A Lab Dup		0.95	0.7	<0.49	<0.49	310
RPD		11.6	6.7	-	-	6.1
T2D	3/18/2012	0.59	0.14	0.0042	0.37	0.036
T2D Lab Dup		0.58	0.14	0.0037	0.34	0.035
RPD		0.9	0.0	6.3	4.2	1.4
DUP2	3/19/2012	34	20	0.15	2.8	1.1
DUP2 Lab Dup		33	19	0.14	2.7	1.1
RPD		1.5	2.6	3.4	1.8	0
T2C	3/27/2012	<0.52	<0.52	<0.52	<0.52	83
T2C Lab Dup		<0.42	<0.42	<0.42	<0.42	85
RPD		-	-	-	-	1.2
T1C	4/2/2012	5.1	12	0.077	1.5	0.60
T1C Lab Dup		4.9	12	0.084	1.4	0.59
RPD		2.0	0.0	4.3	3.4	0.8
T2B	4/5/2012	1.1	0.9	<0.58	<0.58	110
T2B Lab Dup		1.4	0.89	<0.80	<0.80	120
RPD		12.0	0.56	-	-	4.3
T1C	4/9/2012	<0.0058	0.4	<0.0058	1.7	<0.0058
T1C Lab Dup		<0.0035	0.41	<0.0035	1.7 E	0.0041
RPD		-	1.2	-	0	-

Table G.2
RPD - Summa Field/Laboratory Duplicate Pairs
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Sample Location	Collection Date	TCE	cis 1,2 DCE	1,1,1 TCA	Vinyl Chloride	Freon 113
		Concentration in units of parts per million by volume (ppmv)				
T2D	4/17/2012	0.062	0.024	<0.00092	<0.00092	0.0098
T2D Lab Dup		0.061	0.023	<0.0012	0.28	0.0098
RPD		0.8	2.1	-	-	0.0
T1D	4/25/2012	<0.0035	<0.0035	<0.0035	0.85	<0.0035
T1D Lab Dup		0.0028	<0.0018	<0.0018	0.85 E	<0.0018
RPD		-	-	-	0	-
Sample Port F	4/25/2012	<0.0021	<0.0021	<0.0021	0.49	0.46
Sample Port F Lab Dup		<0.0021	<0.0021	<0.0021	0.47	0.44
RPD		-	-	-	2.1	2.2
T1D	4/29/2012	0.028	0.010	<0.0062	1.1	<0.0062
T1D Lab Dup		0.024	0.0083	<0.0021	0.99 E	<0.0021
RPD		7.7	9.3	-	5.3	-
T2B	4/29/2012	2.1	0.73	<0.073	0.18	39
T2B Lab Dup		2.2	0.72	<0.073	0.18	39
RPD		2.3	0.7	-	0	0
T1B	5/10/2012	2.1	1.2	<0.011	0.21	0.024
T1B Lab Dup		2.1	1.3	<0.011	0.21	0.026
RPD		0	4.0	-	0	4.0
T2D	5/15/2012	<0.23	1.1	<0.23	<0.23	53
T2D Lab Dup		<0.23	1.1	<0.23	<0.23	53
RPD		-	0	-	-	0
T1D	5/22/2012	<0.018	5.6	<0.018	0.32	<0.018
T1D Lab Dup		<0.018	5.7	<0.018	0.33	<0.018
RPD		-	0.9	-	1.5	-
Sample Port F	5/22/2012	<0.012	4.3	<0.012	0.30	2.9
Sample Port F Lab Dup		<0.012	4.3	<0.012	0.31	2.9
RPD		-	0	-	1.6	0
T1C	5/31/2012	<0.006	1.5	<0.006	0.24	0.48
T1C Lab Dup		<0.0036	1.6 E	<0.0036	0.25	0.51
RPD		-	3.2	-	2.0	3.0
T1B	6/4/2012	3.2	1.8	0.015	0.24	0.06
T1B Lab Dup		3.2	1.8	0.014	0.25	0.06
RPD		0	0	3.4	2.0	0
T2B	6/4/2012	0.65	0.51	0.02	0.17	5.4
T2B Lab Dup		0.62	0.49	0.02	0.16	5.2
RPD		2.4	2.0	0	3.0	2
T1D	6/4/2012	<0.0084	2.2	<0.0084	0.22	<0.0084
T1D Lab Dup		<0.0084	2.3	<0.0084	0.24	<0.0084
RPD		-	2.2	-	4.3	-

Table G.2
RPD - Summa Field/Laboratory Duplicate Pairs
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Sample Location	Collection Date	TCE	cis 1,2 DCE	1,1,1 TCA	Vinyl Chloride	Freon 113
		Concentration in units of parts per million by volume (ppmv)				
T2D	6/13/2012	0.11	0.55	0.038	0.20	17
T2D Lab Dup		0.11	0.58	0.038	0.23	18
RPD		0	3	0	7.0	2.9
T1B	6/27/2012	1.8	0.95	<0.0092	0.095 J	0.036
T1B Lab Dup		1.8	0.93	<0.0092	0.099 J	0.032
RPD		0	1.1	-	2.1	5.9
T2D	7/3/2012	1.6	0.23	<0.054	0.17	15
T2D Lab Dup		1.6	0.25	<0.054	0.16	15
RPD		0	4.2	-	3.0	0
T2C	7/10/2012	0.38	0.31	<0.045	0.086	10
T2C Lab Dup		0.40	0.29	<0.045	0.092	11
RPD		2.6	3.3	-	3.4	4.8
T1B	7/18/2012	2.2	1.0	<0.0078	0.24	0.024
T1B Lab Dup		2.1	1.0	<0.0078	0.24	0.022
RPD		2.3	0.0	-	0.0	4.3
T1C	7/18/2012	<0.0051	1.5	<0.0051	0.24	0.055
T1C Lab Dup		<0.0051	1.4	<0.0051	0.23	0.054
RPD		-	3.4	-	2.1	0.92
T2C	7/29/2012	0.34	0.22	<0.018	0.075	5.4
T2C Lab Dup		0.36	0.21	<0.018	0.074	5.3
RPD		2.9	2.3	-	0.7	0.9
T2B	7/29/2012	0.21	0.17	<0.009	0.072	3.6
T2B Lab Dup		0.20	0.16	<0.012	0.069	3.7
RPD		2.4	3.0	-	2.1	1.4
T2B	8/13/2012	0.38	0.26	<0.0097	0.11	3.0
T2B Lab Dup		0.36	0.25	<0.0097	0.099	2.9
RPD		2.70	2.0	-	5.3	1.7
T1C	8/13/2012	0.01	0.57	<0.0023	0.17	0.21
T1C Lab Dup		0.011	0.58	<0.0023	0.17	0.20
RPD		8.3	0.9	-	0.0	2.4
T1D	8/28/2012	0.0023	0.67	<0.0018	0.12	<0.0018
T1D Lab Dup		0.0020	0.63	<0.0018	0.11	<0.0018
RPD		7.0	3.1	-	4.3	-
T1B	8/28/2012	0.67	0.22	<0.0027	0.099	0.0049
T1B Lab Dup		0.68	0.21	<0.0027	0.086	0.0033
RPD		0.74	2.3	-	7.0	19.5
T1B	9/9/2012	0.8	0.3	<0.0028	0.15	0.0033
T1B Lab Dup		0.83	0.33	<0.0028	0.16	0.0058
RPD		1.8	4.8	-	3.2	27.5

Table G.2
RPD - Summa Field/Laboratory Duplicate Pairs
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Sample Location	Collection Date	TCE	cis 1,2 DCE	1,1,1 TCA	Vinyl Chloride	Freon 113
		Concentration in units of parts per million by volume (ppmv)				
T2D	9/9/2012	0.3	0.23	0.0046	0.053	0.93
T2D Lab Dup		0.3	0.25	0.0044	0.053	0.92 E
RPD		0	4.2	2.2	0	0.5
T2B	9/19/2012	0.17	0.21	0.0033	0.071	0.014
T2B Lab Dup		0.16	0.2	0.0029	0.066	0.013
RPD		3.0	2.4	-	3.6	3.7
T2D	9/19/2012	0.18	0.14	0.0022	0.070	0.26
T2D Lab Dup		0.19	0.14	0.0024	0.067	0.26
RPD		3	0	4	2	0

Shading indicates RPD greater than 25%.

Notes:

1. % RPD is the relative percent difference, calculated by the formula:

   | Result1 - Result2 | / ((Result1 + Result2) / 2) * 100

2. "–" indicates the RPD can not be calculated because one or both of the results are non-detect.

3. Refer to Appendix F of the ISTT IRM Work Plan for Site-Specific Quality Assurance Project Plan for further details on data quality and data usability.

Table G.3
RPD - Condensate Field/Duplicate Samples
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Sample Location	Collection Date	TCE	cis 1,2 DCE	1,1,1 TCA	Vinyl Chloride	Freon 113
		Concentration in units of micrograms per liter (µg/L)				
T1/Cond	8/13/2012	<0.5	<0.5	<0.5	<0.5	<0.5
DUP1		<0.5	<0.5	<0.5	<0.5	<0.5
RPD		-	-	-	-	-

Notes:

1. % RPD is the relative percent difference, calculated by the formula:

   | Result1 - Result2 | / ((Result1 + Result2) / 2) * 100

2. "–" indicates the RPD can not be calculated because one or both of the results are non-detect.

3. Refer to Appendix F of the ISTT IRM Work Plan for Site-Specific Quality Assurance Project Plan for further details on data quality and data usability.

Table G.4
Detected Concentrations of Methylene Chloride in Trip Blanks - Condensate Samples
Operable Unit # 5/Building 57 Area
Union and Endicott, NY

Compound	Group Number	Collection Date	T1/COND	T2/COND	Trip Blank
			Concentration in units of micrograms per liter (µg/L)		
Methylene Chloride (CH_2Cl_2)	1293156	3/5/2012	<0.5	NS	3.0
	1298243	3/27/2012	<0.5	<0.5	NS
	1301107	4/9/2012	<0.5	<0.5	3.0
	1304871	4/25/2012	<0.5	<0.5	2.5
	1308059	5/9/2012	<0.5	<0.5	2.4
	1311002	5/22/2012	<0.5	<0.5	3.1
	1313463	6/4/2012	<0.5	<0.5	<0.5
	1318958	6/27/2012	<0.5	<0.5	<0.5
	1321276	7/10/2012	<0.5	<0.5	<0.5
	1324908	7/26/2012	<0.5	<0.5	<0.5
	1324908	8/13/2012	<0.5	<0.5	<0.5
	1331603	8/27/2012	<0.5	<0.5	<0.5
	1335989	9/11/2012	<0.5	<0.5	
	1336981	9/19/2012	<0.5	<0.5	0.3 J

Trip Blank was not analyzed by laboratory due to instrumentation issue
"J" indicates an estimated value
NS: Indicates Not Submitted for Analysis

APPENDIX H

ANALYTICAL LABORATORY REPORTS
(PROVIDED ON DISC)