AL Tech Specialty Steel Corporation
Lucas Avenue Plant (OU-1) Site
Chautauqua County
Dunkirk, New York

SITE MANAGEMENT PLAN
NYSDEC Site Number: 907022

July 2019

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Environmental Remediation
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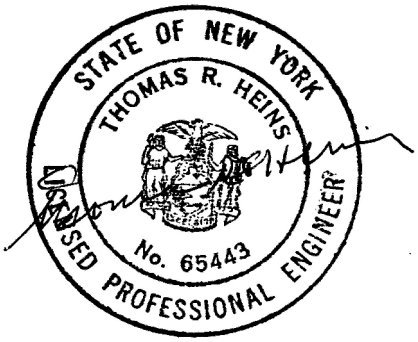
Revisions to Final Approved Site Management Plan

Revision No.	Date Submitted	Summary of Revisions	NYSDEC Approval Date

Certification Statement

I, Thomas Heins, certify that I am currently a NYS-registered professional engineer as in defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



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6/18/19 Date

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List of Abbreviations and Acronyms

COC	Certificate of Completion
CO_2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
EPA	United States Environmental Protection Agency
EWP	Excavation Work Plan
HASP	Health and Safety Plan
IC	Institutional Control
ICM	Interim Corrective Measure
LAP	Lucas Avenue Plant
mg/kg	milligrams per kilogram
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
ppm	Parts per Million
PRR	Periodic Review Report
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RSO	Remedial System Optimization
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
TCE	Trichloroethene
VOC	Volatile Organic Compound

Executive Summary

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification	**907022 AL Tech Specialty Steel Corporation Site**
Institutional Controls:	1. The property may be used for commercial use
Engineering Controls:	1. Cover system
Inspections	**Frequency**
1. Cover inspection	Annually
Monitoring	
1. Groundwater Monitoring	Annually
Maintenance	
1. Swale Maintenance	As needed
Reporting	
1. Groundwater Sampling Data	Annually
2. Periodic Review Report	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1 Introduction

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the AL Tech Specialty Steel Corporation Lucas Avenue Plant (LAP) Site located in Dunkirk, New York (hereinafter referred to as the "Site") (see Figure 1-1). The Site is currently in the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program (Site No. 907022), which is administered by the New York State Department of Environmental Conservation (NYSDEC).

The AL Tech Site is owned by RealCo, Inc. (RealCo), which entered into an Order on Consent in 2013 with the NYSDEC. A figure showing the site location and boundaries of this site is provided in Figure 2-1. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement provided in Appendix A.

Environmental Service Group, Inc., entered into a Remedial Action Contract (No. D009632) with the NYSDEC in July 2016 to remediate the site. The property was remediated to a level sufficient for commercial use. After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional controls and engineering controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Chautauqua County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site.

This SMP was prepared to manage remaining contamination at the site until the Environmental Easement is extinguished in accordance with Environmental Conservation Law Article 71, Title 36. This plan has been approved by the NYSDEC. Compliance with this plan is required by the State and any affected local governments. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a

violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC);

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6 NYCRR Part 375 and the Order on Consent (Index No. A9-0393-9907; Site No. 907022) for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in Appendix B of this SMP.

This SMP was prepared by Ecology and Environment Engineering and Geology, P.C., on behalf of NYSDEC, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010 (NYSDEC 2010), and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Contact information for NYSDEC's project manager is provided in Table 1-1. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER-10 for the following reasons:

- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake, that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Notice within 48-hours of any damage or defect to the foundation, structures, or EC that reduces or has the potential to reduce the effectiveness of an EC, and any action to be taken to mitigate the damage or defect.
- 7-day advance notice of any field activity associated with the remedial program.

- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.
- 60-day advance notice of any proposed changes in site use that are required under the terms of the Order on Consent, 6 NYCRR Part 375, and/or Environmental Conservation Law.

Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.
- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Order on Consent, and all approved work plans and reports, including this SMP.

Table 1-1 includes contact information for the above notification(s). The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B.

Table 1-1 Notifications*

Name	Contact Information
Benjamin Rung NYSDEC Project Manager	(518) 402-9826 benjamin.rung@dec.ny.gov
Chad Staniszewski NYSDEC Regional HW Remediation Engineer	(716) 851-7220 chad.staniszewski@dec.ny.gov
Kelly Lewandowski NYSDEC Site Control	(518) 402-9569 kelly.lewandowski@dec.ny.gov

* Note: Contacts are subject to change and will be updated as necessary.

Figure 1-1

Site Location and Vicinity Map

Dunkirk, New York

Stream/River (USGS NHD)

Railroad

Project Site

0 150 300 600

Feet

Sources: Ecology and Environment, Inc. 2019; USGS 2018; NYSDEC 2018

2 Summary of Previous Investigations and Remedial Actions

2.1 Site Location and Description

The site is located at 100 – 190 West Lucas Avenue in the City of Dunkirk, County of Chautauqua, New York, approximately 0.5 miles west of Central Avenue. It is identified as tax map parcel number 96.06-3-1. The site is bounded by West Lucas Avenue to the north, an active railroad right-of-way owned and maintained by Norfolk Southern Corporation to the south, the City of Dunkirk Department of Public Works facility to the east, and Brigham Road to the west (see Figure 1-1). The boundaries of the site are fully described in the Environmental Easement and land survey map in Appendix A.

The LAP was a one-story, approximately 178,000-square-foot former steel manufacturing facility. The LAP was formerly a part of the larger adjoining 90-acre AL Tech Specialty Steel Site to the south of the site, which is not included as part of the remedial project. The original LAP facility was constructed in 1909, with additions constructed in 1920, 1936, 1940, and 1968. The LAP was primarily used for cold drawing of stainless steel to produce wire. Related activities included lime coating, pickling, bright annealing, and copper and lead plating.

In 1992, AL Tech submitted a Resource Conservation and Recovery Act (RCRA) Remedial Facility Assessment in accordance with the RCRA Corrective Action Program. Information obtained during this assessment identified 24 Solid Waste Management Units and 11 Areas of Concern throughout the larger AL Tech Specialty Steel Site, including the LAP. From 1995 to 1997, AL Tech conducted a RCRA Facilities Investigation (RFI), which documented waste disposal in areas of the LAP (Environmental Strategies Corporation 1998).

Manufacturing activities at the LAP ceased in 1997, and the vacant building fell into disrepair. After AL Tech filed for bankruptcy in 1999, RealCo assumed title of the LAP site. RealCo was responsible for management of an environmental remediation trust to implement RCRA corrective actions at the LAP.

In February 2014, a letter of condemnation was issued for the building by the City of Dunkirk Office of the Housing, Building and Zoning Officer (Zurawski 2014).

2.1.1 Operable Units

As described further in Section 2.2, the AL Tech site is divided into three operable units (OUs) (see Figure 2-1). OU-1 is the subject of the Record of Decision (ROD; see Appendix E) and this SMP.

- OU-1: Lucas Avenue Plant – This includes the building and the property owned by RealCo and situated north of the railway parallel to Lucas Avenue.
- OU-2: Willowbrook Pond – This includes land owned by RealCo; the Brigham Road Plant owned by Dunkirk Acquisition LLC; and the tributary of Crooked Brook located west of the site and owned by various entities.
- OU-3: The AL Tech Plant – This includes all the property in the main facility area owned by Dunkirk Acquisition LLC.

2.2 Physical Setting

2.2.1 Land Use

OU-1 is comprised of one vacant one-story LAP building, as previously described in Section 2.1. A residential neighborhood surrounds the LAP and a public school is located on the north side of Lucas Avenue.

2.2.2 Geology

The site is located on broad glacio-lacustrine sedimentary deposits. Soils are tight silty, clayey soils consisting of urban fill over silt loams of the Niagara silt loam complex.

Site specific boring logs are provided in Appendix C, where available.

2.2.3 Hydrogeology

Groundwater is about 10 feet below the ground surface and is limited due to the tight nature of the bedrock and soils; however, localized ponding can occur. Any groundwater present flows generally to the north toward Lake Erie but is strongly influenced by topographic features and man-made pathways. Bedrock is the Upper Devonian Shales of the Canadaway Group.

Groundwater monitoring well construction logs are provided in Appendix D, where available.

2.3 Investigation and Remedial History

The AL Tech Specialty Steel site and LAP have been the subject of numerous investigations, studies, and remedial activities from 1998 through the present. The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site.

Figure 2-1

Operable Unit Map

Dunkirk, New York

Stream/River (USGS NHD)
Railroad
Al Tech Specialty Steel Site (OU-3)
Lucas Avenue Plant Site

N
W E
S

0 150 300 600
Feet

Sources: Ecology and Environment, Inc. 2019; USGS 2018; NYSDEC 2018

1. RCRA Facility Assessment Report (McLaren/Hart Environmental Engineering Corporation, December 1992).
2. Phase 1 RCRA Facilities Investigation Report, AL Tech Specialty Steel Corporation, Dunkirk, New York, Facility (Environmental Strategies Corporation, October 1998).
3. Sampling and Analysis Plan, Lucas Avenue Plant Decontamination and Demolition (Benchmark Environmental Engineering & Science, January 2001).
4. ICM Work Plan for Decontamination and Demolition of Lucas Avenue Plant (Benchmark Environmental Engineering & Science, April 2001).
5. Investigation Report for LAP West Soil ICM, Lucas Avenue Plant, Dunkirk, New York (Benchmark Environmental Engineering & Science, June 2001).
6. Phase II RCRA Facility Investigation and ICM Report, Former AL Tech Specialty Steel Corporation, Dunkirk, New York (Benchmark Environmental Engineering & Science, October 2003).
7. Former AL Tech Specialty Steel Corporation Facility Supplemental Phase II RFI Field Activities and Findings York (Benchmark Environmental Engineering & Science, August 2004).
8. Corrective Measures Study/Feasibility Study York (Benchmark Environmental Engineering & Science, September 2006).
9. IRMs for AL Tech Specialty Steel Site, Site No. 9-07-022, City of Dunkirk, Chautauqua County, Volumes I-III Summary Report (Ecology and Environment Engineering, P.C., October 2007).
10. Record of Decision, AL Tech Specialty Steel Corporation, Operable Unit Number 01, Lucas Avenue Plant Remedial Program (NYSDEC November 2012).

Based upon investigations completed to date, the primary contaminants of concern at the LAP site are arsenic, barium, cadmium, chromium, lead, trichloroethene (TCE), and polychlorinated biphenyls (PCBs).

2.4 Remedial Action Objectives

The ROD issued for the Site was signed by the NYSDEC and accepted by the New York State Department of Health (NYSDOH) on November 28, 2012, and is provided in Appendix E. NYSDEC selected off-site disposal of contaminated soils as the final remedy.

The Remedial Action Objectives (RAOs) for the Site as listed in the ROD dated November 2012 are as follows:

Groundwater RAOs for Public Health Protection

- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

Groundwater RAOs for Environmental Protection

- Remove the source of groundwater or surface water contamination.

Soil RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure to contaminants volatilizing from contaminants in soil.

Soil RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

2.5 Remaining Contamination

2.5.1 Soil

This section describes the existing soil conditions, both on-site and in the immediate vicinity. Table 2-1 and Figures 2-2A and 2-2B summarize the results of all soil samples collected that met or exceeded the Commercial Use Soil Cleanup Objectives (SCOs) at the site after completion of the remedial action. The soil contaminant classes that remain above SCOs include the following: metals (arsenic, chromium, barium, lead, and cadmium); volatile organic compounds (VOCs, i.e., TCE; and PCBs. Table 2-1 identifies the remaining contamination at the site, the specific area within the site and the sample ID,.

The analytical results exceeded the 16 mg/kg SCO for arsenic in 17 out of 124 documentation samples (approximately 14 percent), with a maximum value of 37 parts per million (ppm) in a sample collected 6 feet below grade on the floor in Area D. The soil in this area was determined to be at a depth where human contact with the soil was unlikely to occur.

The analytical results exceeded the 400 mg/kg SCO for barium in 4 out of 124 documentation samples (approximately 3 percent), with a maximum value of 3,300 ppm in a sample collected 2 feet below grade along a side wall in Area G and 3,300 mg/kg in a sample collected 6 inches below grade in Area E. These samples were collected along Lucas Avenue; therefore, no further excavation was completed.

The analytical results exceeded the 9.3 mg/kg SCO for cadmium in 7 out of 124 documentation samples (approximately 6 percent), with a maximum value of 84.8 ppm in a sample collected 8 feet below grade along a side wall in Area N. This sample was collected along the property boundary with Norfolk Southern Corporation; therefore, no further excavation was completed.

The analytical results exceeded the 1,500 mg/kg SCO for chromium in 14 out of 124 documentation samples (approximately 11 percent), with a maximum value of 8,820 ppm in a sample collected 6 feet below grade on the floor in Area C. The soil in this area was determined to be at a depth where human contact with the soil was unlikely to occur.

The analytical results exceeded the 1,000 mg/kg SCO for lead in 10 out of 124 documentation samples (approximately 8 percent), with a maximum value of 10,400 ppm in a sample collected 0.5 feet below grade along a side wall in Area E. The soil in this area was removed during excavation activities in Area C, which was contiguous with Area E.

The analytical results exceeded the 1.0 mg/kg SCO for PCBs in 7 out of 124 documentation samples (approximately 6 percent), with a maximum value of 60.7 ppm in a sample collected 2 feet below grade along a side wall in Area J. The soil in this area was removed during excavation activities in Area H, which was contiguous with Area J.

The analytical results exceeded the 200 mg/kg SCOs for TCE in 2 out of 124 documentation samples (approximately 2 percent), with a maximum value of 1,930 ppm in a sample collected along a side wall in Area N. This sample was collected along the property boundary with Norfolk Southern Corporation; therefore, no further excavation was completed.

Table 2-1 Former AL Tech Specialty Steel Site OU-1 Remedial Action Project Excavated Soil Sample Log

Area	Sample ID [2]	Analyte in mg/kg [1]						
		As	Cr [3]	Pb	Ba	PCBs	Cd	TCE
A	**A-F-2**	9.8	222.0	207.0	149.0	0.1	0.6	**ND**
A	**A-F-3**	7.2	24.4	22.1	140.0	**ND**	0.4	**ND**
A	**A-W-2**	10.6	519.0	126.0	149.0	**ND**	0.4	**ND**
A	**A-F-1-2**	8.3	301.0	44.7	127.0	0.5	ND	**ND**
A	**A-W-3-2**	8.7	415.0	57.6	54.2	**ND**	ND	**ND**
A	**A-W-1-4**	13.3	**1,770.0**	310.0	106.0	0.2	0.2	**ND**
A	**A-F-4-2**	8.6	199.0	164.0	125.0	0.1	4.6	**ND**
B	**B-F-1-2**	8.6	131.0	138.0	119.0	**ND**	ND	**ND**
C	**C-W-1**	7.3	158.0	20.4	34.5	**ND**	0.4	**ND**
C	**C-W-2**	9.1	669.0	488.3	59.3	**ND**	0.8	**ND**
C	**C-W-3**	7.4	218.0	30.2	51.5	**ND**	0.6	**ND**
C	**C-W-4**	7.9	147.0	49.3	40.5	**ND**	0.6	**ND**
C	**C-W-5**	**16.6**	330.0	56.9	128.0	**ND**	1.4	**ND**
C	**C-W-6**	8.3	421.0	105.0	72.7	**ND**	1.1	**ND**
C	**C-F-10**	12.6	534.0	262.0	136.0	**ND**	1.7	**ND**
C	**C-F-11**	11.7	362.0	123.0	130.0	**ND**	1.0	**ND**
C	**C-F-14**	10.5	197.0	128.0	106.0	**ND**	0.9	**ND**
C	**C-F-2-2**	9.0	9.0	11.5	44.0	**ND**	0.2	**ND**

Table 2-1 Former AL Tech Specialty Steel Site OU-1 Remedial Action Project Excavated Soil Sample Log

Area	Sample ID [2]	Analyte in mg/kg [1]						
		As	Cr [3]	Pb	Ba	PCBs	Cd	TCE
C	C-F-3-2	9.9	1,170.0	397.0	89.2	ND	0.6	ND
C	C-F-4-2	9.9	26.7	132.0	79.8	ND	0.3	ND
C	C-F-6-2	35.9	8,820.0	2,550.0	86.4	ND	4.3	ND
C	C-F-7-2	7.9	557.0	438.0	115.0	ND	0.4	ND
C	C-F-8-2	18.1	3,990.0	473.0	71.4	ND	0.8	ND
C	C-F-9-2	8.0	53.7	28.8	115.0	ND	ND	ND
C	C-F-12-2	9.2	79.1	60.6	106.0	ND	0.7	ND
C	C-F-13-2	6.9	237.0	34.2	119.0	ND	ND	ND
C	C-F-6-3	18.6	2,380.0	724.0	121.0	ND	2.1	ND
C	C-F-8-3	20.3	74.0	78.5	147.0	ND	3.4	ND
C	C-F-5-4	5.5	16.2	15.9	91.6	ND	ND	0.002
D	D-F-1	13.0	1,250.0	1,350.0	135.0	ND	1.7	ND
D	D-F-2	22.1	2,790.0	1,930.0	185.0	ND	3.2	ND
D	D-F-3	37.0	1,770.0	2,420.0	170.0	ND	13.4	ND
D	D-F-4	17.9	2,470.0	985.0	121.0	ND	3.2	ND
D	D-W-1	17.7	1,790.0	889.0	152.0	ND	2.6	ND
D	D-W-5	7.2	23.9	11.9	38.6	ND	ND	ND
D	D-F-8	21.8	3,610.0	457.0	183.0	ND	3.0	ND
D	D-F-9	10.5	189.0	152.0	68.3	0.0	ND	ND
D	D-F-11	11.7	1,200.0	1,690.0	147.0	ND	0.5	ND
D	D-F-5-3	22.0	1,820.0	9,410.0	179.0	ND	2.8	ND
E	E-F-1	12.9	14.4	14.8	72.8	ND	0.1	ND
E	E-F-2	5.7	28.0	56.9	82.3	ND	0.5	ND
E	E-F-3	11.8	14.2	20.1	66.3	ND	0.2	ND
E	E-W-2	23.9	3,740.0	10,400.0	169.0	ND	0.6	ND
E	E-W-3	3.3	148.0	48.4	235.0	ND	ND	ND
E	E-W-4	8.9	51.2	33.5	83.2	ND	0.2	ND
E	E-W-1-4	21.5	1,650.0	8,460.0	3,300.0	9.9	9.5	ND
E	E-W-1-4	28.7	1,960.0	2,650.0	270.0	ND	12.0	ND
E	E-F-4-2	12.9	359.0	315.0	144.0	ND	0.9	ND
E	E-W-6-3	7.5	323.0	154.0	55.0	0.0	0.3	ND
F	F-F-1	5.6	67.7	237.0	288.0	ND	0.7	ND
F	F-F-2	5.1	66.9	125.0	160.0	ND	0.6	ND
F	F-F-3	4.9	58.4	70.4	156.0	ND	0.4	ND
F	F-W-3	6.3	217.0	435.0	219.0	ND	0.4	ND
F	F-W-1-2	10.1	31.9	27.4	105.0	ND	0.2	ND
F	F-W-2-2	6.2	500.0	543.0	142.0	ND	0.6	ND
G	G-1-SW	6.2	433.0	128.0	288.0	ND	0.2	ND
G	G-3-SW	9.5	4,130.0	1,100.0	3,300.0	ND	0.8	ND
G	G-1-F-2	5.5	280.0	33.2	116.0	ND	0.7	ND
G	G-2-F-2	5.7	33.1	11.6	99.3	ND	0.7	ND
G	G-W-2-2	11.3	16.6	18.5	95.4	ND	0.8	ND

Table 2-1 Former AL Tech Specialty Steel Site OU-1 Remedial Action Project Excavated Soil Sample Log

Area	Sample ID [2]	Analyte in mg/kg [1]						
		As	Cr [3]	Pb	Ba	PCBs	Cd	TCE
G	G-F-3-3	9.1	19.4	12.4	90.3	ND	0.3	ND
H	H-1-SW-1	7.4	337.0	151.0	155.0	ND	0.3	ND
H	H-2-SW-1	6.6	167.0	308.0	112.0	ND	0.8	ND
H	H-1-F-2	3.8	64.0	33.0	157.0	ND	0.2	ND
H	H-2-F-2	4.5	161.0	68.7	**418.0**	ND	0.2	
H	H-3-F-2	5.9	181.0	71.0	229.0	ND	ND	ND
H	H-4-F-2	5.7	133.0	44.7	117.0	ND	0.2	ND
H	H-5-F-2	6.9	704.0	127.0	185.0	ND	0.4	ND
H	H-6-F-2	7.1	124.0	44.3	119.0	ND	0.2	ND
I	I-F-1-2	2.0	39.0	12.2	66.8	ND	0.2	ND
J	J-F-1	3.8	23.7	10.7	98.6	ND	0.4	ND
J	J-W-1	7.1	342.0	119.0	118.0	**60.7**	0.6	ND
J	J-W-2	7.0	324.0	62.0	97.0	**12.0**	0.5	ND
K	K-F-1	7.2	464.0	240.0	228.0	0.2	ND	ND
K	K-F-2	4.5	112.0	759.0	119.0	ND	0.4	ND
K	K-F-3	3.9	408.0	135.0	118.0	ND	0.3	ND
K	K-F-4	4.1	258.0	69.0	111.0	ND	0.3	ND
K	K-F-5	5.3	392.0	772.0	148.0	ND	0.4	ND
K	K-F-6	6.2	344.0	150.0	154.0	0.0	ND	ND
K	K-F-7	5.3	161.0	679.0	162.0	ND	0.4	ND
K	K-W-1	3.9	261.0	185.0	187.0	ND	0.5	ND
K	K-W-2	5.5	1,280.0	209.0	252.0	ND	0.5	ND
K	K-W-3	5.5	990.0	207.0	163.0	ND	0.4	ND
K	K-W-4	6.0	34.8	67.8	120.0	ND	0.4	ND
L	L-F-1	8.3	127.0	563.0	111.0	**7.4**	0.6	ND
L	L-F-3	10.0	26.4	125.0	135.0	ND	0.6	ND
L	L-F-4	5.6	146.0	486.0	**434.0**	**24.1**	0.5	ND
L	L-F-7	7.8	116.0	494.0	134.0	ND	0.8	ND
L	L-F-8	6.3	12.3	9.4	134.0	ND	0.5	ND
L	L-F-9	6.4	88.2	457.0	220.0	ND	0.6	ND
L	L-F-10	14.0	788.0	794.0	226.0	**40.5**	0.9	ND
L	L-F-11	4.4	12.3	15.4	90.6	ND	0.4	ND
L	L-F-12	3.1	11.0	38.9	121.0	ND	0.3	ND
L	L-W-1	7.6	14.0	31.0	85.0	ND	0.5	ND
L	L-W-2	5.6	14.8	11.9	105.0	ND	0.5	ND
L	L-W-4	6.0	21.8	10.9	273.0	ND	0.5	ND
L	L-W-7	5.8	15.0	25.5	78.4	ND	0.5	ND
L	L-F-3-1	7.5	14.9	16.0	ND	ND	0.8	ND
L	L-F-5-2	7.4	117.0	316.0	143.0	ND	0.7	ND
L	L-F-6-2	4.0	20.3	13.2	76.6	ND	0.4	ND
L	L-W-6-2	6.0	108.0	210.0	148.0	ND	0.6	ND
L	L-W-5-3	10.8	28.7	16.6	113.0	ND	ND	ND

Table 2-1 Former AL Tech Specialty Steel Site OU-1 Remedial Action Project Excavated Soil Sample Log

Area	Sample ID [2]	Analyte in mg/kg [1]						
		As	Cr [3]	Pb	Ba	PCBs	Cd	TCE
M	**M-F-1**	7.3	373.0	167.0	91.8	**ND**	0.6	**ND**
M	**M-F-2**	9.8	546.0	256.0	112.0	**17.4**	1.1	**ND**
N	**N-F-1**	13.1	19.3	25.5	158.0	**ND**	ND	140.00
N	**N-F-2**	7.2	252.0	31.2	118.0	**ND**	0.1	13.00
N	**N-F-3**	10.0	1,050.0	114.0	118.0	0.0	1.5	26.80
N	**N-SW-2**	8.9	528.0	129.0	175.0	**ND**	0.8	**567.00**
N	**N-SW-3**	14.4	**8,280.0**	87.4	86.8	**ND**	1.7	33.10
N	**N-SW-4**	8.0	617.0	223.0	99.6	**ND**	0.5	0.14
N	**N-SW-5**	8.6	1,010.0	117.0	99.1	0.2	6.2	108.00
N	**N-1-W-1**	8.8	37.6	25.9	161.0	**ND**	1.2	**1,930.00**
N	**N-1-W-3**	4.3	134.0	15.6	22.2	**ND**	0.8	**ND**
N	**N-1-F-1**	9.3	419.0	16.6	97.0	**ND**	1.2	72.40
N	**N-1-3-F-1**	8.5	409.0	394.0	115.0	0.0	1.5	**ND**
N	**N-1-3-F-2**	9.2	245.0	41.3	138.0	**ND**	1.4	**ND**
N	**N-1-3-W-1**	4.4	237.0	30.2	79.5	0.1	**84.8**	**ND**
O	**O-W-2**	9.6	498.0	89.5	76.2	**ND**	8.5	**ND**
O	**O-W-3-2**	7.1	9.9	23.0	51.5	**ND**	0.3	**ND**
O	**O-F-2-3**	14.4	218.0	226.0	138.0	**ND**	**25.2**	0.02
O	**O-F-3-3**	8.5	25.4	14.2	57.8	**ND**	ND	**ND**
O	**O-F-4-3**	**25.7**	634.0	33.3	137.0	**ND**	ND	**ND**
O	**O-F-1-4**	**20.2**	803.0	268.0	131.0	**ND**	**35.6**	0.01
O	**O-W-1-4**	**22.8**	146.0	60.3	60.5	**ND**	**10.0**	0.15

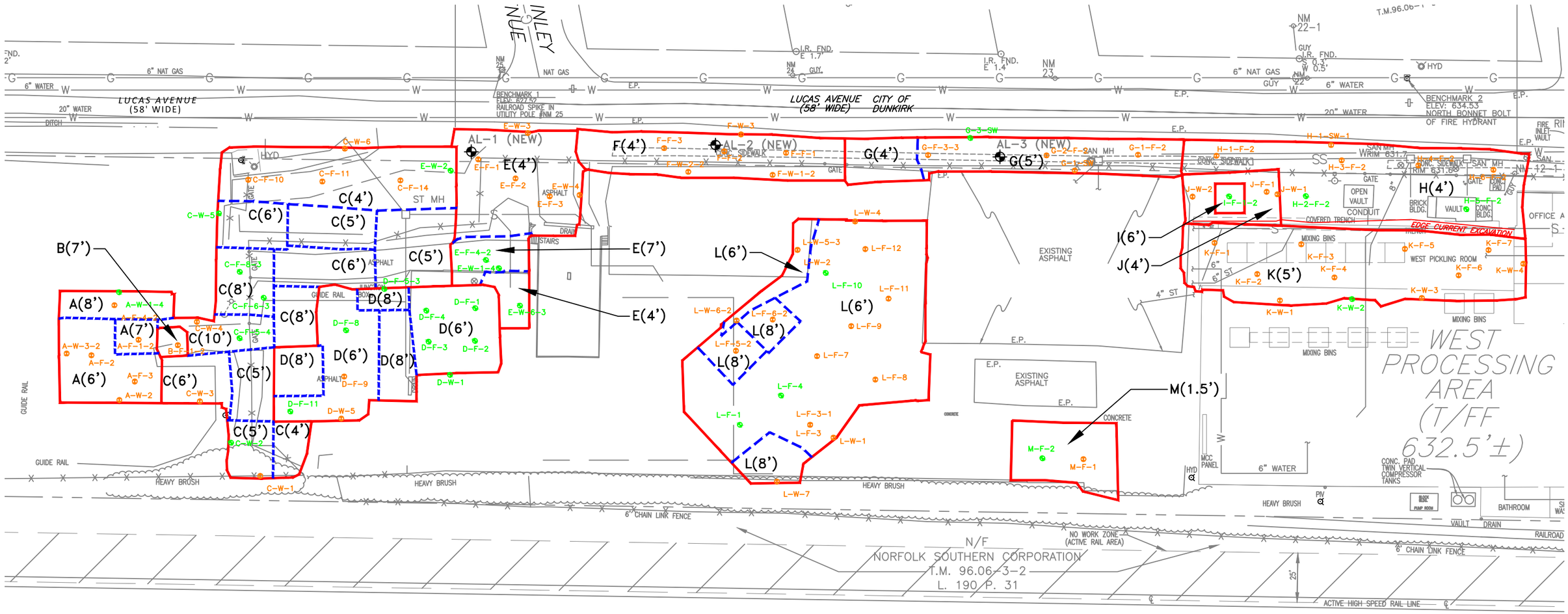
Commercial SCOs are in accordance with 6 NYCRR Part 375 Table 375-6.8(b): Restricted Use Soil Cleanup Objectives and include the following:
Arsenic (As): 16 mg/kg
Barium (Ba): 400 mg/kg
Cadmium (Cd): 9.3 mg/kg
Chromium (Cr), trivalent: 1,500 mg/kg
Lead (Pb): 1,000 mg/kg
Trichloroethene (TCE): 200 mg/kg
Polychlorinated biphenyls (PCBs): 1.0 mg/kg

Notes:
1. *Reported validated data is provided by Paradigm Lab Services.*
2. *For samples in which grab and composite samples were taken at the same location (i.e., with the same sample ID number), the analytical results for VOCs (i.e., TCE) were sampled and reported as grab samples; the analytical results for metals (arsenic, barium, cadmium, chromium, and lead) and PCBs (Aroclor) were sampled and reported as the maximum concentrations for each composite sample.*
3. *It is assumed that total chromium is composed solely of trivalent chromium.*
4. *Highlighted cells indicate that the sample result exceeded the SCO.*

Key:
NA = Sample not analyzed for specific parameter
ND = Non-detect at the parameter's reporting limit

2.5.2 Groundwater

Groundwater remediation was not performed as part of this remedial effort. Numerous previous groundwater assessments were performed as part of the investigations mentioned in Section 2.3. This SMP will consist of long-term monitoring of the groundwater well network to determine trends in groundwater quality and whether an upgradient source of groundwater contamination exists.



SCALE IN FEET

0 50 100 150

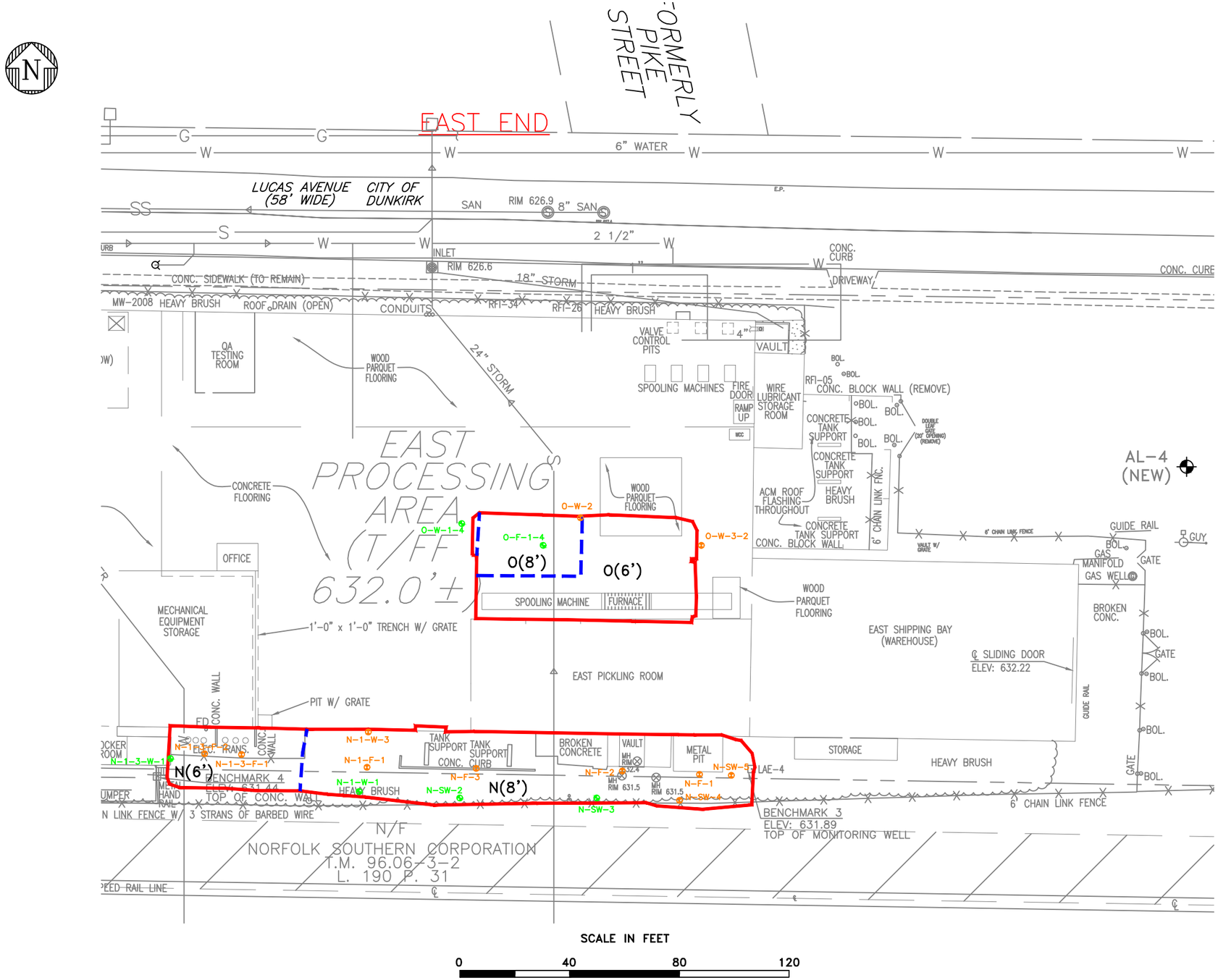
LEGEND

- FINAL EXCAVATION LIMITS
- EXCAVATION SUB–AREA
- L — EXCAVATION AREA NAME
- (6') — EXCAVATION DEPTH
- CONFIRMATION SAMPLE
- DOCUMENTATION SAMPLE

NOTE

1. MAP ENTITLED "SAMPLE POINT LOCATIONS" PREPARED BY FISHER ASSOCIATES, FIRST ISSUED 12/2007 (CAD FILE ALtech Excavations and Samples.dwg)

FIGURE 2–2A EXCAVATIONS AND RE–EXCAVATIONS WEST
FORMER AL–TECH SPECIALTY STEEL SITE
DUNKIRK, NEW YORK



LEGEND

- FINAL EXCAVATION LIMITS
- EXCAVATION SUB-AREA
- N — EXCAVATION AREA NAME
- (6') — EXCAVATION DEPTH
- CONFIRMATION SAMPLE
- DOCUMENTATION SAMPLE

NOTE

1. MAP ENTITLED "SAMPLE POINT LOCATIONS" PREPARED BY FISHER ASSOCIATES, FIRST ISSUED 12/2007 (CAD FILE ALtech Excavations and Samples.dwg)

FIGURE 2-2B EXCAVATIONS AND RE-EXCAVATIONS EAST FORMER AL-TECH SPECIALTY STEEL SITE DUNKIRK, NEW YORK

3 Institutional and Engineering Control Plan

3.1 General

Since residual contamination exists at the site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all IC/ECs on the site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as implementation of the Excavation Work Plan (EWP) (as provided in Appendix F) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

A series of ICs is required by the ROD to: (1) implement, maintain, and monitor EC systems; (2) prevent future exposure to remaining contamination; and (3) limit the use and development of the site to commercial (which allows for commercial or industrial use). Adherence to these ICs on the site is required by the Environmental Easement and will be implemented under this SMP. The ICs at the site are necessary to ensure that residual contaminated material remains undisturbed. Current and future site owners will be required to perform soil characterization and disposal/reuse in accordance with NYSDEC regulations if residual contaminated soil is disturbed and/or excavated. ICs identified in the Environmental

Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figure 1-1. These ICs are:

- The controlled property may be used for commercial use as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and industrial use as described in 6 NYCRR Part 375-1.8(g)(2)(iv);
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Chautauqua County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to site management of the controlled property must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the site must be provided to agents, employees, or other representatives of the State of New York with reasonable prior notice to the property owner to ensure compliance with the restrictions identified by the Environmental Easement; and
- All requirements of the SMP and all referenced plans, latest revision, on file must be adhered to. This applies to all existing and future property owners.

3.3 Engineering Controls

The locations of major ECs are shown in Figure 3-1. Groundwater and soils will be monitored to confirm that contaminant migration and recontamination of remediated soils does not occur and to determine trends in groundwater flow. The analytical results for samples collected from the monitoring locations will be used to evaluate the natural attenuation of contaminants at the site.

3.3.1 Cover

Exposure to remaining contamination at the site is prevented by a cover system placed over the site. This cover system is comprised of a minimum of 12 inches of clean stone, soil, or concrete building slabs. Figure 3-1 shows the location of

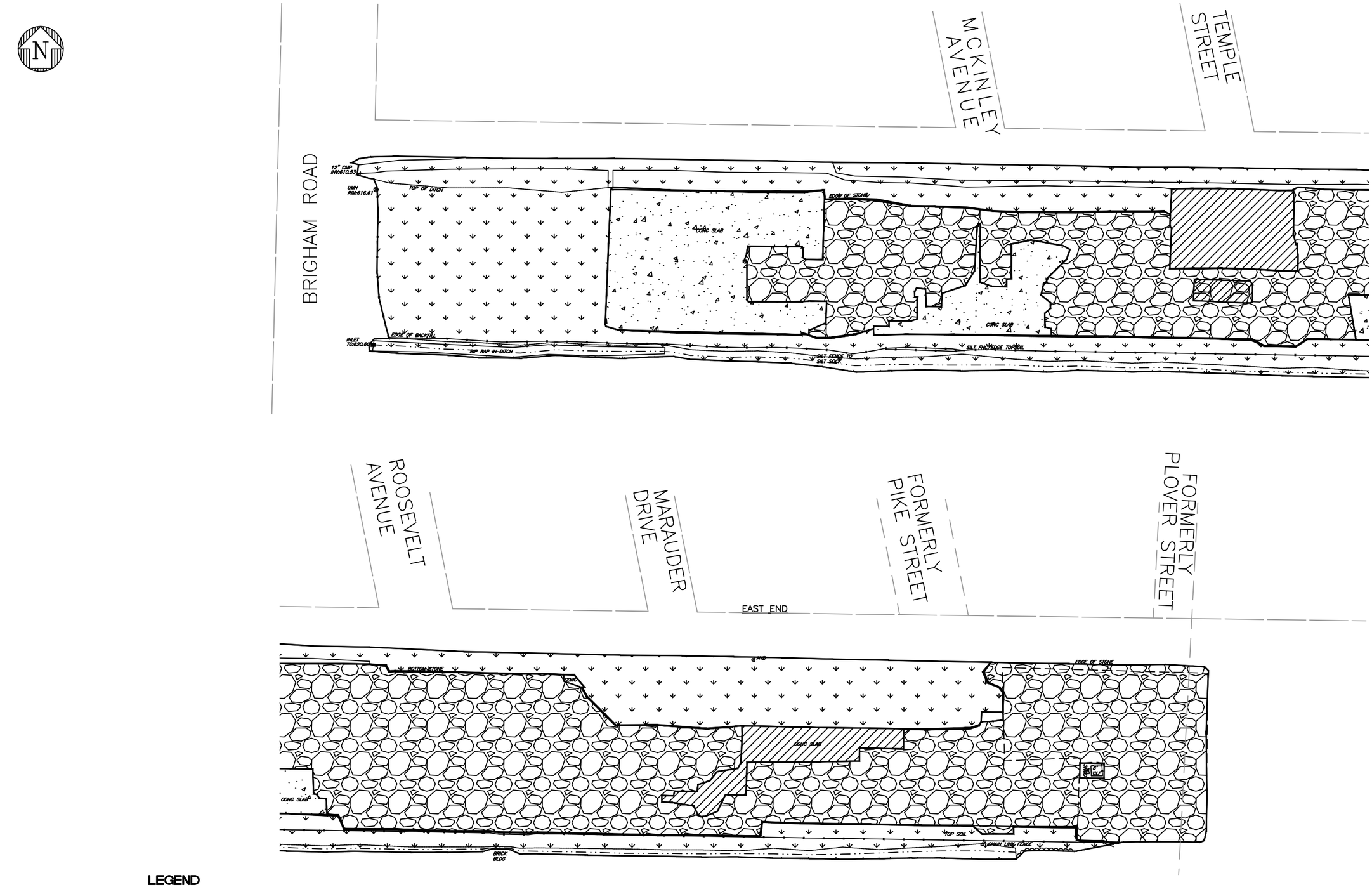
the cover system and applicable demarcation layers. The Excavation Work Plan (EWP) provided in Appendix F outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan prepared for the site and provided in Appendix G.

3.3.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

3.3.2.1 Cover

The cover system is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.



NOTE

1. AS-BUILT CONDITIONS SURVEY PREPARED BY FISHER ASSOCIATES (JUNE 2018).

FIGURE 3-1 ENGINEERING CONTROLS LOCATIONS
FORMER AL-TECH SPECIALTY STEEL SITE
DUNKIRK, NEW YORK

4 Monitoring and Sample Plan

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC. Details regarding the sampling procedures, data quality usability objectives, analytical methods, health and safety procedures, etc., for all samples collected as part of site management for the site are included in the Quality Assurance Project Plan provided in Appendix H and the Health and Safety Plan provided in Appendix G.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media, including groundwater and soil;
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements, including independent validation of analytical data;
- Quality Assurance/Quality Control requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Sitewide Inspection

Sitewide inspections will be performed at least once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Sitewide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix I – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted, including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirmation that site records are up to date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report (PRR). The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this SMP.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs, occurs that reduces, or has the potential to reduce, the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within five (5) days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within seven (7) days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 Post-Remediation Media Monitoring and Sampling

Samples shall be collected from the groundwater on a routine basis. Groundwater sampling locations, required analytical parameters, and schedule are provided in

Table 4-1 – Post-Remediation System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 4-1 Post-Remediation System Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	VOCs (EPA Method SW-846 8260D)	Metals (EPA Method SW-846 6010D)	PCBs (EPA Method SW-846 8082A)	
Groundwater Monitoring Wells On-Site AL-1, AL-2, AL-3,AL-4, LAE-4, MW-2008, RFI-05, RFI-18, RFI-26, RFI-27, RFI-31, RFI-34, RFI-35, & RFI-36 Off-Site TW-6, TW-7, TW-8, TW-12, TW-13, TW-14, & TW-15 Wells Not Found RFI-32 & RFI-33	TCE	Arsenic Barium Cadmium Total Chromium Lead	PCB Aroclors	Annually

Analytical methods: EPA 2007.

Samples shall be collected from on-site soil that is intended to be reused on the site, and soil that is imported to or exported from the site, pursuant to DER-10 Table 5.4(e)4 “Reuse of Soil” and Table 5.4(e)10 “Recommended Number of Soil Samples for Soil Imported To or Exported From a Site”.

Detailed sample collection and analytical procedures and protocols are provided in Appendix J – Soils Management Plan, Appendix H – Quality Assurance Project Plan, and Appendix K – Field Sampling Plan for Groundwater Monitoring Wells.

All sampling equipment decontamination will be performed in accordance with NYSDEC-approved procedures. Sampling methods and equipment have been chosen to minimize decontamination requirements and prevent the possibility of cross-contamination. Standard equipment decontamination procedures for each of the sampling elements are presented in their respective work plans.

Sample shipment shall be performed in strict accordance with all applicable U.S. Department of Transportation (DOT) regulations. Sample packaging and shipping procedures are presented in their respective work plans.

4.3.1 Groundwater Sampling

Groundwater monitoring will be performed annually. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

The network of monitoring wells has been installed to monitor on-site and downgradient groundwater conditions at the site. The network of on-site and off-site wells has been designed to allow for the monitoring of contaminant trends in the local groundwater, as shown in Figure 4-1. Samples collected from the monitoring well network will be compared the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1. (NYSDEC 1998, April 2000 addendum).

Table 4-2 summarizes the well identification numbers, as well as the purpose, location, depths, diameter, and screened intervals. As part of the groundwater monitoring, 16 on-site wells and seven off-site (downgradient) wells are sampled to evaluate the effectiveness of the remedial system.

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements. Where available, monitoring well construction logs are included in Appendix D of this document.

4.3.2 Groundwater Monitoring Well Repairs and Decommissioning

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced if an event renders the wells unusable.

The NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent PRR. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "Commissioner Policy 43: Groundwater Monitoring Well Decommissioning Policy" (NYSDEC 2009). Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

4.3.3 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log(s) as provided in Appendix I - Site Management Forms. Other observations (e.g., groundwater monitoring well integrity, etc.) will be noted in the sampling log. The sampling log will serve as the inspection form for the monitoring network.

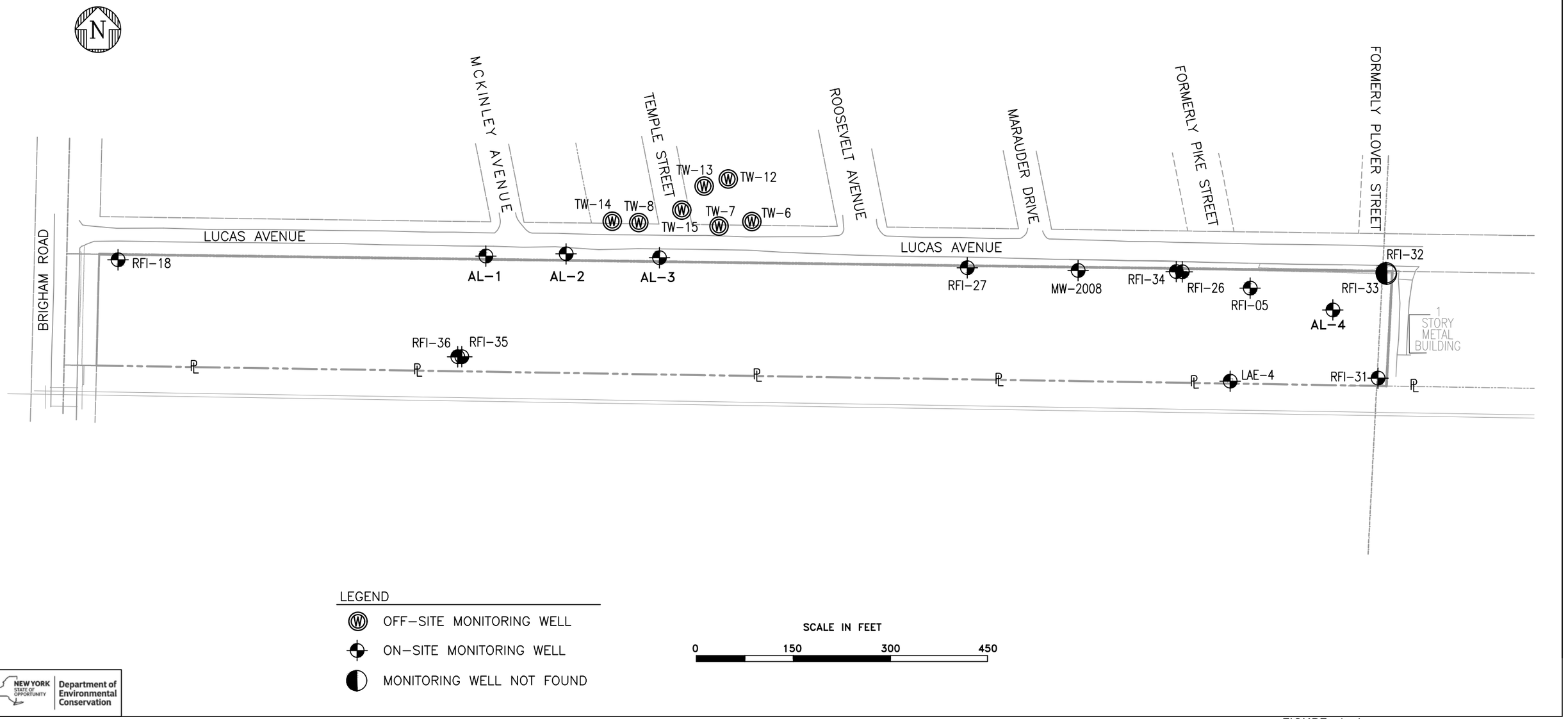


FIGURE 4-1
MONITORING WELL LOCATIONS
FORMER AL-TECH SPECIALTY STEEL SITE
DUNKIRK, NEW YORK

Table 4-2 Monitoring Well Construction Details

Monitoring Well ID	Well Location	Coordinates (longitude/ latitude)	Well Diameter (inches)	Elevation (above mean sea level)			
				Casing	Surface	Screen Top	Screen Bottom
LAE-4	On-site	42.473928° N, 79.339418° W	2	632.28	631.54	Screen length is 10 feet	
AL-1	On-site	42.474430° N, 79.343688 ° W	2	625.53	625.06	618.53	613.53
AL-2	On-site	42.474443° N, 79.343229 ° W	2	628.24	627.72	618.54	613.54
AL-3	On-site	42.474430° N, 79.342694 ° W	2	630.85	630.35	624.05	619.05
AL-4	On-site	42.474234° N, 79.338834 ° W	2	632.02	631.57	619.72	609.72
MW-2008	On-site	42.474391° N, 79.340295° W	2	629.25	628.78	Screen length is 10 feet	
RFI-05	On-site	42.474320° N, 79.339310° W	2	631.54	631.3	624.32	616.32
RFI-18	On-site	42.474400° N, 79.345795° W	2	621.52	617.79	605.29	600.29
RFI-26	On-site	42.474390° N, 79.339698° W	2	630.46	628.46	616.46	606.46
RFI-27	On-site	42.474399° N, 79.340930° W	2	633.68	630.83	622.83	612.83
RFI-31	On-site	42.473947° N, 79.338572° W	2	631.72	630.57	622.57	607.57
RFI-32	On-site	42.474394° N, 79.338531° W	2	631.5	631.18	622.18	607.18
RFI-33	On-site	42.474388° N, 79.338529° W	2	631.68	631.4	604.4	597.4
RFI-34	On-site	42.474391° N, 79.339733° W	2	628.8	628.06	Screen length is 10 feet	
RFI-35	On-site	42.474003° N, 79.343821° W	2	635.00	632.13	Screen length is 10 feet	

Table 4-2 Monitoring Well Construction Details

Monitoring Well ID	Well Location	Coordinates (longitude/ latitude)	Well Diameter (inches)	Elevation (above mean sea level)			
				Casing	Surface	Screen Top	Screen Bottom
RFI-36	On-site	42.474002° N, 79.343844° W	2	635.00	632.27	Screen length is 10 feet	
TW-6	Downgradient (off-site)	42.474586° N, 79.342167° W	2	631.6 (approx.)	631.4	623.4	613.6
TW-7	Downgradient (off-site)	42.474566° N, 79.342355° W	2	630.65 (approx.)	630.45	620.45	610.65
TW-8	Downgradient (off-site)	42.474578° N, 79.342815° W	2	630.37 (approx.)	630.17	620.37	610.57
TW-12	Downgradient (off-site)	42.474766° N, 79.342304° W	2	Not surveyed		Screen length is estimated to be 10 feet	
TW-13	Downgradient (off-site)	42.474734° N, 79.342442° W	2	Not surveyed		Screen length is estimated to be 10 feet	
TW-14	Downgradient (off-site)	42.474582° N, 79.342966° W	2	Not surveyed		Screen length is estimated to be 10 feet	
TW-15	Downgradient (off-site)	42.474632° N, 79.342569° W	2	632.00	Not surveyed		

5 Operation and Maintenance Plan

5.1 General

The site remedy does not rely on any mechanical systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

6 Periodic Assessments/Evaluations

6.1 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program, including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. Green remediation evaluations will be completed for the site during site management and as reported in the PRR.

6.1.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the Project Manager feels appropriate, e.g., during significant maintenance events or in conjunction with storm recovery activities.

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR.

6.1.2 Frequency of System Checks, Sampling, and Other Periodic Activities

Transportation to and from the Site and the use of consumables in relation to visiting the Site in order to conduct system checks and or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces the expenditure of energy or resources.

6.1.3 Metrics and Reporting

As discussed in Section 7.0 and as shown in Appendix I – Site Management Forms, information on energy usage, solid waste generation, transportation and shipping, water usage, and land use and ecosystems will be recorded to facilitate

and document consistent implementation of green remediation during site management and to identify corresponding benefits; a set of metrics has been developed for this purpose.

6.2 Remedial System Optimization

An RSO study will be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. A predefined schedule for RSO evaluation and reporting has not yet been established for this site. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media-specific data and information, and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

7 Reporting Requirements

7.1 Site Management Reports

All site management inspection, maintenance, and monitoring events will be recorded on the appropriate site management forms provided in Appendix I. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table 7-1 and summarized in the PRR.

Table 7-1 Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Annually
Periodic Review Report	Annually, or as otherwise determined by the Department
Groundwater Monitoring Report	Annually

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., groundwater, soil);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;

- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation, such as copies of invoices for maintenance work, receipts for replacement equipment, etc. (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation, such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report

A PRR will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion is issued. After submittal of the initial PRR, the next PRR shall be submitted annually to the Department or at another frequency as may be required by the Department. In the event that the site is subdivided into

separate parcels with different ownership, a single PRR will be prepared that addresses the site described in Appendix A - Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the PRR. The report will include:

- Identification, assessment, and certification of all ECs/ICs required by the remedy for the site.
- Results of the required annual site inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- Data summary tables and graphical representations of contaminants of concern, by media (groundwater and soil), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.
- A site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the site-specific Excavation Work Plan and ROD;
  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan;
  - Trends in contaminant levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document; and
  - The overall performance and effectiveness of the remedy.

For sites whose remedial programs are State-funded, a quantitative and qualitative overview of the site's environmental impacts must be provided through the completion of the Summary of Green Remediation Metrics provided in Appendix I.

This form, as well as a summary of the Green Remediation evaluation, will be included in the PRR.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare, and include in the PRR, the following certification as per the requirements of NYSDEC DER-10:

"*For each institutional or engineering control identified for the site, I certify that all of the following statements are true:*

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program [and generally accepted engineering practices]; and*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] (and if the site consists of multiple properties): [and I have been authorized and designated by all site owners to sign this certification] for the site."

The signed certification will be included in the PRR.

The PRR will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, and the NYSDOH Bureau of Environmental Exposure Investigation. The PRR may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed (see Section 6.2), upon completion of the RSO, an RSO report must be submitted to the Department for approval. The RSO report will document the research/investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model, and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs, etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, Site Control, and the NYSDOH Bureau of Environmental Exposure Investigation.

8 References

6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

Benchmark Environmental Engineering & Science. 2001. *Sampling and Analysis Plan, Lucas Avenue Plant Decontamination and Demolition*. January 2001.

_____. 2001. *ICM Work Plan for Decontamination and Demolition of Lucas Avenue Plant*. April 2001.

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_____. 2003. *Phase II RCRA Facility Investigation and Interim Corrective Measures Report, Former AL Tech Specialty Steel Corporation Dunkirk, New York*. October 2003.

_____. *Former AL Tech Specialty Steel Corporation Facility, Supplemental Phase II RFI Field Activities and Findings*. August 2004.

_____. 2006. *Corrective Measures Study/Feasibility Study*. September 2006.

Ecology and Environment Engineering, P.C. 2007. *Interim Remedial Measures for AL Tech Specialty Steel Site, Site No. 9-07-022, City of Dunkirk, Chautauqua County, New York.* Volume 1-III, Summary Report. October 2007.

Environmental Strategies Corporation. 1998. *Phase 1 RCRA Facilities Investigation Report, AL Tech Specialty Steel Corporation, Dunkirk, New York, Facility*. Volumes I-VI, October 1998.

McLaren/Hart Environmental Engineering Corporation. 1992. RCRA Facility Assessment Report. December 1992.

New York State Department of Environmental Conservation (NYSDEC). 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

_____. 2009. Commissioner Policy 43: Groundwater Monitoring Well Decommissioning Policy. November 2009.

_____. 2010. Technical Guidance for Site Investigation and Remediation, DER-10, 3 May 2010.

_____. 2012. Record of Decision, AL Tech Specialty Steel Corporation Operable Unit Number 01: Lucas Avenue Plant Remedial Program, State Superfund Project, Dunkirk, Chautauqua County, Site No. 907022. December 2012.

U.S. Environmental Protection Agency (EPA). 2007. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition (Revision 6, February 2007).

Zurawski, Allan L. 2014. Condemnation letter from the Office of the Housing, Building and Zoning Officer, City Hall, Dunkirk, New York, to Realco, Inc., regarding the West Lucas Avenue Property – Section 96.06, Block 3, Lot 1, NYSDEC Site #907022. Issued February 14, 2014.

A Environmental Easement

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 1st day of SEPTEMBER 20 15 between Owner(s) RealCo, Inc., having an office at P.O. Box 1932, Windermere, County of Orange, State of Florida (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of two parcels of real property identified in City of Dunkirk assessment records as W Lucas Avenue (parcel A, having a mailing address of 100-198 Lucas Avenue) and Willowbrook Avenue (parcel B, having no known mailing address) located in the City of Dunkirk, County of Chautauqua and State of New York, known and designated on the tax map of the County Clerk of Chautauqua as tax map parcel numbers: 96.06-3-1 (parcel A) and 96.10-1-1 (parcel B), being the same as that property conveyed to Grantor by deed dated May 22, 2000 and recorded in the Chautauqua County Clerk's Office in Liber 2459 and Page 811. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 11.40 +/- acres (parcel A +/- 7.9 acres and parcel B +/- 3.5 acres), and is hereinafter more fully described in the Land Title Surveys dated November 5, 2014 prepared by Popli Design Group, Jeffrey F. Phillips, L.S. (parcel A) and dated August 4, 2011 prepared by Razak Associates (parcel B), which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Order on Consent Index Number: A9-0393-9907 as amendment by Amendment CO 4-20130731-01 on August 13, 2013, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Chautauqua County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential or Restricted Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i) and (ii), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5 the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: 907022
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC

625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

RealCo, Inc.:

By: Yong J Park

Print Name: YONG JIN PARK

Title: PRESIDENT Date: 8/19/15

Grantor's Acknowledgment

STATE OF FLORIDA)
) ss:
COUNTY OF Orange)

On the 19 day of August, in the year 20 15, before me, the undersigned, personally appeared Yong Jin Park, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Giselle M Fernandez
Notary Public - State of Florida

Giselle Fernandez
State of Florida
MY COMMISSION # FF 147537
Expires: August 4, 2018
Bonded through CNA Surety

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: _____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 1st day of September, in the year 2015, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

_____
Notary Public - State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2018

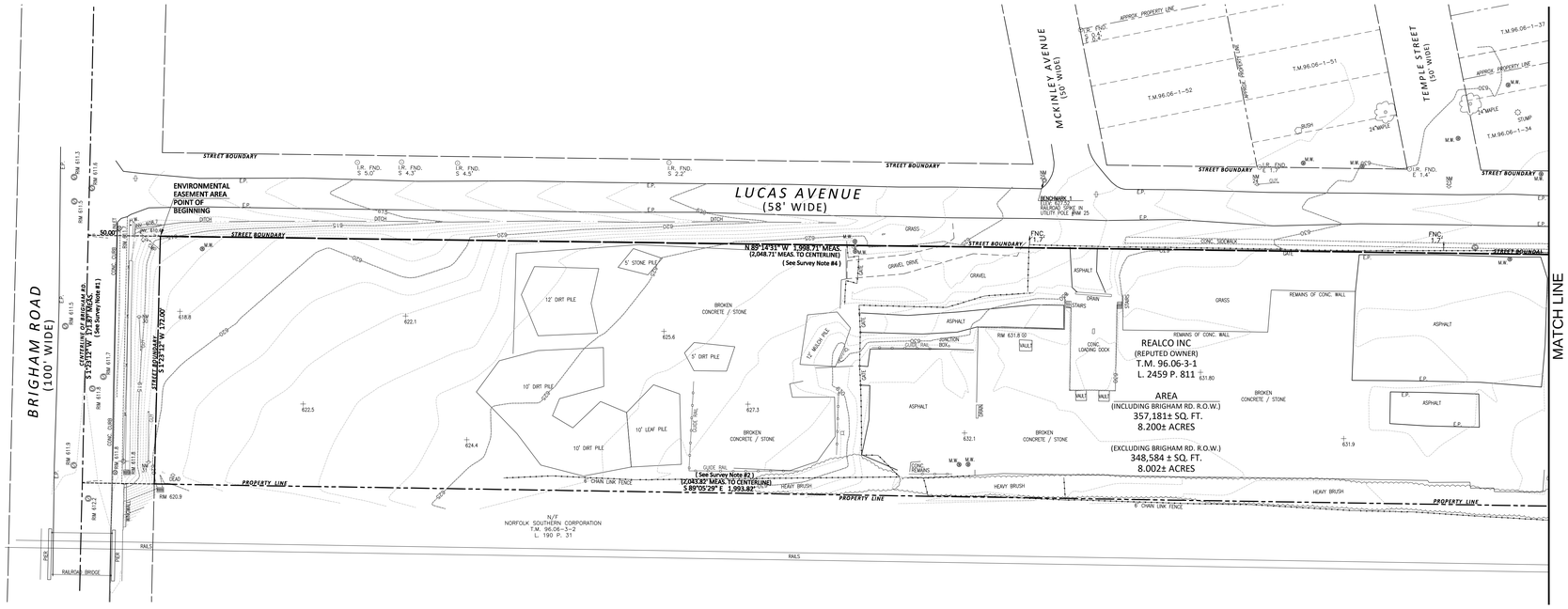
SCHEDULE "A" PROPERTY DESCRIPTION

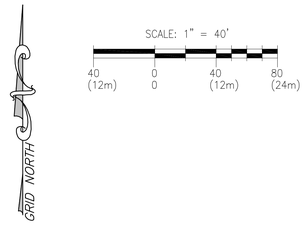
Parcel A: ALL that piece or parcel of property hereinafter designated as Environmental Easement Area, being part of Lot 17 and Lot 23, Township 6,Range 12 of the Holland Land Company's Survey, also identified as Tax Map No. 96.06-3-1 in the City of Dunkirk, County of Chautauqua, State of New York and more particularly described as follows:

BEGINNING at a point on the easterly street boundary of Brigham Road (100 feet wide) at its intersection with the southerly street boundary of Lucas Avenue (58 feet wide), thence; S 1°23'12" W along the easterly street boundary of Brigham Road a distance of 172.00 feet to a point on the northerly right-of-way line of the Norfolk Southern Railroad, thence; S 89°05'29" E along the northerly railroad right-of-way line a distance of 1,993.82 feet to a point on the division line between the property of REALCO INC (reputed owner) on the west and the property of the City of Dunkirk (reputed owner) on the east, thence; N 2°56'58" E along the last mentioned division line 177.36 feet to a point on the southerly street boundary of Lucas Avenue, thence; N 89°14'31" W along the last mentioned street boundary a distance of 1,998.71 feet to the point of beginning, being 348,584± square feet or 8.002 acres, more or less.

Parcel B: Beginning in the northerly line of Willowbrook Avenue (50 feet wide) as now laid out and occupied at the iron pin located 501.86 feet easterly along said northerly line of Willowbrook Avenue from the intersection thereof with the easterly line of Brigham Road (l00 feet wide) as now laid out and occupied; thence northerly at an interior angle of 89° -13' a distance of 114 feet to an iron pin;· thence westerly at an interior angle of 270°-47' a distance of 30 feet to an iron pin; thence northwesterly at an interior angle of 140°-41' a distance of 45.5 feet to an iron pin; thence northerly at an interior angle of 128° 32' a distance of 253 feet to an iron pin; thence easterly at an interior of 89 ° -40' a distance of 401 feet to an iron pin; thence southerly at an interior angel of 91° -05' a distance of 178 feet to an iron pin; thence easterly at an interior angle at 270°-02'-20" a distance of 32.5 feet to an iron pin; thence southerly at an interior angle of 89° -57'40" a distance of 70 feet to an iron pin; thence westerly at an interior angle of 90° -02'-20" a distance of 32.5 feet to an existing iron pin; thence southerly at an interior angle of 269° -57'-40" a distance of 140 feet to an iron pin in said northerly line of Willowbrook Avenue; thence westerly at an interior angle of 90°-02'-20" a distance of 340.5 feet to the point or place of beginning, and containing 3.50 acres of land more or less.

Together with all right, title and interest of first party in and to the northerly one-half of Willowbrook Avenue abutting premises above described.





This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New York Environmental Conservation Law.

THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THIS EASEMENT ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12233 OR AT *DERWEB@GW.DEC.STATE.NY.US*

ENGINEERING / INSTITUTIONAL CONTROLS

- Compliance with the Environmental Easement and the SMP by the Grantor and the Grantor's Successors and assigns;
- All Engineering Controls on the Environmental Easement Area ("EEA") must be operated and maintained as specified in the SMP;
- All Engineering Controls on the EEA must be inspected at a frequency and in a manner defined in the SMP;
- Groundwater, soil vapor and other environmental or public health monitoring must be performed as defined in the SMP;
- Data and information pertinent to Site Management of the EEA must be reported at the frequency and in a manner defined in the SMP;
- The use and development of the EEA is limited to industrial uses only as described in 6 NYCRR Part 375-1.8(g)(2)(iv);
- The EEA may not be used for higher level of use, such as unrestricted or restricted residential or commercial use without additional remediation and amendment of the Environmental Easement, as approved by the NYSDEC;
- All future activities on the EEA that will disturb remaining contaminated material must be conducted in accordance with the SMP;
- The use of groundwater underlying the EEA is prohibited without treatment rendering it safe for intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed within the EEA and any potential impacts that are identified must be monitored or mitigated; and
- Vegetable gardens and farming on the EEA are prohibited.

ENVIRONMENTAL EASEMENT AREA ACCESS

THE N.Y.S.D.E.C. AND / OR THEIR AGENTS MAY ACCESS THE ENVIRONMENTAL EASEMENT AREA AS SHOWN HEREON THROUGH ANY EXISTING STREET ACCESS OR BUILDING INGRESS / EGRESS ACCESS POINT.

THIS SURVEY HAS BEEN PREPARED WITH THE BENEFIT OF AN ABSTRACT OF TITLE PREPARED BY STEWART TITLE INSURANCE COMPANY, SEARCH NO. 198567, DATED DECEMBER 27, 2013.

SURVEYOR'S CERTIFICATION

TO: (1)THE PEOPLE OF THE STATE OF NEW YORK, ACTING THROUGH THEIR COMMISSIONER OF THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION; (2) REALCO INC;

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY THE ALTA AND NSPS, AND INCLUDES ITEMS 4, 5, 7a, 8, 11b & 13 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON JANUARY 14, 2014.

STATE OF NEW YORK
JEFFREY FRANK PHILLIPS
LICENSED LAND SURVEYOR
50773
11/5/14

JEFFREY F. PHILLIPS, LS 50773
FOR: POPLI DESIGN GROUP
555 Penbrooke Drive
Penfield, NY 14526
Phone: 585-388-2060

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

ENVIRONMENTAL EASEMENT AREA DESCRIPTION

NYSDEC SITE NO. 907022

ALL that piece or parcel of property hereinafter designated as Environmental Easement Area, being part of Lot 17 and Lot 23, Township 6, Range 12 of the Holland Land Company's Survey, also identified as Tax Map No. 96.06-3-1 in the City of Dunkirk, County of Chautauqua, State of New York and more particularly described as follows:

BEGINNING at a point on the easterly street boundary of Brigham Road (100 feet wide) at its intersection with the southerly street boundary of Lucas Avenue (58 feet wide), thence; S 1°23'12" W along the easterly street boundary of Brigham Road a distance of 172.00 feet to a point on the northerly right-of-way line of the Norfolk Southern Railroad, thence; S 89°05'29" E along the northerly railroad right-of-way line a distance of 1,993.82 feet to a point on the division line between the property of REALCO INC (reputed owner) on the west and the property of the City of Dunkirk (reputed owner) on the east, thence; N 2°56'58" E along the last mentioned division line 177.36 feet to a point on the southerly street boundary of Lucas Avenue, thence; N 89°14'31" W along the last mentioned street boundary a distance of 1,998.71 feet to the point of beginning, being 348,584± square feet or 8.002 acres, more or less.

RECORD DESCRIPTION

Beginning in the centerline of Brigham Road (100 feet wide) as now laid out and occupied at the intersection thereof with the southerly line of Lucas Avenue (formerly Prospect Avenue) as now laid out an occupied (58 feet wide); thence southerly at an interior angle of 90°22' a distance of 166.8 feet along said centerline of Brigham Road to a point in the northerly line of the N&W Railroad (now or formerly); thence easterly at an interior angle of 89°38' a distance of 2054.5 feet along said northerly line of Railroad lands to an iron pin; thence northerly at an interior angle of 92°24'30" a distance of 166.9 feet to an iron pin in said southerly line of Lucas Avenue; thence westerly at an interior angle of 87°35'30" a distance of 2060.4 feet along said southerly line of Lucas Avenue to the point or place of beginning, and containing 7.88 acres of land more or less.

SURVEY NOTES

1. COURSE 1 - DEED vs. MEASURED DIMENSION:
   -LIBER 554, PAGE 134 (1928) - 174 FEET
   -LIBER 2459, PAGE 811 (2001) - 166.8 FEET
   -MEASURED LENGTH (2014) - 171.87 FEET
2. COURSE 2 - DEED vs. MEASURED DIMENSION:
   -LIBER 2459, PAGE 811 (2001) - 2,054.5 FEET
   -MEASURED LENGTH (2014) - 2,043.82 FEET
3. COURSE 3 - DEED vs. MEASURED DIMENSION:
   -LIBER 656, PAGE 158 (1940) - 173 FEET
   -LIBER 2459, PAGE 811 (2001) - 166.9 FEET
   -MEASURED LENGTH (2014) - 177.36 FEET
4. COURSE 4 - DEED vs. MEASURED DIMENSION:
   -LIBER 2459, PAGE 811 (2001) - 2,060.4 FEET
   -MEASURED LENGTH (2014) - 2,048.71 FEET
5. COORDINATES ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (CORS) - NEW YORK STATE PLANE COORDINATE SYSTEM, WEST ZONE.
6. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. MAPPING UNITS ARE U.S. SURVEY FEET.
4. THE CONTOUR INTERVAL IS 1 FOOT.
5. PORTIONS OF THE SITE HAD SNOW COVER AT THE TIME OF SURVEY.
6. UNDERGROUND UTILITIES ARE NOT REPRESENTED ON THIS SURVEY.

BOUNDARY REFERENCES

1. ABSTRACT OF TITLE PREPARED BY STEWART TITLE INSURANCE COMPANY, SEARCH NO. 198567, DATED DECEMBER 27, 2013.
2. PLAT ENTITLED "MAP OF FLORAL PARK, PROPERTY OF JOHN A STAPF, SUB-DIVISION MAP", PREPARED BY J.P. MORRISSEY, DATED JUNE 1911.
3. RIGHT-OF-WAY AND TRACK MAP, THE NEW YORK, CHICAGO & ST. LOUIS R.R. CO., BUFFALO DIVISION, STATION 2142+30.0 TO STATION 2195+10.0, DATED APRIL 28, 1992.
4. DEED, FILED AT LIBER 190, PAGE 31.
5. DEED, FILED AT LIBER 619, PAGE 437.
6. DEED, FILED AT LIBER 619, PAGE 440.
7. DEED, FILED AT LIBER 619, PAGE 442.

LEGEND

M.W.	MONITORING WELL
BOL.	BOLLARD
	FIRE HYDRANT
	WATER VALVE
	CATCH BASIN
	STORM DRAIN MANHOLE
	MANHOLE (UNKNOWN UTILITY)
	SANITARY SEWER MANHOLE
	LIGHT POLE
	UTILITY POLE

PREPARED FOR:
ecology and environment, inc.
Global Environmental Specialists

SURVEYOR JOB NUMBER:	SU4024.09
SURVEY CREW	W. STRATTON / J. MCCADDEN
DRAWN BY:	W. STRATTON / J. PHILLIPS
CHECKED BY:	J. PHILLIPS / R. WILBERT
REVISIONS	

POPLI DESIGN GROUP
ARCHITECTURE + ENGINEERING
555 Penbrooke Drive
Penfield NY 14526
585 388 2060 | office
585 388 2070 | fax

ALTA / ACSM LAND TITLE SURVEY

FOR

Al Tech Specialty Steel
State Superfund Site
NYSDEC Site No. 907022

REALCO INC
(Reputed Owner)
T.M. 96.06-3-1

Being Part of Lot 17 and Lot 23, Township 6, Range 12 of the Holland Land Company's Survey

City of Dunkirk, County of Chautauqua, State of New York

SCALE: 1" = 40' DATE: November 5, 2014

B List of Site Contacts

Name	Phone/Email Address
RealCo, Inc. Site Owner	
Jim Taravella Ecology and Environment Engineering and Geology, P.C. Qualified Environmental Professional	716-684-8060 jtaravella@ene.com
Benjamin Rung New York State Department of Environmental Conservation Department of Environmental Remediation Project Manager	518-402-9914 benjamin.rung@dec.ny.gov
Chad Staniszewski New York State Department of Environmental Conservation Regional HW Remediation Engineer	(716) 851-7220 chad.staniszewski@dec.ny.gov
Kelly Lewandowski New York State Department of Environmental Conservation Site Control	(518) 402-9569 kelly.lewandowski@dec.ny.gov
Ruth Curley New York State Department of Environmental Conservation Division of Environmental Remediation Project Related Questions	518-402-9767 derweb@dec.ny.gov

C Boring Logs

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name:	Phase II RFI/ICMs	**BORING NUMBER:**	**TW-15**
Project Number:	0041-009-200	**Location:**	Pickle Facility Area A
Client:	RealCo, Inc.	**Start Date/Time:**	01/29/03 / 12:30 PM
Drilling Company:	SJB Services, Inc.	**End Date/Time:**	01/30/03 / 09:30 AM
Driller:	Ron Brown	**Logged By:**	BCH
Helper:	Scott Fuller	**Drilling Method:**	4.25-inch Hollow Stem Auger
Rig Type:	CME-85	**Weather:**	cloudy, cool, 20-25 °F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type, Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
631.09	0	–	–	0	–	augered to 6 fbgs	–	–	–	–	–	concrete
629.09	2	–	–	0	–		–	–	–	–	–	Cement/Bentonite Grout
627.09	4	–	–	0	–		–	–	–	–	–	
625.09	6	–	–	0	–		–	–	–	–	–	seal
623.09	8	S1	9 26 26 50	52	1.9	0.0 - 1.0 **SILTY SAND:** Dark orange/brown, moist, 60% fine sand, 30% non-plastic fines, 10% fine sub-angular gravel, hard, iron-stained mottling 1.0 - 1.9 **SHALE:** Dark grey, intensely weathered, moderately hard, laminated, very fissile, slight organic odor, moist	SM	0.0	NA	n	NA	filter sand, #0
621.09	10	S2	30 50 0 0	50	0.5	Same as S1 (1.0 - 1.9) above	bedrock	5.6	NA	n	NA	
619.09	12	S3	22 50 0 0	50	0.6	Same as S1 (1.0 - 1.9) above, dry	bedrock	0.1	NA	n	NA	
617.09	14	S4	22 50 0 0	50	0.8	Same as S1 (1.0 - 1.9) above, dry	bedrock	5.2	NA	n	NA	
615.09	16	S5	50 0 0 0	0	0.4	Same as S1 (1.0 - 1.9) above	bedrock	8.0	NA	n	NA	
613.09	18	S6	50 0 0 0	0	0.4	Same as S1 (1.0 - 1.9) above, increasing competence, less fissile	bedrock	0.8	NA	n	NA	4", Schedule 40 PVC Riser 4", Schedule 40 PVC Screen

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs
BORING NUMBER: TW-15
Project Number: 0041-009-200
Location: Pickle Facility Area A

CONTINUED:

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
613.09	18	S10	50 0 0 0	0	0.4	Same as S1 (1.0 - 1.9) above, increasing competence, less fissile	bedrock	69.0	NA	n	NA	
611.09	20					*END OF BORING* *Auger and split-spoon refusal @ 19 fbgs*						
609.09	22											
607.09	24											
605.09	26											
603.09	28											
601.09	30											
599.09	32											
	34											
597.09												
	36											
595.09	38											

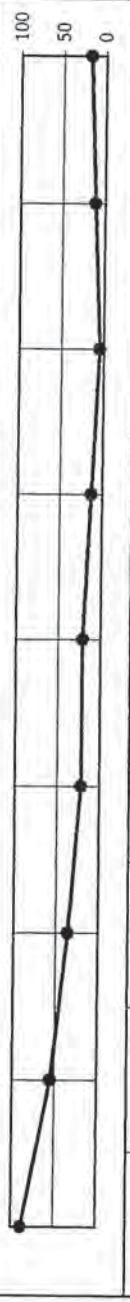
BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs
Project Number: 0041-009-200
Client: RealCo, Inc.
Drilling Company: SJB Services, Inc.
Driller: Ken Fuller
Helper: Scott Fuller
Rig Type: CME-85

BORING NUMBER: RFI-18
Location: SWMU 13C, 17 & 22
Start Date/Time: 02/05/03 / 12:45 PM
End Date/Time: 02/06/03 / 09:15 AM
Logged By: BCH
Drilling Method: 4.25-inch Hollow Stem Auger
Weather: cloudy, cold, breezy, 15-20 °F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type, Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
618.49	0	S1	4 5 13 10	18	0.5	**SANDY LEAN CLAY:** Dark brown, moist, 60% low to medium plasticity fines, 30% fine sand, 10% fine subangular gravel, very stiff	CL	0.0	NA	yes	NA	concrete
616.49	2	S2	5 6 6 6	12	1.6	Same as S1 above, iron-stained mottling, stiff	CL	0.0	NA	no	NA	Cement/Bentonite Grout
614.49	4	S3	3 4 1 4	5	1.5	0.0 - 0.5 Same as S1 above, firm 0.5 - 1.1 **SANDY SILT:** Dark brown/black, moist, 70% low plasticity fines, 30% fine sand, vegetative rootletts, firm	CL ML	0.0	NA	yes	NA	
612.49	6	S4	3 6 7 7	13	1.6	0.0 - 0.1 Same as S3 (0.5 - 1.1) above, stiff 0.1 - 1.7 **SANDY SILT:** Dark olive green, moist, 60% low plasticity fines, 35% fine sand, 5% fine subangular gravel, stiff	ML	0.0	NA	no	NA	
610.49	8	S5	3 7 14 26	21	0.5	**SILTY SAND w/ GRAVEL:** Dark orange/brown, moist, 60% fine sand, 25% low plasticity fines, 15% fine subangular gravel, medium dense, iron-stained mottling	SM	0.0	NA	no	NA	seal
608.49	10	S6	16 10 12 17	22	0.5	Same as S5 above	SM	0.0	NA	no	NA	
606.49	12	S7	20 21 15 20	36	0.4	Same as S6 (0.8 - 1.6) above, moist, dense	SM	0.0	NA	no	NA	filter sand, #0
604.49	14	S8	12 27 28 33	55	0.1	**SHALE:** Dark grey, moist, intensely weathered, moderately hard, laminated, very fissile, slight organic odor	bedrock	0.0	NA	no	NA	4", Schedule 40 PVC Screen
602.49	16	S9	38 39 50 0	89	0.4	Same as S8 above ***END OF BORING*** ***Auger and split-spoon refusal @ 17.5 fbgs***	bedrock	62.2	NA	no	NA	4", Schedule 40 PVC Riser
600.49	18											



BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs
Project Number: 0041-009-200
Client: RealCo, Inc.
Drilling Company: SJB Services, Inc.
Driller: Ron Brown
Helper: Scott Fuller
Rig Type: CME-85

BORING NUMBER: RFI-26
Location: AOC 5A/5B LA Oil Tanks
Start Date/Time: 01/30/03 / 11:25 AM
End Date/Time: 01/31/03 / 10:20 AM
Logged By: BCH
Drilling Method: 4.25-inch Hollow Stem Auger
Weather: sunny, cold, slight breeze, 20-25 °F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
628.17	0	S1	WH 2 5 6	7	0.7	**SILTY SAND:** Dark brown, moist, 70% fine sand 30% non-plastic fines, loose, vegetative rootletts	SM	0.0	NA	yes	NA	concrete
626.17	2	S2	2 22 4 2	26	0.5	0.0 - 0.3 **FILL:** weathered concrete 0.3 - 0.5 **GRAVELLY LEAN CLAY:** Dark olive/brown, moist 70% medium plasticity fines, 20% fine gravel, 10% coarse subangular gravel, firm	FILL CL	0.0	NA	no	NA	Cement/Bentonite Grout
624.17	4	S3	WH 2 5 6	7	1.4	0.0 - 0.5 **SANDY LEAN CLAY:** Dark orange/brown, moist, 80% non-plastic fines, 20% fine sand, firm 0.5 - 0.9 **POORLY GRADED SAND w/ SILT:** Dark orange/brown, wet 90% fine sand, 10% non-plastic fines, loose, slow dilatency 0.9 - 1.4 **SANDY LEAN CLAY:** as above	CL SP-SM CL	0.0	NA	yes	NA	
622.17	6	S4	2 6 6 10	12	1.8	**SANDY LEAN CLAY:** Dark orange/brown with light grey, moist, 80% low to medium plassticity fines, 15% fine sand, 5% fine subrounded gravel, stiff, laminated (mm thick), iron-stained mottling	CL	0.0	NA	no	NA	
620.17	8	S5	1 4 6 6	10	1.9	**SANDY LEAN CLAY:** Dark orange/brown, moist, 70% low to medium plassticity fines, 20% fine sand, 10% fine subangular to subrounded gravel, stiff, iron-stained mottling	CL	0.0	NA	no	NA	seal
618.17	10	S6	4 8 7 7	15	1.5	0.0 - 1.0 Same as S5 above 1.0 - 1.5 **SANDY LEAN CLAY:** Dark grey, wet, 60% low to medium plasticity fines, 30% fine sand, 10% fine subangular to subrounded gravel, soft	CL	0.0	NA	no	NA	filter sand, #0
616.17	12	S7	5 5 6 6	11	2.0	Same as S6 (1.0 - 1.5) above, moist to wet, stiff	CL	0.0	NA	no	NA	
614.17	14	S8	9 14 20 22	34	1.0	0.0 - 0.4 Same as S6 (1.0 - 1.5) above, hard 0.4 - 1.0 **GRAVELLY LEAN CLAY:** Dark grey, moist, 60% non-plastic fines, 35% fine subangular to subrounded gravel, 5% coarse subrounded gravel, hard, loose when disturbed	CL	0.0	NA	no	NA	4", Schedule 40 PVC Screen
612.17	16	S9	25 50 0 0	50	1.2	Same as S8 (0.4 - 1.0) above	CL	0.0	NA	no	NA	4", Schedule 40 PVC Riser
610.17	18											

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs **BORING NUMBER:** **RFI-26**

Project Number: 0041-009-200 **Location:** AOC 5A/5B LA Oil Tanks

CONTINUED:

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
610.17	18	S10	50 0 0 0	0	0.5	**SHALE:** Dark grey, intensely weathered, moderately hard, laminated, very fissile, slight organic odor, moist	bedrock	0.0	NA	no	NA	filter sand, #0
608.17	20	S11	50 0 0 0	0	0.2	Same as S10 above, dry	bedrock	0.0	NA	no	NA	
606.17	22					*END OF BORING* *Auger and split-spoon refusal @ 22 fbgs*						
604.17	24											
602.17	26											
600.17	28											
598.17	30											
596.17	32											
	34											
594.17												
	36											
592.17	38											

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs
Project Number: 0041-009-200
Client: RealCo, Inc.
Drilling Company: SJB Services, Inc.
Driller: Ron Brown
Helper: Scott Fuller
Rig Type: CME-85

BORING NUMBER: RFI-27
Location: AOC 5A/5B LA Oil Tanks
Start Date/Time: 01/31/03 / 01:00 PM
End Date/Time: 01/31/03 / 05:00 PM
Logged By: BCH
Drilling Method: 4.25-inch Hollow Stem Auger
Weather: sunny, cold, breezy, 25-35 °F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
631.24	0	S1	3 2 2 2	4	0.5	**SANDY LEAN CLAY:** Dark brown, moist, 70% low plasticity fines, 20% fine sand, 10% fine subangular gravel, soft, vegetative rootletts	CL	0.0	NA	yes	NA	concrete
629.24	2	S2	4 4 5 2	9	1.6	0.0 - 0.3 Same as S1 above, dark brown/black 0.3 - 1.6 **SILTY SAND:** Dark orange/brown with light grey, moist, 60% fine sand, 35% non to low plasticity fines, 5% fine subangular gravel, loose	CL SM	0.0	NA	yes	NA	Cement/Bentonite Grout
627.24	4	S3	3 6 6 7	12	1.5	Same as S2 (0.3 - 1.6) above 0.3 - 0.7 wet, slow dilatency	SM	0.0	NA	no	NA	seal
625.24	6	S4	9 16 16 15	32	1.6	Same as S2 (0.3 - 1.6) above 0.0 - 0.3 wet, slow dilatency	SM	0.0	NA	no	NA	4", Schedule 40 PVC Riser
623.24	8	S5	22 50 0 0	50	0.5	**SHALE:** Dark grey, moist, intensely weathered, moderately hard, laminated, very fissile, slight organic odor	bedrock	2.2	NA	no	NA	filter sand, #0
621.24	10	S6	28 50 0 0	50	0.5	Same as S5 above	bedrock	0.0	NA	no	NA	
619.24	12	S7	15 50 0 0	50	0.4	Same as S5 above	bedrock	10.5	NA	no	NA	
617.24	14	S8	50 0 0 0	0	0.1	Same as S5 above, increasing competency	bedrock	14.7	NA	no	NA	
615.24	16	S9	50 0 0 0	0	0.4	Same as S8 above, dry	bedrock	7.1	NA	no	NA	4", Schedule 40 PVC Screen
613.24	18					***END OF BORING*** ***Auger and split-spoon refusal @ 18 fbgs***						

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs
Project Number: 0041-009-200
Client: RealCo, Inc.
Drilling Company: SJB Services, Inc.
Driller: Ken Fuller
Helper: Scott Fuller
Rig Type: CME-85

BORING NUMBER: **RFI-31**
Location: Pickle Facility Area D
Start Date/Time: 02/03/03 / 09:40 AM
End Date/Time: 02/03/03 / 01:50 PM
Logged By: BCH
Drilling Method: 4.25-inch Hollow Stem Auger
Weather: partly to mostly sunny, cool, slight breeze, 30-35 °F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
631.92	0	–	–	0	–	augered to 4 fbgs 0.0 - 1.0 concrete slab	–	–	–	–	–	concrete
629.92	2	–	–	0	–		–	–	–	–	–	Cement/Bentonite Grout
627.92	4	S1	WH 3 4 8	7	1.7	SANDY LEAN CLAY: Orange/brown, moist, 60% low to medium plasticity fines, 30% fine sand, 10% fine subangular to subrounded gravel, firm	CL	1.5	NA	no	NA	seal
625.92	6	S2	10 11 11 12	22	1.7	0.0 - 1.1 Same as S1 above 1.1 - 1.7 POORLY GRADED SAND w/ SILT: Dark grey, wet, 90% fine sand, 10% non-plastic fines, slow dilatency, medium dense	CL SP-SM	0.0	NA	no	NA	4", Schedule 40 PVC Riser
623.92	8	S3	4 7 10 11	17	1.3	Same as S2 (1.1 - 1.7) above, wet	SP-SM	0.0	NA	no	NA	
621.92	10	S4	2 4 4 5	8	1.4	Same as S2 (1.1 - 1.7) above, wet, occaisional fine subrounded gravel (< 5%)	SP-SM	0.0	NA	no	NA	filter sand, #0
619.92	12	S5	4 5 10 7	15	1.9	Same as S2 (1.1 - 1.7) above, wet, low grading to medium plasticity fines, rapid dilatency	SP-SM	0.0	NA	no	NA	
617.92	14	S6	WH WH 2 2	2	1.5	0.0 - 0.9 SANDY LEAN CLAY: Dark grey, moist to wet, 80% medium to high plasticity fines, 20% fine sand, soft 0.9 - 1.5 Same as S2 (1.1 - 1.7) above, wet, rapid dilatency	CL SP-SM	0.0	NA	no	NA	
615.92	16	S7	WH 4 4 4	8	2.0	Same as S6 above, varved layers (mm thick), wet, occaisional fine subangular gravel (<5%)	CL SP-SM	0.0	NA	no	NA	4", Schedule 40 PVC Screen
613.92	18											

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs
Project Number: 0041-009-200
BORING NUMBER: RFI-31
Location: Pickle Facility Area D

CONTINUED:

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
613.92	18	S8	WH WH WH 8	0	1.9	**CLAYEY SAND:** Dark grey, wet, 70% fine sand, 30% medium plasticity fines, slow dilatency, very loose	SC	0.0	NA	no	NA	filter sand, #0 4", Schedule 40 PVC Screen
611.92	20	S9	0 0 0 0	0	1.4	0.0 - 0.4 Same as S8 above 0.4 - 1.4 **CLAYEY SAND:** Dark grey, wet, 60% fine sand, 30% medium plasticity fines, 10% fine subrounded gravel, medium dense, slow dilatency	SC	0.0	NA	no	NA	
609.92	22	S10	11 18 16 12	34	1.7	0.0 - 0.6 Same as S9 (0.4 - 1.4) above, wet 0.6 - 1.7 **SANDY LEAN CLAY:** Dark grey, moist, 60% low plasticity fines, 20% fine sand, 15% fine subangular gravel, 5% coarse subangular gravel, hard	SC CL	0.0	NA	no	NA	
607.92	24	S11	WH 10 12 27	22	0.9	Same as S10 (0.6 - 1.7) above, moist	CL	0.0	NA	no	NA	
605.92	26					*END OF BORING* *Sampled to 26 fbgs and advanced boring to 24 fbgs*						
603.92	28											
601.92	30											
599.92	32											
597.92	34											
595.92	36											
	38											

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs
Project Number: 0041-009-200
Client: RealCo, Inc.
Drilling Company: SJB Services, Inc.
Driller: Ken Fuller
Helper: Scott Fuller
Rig Type: CME-85

BORING NUMBER: RFI-32
Location: Pickle Facility Area D
Start Date/Time: 02/03/03 / 03:00 PM
End Date/Time: 02/04/03 / 10:00 AM
Logged By: BCH
Drilling Method: 4.25-inch Hollow Stem Auger
Weather: partly to mostly sunny, cool, slight breeze, 30-35 °F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
631.50	0	–	– – – –	0	–	augered to 4 fbgs	–	–	–	–	–	concrete
629.50	2	–	– – – –	0	–		–	–	–	–	–	Cement/Bentonite Grout
627.50	4	S1	2 4 6 7	10	1.8	**SANDY LEAN CLAY:** Dark orange/brown, moist, 70% low plasticity fines, 30% fine sand, stiff, iron-stained mottling	CL	0.0	NA	no	NA	
625.50	6	S2	9 13 13 12	26	1.6	0.0 - 0.55 Same as S1 above 0.55 - 1.6 **SILTY SAND:** Dark grey, wet, 80% fine sand, 20% non to low plasticity fines, medium dense, rapid dilatency	CL SM	0.0	NA	no	NA	seal
623.50	8	S3	3 5 5 5	10	1.4	Same as S2 (1.1 - 1.6) above, wet, rapid dilatency, loose	SM	0.0	NA	no	NA	
621.50	10	S4	2 4 5 6	9	1.5	Same as S2 (1.1 - 1.6) above, wet, loose	SM	0.0	NA	no	NA	
619.50	12	S5	5 5 6 3	11	1.7	0.0 - 0.9 Same as S2 (1.1 - 1.6) above, wet 0.9 - 1.7 **CLAYEY SAND:** Dark grey, wet, 60% fine sand, 40% low to medium plasticity fines, medium dense, slow dilatency	SM SC	0.0	NA	no	NA	filter sand, #0
617.50	14	S6	WH 1 2 1	3	2.0	Same as S2 (1.1 - 1.6) and S5 (0.9 - 1.7) above, varved (mm thick), wet, soft	SM CL	0.0	NA	no	NA	
615.50	16	S7	WH WH WH 3	0	1.9	0.0 - 1.3 Same as S6 above 1.3 - 1.9 **SANDY LEAN CLAY:** Dark grey, wet to moist, 60% medium plasticity fines, 40% fine sand, very soft	CL	0.0	NA	no	NA	4", Schedule 40 PVC Riser 4", Schedule 40 PVC Screen
613.50	18											

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

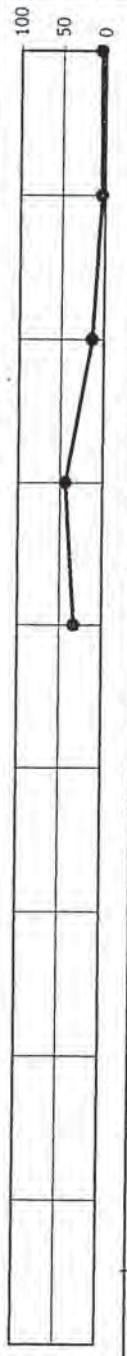
FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs **BORING NUMBER:** RFI-32

Project Number: 0041-009-200 **Location:** Pickle Facility Area D

CONTINUED:

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type,Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
613.50	18		WH									
		S8	2	5	1.1	CLAYEY SAND: Dark grey, wet, 60% fine sand, 30% low to medium plasticity fines, 10% fine subangular gravel, slow dilatency, loose	SC	0.0	NA	no	NA	
			3									
611.50	20		4									
			WH									
		S9	2	4	1.3	Same as S8 above, wet, slow dilatency, very loose	SC	0.0	NA	no	NA	
			2									
609.50	22		3									
			4									
		S10	7	14	1.8	0.0 - 1.3 Same as S8 above, wet, soft 1.3 - 1.8 Same as S2 (1.1 - 1.6) above, wet rapid dilatency	SC SM	0.0	NA	no	NA	
			7									
607.50	24		10									
			3									
		S11	4	44	0.0	no recovery	na	NA	NA	no	NA	
			40									
605.50	26		29									
			12									
		S12	17	33	1.6	0.1 - 0.6 Same as S8 above, moist to wet, dense 0.6 - 1.6 SANDY LEAN CLAY: Dark grey, moist, 60% medium plasticity fines, 20% fine sand, 15% fine subangular gravel, 5% coarse subangular gravel, hard	SC CL	0.0	NA	no	NA	
			16									
603.50	28		20									
						END OF BORING *Sampled to 28 fbgs and advanced boring to 24 fbgs*						
601.50	30											
599.50	32											
	34											
597.50												
	36											
595.50	38											



Well Construction Details: filter sand, #0; 4", Schedule 40 PVC Screen

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name:	Phase II RFI/ICMs	**BORING NUMBER:**	**RFI-33**
Project Number:	0041-009-200	**Location:**	Pickle Facility Area D
Client:	RealCo, Inc.	**Start Date/Time:**	02/04/03 / 10:05 AM
Drilling Company:	SJB Services, Inc.	**End Date/Time:**	02/05/03 / 11:00 AM
Driller:	Ken Fuller	**Logged By:**	BCH
Helper:	Scott Fuller	**Drilling Method:**	4.25-inch Hollow Stem Auger
Rig Type:	CME-85	**Weather:**	cloudy, cold, windy, 20 - 38 °F

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type, Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
631.68	0	–	– – – –	0	–	augered to 24 fbgs boring log data from 0.0 - 24.0 fbgs taken from RFI-32	–	–	–	–	–	concrete
629.68	2	–	– – – –	0	–		–	–	–	–	–	
627.68	4	S1	2 4 6 7	10	1.8	SANDY LEAN CLAY: Dark orange/brown, moist, 70% low plasticity fines, 30% fine sand, stiff, iron-stained mottling	CL	0.0	NA	no	NA	Cement/Bentonite Grout
625.68	6	S2	9 13 13 12	26	1.6	0.0 - 0.55 Same as S1 above 0.55 - 1.6 SILTY SAND: Dark grey, wet, 80% fine sand, 20% non to low plasticity fines, medium dense, rapid dilatency	CL SM	0.0	NA	no	NA	
623.68	8	S3	3 5 5 5	10	1.4	Same as S2 (1.1 - 1.6) above, wet, rapid dilatency, loose	SM	0.0	NA	no	NA	
621.68	10	S4	2 4 5 6	9	1.5	Same as S2 (1.1 - 1.6) above, wet, loose	SM	0.0	NA	no	NA	
619.68	12	S5	5 5 6 3	11	1.7	0.0 - 0.9 Same as S2 (1.1 - 1.6) above, wet 0.9 - 1.7 CLAYEY SAND: Dark grey, wet, 60% fine sand, 40% low to medium plasticity fines, medium dense, slow dilatency	SM SC	0.0	NA	no	NA	
617.68	14	S6	WH 1 2 1	3	2.0	Same as S2 (1.1 - 1.6) and S5 (0.9 - 1.7) above, varved (mm thick), wet, soft	SM CL	0.0	NA	no	NA	
615.68	16	S7	WH WH WH 3	0	1.9	0.0 - 1.3 Same as S6 above 1.3 - 1.9 SANDY LEAN CLAY: Dark grey, wet to moist, 60% medium plasticity fines, 40% fine sand, very soft	CL	0.0	NA	no	NA	4", Schedule 40 PVC Riser
613.68	18											

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FIELD BOREHOLE LOG

Project Name: Phase II RFI/ICMs **BORING NUMBER:** **RFI-33**

Project Number: 0041-009-200 **Location:** Pickle Facility Area D

CONTINUED:

Elevation (fmsl)	Depth (fbgs)	Sample No.	Blows (per 6")	SPT N-Value	Recovery	SOIL DESCRIPTION USCS Classification: Color, Moisture Condition, Percentage of Soil Type, Texture, Plasticity, Fabric, Bedding, Other	USCS Code	PID Scan (ppm)	PID HDSP (ppm)	Samples (y/n)	Penetrometer (tons/SF)	Well Construction Details
613.68	18	S8	WH 2 3 4	5	1.1	**CLAYEY SAND:** Dark grey, wet, 60% fine sand, 30% low to medium plasticity fines, 10% fine subangular gravel, slow dilatency, loose	SC	0.0	NA	no	NA	Cement/Bentonite Grout
611.68	20	S9	WH 2 2 3	4	1.3	Same as S8 above, wet, slow dilatency, very loose	SC	0.0	NA	no	NA	
609.68	22	S10	4 7 7 10	14	1.8	0.0 - 1.3 Same as S8 above, wet, soft 1.3 - 1.8 Same as S2 (1.1 - 1.6) above, wet rapid dilatency	SC SM	0.0	NA	no	NA	
607.68	24	S11	2 4 7 18	11	0.9	0.0 - 0.6 **CLAYEY SAND w/ GRAVEL:** Dark grey, wet to moist, 60% fine sand, 20% medium plasticity fines, 15% fine subangular gravel, 5% coarse subangular gravel, medium dense 0.6 - 0.9 **SANDY LEAN CLAY w/ GRAVEL:** Dark grey, moist, 60% medium plasticity fines, 20% fine sand, 15% fine subangular gravel, 5% coarse subangular gravel, stiff	SC CL	0.0	NA	no	NA	seal
605.68	26	S12	22 29 25 30	54	1.7	Same as S11 (0.6 - 0.9) above, hard, some fissile shale pieces (< 5%)	CL	0.3	NA	no	NA	filter sand, #0
603.68	28	S13	12 50 50 0	100	0.7	**SILTY GRAVEL w/ SAND:** Dark grey, moist to wet, 60% fine subangular gravel, 20% low to non-plastic fines, 15% fine sand, 5% coarse subangular gravel, very dense	GM	0.0	NA	no	NA	4", Schedule 40 PVC Screen
601.68	30	R1	–	0	5.0	**SHALE:** Greyish black (N2), moist to wet, thin-bedded, medium hard, broken, slight weathering (filled fractures with medium to high plasticity fines) filled fracture intervals (fbgs): 0.55-0.75, 1.5-1.7, 2.05-2.15, 2.25-2.6, 2.9-3.15 Modified recovery = 3.0 feet; run length = 5.0 feet; RQD = 60% or fair Approximately 220 gallons of potable water lost during advancement	bedrock	0.0	NA	no	NA	4", Schedule 40 PVC Riser
599.68	32		–									
			–									
	34		–									
597.68						*END OF BORING* *Sampled from 24 to 29 fbgs - spoon and auger refusal @ 29 fbgs* *NX coring from 29 to 34 fbgs*						
	36											
595.68	38											

D Monitoring Well Construction Logs

ENVIRONMENTAL STRATEGIES CORPORATION
Four Penn Center West, Suite 315
Pittsburgh, Pennsylvania 15276
(412) 787-5100

Project No.: 483803 | Site ID: RFI-05

Project Name: AL TECH - DUNKIRK, NEW YORK

Site Location: Northeast Corner of Lucas Ave. Plant

Date(s): 10/28/96 - 10/28/96 | Total Depth: 15.00'

Top-Well Casing: 634.26' | Datum: Mean Sea Level

Contractor: Earth Dimensions | Comp. Depth: 14.98'

Conductor Casing: type: NAO-Not Applicable; dia: 0.00in fm: 0.00' to: 0.00'

Drilling Method: Hollow Stem Auger | Grnd. Surf. El.: 631.99'

Blank Casing: type: PVC dia: 2.00in fm: -2.2' to: 6.98'

Logged By: Greg Frisch | Permit Date: / /

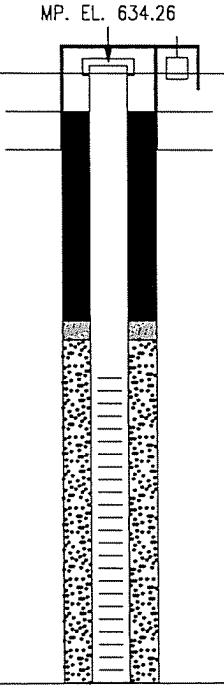
Remarks:

Screens: type: Slotted size: 0.010in dia: 2.00in fm: 6.98' to: 14.98'
type: size: dia: fm: to:

Depth (feet)	Blow Count	Recovery (%)	Sample No.	Graphic Log	USCS Code	Material Description
0	9 14 25 22	70			CL ML	GRAVELLY CLAY, bricks, trace sand, fill. SILT, dark gray, grade to silty clay at 2.5 feet.
	5 7 22 25	80	SB-RFI-005-0204		ML	SILTY CLAY, brown with gray mottling, low plasticity, dry.
5	7 12 18 17	70				
		0	SHELBY TUBE		ML	SILT, medium brown to olive brown, low plasticity, moist.
	10 18 25 27	90			ML	Color change to medium to dark gray.
10	5 13 20 18	100				
	12 18 14 15	80	SB-RFI-005-1214			
15	32 51 R/3	20			S	SHALE, weathered, dark gray, wet.
20						
25						
30						

Well Construction

MP. EL. 634.26



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NATURE'S WAY ENVIRONMENTAL
Consultants & Contractors, Inc.
3553 Crittenden Road
Alden, NY 14004
(716) 937- 6527
www.natureswayenvironmental.com

HOLE NUMBER: MW1

DATE: 11-28-17 ELEVATION:

PROJECT: Al-Tech Specialty Steel Site
Lucas Avenue, Dunkirk, NY

PREPARED FOR: Environmental Services Group

BORING LOCATION:

SN	0/6	6/12	12/18	18/24	PID (ppm)	DESCRIPTION AND CLASSIFICATION	REC	REMARKS	COMMENTS
1	8				0	Moist to extremely moist, brown, gravelly (SILTY-SAND) fill, with 20 to 40% gravel, very fine size sand, little silt, compact	1.0	8" road box encased in concrete	Sandy soil fill with some gravel to 4.5 feet over clayey shale residuum to 6.0 feet over shale rock to refusal
		10							
			17						
				14					
2	7				0		0.4'	Cement / bentonite grout	
		10							
			8					Bentonite chips	
				12					
3	3				0		1.4'	2" PVC riser pipe	
		7				4.5			
			10			Moist, distinctly mottled, brown, shaley (CLAYEY-SILT) with 15 to 30% mostly shale gravel, some clay, very stiff, thinly bedded		#00 size sand	
				10		6.0			
4	17				5.2	Shale rock, gray, soft to moderately soft, fissile, weathered	1.2'		
		50/5"							
								2" 10-slot PVC screen	
5	30				7.1		0.6'		
		50/2"							
6	27				0		0.9'	#00N sand	
		50/3"							
7	50/1"				0		0.1'		
						12.5			
						Auger refusal at 12.5' bgs			No water at completion

MONITORING WELL: 0.2 — 1.5 — 2.5 — 4.5 — 5.5 — 7.0 — 12.0 — 12.5

LOGGED BY: Dale M. Gramza, P.G.

NATURE'S WAY ENVIRONMENTAL
Consultants & Contractors, Inc.
3553 Crittenden Road
Alden, NY 14004
(716) 937- 6527
www.natureswayenvironmental.com

HOLE NUMBER: MW2

DATE: 11-27-17

ELEVATION:

PROJECT: Al-Tech Specialty Steel Site
Lucas Avenue, Dunkirk, NY

PREPARED FOR: Environmental Services Group

BORING LOCATION:

SN	0/6	6/12	12/18	18/24	PID (ppm)	REC
1	10				0	2.0'
		15				
			18			
				20		
2	8				0	1.0'
		8				
			4			
				7		
3	10				0	2.0'
		15				
			16			
				31		
4	50/4"				7.2	0.3'
5	27				2.5	0.5'
		50/1"				
6	42				9.8	0.7'
		50/3"				
7	30				47.2	0.4'
		50/1"				
8	50/3"				9.4	0.3'

LITH

DESCRIPTION AND CLASSIFICATION

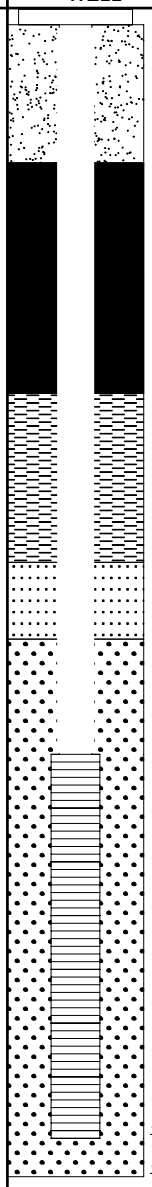
Moist, brown, gravelly (SANDY-SILT) fill, with 15 to 25% gravel, little fine size sand, dense — 2.5

Moist, brown, gravelly (CLAYEY-SILT) fill, with 15 to 25% gravel, little clay, compact to dense — 5.0

Shale rock, olive gray to gray, soft to moderately soft, fissile, dry — 15.2

Auger refusal at 15.2' bgs

MONITORING WELL



REMARKS

8" road box encased in concrete

Cement / bentonite grout

2" PVC riser pipe

Bentonite chips

#00 size sand

2" 10-slot PVC screen

#00N Sand

COMMENTS

Silty soil fill with little gravel and sand to 2.5 feet over apparent silty soil fill with little gravel and clay to 5.0 feet over shale rock to refusal

No water at completion

LOGGED BY: Dale M. Gramza, P.G.

NATURE'S WAY ENVIRONMENTAL
Consultants & Contractors, Inc.
3553 Crittenden Road
Alden, NY 14004
(716) 937- 6527
www.natureswayenvironmental.com

HOLE NUMBER: MW3

DATE: 11-27-17 ELEVATION:

PROJECT: Al-Tech Specialty Steel Site
Lucas Avenue, Dunkirk, NY

PREPARED FOR: Environmental Services Group

BORING LOCATION:

SN	0/6	6/12	12/18	18/24	PID (ppm)	DESCRIPTION AND CLASSIFICATION	REC
1	6				0	Moist, dark brown (SILT) topsoil, with little very fine size sand, compact (0.4)	1.5'
		18			0		
			14				
				17			
2	10				0.2	Moist, brown, gravelly (SILTY-SAND) fill, with 15 to 25% gravel, very fine to fine size sand, little silt, compact (2.0)	1.3'
		11					
			14			Moist, brown (SAND-SILT-CLAY) fill, with 5 to 15% gravel, little clay and very fine size sand, compact	
				15			
3	5				1.1		1.6'
		6					
			7				
				6		(6.0)	
4	10				7.6	Moist, olive brown, gravelly (SAND-SILT- CLAY) with 15 to 25% gravel, little clay and very fine size sand, dense, massive soil stucture	1.8'
		14					
			17				
				22		(8.0)	
5	22				2.0	Shale rock, dark gray, fissile, wet, becoming gray and moist below 10.0'	0.8'
		50/3"					
6	50/4"						0.5'
7						Auger refusal at 12.0' bgs (12.3)	

MONITORING WELL	REMARKS	COMMENTS
0.2	8" road box encased in concrete	Topsoil to 0.4 foot over sandy soil fill with little gravel to 2.0 feet over apparent loamy soil fill with trace gravel to 6.0 feet over loamy glacial till to 8.0 feet over shale rock to refusal
2.3	2" PVC riser pipe	
	Bentonite chips	
4.3	#00 size sand	
5.3		
6.8	2" 10-slot PVC screen	
11.8	#00N sand	
12.3		No water at completion

LOGGED BY: Dale M. Gramza, P.G.

NATURE'S WAY ENVIRONMENTAL
Consultants & Contractors, Inc.
3553 Crittenden Road
Alden, NY 14004
(716) 937- 6527
www.natureswayenvironmental.com

HOLE NUMBER: MW4

DATE: 11-28-17

ELEVATION:

PROJECT: Al-Tech Specialty Steel Site
Lucas Avenue, Dunkirk, NY

PREPARED FOR: Environmental Services Group

BORING LOCATION:

SN	0/6	6/12	12/18	18/24	PID (ppm)	LITH	DESCRIPTION AND CLASSIFICATION	REC	MONITORING WELL	REMARKS	COMMENTS
1	17				0		Moist, faintly mottled, brown (SILT) fill with 5 to 15% gravel, trace very fine size sand, dense	1.3'	0.2	8" road box encased in concrete	Silty soil fill with trace gravel to 2.0 feet over clayey lake sediment to 6.0 feet over silty lake sediment to 18.0 feet over silty lake sediment with trace gravel to 22.5 feet over apparent shale rock to refusal
		13							1.5		
			17								
				15			2.0				
2	5				0		Moist, distinctly mottled, brown (CLAYEY-SILT) with some clay, stiff, blocky soil structure	1.4'		Cement/ bentonite grout	
		6									
			6								
				5							
3	3				0			1.7'		2" PVC riser pipe	
		5									
			7								
				6			6.0				
4	4				0		Extremely moist to wet, gray (SILT) with trace very fine size sand, compact to loose, weakly thinly bedded, with occasional (CLAYEY-SILT) layers	1.8'			
		5									
			7								
				9					7.8		
5	1				0			1.3'		Bentonite chips	
		3									
			4								
				4					9.8		
6	3				0			1.3'		#00 size sand	
		4							10.8		
			5								
				7							
7	3				0			1.2'	12.3		
		3								2" 10-slot PVC screen	
			3								
				3							
8	2				0			1.7'			
		2									
			2								
				3							
9	1				0			1.8'			
		1									
			2								
				2			18.0				
10	2				0		Extremely moist, gray (SILT) with 5 to 15% gravel, little clay, loose	0.8'			
		3									
			4								
				5						#00N sand	
11	1				0			1.6'			
		2									

LOGGED BY: Dale M. Gramza, P.G.

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HOLE NUMBER: MW4

DATE: 11-28-17 ELEVATION:

PROJECT: Al-Tech Specialty Steel Site
Lucas Avenue, Dunkirk, NY

PREPARED FOR: Environmental Services Group

BORING LOCATION:

SN	0/6	6/12	12/18	18/24	PID (ppm)	LITH	DESCRIPTION AND CLASSIFICATION	REC	MONITORING WELL	REMARKS	COMMENTS
			2		0		Extremely moist, gray (SILT) with 5 to 15% gravel, little clay, loose 22.5	0.8'	22.3	#00N sand	No water at completion
				4			Shale rock, gray, fissile 22.8		22.8		
12	1						Auger refusal at 22.8' bgs				
		50/2"									

LOGGED BY: Dale M. Gramza, P.G. PAGE 2 of 2

ENVIRONMENTAL STRATEGIES CORPORATION
Four Penn Center West, Suite 315
Pittsburgh, Pennsylvania 15276
(412) 787-5100

Project No.: 483803	Site ID: RB-04
Project Name: AL TECH - DUNKIRK, NEW YORK	
Site Location: Lucas Avenue Plant - CAMU A	
Date(s): 10/30/96 - 10/30/96	Total Depth: 9.00'
Contractor: Earth Dimensions	Comp. Depth: NA
Drilling Method: Hollow Stem Augers	Grnd. Surf. El.: 632.30'
Logged By: Pat Peterson	Permit Date: / /
Remarks:	
Top-Well Casing: NA	Datum: Mean Sea Level
Conductor Casing: type:	dia: 0.00in fm: 0.00' to: 0.00'
Blank Casing: type:	dia: 0.00in fm: 0.0' to:
Screens: type: size:	dia: fm: to:
type: size:	dia: fm: to:

Depth (feet)	Blow Count	Recovery (%)	Sample No.	Graphic Log	USCS Code	Material Description	Well Construction
0	2 3 3 5	60	SB-RB-04-0002		F/SC	CLAYEY SAND, fine to medium grain, fill.	
	2 4 2 2	70			F/SM	SAND, fine to medium grain, gray, moist, fill.	
5	5 24 8 16	80	SB-RB-04-0406				
	5 24 32 44	100			ML	CLAYEY SILT, trace fine gravel, light olive brown, low plasticity, mottle, moist.	
	10 99 R/S	30			S	SHALE, weathered, gray, dry.	
10							
15							
20							
25							
30							

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ENVIRONMENTAL STRATEGIES CORPORATION
Four Penn Center West, Suite 315
Pittsburgh, Pennsylvania 15276
(412) 787-5100

Project No.: 483803		Site ID: RB-05	
Project Name: AL TECH - DUNKIRK, NEW YORK			
Site Location: Lucas Avenue Plant - CAMU A			
Date(s): 10/28/96 - 10/28/96	Total Depth: 11.00'	Top-Well Casing: NA	Datum: Mean Sea Level
Contractor: Earth Dimensions	Comp. Depth: NA	Conductor Casing: type:	dia: 0.00in fm: 0.00' to: 0.00'
Drilling Method: Hollow Stem Auger	Grnd. Surf. El.: 632.46'	Blank Casing: type:	dia: 0.00in fm: 0.0' to:
Logged By: Pat Peterson	Permit Date: / /	Screens: type: size:	dia: fm: to:
Remarks:		type: size:	dia: fm: to:

Depth (feet)	Blow Count	Recovery (%)	Sample No.	Graphic Log	USCS Code	Material Description	Well Construction
0					F/CL	GRAVEL, change to gravelly clay at 0.5', fill.	
					CL	CLAY, yellowish brown, some iron staining and mottling, plastic, moist; increase in silt at 4 feet with trace round gravel.	
5					ML	SILT, trace round gravel, light olive brown, dry.	
					GM	GRAVELLY SILT, and gravel, dark yellowish brown, dry to moist.	
10					S	SHALE, weathered, gray, damp.	
15							
20							
25							
30							

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ENVIRONMENTAL STRATEGIES CORPORATION
Four Penn Center West, Suite 315
Pittsburgh, Pennsylvania 15276
(412) 787-5100

Project No.: 483803		Site ID: RFI-05	
Project Name: AL TECH - DUNKIRK, NEW YORK			
Site Location: Northeast Corner of Lucas Ave. Plant			
Date(s): 10/28/96 - 10/28/96	Total Depth: 15.00'	Top-Well Casing: 634.26'	Datum: Mean Sea Level
Contractor: Earth Dimensions	Comp. Depth: 14.98'	Conductor Casing: type: NAO-Not Applicable; dia: 0.00in fm: 0.00' to: 0.00'	
Drilling Method: Hollow Stem Auger	Grnd. Surf. El.: 631.99'	Blank Casing: type: PVC dia: 2.00in fm: -2.2' to: 6.98'	
Logged By: Greg Frisch	Permit Date: / /		
Remarks:		Screens: type: Slotted size: 0.010in dia: 2.00in fm: 6.98' to: 14.98'; type: size: dia: fm: to:	

Depth (feet)	Blow Count	Recovery (%)	Sample No.	Graphic Log	USCS Code	Material Description
0	9 14 25 22	70			CL	GRAVELLY CLAY, bricks, trace sand, fill.
					ML	SILT, dark gray, grade to silty clay at 2.5 feet.
	5 7 22 25	80	SB-RFI-005-0204		ML	SILTY CLAY, brown with gray mottling, low plasticity, dry.
5	7 12 18 17	70				
		0	SHELBY TUBE		ML	SILT, medium brown to olive brown, low plasticity, moist.
	10 18 25 27	90			ML	Color change to medium to dark gray.
10	5 13 20 18	100				
	12 18 14 15	80	SB-RFI-005-1214			
15	32 51 R/3	20			S	SHALE, weathered, dark gray, wet.
20						
25						
30						

Well Construction

MP. EL. 634.26

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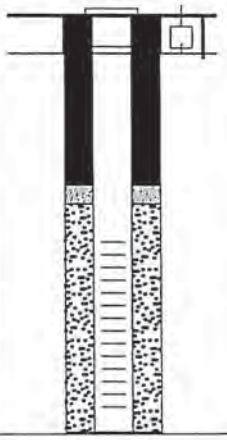
ENVIRONMENTAL STRATEGIES CORPORATION
Four Penn Center West, Suite 315
Pittsburgh, Pennsylvania 15276
(412) 787-5100

Project No.: 483803	Site ID: RFI-08
Project Name: AL TECH - DUNKIRK, NEW YORK	
Site Location: NW Storage Area of Lucas Ave. Plant	
Date(s): 10/29/96 - 10/29/96	Total Depth: 11.00'
Contractor: Earth Dimensions	Comp. Depth: 10.95'
Drilling Method: Hollow Stem Auger	Grnd. Surf. El.: 631.80'
Logged By: Pat Peterson	Permit Date: / /
Remarks:	
Top-Well Casing: 631.50'	Datum: Mean Sea Level
Conductor Casing: type: NAO dia: 0.00in fm: 0.00' to: 0.00'	
Blank Casing: type: PVC dia: 2.00in fm: 0.0' to: 5.95'	
Screens: type: Slotted size: 0.010in dia: 2.00in fm: 5.95' to: 10.95'	
type: size: dia: fm: to:	

Depth (feet)	Blow Count	Recovery (%)	Sample No.	Graphic Log	USCS Code	Material Description
0					C	CONCRETE, underlain with gravel and concrete fill.
	23 50 7 7	80			SP	SAND, fill.
	70 35 15 18	100				
5	16 15 17 20	100	SB-RFI-008-0507		GC	GRAVELLY CLAY, some silt, medium plasticity, olive brown, moist.
	20 40 50 65	10				
10	45 99 R/3	20			S	SHALE, weathered, dark gray, dry.
15						
20						
25						
30						

Well Construction

MP. EL. 631.50



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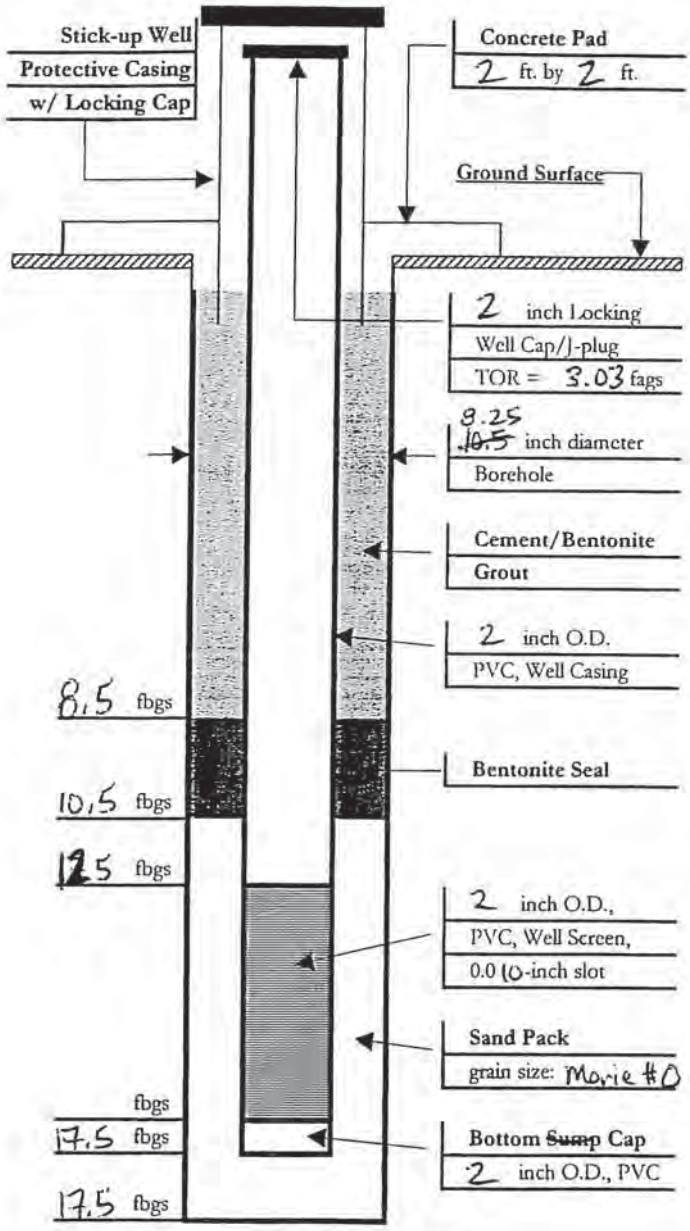
BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

STICK-UP WELL/PIEZOMETER COMPLETION DETAIL

Project Name:	Phase II RFI/CMS	WELL NUMBER:	RFI-18
Client:	Read Co, Inc.	Date Installed:	2/5/03
Boring Location:	~~SWMU~~ SWMU 13C, 17 + 22	Project Number:	0041-009-200



Driller Information

Company:	SJB Services, Inc.
Driller:	Ken Fuiler
Helper:	Scott Fuiler
Permit Number:	NA
Drill Rig Type:	CME-85

Well Information

Land Surface Elevation:		fmsl (approximate)
Drilling Method:	4 1/4" HSA	
Soil Sample Collection Method:	2" split spoon	
Drilling Fluid:	NA	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	2" Sch. 40 PVC
Screen:	2" Sch. 40 PVC, 0.010-inch
Sump:	NA
Sand Pack:	Morie #0
Bentonite ~~Pellets~~:	Chips. medium

Well Development

Well Purpose:	groundwater monitoring	
Techneque(s):	poly. disp. bailer - purge/surge	
Date Completed:	2/20/03	
BM/TK Personnel	RLD	
Total Volume Purge:	8.5	gallons
Static Water Level:	16.08	fbTOR
Pump Depth:	NA	
Pumping Duration:	NA	minutes
Yeild:	NA	gpm
Specific Capacity:	NA	gpm/ft

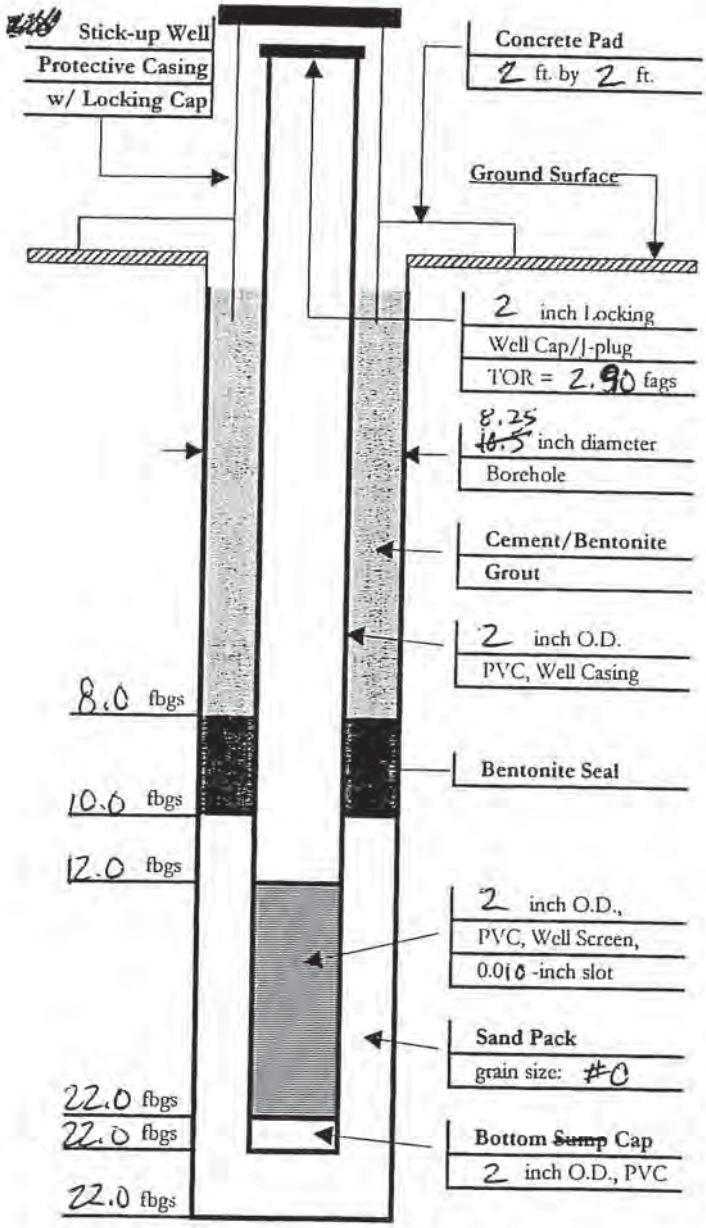
Comments: Bedrock = 14 fbgs
First GW = NA

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

STICK-UP WELL/PIEZOMETER COMPLETION DETAIL

Project Name: Phase II RFI/ICMs
Client: RealCo, Inc.
Boring Location: Lucas Avenue - AOC 5A/5B

WELL NUMBER: RFI-26
Date Installed: 1/30/03
Project Number: 0041-009-200



Driller Information

Company:	SJB Services, Inc.
Driller:	Ron Brown
Helper:	Scott Fuller
Permit Number:	NA
Drill Rig Type:	CME-85

Well Information

Land Surface Elevation:		fmsl (approximate)
Drilling Method:	4 1/4" HSA	
Soil Sample Collection Method:	2" split spoon	
Drilling Fluid:	none	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	2" Sch. 40 PVC
Screen:	2" Sch 40 PVC, 0.010 inch
Sump:	NA
Sand Pack:	Morie #0 sand
Bentonite Pellets:	medium chips

Well Development

Well Purpose:	groundwater monitoring	
Techneque(s):	poly disp. bailer-purge/surge	
Date Completed:	2/20/03	
BM/TK Personnel	RLD	
Total Volume Purge:	27.0	gallons
Static Water Level:	8.66	fbTOR
Pump Depth:	NA	
Pumping Duration:		minutes
Yeild:		gpm
Specific Capacity:		gpm/ft

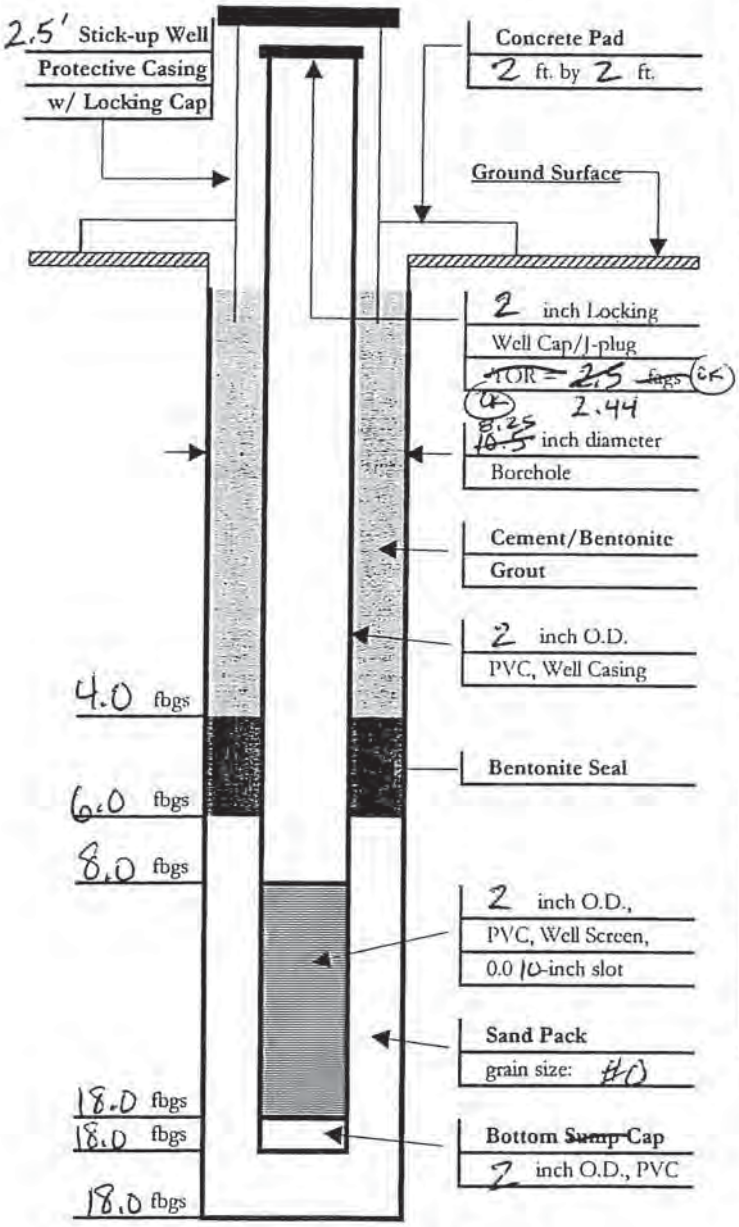
Comments: Bedrock = 18.0 fbgs
First GW = 4.5 fbgs

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

STICK-UP WELL/PIEZOMETER COMPLETION DETAIL

Project Name: Phase II RFI/RCRA
Client: RealCo, Inc.
Boring Location: Bilco's Avenue - AOC 5A/5B

WELL NUMBER: RFI-27
Date Installed: 1/31/03
Project Number: 0041-009-200



Driller Information

Company:	SJB Services, Inc.
Driller:	Ron Brown
Helper:	Scott Fuller
Permit Number:	NA
Drill Rig Type:	CME-85

Well Information

Land Surface Elevation:		fmsl (approximate)
Drilling Method:	4 1/4 HSA	
Soil Sample Collection Method:	2" split-spoon	
Drilling Fluid:	none	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	2" Sch. 40 PVC
Screen:	2" Sch. 40 PVC, 0.010-inch
Sump:	NA
Sand Pack:	Morie #0 sand
Bentonite Pellets:	medium chips

Well Development

Well Purpose:	groundwater monitoring	
Techneque(s):	poly. disp. bailer - purge/surge	
Date Completed:	2/20/03	
BM/TK Personnel	~~BBB~~ RLD	
Total Volume Purge:	18.75	gallons
Static Water Level:	10.32	fbTOR
Pump Depth:	NA	
Pumping Duration:		minutes
Yeild:		gpm
Specific Capacity:		gpm/ft

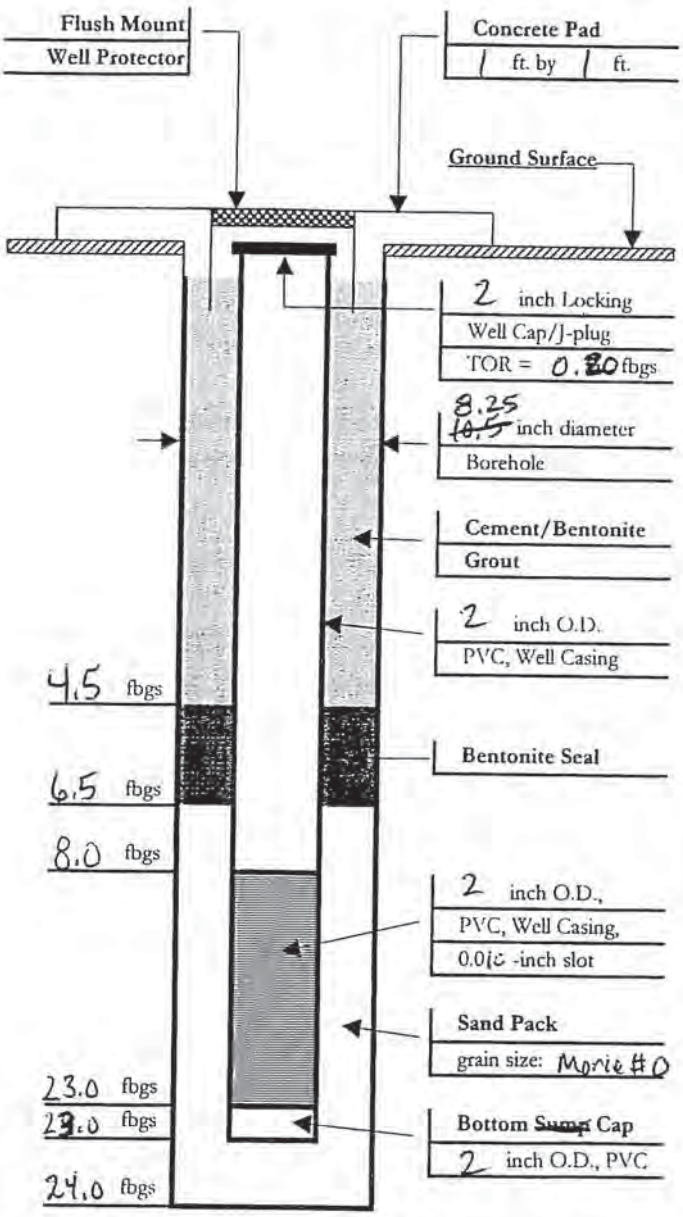
Comments: Bedrock = 8.0 fbgs
First GW = 4.5 fbgs

BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FLUSHMOUNT WELL/PIEZOMETER COMPLETION DETAIL

Project Name: Phase II RFI/ICMS
Client: Reed Co., Inc.
Boring Location: Pickle Facility Area D

WELL NUMBER: RFI-31
Date Installed: 2/3/03
Project Number: 0041-009-200



Driller Information

Company:	SJB Services, Inc.
Driller:	Ken Fuller
Helper:	Scott Fuller
Permit Number:	NA
Drill Rig Type:	CME-85

Well Information

Land Surface Elevation:		fmsl (approximate)
Drilling Method:	4 1/4" HSA	
Soil Sample Collection Method:	2" split spoon	
Drilling Fluid:	NA	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	2" Sch. 40 PVC
Screen:	2" Sch 40 PVC, 0.010-inch
Sump:	NA
Sand Pack:	Morie #0
Bentonite ~~Pellets~~:	Chips: medium

Well Development

Well Purpose:	groundwater monitoring	
Techneque(s):	poly. disp. bailer - purge/surge	
Date Completed:	2/26/03	
BM/TK Personnel	BCH, RLD	
Total Volume Purge:	33.5	gallons
Static Water Level:	3.74	fbTOR
Pump Depth:	NA	
Pumping Duration:		minutes
Yeild:		gpm
Specific Capacity:		gpm/ft

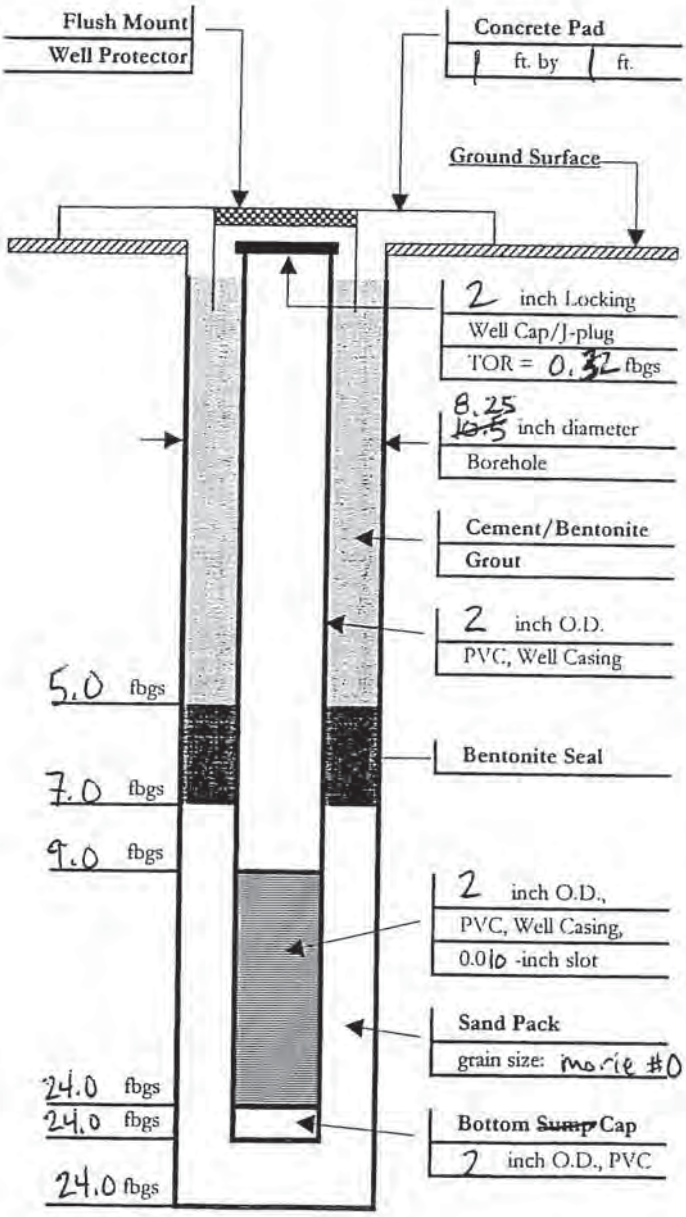
Comments: Bedrock = NA
First GW = 6.0 fbgs

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FLUSHMOUNT WELL/PIEZOMETER COMPLETION DETAIL

Project Name: Phase II RFI/CMS
Client: RealCo, Inc.
Boring Location: Pickle Facility Area D

WELL NUMBER: RFI-32
Date Installed: 2/4/03
Project Number: 0041-009-200



Driller Information

Company:	SJB Services, Inc.
Driller:	Ken Fuller
Helper:	Scott Fuller
Permit Number:	NA
Drill Rig Type:	CME-85

Well Information

Land Surface Elevation:		fmsl (approximate)
Drilling Method:	4¼" HSA	
Soil Sample Collection Method:	2" split spoon	
Drilling Fluid:	NA	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	2" Sch. 40 PVC
Screen:	2" Sch 40 PVC, 0.010-inch
Sump:	NA
Sand Pack:	Morie #0
Bentonite ~~Pellets~~:	Chips: Medium

Well Development

Well Purpose:	groundwater Monitoring	
Techneque(s):	poly. disp. bailer - purge/surge	
Date Completed:	2/20/03	
BM/TK Personnel	BCH, RLD	
Total Volume Purge:	30.0	gallons
Static Water Level:	8.04	fbTOR
Pump Depth:	NA	
Pumping Duration:		minutes
Yeild:		gpm
Specific Capacity:		gpm/ft

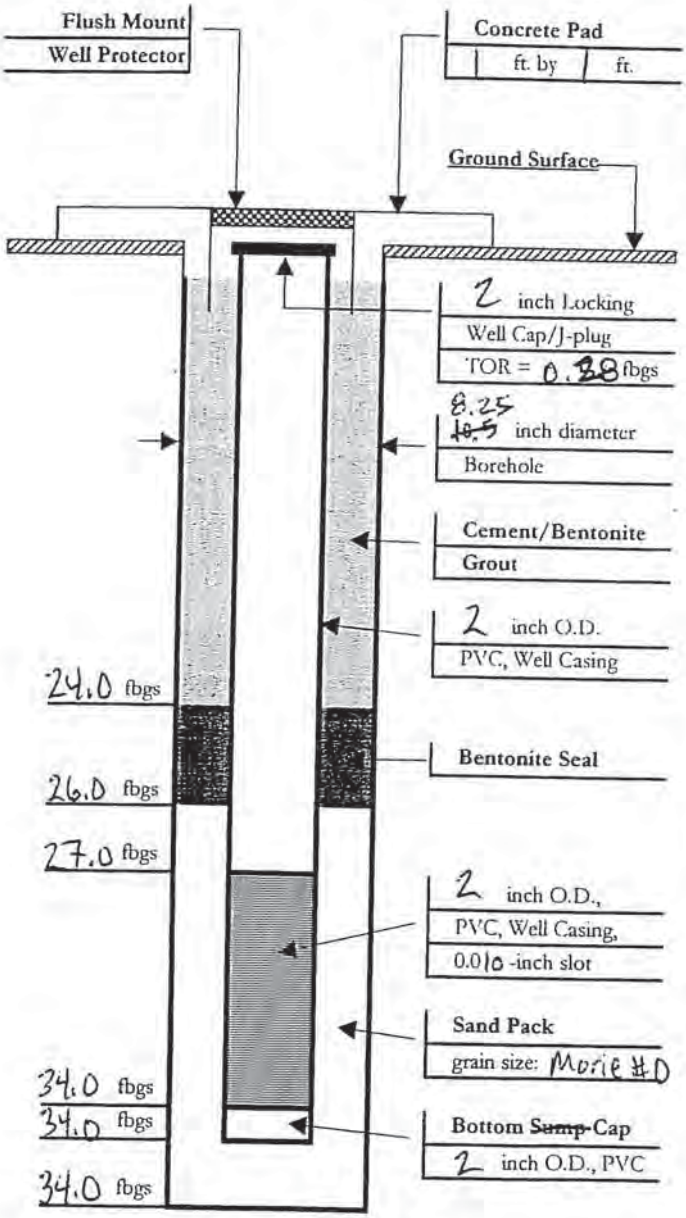
Comments: Bedrock = NA
First GW = 6.5 fbgs

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

FLUSHMOUNT WELL/PIEZOMETER COMPLETION DETAIL

Project Name: Phase II RFI/ICMS
Client: RealCo, Inc.
Boring Location: Pickle Facility Area D

WELL NUMBER: RFI-33
Date Installed: 2/5/03
Project Number: 0041-009-200



Driller Information

Company:	SJB Services, Inc.
Driller:	Ken Fuiler
Helper:	Scott Fuiler
Permit Number:	NA
Drill Rig Type:	CME-85

Well Information

Land Surface Elevation:		fmsl (approximate)
Drilling Method:	4 1/4" HSA	
Soil Sample Collection Method:	2" split spoon	
Drilling Fluid:	potable water	
Fluid Loss During Drilling:	220	gallons (approximate)

Material of Well Construction

Casing:	2" sch. 40 PVC
Screen:	2" sch. 40 PVC, 0.010-inch
Sump:	NA
Sand Pack:	Morie #0
Bentonite ~~Pellets~~:	Chips: medium

Well Development

Well Purpose:	Groundwater monitoring	
Techneque(s):	poly. disp. bailer - purge/surge	
Date Completed:	2/20/03	
BM/TK Personnel	RLD	
Total Volume Purge:	45.0	gallons
Static Water Level:	8.82	fbTOR
Pump Depth:	NA	
Pumping Duration:		minutes
Yeild:		gpm
Specific Capacity:		gpm/ft

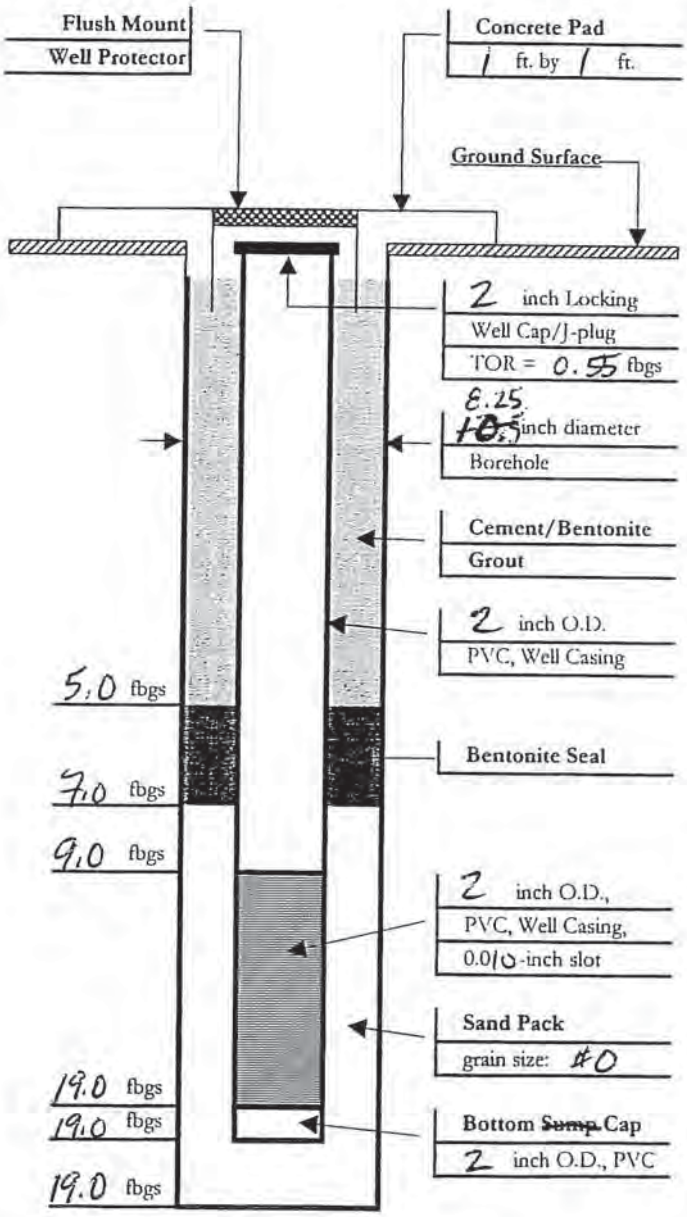
Comments: Bedrock = 29.0 fbgs
First GW = 6.5 fbgs

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

FLUSHMOUNT WELL/PIEZOMETER COMPLETION DETAIL

Project Name: Phase II RFI/CMS
Client: RealCo, Inc.
Boring Location: Lucas Avenue

WELL NUMBER: TW-15
Date Installed: 1/29/03
Project Number: 0041-009-200



Driller Information

Company:	SJB Services, Inc.
Driller:	Ron Brown
Helper:	Scott Fuller
Permit Number:	NA
Drill Rig Type:	CME-85

Well Information

Land Surface Elevation:		fmsl (approximate)
Drilling Method:	4¼ HSA	
Soil Sample Collection Method:	Split Spoon (2")	
Drilling Fluid:	None	
Fluid Loss During Drilling:	NA	gallons (approximate)

Material of Well Construction

Casing:	2" Sch. 40 PVC
Screen:	2" Sch. 40 PVC, 0.010-inch
Sump:	NA
Sand Pack:	Morie #0 sand
Bentonite Pellets:	3/8" - medium chips

Well Development

Well Purpose:	groundwater monitoring	
Techneque(s):	poly. disp. bailer - purge/surge	
Date Completed:	2/18/03	
BM/TK Personnel	RLD	
Total Volume Purge:	19.0	gallons
Static Water Level:	1.92	fbTOR
Pump Depth:	NA	
Pumping Duration:		minutes
Yeild:		gpm
Specific Capacity:		gpm/ft

Comments: Bedrock = 8.0 fbgs
First GW: NA

RealCo Inc.
P.O. Box 9, Lake View, NY 14085
(716) 510-6678 FAX: (716) 649-9249

December 21, 2001

Ms. Denise Radtke, Sr. Engineering Geologist
Division of Solid & Hazardous Materials
NYS Dept. of Environmental Conservation
625 Broadway, 8th Floor
Albany, New York 12233-7252

Re: Boring Logs for the LAP Groundwater Monitoring Wells

Dear Denise:

Enclosed please find copies of boring logs for the LAP groundwater monitoring wells TW-5 through TW-11 and SP-1 through SP-3. Environmental Strategies Corporation apparently did not prepare boring logs for TW-12 through TW-14.

Please let me know if you need any additional information.

Sincerely,

Jin Park
President

Enclosures

Boring Log: TW-5

Project: RealCo

Project No.: 193062

Location: Dunkirk, NY

Geologist: Pat Peterson

Completion Date: 3/6/2000

Surface Elevation (ft. MSL): 630.52

Total Depth (ft. bgs): 20

TOC Elevation (ft. MSL):

Borehole Diameter (in.) 8.5

ESC

Sample Data			SUBSURFACE PROFILE		
Depth	Sample Interval	PID (ppm)	Symbol	Description	Well Construction
0				Ground Surface	
1	--	NA		*Gravelly Clay* Topsoil with gravel and fines, organics, dark brown to black, moist	
2					
3	--	NA		*Clayey Silt* medium brown with gray mottling, some fine gravel; stiff, low to moderate plasticity, moist	
4					
5	--	NA			
6				*Same as above* Becoming lighter brown and very stiff with iron staining	
7					
8					
9	--	NA		*Weathered Shale* Clay with shale fragments, gray, dry to moist at depth, very stiff	
10					
11					
12					
13					
14					
15				*Augered* Split spoon refusal	
16					
17					
18					
19					
20					

Subcontractor: Parratt Wolff

Method: Hollow stem auger

Driller:

Boring Log: TW-6

Project: RealCo

Project No.: 193062

Location: Dunkirk, NY

Geologist: Pat Peterson

Completion Date: 3/6/2000

Surface Elevation (ft. MSL): 631.40

Total Depth (ft. bgs): 18

TOC Elevation (ft. MSL):

Borehole Diameter (in.) 8.5

Sample Data			SUBSURFACE PROFILE		
Depth	Sample Interval	PID (ppm)	Symbol	Description	Well Construction
0				Ground Surface	
1	--	NA		*Gravelly Clay* Topsoil with gravel and fines, organics, dark brown, moist	
2				*Silty Clay* Light brown, some fine gravel and sand, plastic, moist	
3	--	NA			
4					
5	--	NA		*Clayey Silt* Light brown, some fine gravel and sand, iron staining, non plastic, moist	
6					
7					
8					
9	--	NA		*Weathered Shale* Clay with shale fragments, gray, dry to moist at depth, very stiff	
10					
11					
12					
13					
14				*Augered* Split spoon refusal	
15					
16					
17					
18				Boring Terminated	
19					
20					

Subcontractor: Parratt Wolff

Method: Hollow stem auger

Driller:

Boring Log: TW-7

Project: RealCo

Project No.: 193062

Location: Dunkirk, NY

Geologist: Pat Peterson

Completion Date: 3/8/2000

Surface Elevation (ft. MSL): 630.45

Total Depth (ft. bgs): 20

TOC Elevation (ft. MSL):

Borehole Diameter (in.) 8.5

ESC

Sample Data			SUBSURFACE PROFILE		
Depth	Sample Interval	PID (ppm)	Symbol	Description	Well Construction
0				Ground Surface	
1	--	NA		*Gravelly silt* Topsoil with gravel and fines, organics, dark brown, moist to wet	
2					
3	--	NA			
4					
5	--	NA		*Clayey Silt* Light brown, some fine gravel and sand, slightly plastic, moist	
6					
7					
8					
9	--	NA			
10				*Weathered Shale* Clay with shale fragments, gray, dry to moist at depth, very stiff	
11					
12					
13					
14					
15				*Augered* Split spoon refusal	
16					
17					
18					
19					
20					

Subcontractor: Parratt Wolff

Method: Hollow stem auger

Driller:

Boring Log: TW-8

Project: RealCo

Project No.: 193062

Location: Dunkirk, NY

Geologist: Pat Peterson

Completion Date: 3/7/2000

Surface Elevation (ft. MSL): 630.17

Total Depth (ft. bgs): 19.8

TOC Elevation (ft. MSL):

Borehole Diameter (in.) 8.5

Sample Data			SUBSURFACE PROFILE		
Depth	Sample Interval	PID (ppm)	Symbol	Description	Well Construction
0				Ground Surface	
1	--	NA		*Gravelly silt* Topsoil with gravel and fines, organics, dark brown, moist to wet	
2					
3	--	NA			
4					
5	--	NA		*Clayey Silt* Light brown, some fine gravel and sand, slightly plastic, moist	
6					
7	--	NA			
8					
9	--	NA			
10				*Weathered Shale* Clay with shale fragments, gray, dry to moist at depth, very stiff	
11					
12					
13					
14					
15				*Augered* Split spoon refusal	
16					
17					
18					
19					
20					

Subcontractor: Parratt Wolff

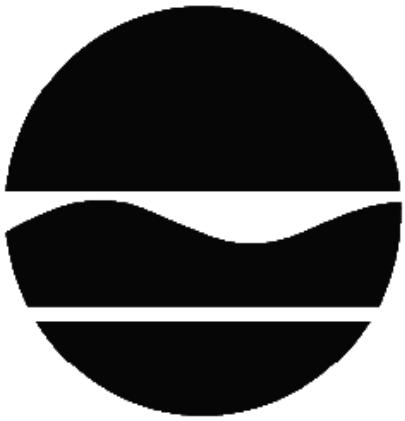
Method: Hollow stem auger

Driller:

E Record of Decision

RECORD OF DECISION

Al Tech Specialty Steel Corporation
Operable Unit Number 01: Lucas Avenue Plant Remedial Program
State Superfund Project
Dunkirk, Chautauqua County
Site No. 907022
November 2012



Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - RECORD OF DECISION

Al Tech Specialty Steel Corporation
Operable Unit Number: 01
State Superfund Project
Dunkirk, Chautauqua County
Site No. 907022
November 2012

Statement of Purpose and Basis

This document presents the remedy for Operable Unit Number: 01: Lucas Avenue Plant Remedial Program of the Al Tech Specialty Steel Corporation site, a Class 2 inactive hazardous waste disposal site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for Operable Unit Number: 01 of the Al Tech Specialty Steel Corporation site and the public's input to the proposed remedy presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

The elements of the selected remedy are as follows:

The elements of the proposed remedy are as follows:

1. Remedial Design. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;

- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Removal of USTs and Transformers. All underground storage tanks (USTs) and electrical transformers will be removed and properly disposed. Nine USTs are located in two separate rooms beneath the floor in the northeast section of the building. There is residual oil and sludge in the tanks and the rooms are partially flooded with groundwater. The rooms will be dewatered and the tanks removed and impact to the environment will be determined. If necessary any impacted soils will be excavated and treated or disposed.

The western portion of the Site contains numerous abandoned vats and tanks once used in the pickle process. The baths contain residuals, including chromium, from these processes. All tanks will be cleaned and removed from the site and properly disposed or recycled as appropriate.

Three, intact, transformers, each containing as much as 290 gallons of oil are located in an electrical equipment room in the south central part of the building. The transformers are marked as containing PCBs will be removed and properly disposed. No residual PCBs were noted around the base of the transformers, however, due to subsequent trespassers illegally removing electrical wire and components, this area will be re-assessed after the transformers are removed.

3. Demolition. The current condition of the Lucas Avenue Plant prevents safe remediation within and around the building. In addition, brick containing cyanide and copper residuals are present in the west and east pickle bath areas respectively. Demolition of the building is necessary to remove and properly dispose of this material. The remaining building will be demolished leaving floor slabs in place. Building materials will be reclaimed and recycled where possible.

4. Excavation. The 2007 IRM removed a large quantity of contaminated soil, however, the IRM did not address all areas at the site and contaminated soils remain. Approximately 4,186 cubic yards of additional contaminated soil will be removed. The excavations include:

a) Excavation and off-site disposal of characteristic hazardous waste metals including cadmium, chromium and lead. A portion of the soils in the western portion of the Site contain metals that when sampled for Toxic Leachate Characteristic Leaching Procedure (TCLP) characterizes those soils as hazardous waste. Approximately 3,038 cubic yards of soils may be determined to be considered hazardous waste. All soils and material determined to be hazardous waste will be removed from the Site

b) An additional approximately 660 cubic yards of soil containing elevated levels of metals and/or SVOCs will be excavated and properly disposed.

c) Excavation and off-site disposal of approximately 488 cubic yards of VOC contaminated soils. The remedial goal for the VOC impacted soils is the Commercial values defined in 6NYCRR Part375-6.8.

5. In-Situ Soil Treatment. Before backfilling the excavation containing VOCs the bottom of the excavation will be treated by applying a product(s) intended to hasten reductive de-chlorination of remaining VOCs in soil and groundwater,

6. Site Cover. A site cover will be required to allow for commercial use of the site [as a component of the site development.] The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

7. Institutional Control. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and,
- requires compliance with the Department approved Site Management Plan.

8. Site Management Plan. A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective;
   - Institutional Controls: The Environmental Easement discussed above details institutional controls necessary at the site that restricts use of the site, restricts groundwater use, ensures that the owner of the site incorporates a Department approved Site Management Plan, and ensures periodic certification that the property is only used for activities allowed by the restrictions,
   - Engineering Controls: A soil cover will be required to be maintained where building structures and pavement is not being maintained.

b. an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination; and,

c. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
   - monitoring of groundwater to assess the performance and effectiveness of the remedy;

- a schedule of monitoring and frequency of submittals to the Department;
- monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan.
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and,
- steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

11/28/2012

Date

Robert W. Schick, P.E., Director
Division of Environmental Remediation

RECORD OF DECISION

Al Tech Specialty Steel Corporation
Dunkirk, Chautauqua County
Site No. 907022
October 2012

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This Record of Decision (ROD) identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for selecting the remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

Dunkirk Free Library
Attn: Ms. Janice Dekoff
536 Central Avenue
Dunkirk, NY 14048
Phone: (716)366-2511

New York State Department of Conservation

Attn: Maurice Moore
270 Michigan Avenue
Buffalo, NY 14203-2915
Phone: (716) 851-7220

A public meeting was also conducted. At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) were presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period was held, during which verbal or written comments were accepted on the proposed remedy.

Comments on the remedy received during the comment period are summarized and addressed in the responsiveness summary section of the ROD.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:
The former AlTech Specialty Steel Corp. (AlTech) is an approximately 90 acre industrial site in the City of Dunkirk, Chautauqua County. Located north of Willowbrook Avenue, south of Lucas Avenue, east of Brigham Road the site is surrounded by mixed residential/commercial parcels including, single family residential, a lumber supply center, a municipal garage and the Dunkirk High School athletic fields.

Site Features:
The main facilities contain a mixture of active and inactive buildings and open land. The active facilities are partially fenced and consist mainly of the Brigham Road Plant and the Bar Finish and Storage Facility. There are inactive buildings, such as, the Howard Avenue Plant which are used for various purposes. An approximately 1.65 acre man-made cooling pond known as Willowbrook Pond is located in the southwest corner of the main facilities. A tributary to Crooked Brook flows southeast to northwest toward Lake Erie through the southwest corner of the site. Open land on and around the main facilities includes maintained lawn areas and unmaintained former fill and disposal areas that have vegetated with native opportunistic grass, brush and tree species.

North of the main facilities is the former Lucas Avenue Plant (LAP.) The LAP is a one-story, approximately 178,000-square-foot former manufacturing facility located on the south side of the

west end of Lucas Avenue. Situated on a rectangular parcel of land 2025' by 200' the LAP was formerly a part of the larger adjoining Al Tech site. The original LAP facility was constructed in 1909, with additions constructed in 1920, 1936, 1940, and 1968. The site is bordered by a rail line to the south, Brigham Road to the west, a City of Dunkirk Department of Public Works (DPW) building to the east and Lucas Avenue to the north. A residential neighborhood and public school are located on the north side of Lucas Avenue.

Zoning/Uses(s):
Current zoning is industrial. Since 2002, Dunkirk Acquisition, LLC d.b.a. Dunkirk Specialty Steel, has operated a large portion of the site as a steel and stainless steel processing facility.

Historic Use(s):
Industrial use of the site has included the manufacture of iron and steel dating back to 1908. Foundry operations gave way to forging and finishing of stainless steel rod and wire from supplied billets. Past operations at the facility leading to site contamination have included; pickling operations using molten sodium or barium salts, trichloroethylene pickle baths, metal plating operations, solid waste disposal, spillages and discharges into the cooling pond.

Experiencing financial difficulties through the late 1990's AlTech Specialty Steel ceased operations in 2001. An asset holding corporation, named RealCo emerged from these difficulties to address environmental issues at the idled facility, including, but not limited to the Lucas Avenue Plant and Willowbrook Pond. In 2002 Dunkirk Acquisition, LLC d.b.a. Dunkirk Specialty Steel acquired out of bankruptcy, the assets of the AlTech Site except for the Lucas Avenue Plant, the Brigham Road Pickle Room and the Willowbrook Pond.

The AlTech site is divided into three operable units (see Figure 2.)
An operable unit (OU) represents a portion of a site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from site contamination.

OU-1 Lucas Avenue Plant - OU-1 includes the building and the property owned by RealCo identified as SBL 96.01-3-1 situated north of the railway parallel to Lucas Avenue.

OU-2 Willowbrook Pond - This includes that area identified by SBL 96.10-1-1 owned by RealCo; the property known as the Brigham Road Plant, identified by SBL 96.06-3-79, owned by Dunkirk Acquisition LLC; and the off-site extent of the impacted Tributary of Crooked Brook to the west of the site, identified by various SBLs and owners.

OU-3 The AlTech Plant - This includes all the property in the main facility area identified by SBL 96.06-3-78 and SBL 96.06-3-77 both owned by Dunkirk Acquisition LLC.

Geology-Hydrology
The site is located on broad glacio-lacustrine sedimentary deposits. Soils are tight silty, clayey soils consisting of urban fill over silt loams of the Niagara Silt loam complex. Groundwater is about ten feet below the ground surface and is limited due to the tight nature of the bedrock and soils, however localized ponding can occur. Any groundwater present flows generally to the

north toward Lake Erie but is strongly influenced by topographic features and man-made pathways. Bedrock is the Upper Devonian Shales of the Canadaway Group.

Operable Unit (OU) Number 01 is the subject of this document.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the RI to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

RealCo Inc.

The former AlTech facility in Dunkirk is subject to a 1995 Department Order whereby AlTech was legally obligated to establish an Environmental Remediation Trust Fund to finance environmental remedial at the Dunkirk Site. A subsequent 1999 Order recognized RealCo, as a corporation and noted that RealCo would take title to certain real and personal property owned by the AlTech Specialty Steel Corporation and ordered that RealCo undertake environmental remediation required at the Dunkirk and a sister facility in Watervliet NY

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- air
- groundwater
- surface water
- soil
- sediment
- soil vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified for this Operable Unit at this site is/are:

Petroleum Products
trichloroethene (TCE)
chromium
lead
arsenic
cyanides (soluble cyanide salts)
pcb-aroclor 1260

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

Lucas Ave IRM - West End Demolition/Soil Removal

A 2007 IRM removed 4,689 cubic yards of contaminated soils containing lead, arsenic and hexavalent chromium. Soil excavation required partial demolition of the existing building

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU 01.

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.
Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU 01.

Site-wide investigations from 1992 to 2008 studied solid waste management units and areas of concern. The studies investigated all media including; surface soil, subsurface soil, groundwater, sediments, ambient air and soil vapor/sub-slab vapor. Also included were studies focusing on sediments and ecological impacts to the tributary of Crooked Brook.

In 1998 the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York State. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

Based upon investigations completed to date, the primary contaminants of concern on the site are chromium, lead, chlorinated solvents and polychlorinated biphenyls (PCBs).

OU-1 (Lucas Avenue Plant) - Soils are impacted with metals, SVOCs and Volatile Organic Compounds (VOCs.) Groundwater impacted with metals including chromium and barium has migrated off-site from the western portion of the former facility into the residential area to the north. An Interim Remedial Measure (IRM) removed hexavalent chromium, lead and barium contaminated soils which were contributing to groundwater contamination. Soil remains which require further remediation.

VOCs, including trichloroethylene (2,400 ppm), exist in the soils to the rear of eastern portion of the Lucas Avenue Plant. In this area these VOCs have impacted on-site groundwater (7,300 ppb) under the facility extending to the north. A Soil Vapor intrusion (SVI) study in this eastern area was completed in 2008. Groundwater and soil vapor sampling results indicated impacts at the property line but was not an off-site impact. VOCs, mainly TCE were detected in the sub-slab vapor below the floor and in the indoor air in the pickle room area. Petroleum storage tanks remain in the basement of the Lucas Avenue Facility and there are transformers that contain PCBs within the plant.

The site presents a significant environmental threat due to the ongoing releases of contaminants from source areas such as contaminated soils, sediments, contaminated building structures and impacted groundwater.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

The site is fenced, which restricts public access. However, persons who enter the site could contact contaminants in the soil by walking on the site, digging or otherwise disturbing the soil. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not contaminated by the site. Volatile organic compounds in groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site redevelopment and occupancy.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the

contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the feasibility study (FS) report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.
The basis for the Department's remedy is set forth at Exhibit D.

The estimated present worth cost to implement the remedy is $4,630,000. The cost to construct the remedy is estimated to be $4,250,000 and the estimated average annual cost is $25,000.

The elements of the selected remedy are as follows:

1. Remedial Design. A remedial design program would be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Removal of USTs and Transformers. All underground storage tanks (USTs) and electrical transformers will be removed and properly disposed. Nine USTs are located in two separate rooms beneath the floor in the northeast section of the building. There is residual oil and sludge in the tanks and the rooms are partially flooded with groundwater. The rooms will be dewatered and the tanks removed and impact to the environment will be determined. If necessary any impacted soils will be excavated and treated or disposed.

The western portion of the Site contains numerous abandoned vats and tanks once used in the pickle process. The baths contain residuals, including chromium, from these processes. All tanks will be cleaned and removed from the site and properly disposed or recycled as appropriate.

Three, intact, transformers, each containing as much as 290 gallons of oil are located in an electrical equipment room in the south central part of the building. The transformers are marked as containing PCBs will be removed and properly disposed. No residual PCBs were noted around the base of the transformers, however, due to subsequent trespassers illegally removing electrical wire and components, this area will be re-assessed after the transformers are removed.

3. Demolition. The current condition of the Lucas Avenue Plant prevents safe remediation within and around the building. In addition, brick containing cyanide and copper residuals are present in the west and east pickle bath areas respectively. Demolition of the building is necessary to remove and properly dispose of this material. The remaining building will be demolished leaving floor slabs in place. Building materials will be reclaimed and recycled where possible.

4. Excavation. The 2007 IRM removed a large quantity of contaminated soil, however, the IRM did not address all areas at the site and contaminated soils remain. Approximately 4,186 cubic yards of additional contaminated soil will be removed. The excavations include:

a) Excavation and off-site disposal of characteristic hazardous waste metals including cadmium, chromium and lead. A portion of the soils in the western portion of the Site contain metals that when sampled for Toxic Leachate Characteristic Leaching Procedure (TCLP) characterizes those soils as hazardous waste. Approximately 3,038 cubic yards of soils may be determined to be considered hazardous waste. All soils and material determined to be hazardous waste will be removed from the Site

b) An additional approximately 660 cubic yards of soil containing elevated levels of metals and/or SVOCs will be excavated and properly disposed.

c) Excavation and off-site disposal of approximately 488 cubic yards of VOC contaminated soils. The remedial goal for the VOC impacted soils is the Commercial values defined in 6NYCRR Part375-6.8.

5. In-Situ Soil Treatment. Before backfilling the excavation containing VOCs the bottom of the excavation will be treated by applying a product(s) intended to hasten reductive de-chlorination of remaining VOCs in soil and groundwater,

6. Site Cover. A site cover will be required to allow for commercial use of the site [as a component of the site development.] The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

7. Institutional Control. Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allows the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and,
- requires compliance with the Department approved Site Management Plan.

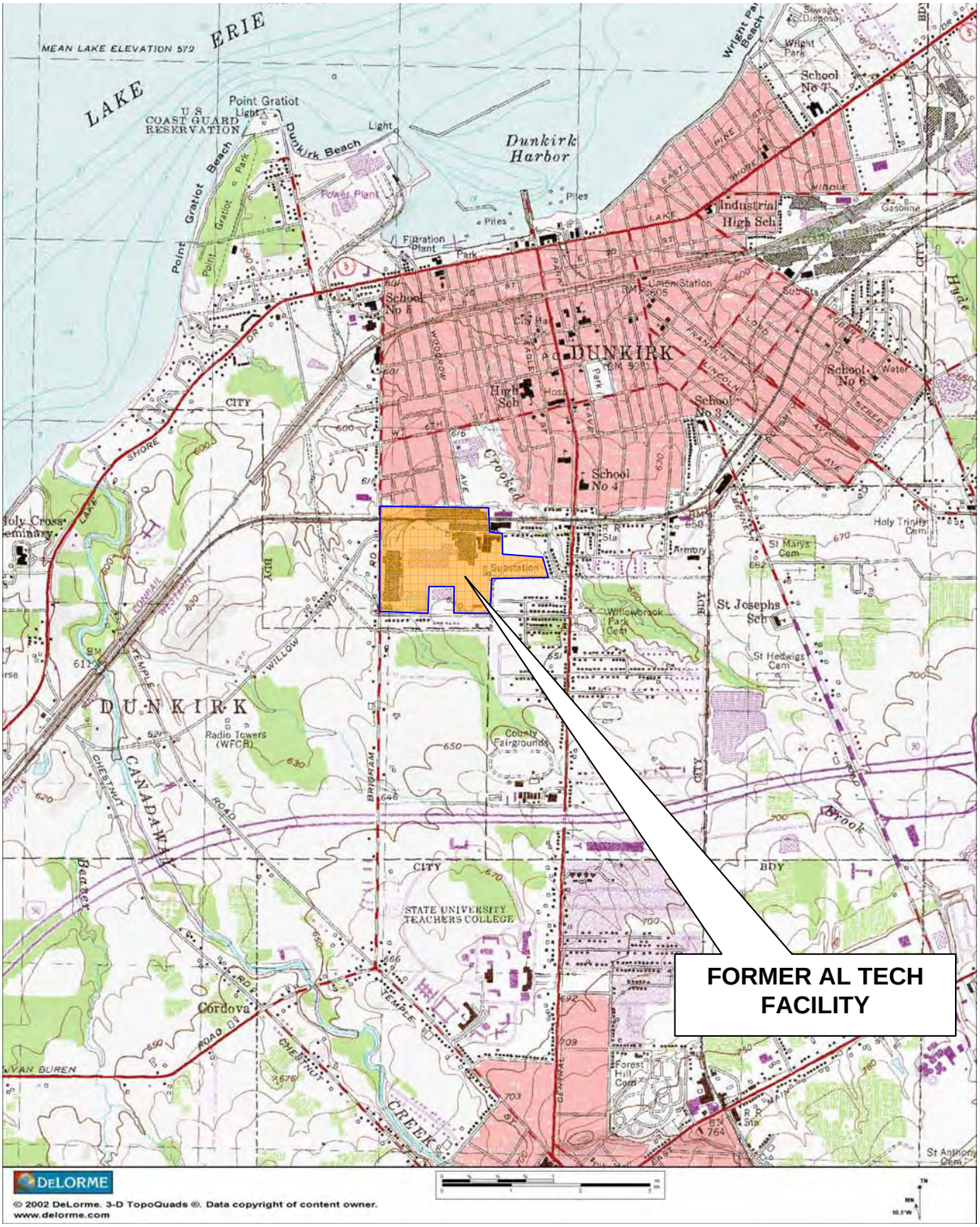
8. Site Management Plan. A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective;
   - Institutional Controls: The Environmental Easement discussed above details institutional controls necessary at the site that restricts use of the site, restricts groundwater use, ensures that the owner of the site incorporates a Department approved Site Management Plan, and ensures periodic certification that the property is only used for activities allowed by the restrictions,
   - Engineering Controls: A soil cover will be required to be maintained where building structures and pavement is not being maintained.

b. an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination; and,

c. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
   - monitoring of groundwater to assess the performance and effectiveness of the remedy;
   - a schedule of monitoring and frequency of submittals to the Department;
   - monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan.
   - descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
   - a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
   - provisions for the management and inspection of the identified engineering controls;
   - maintaining site access controls and Department notification; and,
   - steps necessary for the periodic reviews and certification of the institutional and/or engineering controls. .

FIGURE 1



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PROJECT NO.: 0041-012-100

DATE: JANUARY 2008

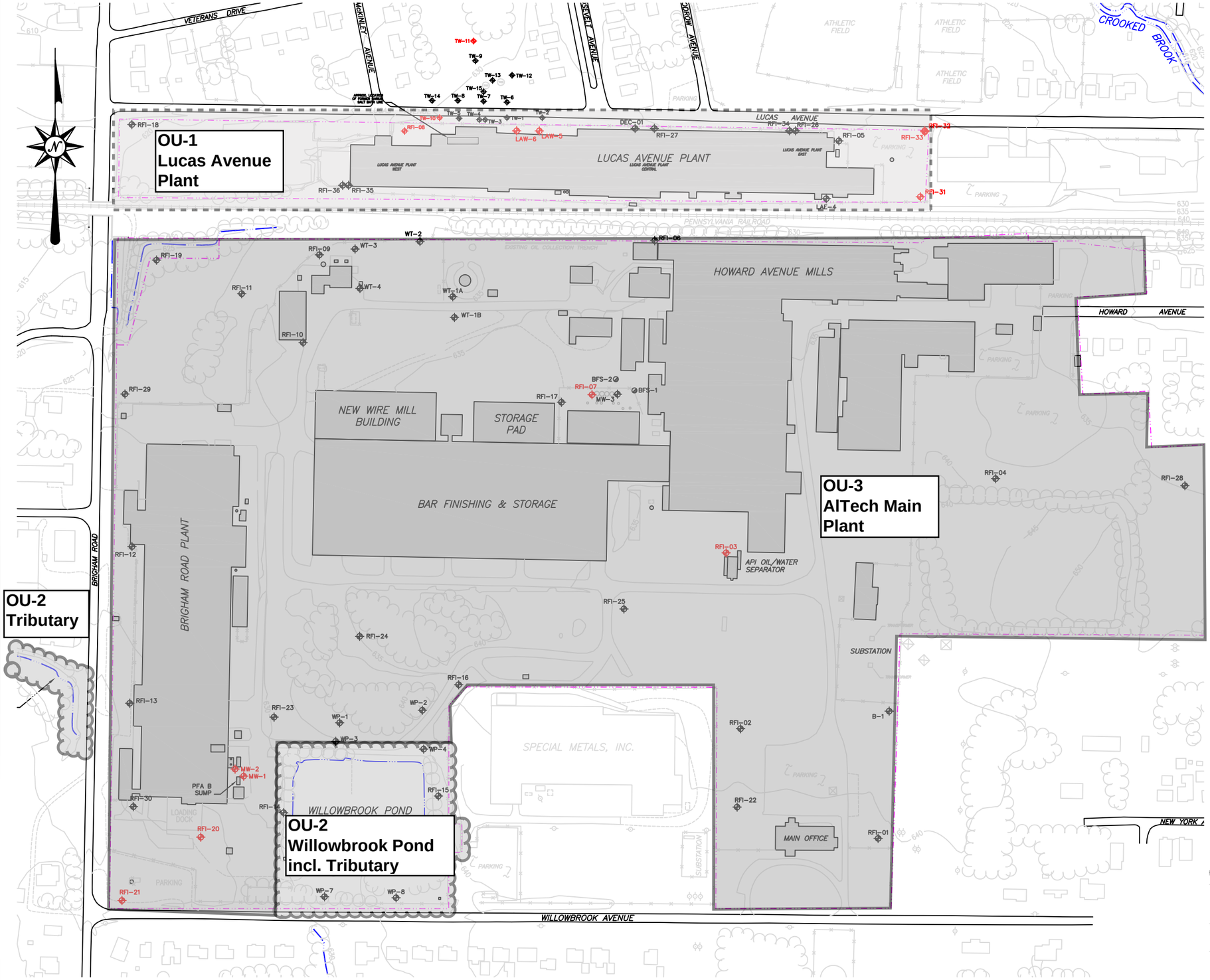
DRAFTED BY: BCH

SITE VICINITY AND LOCATION MAP

PROPOSED REMEDIAL ACTION PLAN

FORMER AL TECH SPECIALTY STEEL CORPORATION FACILITY
DUNKIRK, NEW YORK

PREPARED FOR
REALCO, INC.



Operable Units at AlTech Specialty Steel Site #907022

INVESTIGATION LOCATIONS:

- RFI-11 — MONITORING WELL LOCATION AND DESIGNATION
- TW-1 — TEMPORARY MONITORING WELL LOCATION AND DESIGNATION
- RFI-07 — MONITORING WELL NOT SAMPLED AS WELL NOT LOCATED AND/OR DESTROYED
- BFS-1 — BFS ICM WELLS (RECOVERY & OBSERVATION)

OU-1 Lucas Avenue Plant

OU-2 Willowbrook Pond incl. Tributary

OU-3 AlTech Main Plant

250' 0' 125' 250'

SCALE: 1 INCH = 250 FEET
SCALE IN FEET
(approximate)

REFERENCES:

1. McINTOSH & McINTOSH, P.C. DRAWING TITLED, "TOPOGRAPHICAL MAP OF THE AL TECH SPECIALTY STEEL CORPORATION SITE," DATED APRIL 2, 1996, JOB NO. 6216, FILE: ALTECH.DWG.
2. DRAWING TITLED, "SURVEY OF PROPERTY OF ALLEGHENY-LUDLUM STEEL CORP.," DATED SEPT. 21, 1976, REV. JAN. 5, 1977 AND 12-27-78.
3. ESC. DRAWING TITLED, "SITE LAYOUT, REVISED PHASE II RFI," DATED 05-13-98, DRAWING NO. 193055-D03, FILE: D03.DWG.

DATE: OCTOBER 2011
DRAFTED BY: AJZ

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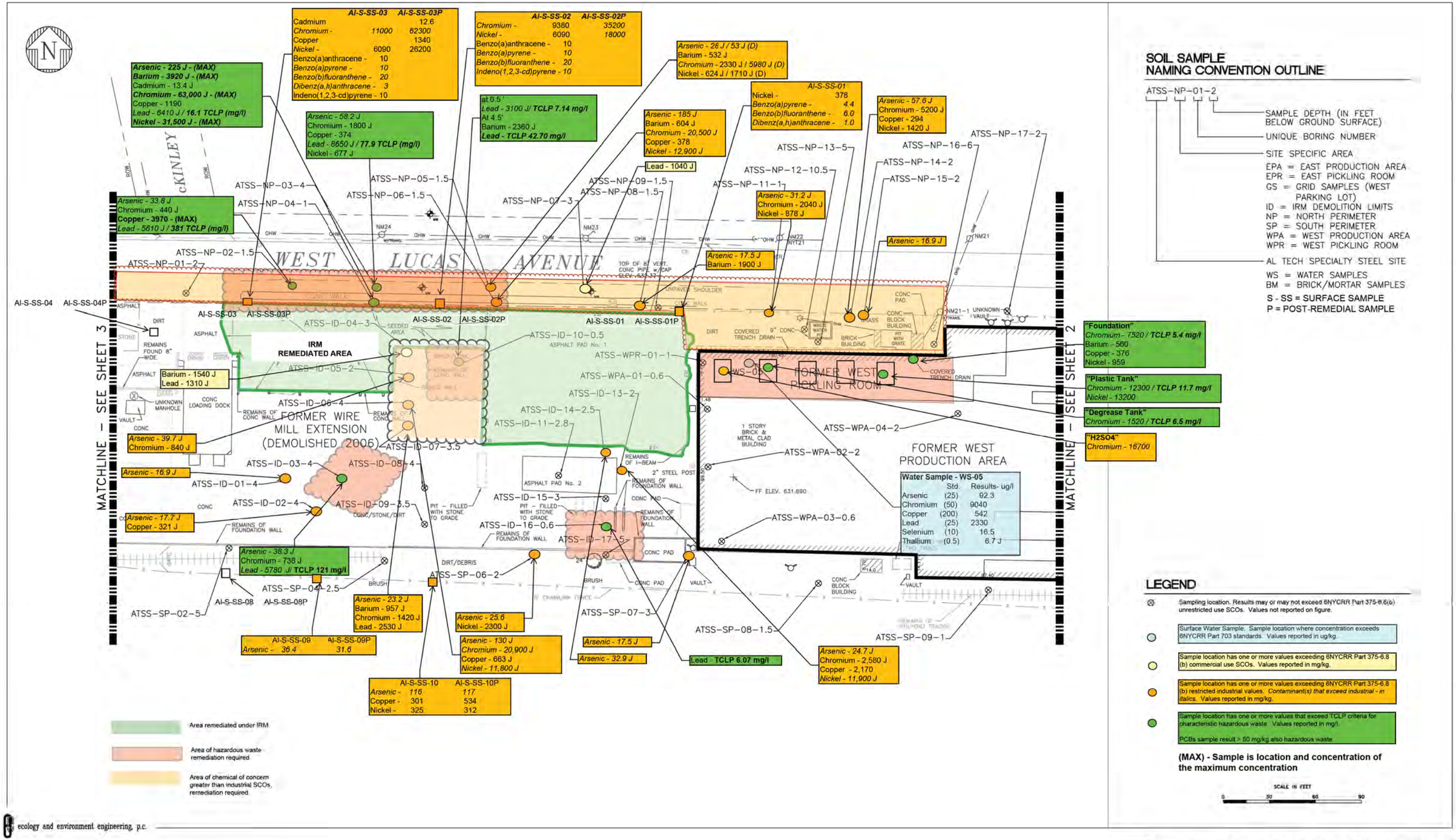
JOB NO.: 0041-013-600

SITE PLAN

FORMER AL TECH SPECIALTY STEEL CORPORATION FACILITY
DUNKIRK, NEW YORK
PREPARED FOR
REALCO, INC.

FIGURE 2

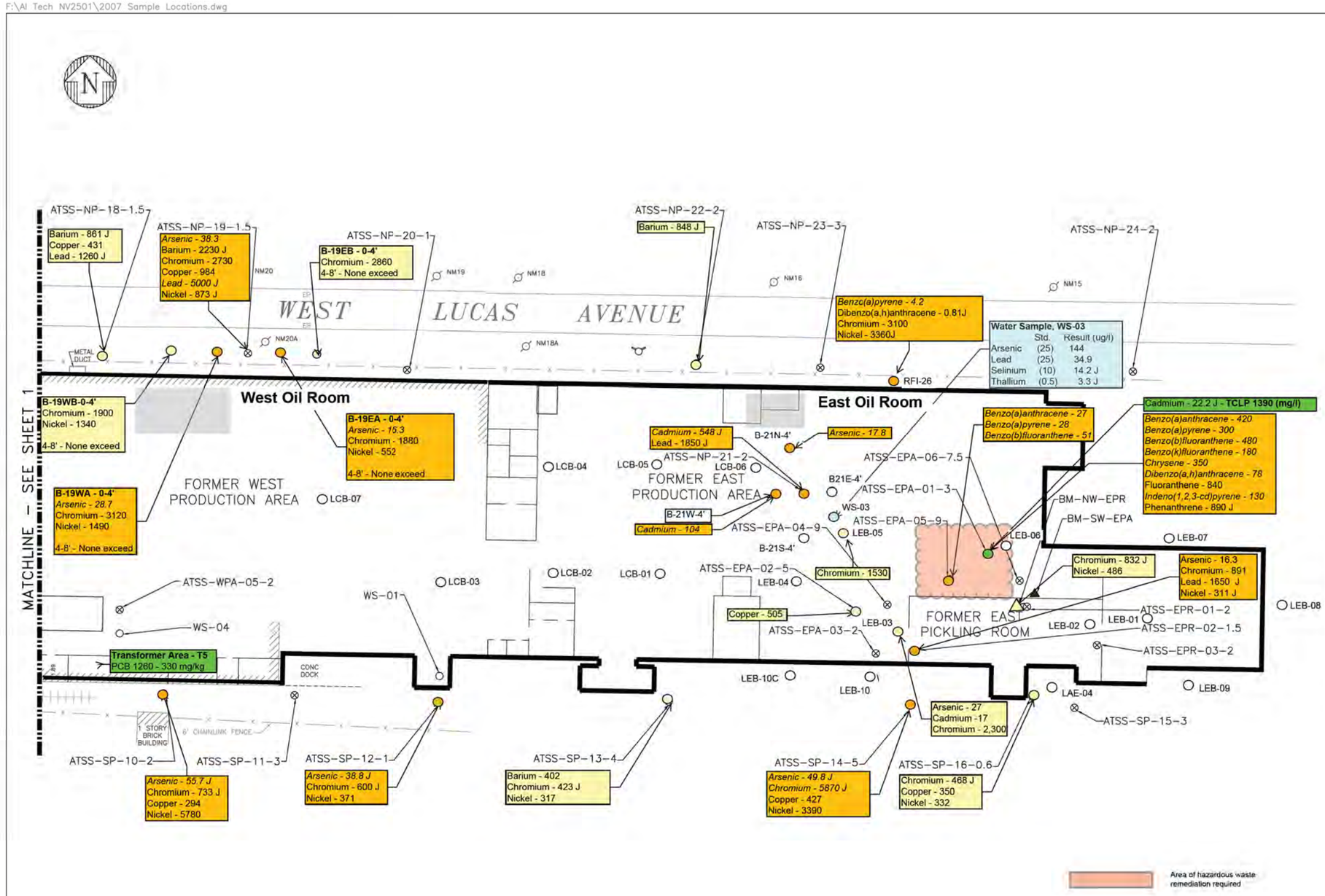


ecology and environment engineering, p.c.

FIGURE 3 **FORMER ALTECH SPECIALTY STEEL SITE SITE METALS CONTAMINATED SOIL**

SHEET 1

F:\Al Tech NV2501\2007 Sample Locations.dwg



SOIL SAMPLE NAMING CONVENTION OUTLINE

ATSS-NP-01-2

- SAMPLE DEPTH (IN FEET BELOW GROUND SURFACE)
- UNIQUE BORING NUMBER
- SITE SPECIFIC AREA
  - EPA = EAST PRODUCTION AREA
  - EPR = EAST PICKLING ROOM
  - GS = GRID SAMPLES (WEST PARKING LOT)
  - ID = IRM DEMOLITION LIMITS
  - NP = NORTH PERIMETER
  - SP = SOUTH PERIMETER
  - WPA = WEST PRODUCTION AREA
  - WPR = WEST PICKLING ROOM
- AL TECH SPECIALTY STEEL SITE
- WS = WATER SAMPLES
- BM = BRICK/MORTAR SAMPLES

LEGEND

- Sampling location. Location not analyzed for metals or SVOCs or results may or may not exceed 6NYCRR Part 375-6.8(b) unrestricted use SCOs. Values not reported on figure.
- Surface Water Sample. Sample location where concentration exceeds 6NYCRR Part 703 standards. Values reported in ug/kg.
- Sample location has one or more values exceeding 6NYCRR Part 375-6.8 (b) commercial use SCOs. Values reported in mg/kg.
- Sample location has one or more values exceeding 6NYCRR Part 375-6.8 (b) restricted industrial values. *Contaminant(s) that exceed industrial - in italics.* Values reported in mg/kg.
- Sample location has one or more values that exceed TCLP criteria for characteristic hazardous waste. Values reported in mg/l.

  PCBs sample result > 50 mg/kg also hazardous waste

(MAX) - Sample is location and concentration of the maximum concentration

SCALE IN FEET
0 30 60 90

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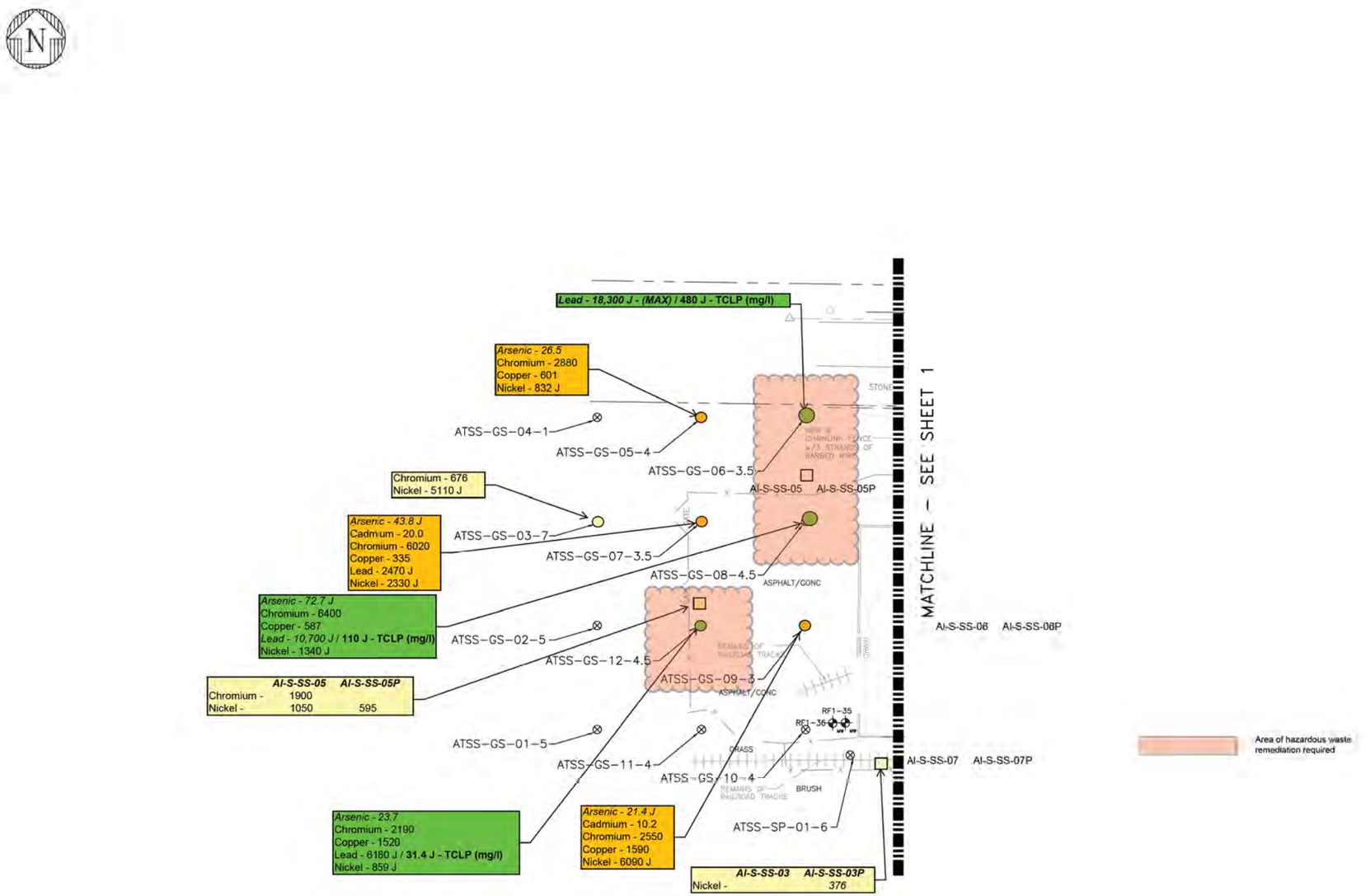
FIGURE 3 **FORMER ALTECH SPECIALTY STEEL SITE**
SHEET 2 **METALS CONTAMINATED SOIL**

F:\Al Tech NV2501\2007 Sample Locations.dwg



SOIL SAMPLE NAMING CONVENTION OUTLINE

ATSS-NP-01-2

- SAMPLE DEPTH (IN FEET BELOW GROUND SURFACE)
- UNIQUE BORING NUMBER
- SITE SPECIFIC AREA
  - EPA = EAST PRODUCTION AREA
  - EPR = EAST PICKLING ROOM
  - GS = GRID SAMPLES (WEST PARKING LOT)
  - ID = IRM DEMOLITION LIMITS
  - NP = NORTH PERIMETER
  - SP = SOUTH PERIMETER
  - WPA = WEST PRODUCTION AREA
  - WPR = WEST PICKLING ROOM
- AL TECH SPECIALTY STEEL SITE
- WS = WATER SAMPLES
- BM = BRICK/MORTAR SAMPLES
- S - SS = SURFACE SAMPLE
- P = POST-REMEDIAL SAMPLE

Area of hazardous waste remediation required

LEGEND

- ⊗ Sampling location. Results may or may not exceed 6NYCRR Part 375-6.8(b) unrestricted use SCOs. Values not reported on figure.
- ○ Sample location has one or more values exceeding 6NYCRR Part 375-6.8 (b) commercial use SCOs. Values reported in mg/kg.
- ● Sample location has one or more values exceeding 6NYCRR Part 375-6.8 (b) restricted industrial values. *Contaminant(s) that exceed industrial - in italics.* Values reported in mg/kg.
- ● Sample location has one or more values that exceed TCLP criteria for characteristic hazardous waste. Values reported in mg/l.
  PCBs sample result > 50 mg/kg also hazardous waste

(MAX) - Sample is location and concentration of the maximum concentration

SCALE IN FEET
0 30 60 90

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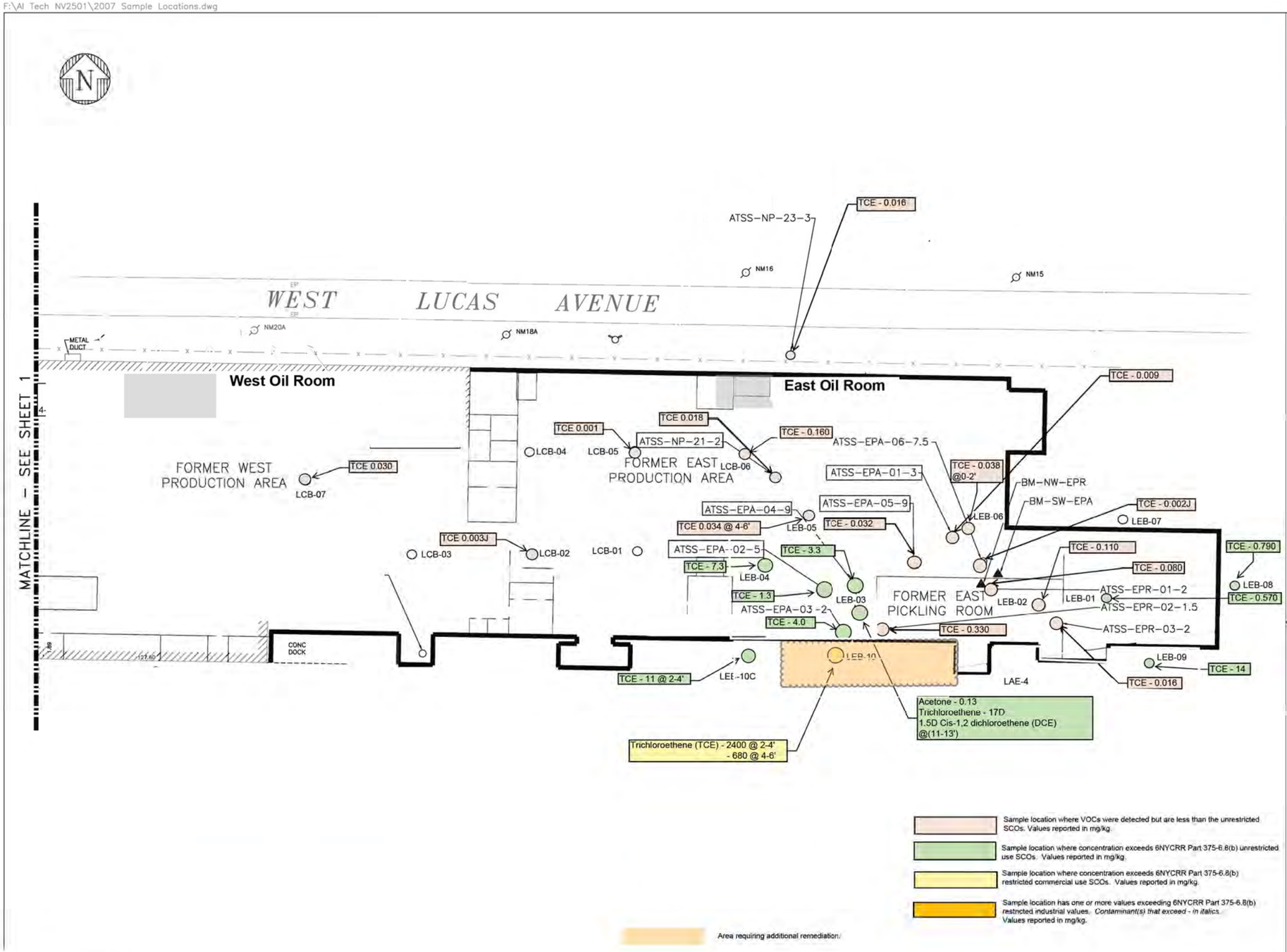
FIGURE # 3 **FORMER ALTECH SPECIALTY STEEL SITE METALS CONTAMINATED SOIL**

SHEET 3

F:\Al Tech NV2501\2007 Sample Locations.dwg



SOIL SAMPLE NAMING CONVENTION OUTLINE

ATSS-NP-01-2

- SAMPLE DEPTH (IN FEET BELOW GROUND SURFACE)
- UNIQUE BORING NUMBER
- SITE SPECIFIC AREA
  - EPA = EAST PRODUCTION AREA
  - EPR = EAST PICKLING ROOM
  - GS = GRID SAMPLES (WEST PARKING LOT)
  - ID = IRM DEMOLITION LIMITS
  - NP = NORTH PERIMETER
  - SP = SOUTH PERIMETER
  - WPA = WEST PRODUCTION AREA
  - WPR = WEST PICKLING ROOM
- AL TECH SPECIALTY STEEL SITE
- WS = WATER SAMPLES
- BM = BRICK/MORTAR SAMPLES

LEGEND

- PROPOSED BORING LOCATIONS
- WATER SAMPLE LOCATIONS
- BRICK/MORTAR SAMPLE LOCATIONS

SCALE IN FEET
0 30 60 90

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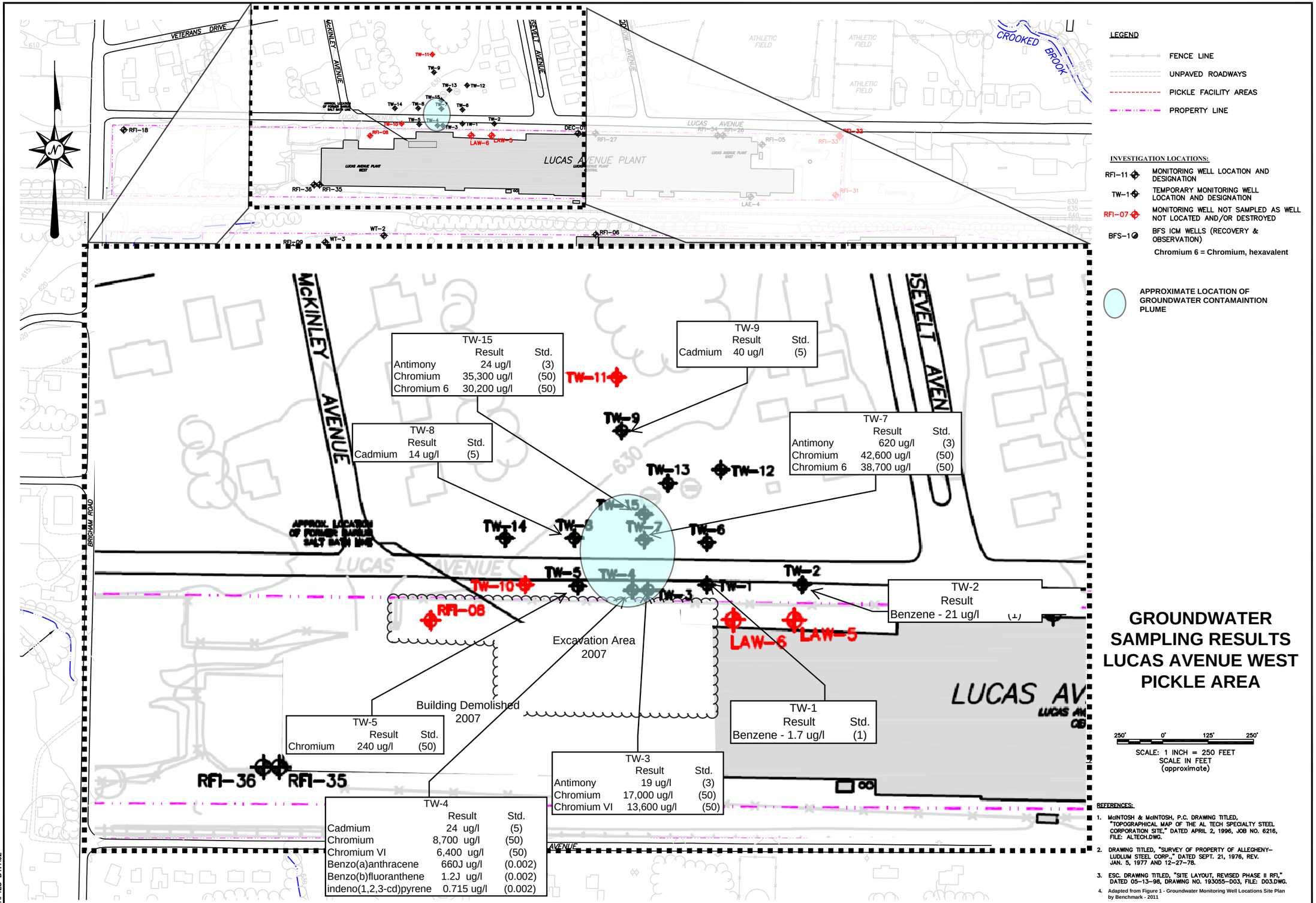
FIGURE 4 **FORMER ALTECH SPECIALTY STEEL SITE VOC CONTAMINATED SOIL**



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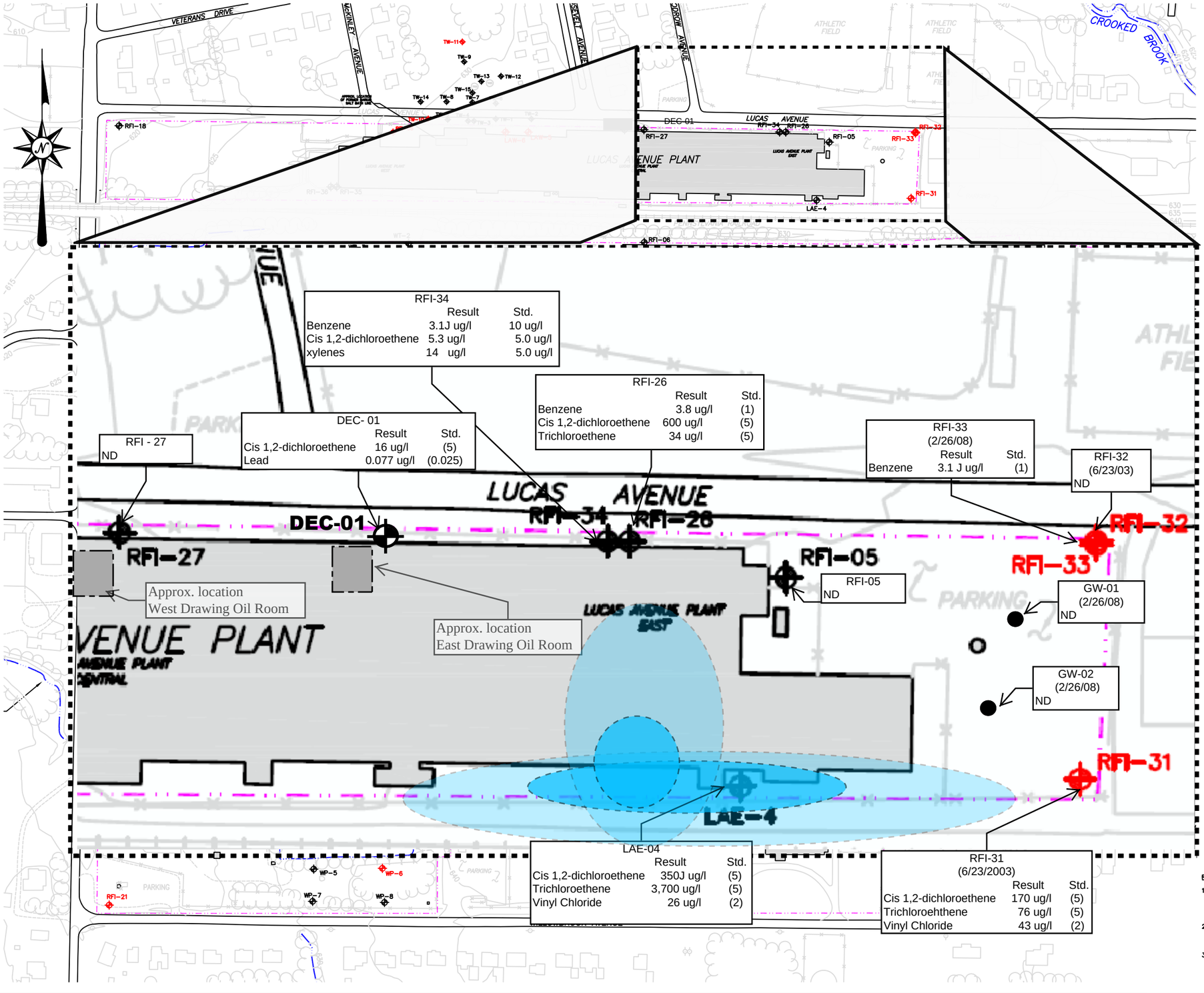
JOB NO.: 0041-013-600

GROUNDWATER MONITORING SUMMARY REPORT (OCTOBER 2011)
FORMER AL TECH SPECIALTY STEEL CORPORATION FACILITY
DUNKIRK, NEW YORK
PREPARED FOR
REALCO, INC.

FIGURE 5



LEGEND

- FENCE LINE
- UNPAVED ROADWAYS
- PICKLE FACILITY AREAS
- PROPERTY LINE

INVESTIGATION LOCATIONS:

- RFI-11 ⊕ MONITORING WELL LOCATION AND DESIGNATION
- RFI-07 ⊕ MONITORING WELL NOT SAMPLED AS WELL NOT LOCATED AND/OR DESTROYED

TCE ~ 1 ppm

TCE > 1000 ppm

GROUNDWATER SAMPLING RESULTS LUCAS AVENUE EAST PICKLE AREA

250' 0' 125' 250'

SCALE: 1 INCH = 250 FEET
SCALE IN FEET
(approximate)

REFERENCES:

1. McINTOSH & McINTOSH, P.C. DRAWING TITLED, "TOPOGRAPHICAL MAP OF THE AL TECH SPECIALTY STEEL CORPORATION SITE," DATED APRIL 2, 1996, JOB NO. 6216, FILE: ALTECH.DWG.
2. DRAWING TITLED, "SURVEY OF PROPERTY OF ALLEGHENY-LUDLUM STEEL CORP.," DATED SEPT. 21, 1976, REV. JAN. 5, 1977 AND 12-27-78.
3. ESC. DRAWING TITLED, "SITE LAYOUT, REVISED PHASE II RFI," DATED 05-13-98, DRAWING NO. 193055-D03, FILE: D03.DWG.

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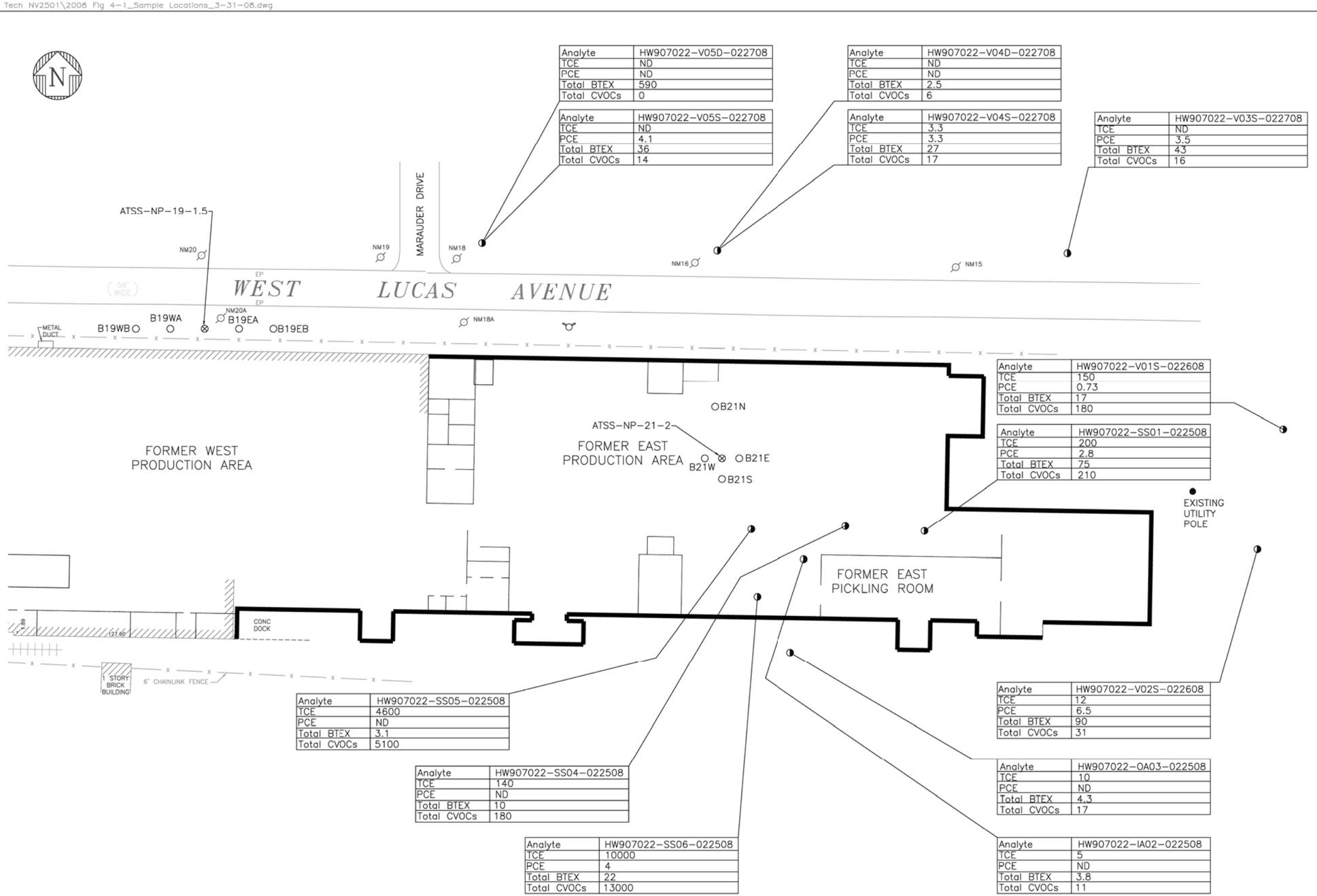
JOB NO.: 0041-013-600

GROUNDWATER MONITORING SUMMARY REPORT (OCTOBER 2011)
FORMER AL TECH SPECIALTY STEEL CORPORATION FACILITY
DUNKIRK, NEW YORK
PREPARED FOR
REALCO, INC.

FIGURE 6

F:\Al Tech NV2501\2008 Fig 4-1_Sample Locations_3-31-08.dwg



Analyte	HW907022-V05D-022708
TCE	ND
PCE	ND
Total BTEX	590
Total CVOCs	0

Analyte	HW907022-V05S-022708
TCE	ND
PCE	4.1
Total BTEX	36
Total CVOCs	14

Analyte	HW907022-V04D-022708
TCE	ND
PCE	ND
Total BTEX	2.5
Total CVOCs	6

Analyte	HW907022-V04S-022708
TCE	3.3
PCE	3.3
Total BTEX	27
Total CVOCs	17

Analyte	HW907022-V03S-022708
TCE	ND
PCE	3.5
Total BTEX	43
Total CVOCs	16

Analyte	HW907022-V01S-022608
TCE	150
PCE	0.73
Total BTEX	17
Total CVOCs	180

Analyte	HW907022-SS01-022508
TCE	200
PCE	2.8
Total BTEX	75
Total CVOCs	210

Analyte	HW907022-SS05-022508
TCE	4600
PCE	ND
Total BTEX	3.1
Total CVOCs	5100

Analyte	HW907022-SS04-022508
TCE	140
PCE	ND
Total BTEX	10
Total CVOCs	180

Analyte	HW907022-SS06-022508
TCE	10000
PCE	4
Total BTEX	22
Total CVOCs	13000

Analyte	HW907022-V02S-022608
TCE	12
PCE	6.5
Total BTEX	90
Total CVOCs	31

Analyte	HW907022-0A03-022508
TCE	10
PCE	ND
Total BTEX	4.3
Total CVOCs	17

Analyte	HW907022-IA02-022508
TCE	5
PCE	ND
Total BTEX	3.8
Total CVOCs	11

2008 SOIL VAPOR SAMPLE NAMING CONVENTION OUTLINE

HW907022-V03S-022708

- HW907022 — NYSDEC SITE NUMBER
- V03S — ID NUMBER
- S — SHALLOW OR DEEP (WHERE APPLICABLE)
- 022708 — SAMPLE DATE

LEGEND

- ⊗ 2007 BORING LOCATIONS (SEE FIGURE A-1C FROM THE 2007 SITE INVESTIGATION REPORT (SEPTEMBER 2007 BY EEEPC) FOR NAMING CONVENTION OUTLINE
- ◑ 2008 SOIL VAPOR SAMPLE LOCATION
- ○ NYSDEC SOIL SAMPLE LOCATION, 2/26/08 AND 2/27/08
- NM15 ☼ EXISTING POWERPOLE LOCATION
- x EXISTING FENCE LOCATION
- ☿ EXISTING HYDRANT LOCATION

ABBREVIATIONS

$\mu g/m^3$ = MICROGRAM PER CUBIC METER

TCE = TRICHLOROETHENE

PCE = TETRACHLOROETHENE

BTEX = BENZENE, TOLUENE, ETHYLBENZENE AND TOTAL ZYLENES

CVOCs = CHLORINATED VOLATILE ORGANIC COMPOUNDS

NOTE:

1. GEOPROBE POINT LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS AND ARE FOR REFERENCE PURPOSES ONLY.
2. ALL CONCENTRATIONS ARE IN $\mu g/m^3$.

SCALE IN FEET

0 30 60 90

ecology and environment engineering, p.c.

FIGURE # 7 FORMER AL TECH SPECIALTY STEEL SITE
VOC CONCENTRATIONS IN
SOIL VAPOR SAMPLES

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into four categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs) and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 6.1.1 are also presented.

Waste/Source Areas

As described in the RI report, waste/source materials were identified at the site and are impacting groundwater, soil and soil vapor.

Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375 (au). Source areas are areas of concern at a site where substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium.

Numerous waste/source areas exist at the Lucas Avenue Plant, including:

- Metals contaminated soils
- Remaining degreaser and pickle tanks
- VOC contaminated soils
- Petroleum USTs
- PCB containing transformers
- Cyanide and copper contaminated brick

Residuals from former, molten barium and chromium salt pickling operations and a former battery room in the western end of the former facility have contaminated soils with metals including, but not limited to, chromium, barium, arsenic and lead (see Figure 3.) Residuals from these soils continue to impact groundwater which has been identified as migrating offsite into a nearby residential area (see Figure 5.)

Several degreaser, acid neutralizing and pickle tanks also remain in the western pickle area (Figure 3) that have residual materials contaminated with lead, barium and chromium and are characteristically hazardous for chromium as high as 11.7 mg/l (TCLP regulatory level of 5.0 mg/l.) Deteriorating conditions at the former facility increasingly allow precipitation to contact this contamination which in turn, continues to contribute to the degradation of groundwater.

Former pickling operations in the eastern end of the former facility (Figure 4) have contaminated soils with VOCs including trichloroethene (TCE) as high as 2,400 mg/kg (unrestricted 0.68 mg/kg.) The TCE in the soils has: impacted groundwater (Figure 6); has contributed to the buildup of soil vapor under the floor of the building; and has been identified in the indoor air of the facility.

Several underground storage tanks (USTs) are located in two separate underground rooms located in the center of the facility (Figure 3) with total capacity of 8000 and 12,000 gallons respectively. Petroleum residuals remain in the tanks, vault floors and walls and standing water is evident in the rooms. The presence of groundwater, type of materials handled, and the presence of contamination suggest the potential to affect adjacent subsurface soils and groundwater. In addition, previous testing indicated that the oil and sludge residuals from the remaining oil tanks contained metals and were characteristically hazardous for barium.

Transformers within an electrical room (Figure 3) contain PCBs including Arochlor 1260 as high as 310 mg/kg (see Table 2.) The results of the transformer oil testing confirmed the transformers are considered by regulation to be PCB contaminated. EPA regulations require that all free flowing liquid from these transformers be emptied and be thermally incinerated.

Walls in the eastern pickle area are constructed of brick (Figure 3.) Some of these bricks have been contaminated with high levels of copper as high as 20,000 mg/kg and cyanide as high as 710 mg/kg. The presence of this contamination is a threat by contact. In addition, as in the western pickle area, continuing deterioration of the building will allow precipitation to enter the facility which will increase the potential for the high levels of copper and cyanide to become mobile in the environment.

Certain waste/source areas identified at the site were addressed by the IRM(s) described in Section 6.2. The remaining waste/source area(s) identified during the RI will be addressed in the remedy selection process.

Groundwater

Monitoring wells were installed to monitor both the overburden and the bedrock groundwater quality surrounding the Lucas Avenue Plant. Groundwater samples have been collected from wells around the Lucas Avenue facility since the beginning of investigations with the most recent sampling in May of 2011. The samples were collected to assess groundwater conditions on and off-site. Results from the sampling (see Table 1) indicate that contamination in shallow groundwater at the site exceeds the SCGs for VOCs and inorganics.

Groundwater near the eastern portion of the Lucas Avenue facility (Figure 6) has VOCs exceeding groundwater quality standards. Groundwater in the Eastern Pickle Area has been compromised by the presence of VOCs, including TCE, similar to the contaminants in the soils. The highest concentrations of these VOCs were found in monitoring well LAE-04 which is near the suspected source area. Evidence of the potential for groundwater contaminant migration has been noted in monitoring wells downgradient of the source in both overburden and shallow bedrock wells. The presence of contaminants in these downgradient wells indicates the VOCs are migrating horizontally. Concentrations in the downgradient overburden are higher than the concentration in the bedrock, indicating there is more lateral migration than vertical migration. TCE has been found at the site boundary however, groundwater sampled off site indicated no impacts.

Concentrations have decreased over time but still remain notably above the groundwater quality standards. Un-remediated source soils and continued degradation of the building allow increased infiltration to mobilize the VOCs that could compromise off-site groundwater quality.

Benzene and xylene were found to exceed the groundwater quality standards in monitoring wells directly downgradient of rooms containing drawing oil tanks. Benzene exceeded the groundwater standards in 5 samples and xylene exceeded in one sample. Benzene and xylene are principal components of petroleum contamination. The drawing oil tank rooms are located in the eastern portion of the building adjacent to Lucas Avenue. The benzene and xylene were detected in monitoring wells adjacent to a roadway, which may indicate the

groundwater quality has been compromised with general runoff from highway sources. The presence of these contaminants, however, could be indicative of residuals from the USTs within the facility, and this cannot be ruled out as a source.

Inorganic compounds including chromium, antimony, cadmium and lead have been detected in shallow groundwater adjacent to and migrating off-site from former pickle operations located in the western portion of the Lucas Avenue facility (see Figure 5). Soil is contaminated by residuals from the former pickle operations that incorporated molten salts as the pickle medium and has contributed to groundwater contamination. Sampling results also note that widespread areas are impacted with iron, manganese, magnesium and sodium. At former steel manufacturing sites these metals are expected and attributed to operations and historic fill.

A large area of chromium and barium contaminated soil within the former pickle area was addressed by an IRM in May 2007 when approximately 4,689 cubic yards of soil was excavated and properly disposed. The excavation was then backfilled with a mixture of soils and peat, intended to passively reduce hexavalent chromium to less toxic trivalent chromium in groundwater. Subsequent groundwater monitoring indicates limited success of the IRM as concentrations directly adjacent to the excavated area have not substantially decreased. Post excavation sampling during the IRM noted contaminated soils. The presence of these remaining soils limits the success of the IRM and continues to represent a source of groundwater contamination.

Table #1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Benzene	ND - 74	5	5 of 24
Cis-1,2-dichloroethene	ND - 600	5	5 of 24
Trichloroethene (TCE)	ND - 3700	5	3 of 24
Vinyl chloride	ND - 43	5	2 of 24
Xylene	ND - 14	5	1 of 24
SVOCs			
Benzo(a)anthracene	ND - 0.066J	0.002	1 of 22
Benzo(b)fluoranthene	ND - 1.2 J	0.002	1 of 22
Indeno(1,2,3-cd)pyrene	ND - 0.71J	0.002	1 of 22
Inorganics			
Antimony	ND - 620	3	3 of 17
Cadmium	ND - 40	5	3 of 22
Chromium	ND - 42,600	50	8 of 22
Iron	110 - 20,200	300	22 of 25
Lead	ND - 77	25	1 of 22
Magnesium	13,800 - 151,000	35,000	12 of 25
Manganese	13 - 3,700	300	6 of 25
Sodium	12,300 - 805,000	20,000	21 of 23

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

As noted on Figure(s) 5 & 6, the primary groundwater contaminants are VOCs including TCE and benzene, associated with pickle operations and petroleum storage. Inorganics including chromium and cadmium associated with residuals from molten salt pickle operations within the Lucas Avenue plant.

Based on the findings of the RI, the presence of metals and VOCs in soils and petroleum residuals in USTs and in soils at the facility has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will be addressed by the remedy selection process are: TCE, cis-1,2-dichloroethene, vinyl chloride, and inorganics, including chromium, cadmium and lead. Active remediation of groundwater is not anticipated, however, improvement of groundwater quality is expected after removal of source soils and residuals. Continued monitoring of the groundwater is necessary to determine if groundwater quality is indeed improving. An environmental easement prohibiting use of groundwater for potable purposes will be required. If after a period of monitoring, not to exceed five years, groundwater quality has not significantly improved, more active measures to address groundwater contamination will need to be evaluated.

Soil

Samples of soils were collected during various remedial investigations with the latest sampling being conducted after implementation of the IRM to remove highly contaminated soils from the western pickle room. During the site investigations, 99 soil borings and 20 surface locations were sampled. Sampling depths extended from 0 to 13 feet, however, most samples were collected from the surface to depths of up to 6 feet, corresponding to the fill material situated over native lacustrine silts and clay. From these sampling locations, 140 samples were analyzed for VOCs. Metals, including mercury were analyzed from 129 samples while SVOCs and PCBs were analyzed from 81 samples. Cyanide was analyzed for in 91 samples and hexavalent chromium was analyzed for in 24 samples. Fifty-nine samples were analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) a Federal EPA test method used to characterize waste as either hazardous or non-hazardous for the purpose of disposal.

Exceedances of the VOCs are limited to an area in the eastern portion of the Site (see Figure 6) where vapor degreasers were used in the manufacturing process. Five VOCs (maximum concentration), including acetone (0.130 mg/kg), cis-1,2-dichloroethene (130J mg/kg), trans-1,2-dichloroethene (0.230 mg/kg), TCE (2400 mg/kg) and vinyl chloride (0.220 mg/kg) were detected above the NYSDEC Unrestricted Use SCOs in one or more of the 140 soil sample locations. TCE exceeded the SCO of 0.47 mg/kg in 14 of 140 samples. Breakdown products from the natural degradation of TCE such as cis-1,2-dichlorethene, found in 3 of 140 samples and trans-1,2-dichloroethene and vinyl chloride were found in 1 of 140 samples. Acetone was found in five of 140 soil samples collected.

Associated with an area where degreasing operations were conducted, the highest concentration of TCE was found in soils where a storage tank was located. TCE at sampling location LEB-10 was found to exceed SCOs as high as 2400 mg/kg, from (2'– 4') and 680 mg/kg at (4'–6'). Concentrations of TCE quickly decrease both with depth and laterally from this former tank area. Acetone was found to exceed the unrestricted SCOs of 0.05 mg/kg only in five samples. The highest exceedance of these five samples was 0.170 mg/kg and is considered an inconsequential amount. Degradation products of TCE were also found in the soils in the former tank area. Cis-1,2-dichloroethene was found as high as 1.5 mg/kg exceeding the unrestricted SCO of 0.25 mg kg in three samples. Trans-1,2-dichloroethene and vinyl chloride were found in one sample exceeding unrestricted SCOs. When compared to commercial use SCOs only TCE at sample LEB-10 exceeds the SCO

Fifteen SVOC analytes (see Table 2), all polycyclic aromatic hydrocarbons [PAHs], exceeded NYSDEC Unrestricted Use SCOs (in mg/kg). PAHs generally adhere to solid particles and are common constituents of

soils in urban and industrial areas. The primary source of PAHs is from the incomplete combustion of wood (wood-burning stoves and furnaces) and fuel (motor vehicles and other gas-burning engines.) Other sources include smoke (industrial, cigarette, charcoal grills, etc.) and soot, asphalt, oils, and greases.

Out of the fifteen compounds six of 81 samples exceeded the unrestricted SCOs for benzo(a)pyrene. Five of 81 samples exceeded unrestricted SCOs for benzo(b)fluoranthene, Four of 81 samples exceeded for benzo(a)anthracene and three of 81 exceeded for indeno(1,2,3-cd)pyrene. Benzo(k)fluoranthene, chrysene and dibenzo(a,h)anthracene exceeded unrestricted SCOs twice out of 81samples respectively. The remaining SVOCs, acenaphthene, anthracene, benzo(g,h,i)perylene, fluoranthene, naphthalene, phenanthrene and pyrene exceeded the unrestricted SCOs in one of 81 samples.

When compared to the restricted use SCOs for commercial use properties six of 81 samples exceeded for benzo(a)pyrene, five of 81 samples exceeded unrestricted SCOs for benzo(b)fluoranthene, four of 81 samples exceeded for benzo(a)anthracene, three of 81 exceeded for indeno(1,2,3-cd)pyrene, one of 81 samples exceeded for dibenzo(a,h)anthracene, benzo(k)fluoranthene, chrysene, fluoranthene and phenanthrene.

Distributions of the PAHs were mostly in the western end of the Lucas Avenue Plant, samples in this area were mainly surface soil samples in areas where there was a higher activity from shipping and pickling operations. Two areas in the eastern pickle area had significantly higher concentrations corresponding to specific process areas including a machine pit.

Elevated metals were found within the facility and in surrounding areas resulting from manufacturing processes at the Lucas Avenue Plant (see Table 2). A total of 129 samples were analyzed for metals. As expected, widespread areas are impacted with iron, manganese, magnesium and sodium, attributed to operations and historic fill. Of the 129 samples, eleven metals had concentrations exceeding the NYSDEC Part 375 Un-restricted Use SCOs. The greatest number of samples, 105 of 129, exceeded the chromium SCO. Nickel had the second most, with the SCOs being exceeded in 87 of 129 samples. Lead, copper and zinc exceeded SCOs in 69, 67 and 47 of 129 samples, respectively. The aforementioned metals were mostly associated with remaining soils north of the IRM excavation area, isolated areas under remaining slabs and from fill soils in a parking area to the west of the IRM. Arsenic as high as 225 mg/kg was found to exceed the unrestricted SCO of 13 mg/kg in surface soils all around the facility, however, the areas of greatest concentrations were associated with operational areas. Selenium, cadmium and barium were found in 34, 20 and 11 of 129 samples, respectively. These contaminants were not widespread being found mostly near pickle bath areas. Lesser quantities of silver (8 of 129), mercury (4 of 129) were found randomly located. Total cyanide was analyzed for in 91 samples, but none of the results exceeded the Unrestricted Use SCOs for cyanide.

When compared to the restricted use SCOs for commercial use only five metals exceed the SCO. Of the five metals arsenic exceeded the SCO in 35 of the 129 samples, lead exceeded in 9 of 129 samples, chromium exceeded in 8 of 129 samples, nickel exceeded in 5 of 129 samples and cadmium exceeded in 2 of 129 samples

A total of 24 samples were analyzed for hexavalent chromium. Only one sample exceeded the unrestricted SCO for this compound, however, this compound readily transforms from the more toxic hexavalent state to the more stable and less toxic trivalent state when exposed to the atmosphere. Because hexavalent chromium is found in impacted groundwater, chromium, when found in higher concentrations at the site near suspected disposal areas, such as the pickle areas, has the potential to be the hexavalent state.

A total of 59 soil samples were analyzed for Toxic Characteristic Leaching Procedure (TCLP.) The TCLP analysis is designed to simulate the leaching a waste will undergo if disposed of in a sanitary landfill. When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water. The

TCLP helps identify wastes likely to leach concentrations of contaminants that may be harmful to human health or the environment. Thirteen of 59 samples exceeded the EPA Toxicity Characteristic Constituent Regulatory levels for TCLP analyses for two metals, chromium and cadmium, thus exhibiting toxicity characteristic as hazardous waste. In twelve samples, lead exceeded the TCLP regulatory level of (5.0 mg/l), with a maximum concentration of 480 mg/l. All of these twelve samples were collected from the western end of the Lucas Avenue Plant and in the west parking lot area. Both areas correspond to the location of the former battery storage and pickle area. Only one sample exceeded the EPA TCLP regulatory level of 1.0 mg/l for cadmium. This sample was collected from the eastern production area.

Table #2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
Acetone	ND – 0.170	0.05	5/140	500	0/140
2-Butanone (MEK)	ND – 0.016	0.12	0/140	500	0/140
Carbon disulfide	ND – 0.027	N/A	N/A	N/A	N/A
Cis-1,2-Dichloroethene	ND – 1.5	0.25	3/140	500	0/140
1,1-dichloroethene	ND – 0.041	0.33	0/140	240	0/140
Ethylbenzene	ND – 0 .006	1	0/140	390	0/140
Methylene chloride	ND – 0.033	0.05	0/140	500	0/140
trans -1,2-Dichloroethene	ND – 0.230	0.19	1/140	500	0/140
Trichloroethene	ND – 2,400	0.47[d]	14/140	200	2/140
Tetrachloroethene	ND – 0.310	1.3	0/140	150	0/140
Toluene	ND – 0.026	0.7	0/140	500	0/140
Vinyl chloride	ND – 0.220	0.02	1/140	13	0/140
Xylenes (mixed)	ND – 0.039	0.26	0/140	500	0/140
SVOCs					
Acenaphthene	ND - 62	20	1/81	500	0/81
Acenaphthylene	ND - 3.9	100	0/81	500	0/81
Anthracene	ND - 130	100	1/81	500	0/81
Benzo(a)anthracene	ND - 420	1	4/81	5.6	4/81
Benzo(g,h,i)perylene	ND - 150	100	1/81	500	0/81
Benzo(a)pyrene	ND - 300	1	6/81	1	6/81
Benzo(b)fluoranthene	ND - 480	1	5/81	5.6	5/81
Benzo(k)fluoranthene	ND - 180	0.8	2/81	56	1/81
Chrysene	ND - 350	1	2/81	56	1/81
Dibenzo(a,h)anthracene	ND - 78	0.33	2/81	0.56	2/81
Fluoranthene	ND - 840	100	1/81	500	1/81
Fluorene	ND - 62	30	1/81	500	0/81
Indeno(1,2,3-cd)pyrene	ND - 130	0.5	3/81	5.6	3/81
Naphthalene	ND - 29	12	1/81	500	0/81
Phenanthrene	ND - 890	100	1/81	500	1/81

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
Pyrene	ND - 350	100	1/81	500	0/81
Inorganics					
Arsenic	2.7 - 225	13	45/129	16	35/129
Barium	5.6 - 3,920	350	11/129	400	11/129
Cadmium	0.1 - 548	2.5	20/129	9.3	7/129
Chromium	10.9 - 63,000	19	105/129	1,500	21/129
Chromium, hexavalent	ND - 8.72	1.0	1/24	400	0/24
Copper	10.2 - 3,970	50	67/129	270	22/129
Cyanide	0.1 - 21.8	27	0/91	27	0/129
Lead	9.1 - 18,300	63	69/129	1,000	16/129
Nickel	8.3 - 31,500	30	87/129	310	36/129
Mercury	ND - 0.3	0.18	4/129	2.8	0/129
Selenium	0.5 - 13.2	3.9	34/129	1,500	0/129
Silver	0.7 - 11.4	2.0	8/129	1,500	0/129
Zinc	7.5 - 695	109	47/129	10,000	0/129
Pesticides/PCBs					
PCBs	ND - 0.110	0.1	1/104	1	0/110

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.

The primary soil contaminants are VOCs, SVOCs consisting mainly of (PAHs) and metals (specifically, arsenic, cadmium, chromium and lead) associated with operation of the former steel finishing operations at the Lucas Avenue Plant. As noted on Figures 3 & 4, the primary soil contamination is associated with the former pickling areas. VOC contamination is largely associated with processes in the eastern portion of the plant with the highest contamination in an area of a former storage tank. Metals contamination is mostly in the western portion of the plant in areas where pickle baths contained metals salts. This area was also a battery storage area. Additional contamination was noted in a parking area near the pickle baths where fill was used to level the area.

Decades of operations at the Lucas Avenue plant has resulted in PAH and metals soil contamination above the unrestricted SCGs. PAH and inorganic soil contamination such as iron, manganese, magnesium and sodium, including lower levels of arsenic, is associated with historic activity at the site. Copper and zinc are also noted in numerous samples associated with process areas. Therefore, PAH and metal soil contamination, with the exception of higher levels of arsenic, barium, cadmium, chromium and lead, are not considered a site specific contaminant of concern. Copper and zinc, will be addressed during remediation because of being collocated in areas associated with other contaminants of concern.

Based on the findings of the Remedial Investigation, the presence of VOCs and metals has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary

contaminants of concern, to be addressed by the remedy selection process are, TCE, arsenic, barium, cadmium chromium, and lead.

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor, sub-slab soil vapor under structures, and indoor air. At this site due to the presence of buildings in the impacted area a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

Based on the concentration detected, and in comparison with the NYSDOH Soil Vapor Intrusion Guidance, the primary soil vapor contaminant is trichloroethylene (TCE) which was associated with the degreasing operation at the Lucas Avenue Plant. Soil vapor samples were collected from the sub-slab of the eastern portion of the Lucas Avenue Plant within and around the degreasing operation area. The samples were collected to assess the potential for soil vapor intrusion. A total of four sub-slab samples, one indoor ambient air sample, and one outdoor ambient air sample were collected from the structure. Additional soil vapor samples were collected from adjacent properties. Indoor air and outdoor air samples were also collected at this time.

Total chlorinated VOC concentrations in sub-slab samples were calculated and ranged from180 $\mu g/m^3$ to13,000 $\mu g/m^3$. Of the total TCE was detected in all four of the sub-slab samples at concentrations ranging from140 $\mu g/m^3$ to10,000 $\mu g/m^3$. The maximum concentration detected was collected near the south wall of the building. The ambient indoor and outdoor samples also contained TCE at concentrations of $5\mu g/m^3$ and $10\mu g/m^3$, respectively. When compared to the NYSDOH decision matrices in the "Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York dated October 2006" the concentration in the sub-slab coupled with the concentration in the indoor and ambient air mitigation is appropriate to minimize current or potential exposures associated with soil vapor intrusion.

As noted on Figure 7, the primary soil vapor contamination is found under the eastern portion of the Lucas Avenue Plant building in an area known as Pickle Facility "D". Soil vapor testing was completed on adjacent properties that did not find any TCE exceeding the NYS DOH matrices. This information coupled with extent of groundwater contamination was considered and it was determined that; remediation of the source area will reduce VOC impacts lessening the likelihood of further migration; a permanent easement will be necessary, to require the evaluation of soil vapor intrusion and if warranted the installation of a vapor mitigation system before re-use of any on-site buildings or occupying new buildings; and that no further action is needed for off-site residential properties.

Based on the findings of the Remedial Investigation, the presence of VOCs has resulted in the contamination of soil vapor. The site contaminant considered to be the primary contaminants of concern which will drive the remediation of soil vapor to be addressed by the remedy selection process is trichloroethylene.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Because no further action is anticipated with this alternative there are no costs assigned.

Alternative 2: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil cleanup objectives (SCOs) listed in Part 375-6.8 (a). This alternative would include: demolition of the existing structures, removal of all characteristic hazardous waste, excavation of all material exceeding unrestricted SCOs and treatment of metals impacted groundwater in the western portion of the site and VOC impacted groundwater in the eastern portion of the site.

At the Lucas Avenue site, given the historical operations, it is assumed that all of the non-native material used as fill at the site would exceed the unrestricted SCOs. Native soils at the site are lacustrine silts and clays. Previous remedial efforts during the IRM have shown these native soils are relatively impermeable and not largely impacted except in isolated areas. The average depth to bedrock at the site is 10' below the surface. In estimating quantities to be remediated to pre-disposal or unrestricted use, it is assumed that if all material, both non-native fill material and native soils were excavated to bedrock from below the former facility, this quantity would conservatively estimate the entire quantity of non-native fill material from the entire site. It is further assumed that this material would be excavated for off-site disposal.

Groundwater is impacted with metals or VOCs in separate areas of the site. To estimate a cost to remediate the groundwater to return site to pre-disposal conditions it is assumed that three volumes of groundwater from each area would have to be removed and treated after removal of soils exceeding unrestricted SCOs.

Removal of impacted soils to unrestricted SCOs and treatment of three volumes of groundwater after removal of all impacted soils would return the site to pre-release conditions allowing for unrestricted use of the site. The alternative would be fully protective of human health and the environment as all impacts from former operations would be removed. This alternative does not consider potential zoning restrictions on use, nor does it consider pre-existing impediments to use such as location (including proximity to the active rail corridor). This alternative requires no future monitoring or placement of easements or restrictions.

Present Worth: *$17,500,000*
Capital Cost: *$17,500,000*
Annual Cost: *$0*

Alternative 3: Restoration to Commercial Re-Use

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A. The Lucas Avenue Plant is an approximately 118,000 square foot building on an approximately 8.25 acre parcel. Facilities of this size needing remediation often have discrete areas of impact, each requiring different remedial techniques. As noted in the environmental assessment, various media have been impacted by past operations. Media impacted at Lucas Avenue include, soil, groundwater, and soil vapor. The selected remedy is a presumptive remedy intending to address impacts to these media. This alternative would include:

1. Building demolition;
2. Excavation and off-site disposal of characteristic hazardous waste metals including cadmium, chromium and lead;
3. Excavation and proper disposal of metals and SVOC contaminated soils containing elevated concentrations, to the extent feasible;
4. Continued monitoring of groundwater off-site to assess impacts of remedial efforts;
5. Excavation and off-site disposal of VOC contaminated soils to the extent feasible;
6. Backfill VOC excavation after treatment of bottom of excavation with a substance intended to hasten reductive de-chlorination of remaining VOCs in soil and groundwater;
7. Backfill excavations with off-site soil satisfying the requirements of 6NYCRR Part 375-6.7(d),
8. Removal of all underground storage tanks (USTs);
9. Removal and proper disposal of all electrical transformers;
10. Site cover consisting either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover. Where the soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use; and
11. Placement of an environmental easement on the property, restricting future use of the property to commercial and industrial use, requiring evaluation of soil vapor intrusion and the installation of a vapor mitigation system if warranted, prohibiting use of groundwater, and requiring future use to adhere to a Site Management Plan (SMP).

Groundwater is impacted with metals and VOCs in separate areas of the site. It is assumed that three volumes of groundwater from each area would have to be removed and treated after removal of soils. Removal of characteristic hazardous wastes and other impacted soils coupled with the removal and treatment of approximately three volumes of groundwater would return the site to conditions allowing for commercial use of the site. Following removal of wastes and soil in metals and SVOC impacted areas groundwater would be evaluated for future treatment after five years following removal of wastes and soil in metals and SVOC impacted areas.

Present Worth:.....*$4,630,000*
Capital Cost:.....*$4,250,000*
Annual Costs:.....*$25,000*

Exhibit C

REMEDIAL ALTERNATIVE COSTS

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Action	0	0	0
Restoration to Unrestricted Use	17,500,000	0	17,500,000
Restoration to Commercial Re-Use	4,250,000	25,000	4,630,000

Exhibit D

SUMMARY OF THE SELECTED REMEDY

The Department is proposing Alternative #3, Restoration to Commercial Re-Use as the remedy for this site. Alternative #3 will achieve the remediation goals for the site by; removing all characteristic hazardous waste and removing SVOC, VOC, and metals contaminated soils to the extent feasible; removing all USTs; removing all transformers; addressing impacted groundwater; placing an easement restricting re-use; prohibiting groundwater use; requiring evaluation of soil vapor intrusion and the installation of a sub-slab vapor mitigation system, if warranted; and requiring adherence to requirements of a SMP. The elements of this remedy are described in Section 7. The selected remedy is depicted in Figures 3 & 4.

Basis for Selection

The selected remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the CMS/FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

The selected remedy (Alternative 3) will satisfy this criterion by removing all hazardous waste and VOC contaminated soils to the extent feasible and properly disposing of them off-site which addresses the source of the groundwater contamination, the most significant threat to public health and the environment. The goal to remove VOCs to the extent feasible rather than protection of groundwater SCOs was chosen because sampling shows that VOCs groundwater contamination has not migrated offsite. In-situ soil treatment will be implemented prior to backfilling with clean, off-site soils; an environmental easement will be placed on the property prohibiting use of groundwater; evaluation of soil vapor migration and if warranted installation of a vapor mitigation system before any new structures are built.

Alternative 3 further satisfies this criterion by requiring a cover system as part of development. The cover will be required in areas not covered by components of development (e.g. buildings or pavement), and will consist of imported soils satisfying the requirements of 6NYCRR Part 375-6.7 (d). Additionally, Alternative 3 satisfies this criterion by removing USTs and all transformers and placing an environmental easement restricting re-use, and requires adherence to a SMP. Alternative 1 (No Action), does not provide any protection to public health and the environment and will not be evaluated further. Alternative 2, removal of all soil contaminated above the “unrestricted” soil cleanup objective, meets this threshold criterion.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Alternative 3 complies with SCGs to the extent practicable. It addresses source areas of contamination and complies with the restricted use SCOs at the surface through construction of a cover system where a cover in the form buildings or pavement resulting from site development will not be provided. The preferred alternative also provides for the conditions necessary to restore groundwater quality to the extent practicable. Because both Alternatives 2 and 3 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Long-term effectiveness is accomplished by both Alternatives 2 and 3. Alternative 2 results in removal of all of the chemical contamination at the site and removes the need for property use-restrictions and long-term monitoring. Alternative 3 will result in the removal of all of the hazardous waste along with metals and VOC contaminated soil to the extent feasible, but it will require an environmental easement and long-term monitoring.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternative 2, excavation and off-site disposal, reduces the toxicity, mobility and volume of on-site waste by transferring the material to an approved off-site location. However, depending on the disposal facility, the volume of the material would not be reduced. Alternative 3 does not reduce the volume of the material or remove all the on-site impacted material but removal to the extent feasible does reduce toxicity and mobility. Both alternatives are considered permanent.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternatives 2 and 3 both have short-term impacts which could easily be controlled. Alternative 2 would require more total time to implement because of the greater volume of soil to be excavated. Alternative 2 would cause greater truck traffic on local roads compared to Alternative 3. Alternative 2 also requires complete demolition and removal of all concrete flooring and foundations which contributes to the increased time to implement.

Alternative 3 will decrease the direct and indirect emission of green house gasses because of; the reduced number of truck trips; equipment run time for disposal and backfill; than for Alternative 2 due to the lesser soil removal volume; and the reduced area of slab and foundation to be demolished and removed.

Alternatives 2 and 3 both have short-term and as yet undetermined long term impacts on the environment due to the increase in direct and indirect emissions of green house gasses. These impacts are not easy to control by engineering means or alternative methods and reduction of impacts is predicated on duration of activity. To complete the remedy, Alternative 2 would release about twenty times as much CO_2 into the atmosphere as

Alternative 3 taking into account the fuel burned during the excavation, transport to disposal location, excavation, transport and equipment run time required for backfill and restoration. This increased quantity is because of the increased volume of soil and addition time required to complete the remediation in Alternative 2.Therefore, Alternative 3 would be considered the more “green” remedial choice.

The length of time to reach the remedial goals is similar for both alternatives with an advantage for Alternative 3 due to the decreased time necessary to implement the remedy.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Alternatives 2 and 3 are readily implementable. Alternative 2 is less feasible due to the increased volume of material to be disposed and the increased volume of backfill material needed. Further technical feasibility issues arise with Alternative 2 due to the proximity of the rail line and Lucas Avenue. Protective engineering controls such as shoring would be needed in order to avoid impacting the structural integrity of these transportation lines due to the requisite depths of excavation.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

The costs of the alternatives vary significantly. With its significantly larger volume of soil to be handled, Alternative 2 (excavation and off-site disposal) exhibits a significantly higher present worth cost without a commensurate increase in protectiveness.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The current zoning for this site and the anticipated use of the site is industrial. Both Alternatives 2 and 3 comport with industrial use.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative #3 is being selected because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.

Alternative #3 is more cost effective and more readily implementable from a time to completion aspect as well as from a technical feasibility aspect. Alternative #3 achieves remedial action objectives for commercial use. This alternative also has the least impact on the local community because of the reduced time to implement which will result in less heavy truck traffic on local roads. In addition to the reduced impact on the community, Alternative #3 is the preferred alternative due to the decrease in the direct and indirect emission of green house gasses realized by the reduced number of truck trips and decreased equipment run time required for disposal and backfill due to reduced volume to be removed and by not requiring removal and demolition of the entire slab and foundation.

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

AlTech Specialty Steel Corporation Site
Operable Unit No. 1: Lucas Avenue Plant Remedial Program
State Superfund Project
Dunkirk, Chautauqua County, New York
Site No. 907022

The Proposed Remedial Action Plan (PRAP) for the AlTech Specialty Steel Corporation Site, Operable Unit No. 1: Lucas Avenue Remedial Program (AlTech – Lucas Ave) was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on September 18, 2012. The PRAP outlined the remedial measure proposed for the contaminated groundwater, soil and soil vapor at the AlTech - Lucas Ave site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on October 4, 2012 which included a presentation of the remedial investigation feasibility study (RI/FS) for the AlTech – Lucas Ave as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on October 18, 2012.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

COMMENT 1: Why has it taken so many years to get to this point?
RESPONSE 1: The AlTech site is a large, ninety acre site that has several diverse environmental problems. Environmental assessments of the site led to defining three areas of contamination which are referred to as Operable Units. Operable Units represent portions of a site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from site contamination. Progress has been made to remove sources of contamination such as; removal of pickling salt baths at the Bar Finish and Storage Mill, removal of the Brigham road pickle baths and demolition of the pickling room. In addition, the demolition of the western end of the Lucas Avenue Plant and removal of significantly contaminated soil was completed in 2007. The remediation of PCBs in Willowbrook Pond is also currently being evaluated.

COMMENT 2: Can the site be considered a brownfield?
RESPONSE 2: Yes, one definition of the word “brownfield” is any real property where the redevelopment or re-use of the property is complicated by the presence or potential presence of contamination.

COMMENT 3: Is the playground across the street (from the site) impacted by the site contamination?
RESPONSE 3: Soil and groundwater samples directly across the street from the site did not indicate any site related impacts*.

(*Soil Investigation Intrusion Evaluation AL Tech Specialty Steel Site, Site No. 9-07-022, City of Dunkirk, Chautauqua County" June 2008, prepared by Ecology and Environment Engineering)

COMMENT 4: Did the School District do an environmental study when they renovated and built the high school?
RESPONSE 4: The Department is not aware of any environmental studies of the property. This question should be directed to the School District.

COMMENT 5: Is there anything we (the public) can do to hurry this project along?
RESPONSE 5: The public can enable the project by staying informed about the progress being made, by continuing to receive fact sheets by signing up for the listserv, and discussing the redevelopment of the property with City officials.

COMMENT 6: The Fire Department would like the building torn down as soon as possible. There have been a number of nuisance fires set within the building over the years.
RESPONSE 6: The Department is aware of these instances and will move forward in a timely manner.

COMMENT 7: What is RealCo? Are they paid for administering the funds?
RESPONSE 7: RealCo, Inc. is a corporation organized and doing business under the laws of Delaware to undertake as its primary activity the environmental remediation required at the AL Tech facilities in Dunkirk and Watervliet. A Department issued Order on Consent (Index No. A9-0393-9907) noted that RealCo would take title to certain real and personal property owned by AL Tech Specialty Steel Corporation and a trust fund was set up from funds paid by responsible parties for the purpose of remediating the Dunkirk and Watervliet facilities. RealCo was entitled to a percent of the Trust Fund for administrative purposes.

COMMENT 8: Is the alternative of meeting residential soil cleanup values ever chosen on Superfund sites?
RESPONSE 8: It is DEC's policy, consistent with applicable statutes and regulations, that all remedies will be protective of public health and the environment. DEC's preference is that remedial programs, including the selection of soil cleanup levels, be designed such that the performance standard results in the implementation of a permanent remedy resulting in no future land use restrictions. However, when developing and evaluating remedies future site use can be considered as it is not always feasible to return a site to a condition where no restrictions are required.

COMMENT 9: What are the potential delays to completing the demolition?
RESPONSE 9: The next step after issuance of the Record of Decision is to complete the engineering design of the remedy and address applicable local demolition requirements. Actual construction of the remedy would follow pending funding.

COMMENT 10: Is the groundwater near the homes getting better or worse?

RESPONSE 10: The groundwater quality near the homes has been consistently above groundwater standards. The interim remedial measure in 2007 was designed to remove a large quantity of contaminated soil that was considered a source for metals, such as chromium, which were impacting groundwater quality. Subsequent sampling has noted a decline in groundwater levels immediately downgradient of the excavation.

COMMENT 11: Residents would like to know when DEC is sampling groundwater at the site.
RESPONSE 11: The Department will continue to notify property owners upon whose property they will be sampling. Subscribing to the Department's listserv at http://www.dec.ny.gov/chemical/61092.html will keep interested parties up to date on Department activities at this site and other sites in Chautauqua County.

APPENDIX B

Administrative Record

Administrative Record

AlTech Specialty Steel Corporation Site
Operable Unit No. 1: Lucas Avenue Plant remedial Program
State Superfund Project
Dunkirk, Chautauqua County, New York
Site No. 907022

Proposed Remedial Action Plan for the AlTech Specialty Steel Corporation site, Operable Unit No. 1: Lucas Avenue Plant Remedial Program, dated September 2012, prepared by the Department.

Order on Consent, Index No. R4-1467-93-02, between the Department and AL Tech Specialty Steel Corporation, executed on August 4, 1995.

Order on Consent, Index No. A9-0393-9907, between the Department and RealCo, executed on September 7, 1997.

1. "Phase 1 RCRA Facilities Investigation Report AL Tech Specialty Steel Corporation Dunkirk, New York Facility" Volume 1 of 6, October 1998, prepared by Environmental Strategies Corporation
2. "Phase 1 RCRA Facilities Investigation Report AL Tech Specialty Steel Corporation Dunkirk, New York Facility" Volume 2 of 6, October 1998, prepared by Environmental Strategies Corporation
3. "Phase 1 RCRA Facilities Investigation Report AL Tech Specialty Steel Corporation Dunkirk, New York Facility" Volume 3 of 6, October 1998, prepared by Environmental Strategies Corporation
4. "Phase 1 RCRA Facilities Investigation Report AL Tech Specialty Steel Corporation Dunkirk, New York Facility" Volume 4 of 6, October 1998, prepared by Environmental Strategies Corporation
5. "Phase 1 RCRA Facilities Investigation Report AL Tech Specialty Steel Corporation Dunkirk, New York Facility" Volume 5 of 6, October 1998, prepared by Environmental Strategies Corporation
6. "Phase 1 RCRA Facilities Investigation Report AL Tech Specialty Steel Corporation Dunkirk, New York Facility" Volume 6 of 6, October 1998, prepared by Environmental Strategies Corporation
7. "Sampling and Analysis Plan, Lucas Avenue Plant Decontamination and Demolition" January 2001, prepared by Benchmark Environmental Engineering & Science
8. "ICM Work Plan for Decontamination and Demolition of Lucas Avenue Plant" April 2001, prepared by Benchmark Environmental Engineering & Science
9. "Investigation Report for LAP West Soil ICM Lucas Avenue Plant Dunkirk, New York" July 2001, prepared by Benchmark Environmental Engineering & Science
10. "Phase II RCRA Facility Investigation and Interim Corrective Measures Report Former AL Tech Specialty Steel Corporation Dunkirk, New York" October 2003, prepared by Benchmark Environmental Engineering & Science
11. "Former AlTech Specialty Steel Corporation Facility Supplemental Phase II RFI Field Activities and Findings" August 2004, prepared by Benchmark Environmental Engineering & Science

12. “Corrective Measures Study/Feasibility Study” September 2006, prepared by Benchmark Environmental Engineering & Science
13. “Interim Remedial Measures for AL Tech Specialty Steel Site, Site No. 9-07-022, City of Dunkirk, Chautauqua County, Volume 1 Summary Report” October 2007, prepared by Ecology and Environment Engineering
14. “Interim Remedial Measures for AL Tech Specialty Steel Site, Site No. 9-07-022, City of Dunkirk, Chautauqua County, Volume II Site Investigation Report” October 2007, prepared by Ecology and Environment Engineering
15. “Interim Remedial Measures for AL Tech Specialty Steel Site, Site No. 9-07-022, City of Dunkirk, Chautauqua County, Volume III Asbestos Survey Report” October 2007, prepared by Ecology and Environment Engineering
16. “Soil Investigation Intrusion Evaluation AL Tech Specialty Steel Site, Site No. 9-07-022, City of Dunkirk, Chautauqua County” June 2008, prepared by Ecology and Environment Engineering
17. RealCo (Former Al-Tech Specialty Steel Corp. Facility) Site Dunkirk, New York Groundwater Monitoring Summary Report” October 2011 prepared by Benchmark Environmental Engineering & Science

F

Excavation Work Plan

Excavation Work Plan
for the Al-Tech Specialty Steel Corporation Site (OU-1)
NYSDEC Site No. 9-07-022
Dunkirk, New York
May 2019

Prepared by: Ecology and Environment Engineering and Geology, P.C.

Reviewed by: NYSDEC

Accepted for Use:

Revisions:

Dated	Revisions	By

F-1 Notification

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table F-1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B.

Table F-1 Notifications*

Benjamin Rung New York State Department of Environmental Conservation Project Manager	(518) 402-9826 benjamin.rung@dec.ny.gov
Chad Staniszewski New York State Department of Environmental Conservation Regional HW Remediation Engineer	(716) 851-7220 chad.staniszewski@dec.ny.gov
Kelly Lewandowski New York State Department of Environmental Conservation Site Control	(518) 402-9569 kelly.lewandowski@dec.ny.gov
Ruth Curley New York State Department of Environmental Conservation Division of Environmental Remediation	(518) 402-9767 ruth.curley@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix I of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

F-2 Soil Screening Methods

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Sections F-6 and F-7 of this Appendix.

F-3 Soil Staging Methods

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected, and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

F-4 Materials Excavation and Load-Out

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

F-5 Materials Transport Off-Site

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

Truck transport routes are as follows: head east on W Lucas Avenue toward Marauder Drive; turn right onto Central Avenue; turn left onto Newton Street; turn right onto Main Street; turn left onto William Street; turn right onto NY-60 S for 1.0 mile until you reach New York State Thruway Interstate 90. A map is provided in Figure F-1. All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

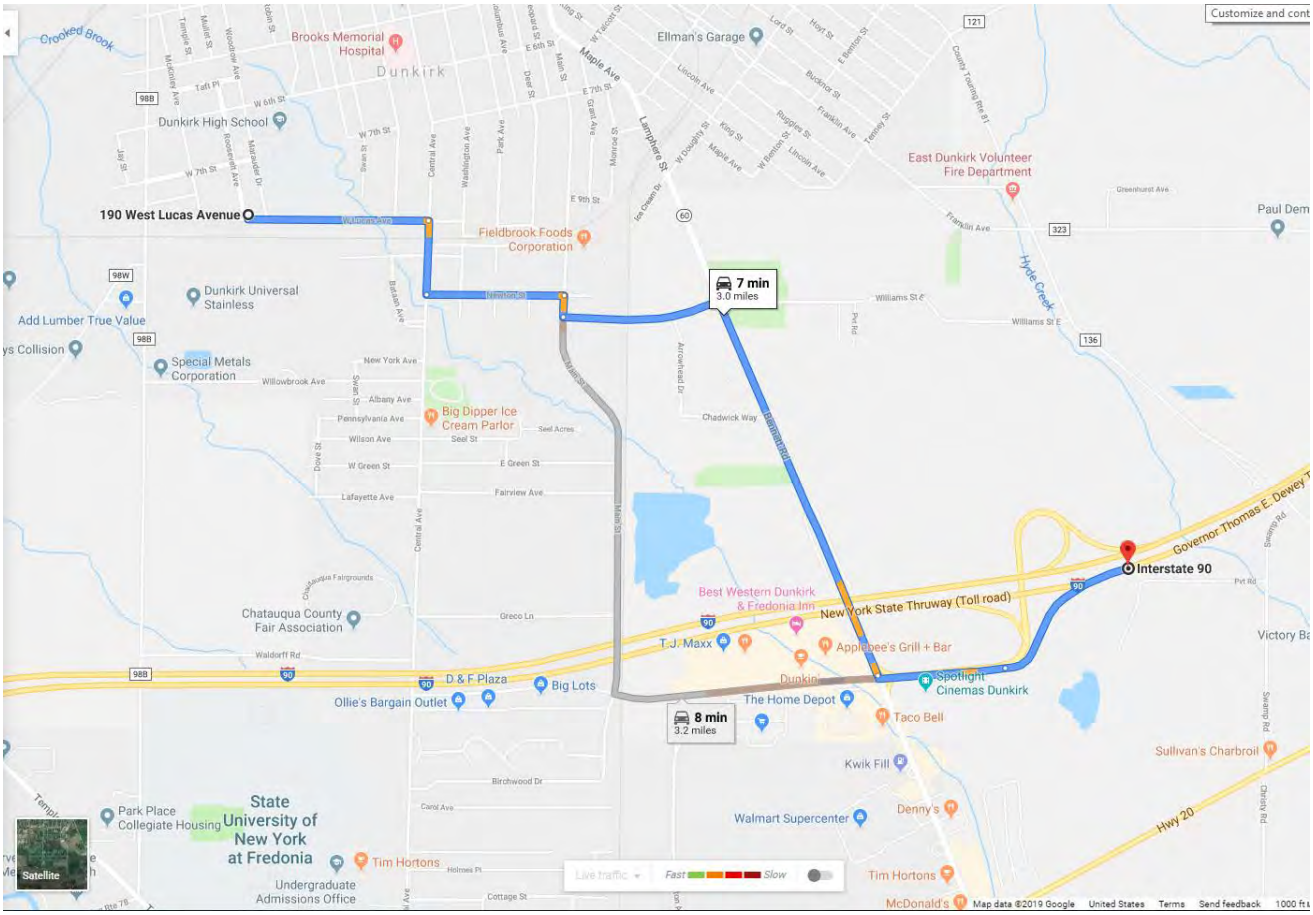


Figure F-1 Map from Al-Tech Site to New York State Thruway Interstate 90

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

F-6 Materials Disposal Off-Site

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

F-7 Materials Reuse On-Site

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

F-8 Fluids Management

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal

regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

F-9 Cover System Restoration

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Record of Decision. The existing cover system is comprised of a minimum of 12 inches of clean soil. The demarcation layer, consisting of orange snow fencing material or equivalent material will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

F-10 Backfill from Off-Site Sources

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use imported material shall meet the commercial soil quality standards listed in Table 375-6.8(b) of the 6 NYCRR Part 375 Regulations. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

F-11 Stormwater Pollution Prevention

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

F-12 Excavation Contingency Plan

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

F-13 Community Air Monitoring Plan

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

F-14 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will include odor masking agents or other odor control methods. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

F-15 Dust Control Plan

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

G Health and Safety Plan

May 7, 2019

GENERIC SITE-SPECIFIC HEALTH AND SAFETY PLAN

Project: Al-Tech Specialty Steel Corporation Site

Project No.: NYSDEC Number 907022

TDD/PAN No.: _____

Project Location: Dunkirk, Chautauqua County, NY

Proposed Date of Field Activities: _____

Project Director: _____

Project Manager: _____

Prepared by: _____ Date Prepared: _____

Approved by: _____ Date Approved: _____

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1. INTRODUCTION

1.1 POLICY

It is COMPANY's policy to ensure the health and safety of its employees, the public, and the environment during the performance of work it conducts. This site-specific health and safety plan (SHASP) establishes the procedures and requirements to ensure the health and safety of COMPANY employees for the above-named project. COMPANY's overall safety and health program is described in *Corporate Health and Safety Program* (CHSP). After reading this plan, applicable COMPANY employees shall read and sign COMPANY's Site-Specific Health and Safety Plan Acceptance form.

This SHASP has been developed for the sole use of COMPANY employees and is not intended for use by firms not participating in COMPANY's training and health and safety programs. Subcontractors are responsible for developing and providing their own safety plans.

This SHASP has been prepared to meet the following applicable regulatory requirements and guidance:

Applicable Regulation/Guidance
29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER)
Other:

1.2 SCOPE OF WORK

Description of Work: This project involves operation, maintenance, and monitoring of a NYSDEC inactive hazardous waste site, including site inspections and sampling of lead, arsenic, barium, cadmium, chromium, TCE, and PCB contaminated environmental media, such as groundwater and soils.

Equipment/Supplies: Attachment 1 contains a checklist of equipment and supplies that will be needed for this work.

The following is a description of each numbered task:

Task Number	Task Description
I	Long-Term Monitoring and Reporting
II	Operations and Maintenance

1.3 SITE DESCRIPTION

Site Map: A site map or sketch is attached at the end of this plan.

Site History/Description (see project work plan for detailed description): The site is located at 100 – 190 West Lucas Avenue in the City of Dunkirk, County of Chautauqua, New York, approximately 0.5 miles west of Central Avenue. It is identified as tax map parcel number 96.06-3-1. The site is bounded by West Lucas Avenue to the north, an active railroad Right of Way (ROW) owned and maintained by Norfolk Southern Corporation to the south, the City of Dunkirk Department of Public Works facility to the east, and Brigham Road to the west (see Figure 1-2 of the SMP)

Is the site currently in operation? ☐ Yes ☒ No

Locations of Contaminants/Wastes: The contaminants are in the groundwater and soil.

Types and Characteristics of Contaminants/Wastes:

☒ Liquid	☒ Solid	☐ Sludge	☐ Gas/Vapor
☐ Flammable/Ignitable	☐ Volatile	☐ Corrosive	☐ Acutely Toxic
☐ Explosive	☐ Reactive	☐ Carcinogenic	☐ Radioactive
☐ Medical/Pathogenic	Other:		

2. ORGANIZATION AND RESPONSIBILITIES

COMPANY team personnel shall have on-site responsibilities as described in COMPANY's standard operating procedure (SOP) for Site Entry Procedures. The project team, including qualified alternates, is identified below.

Name	Site Role/Responsibility
TBD based on actual field crew and activities	Project/Task Manager
TBD based on actual field crew and activities	Site Safety Officer
TBD based on actual field crew and activities	Field Tech

3. TRAINING

Prior to work, COMPANY team personnel shall have received training as indicated below. As applicable, personnel shall have read the project work plan, sampling and analysis plan, and/or quality assurance project plan prior to project work.

Training	Required
40-Hour Initial Health and Safety Training and Annual Refresher	X
First Aid/CPR (within 2 years)	X
Hazard Communication (29 CFR 1910.1200)	X
40-Hour Radiation Protection Procedures and Investigative Methods	
8-Hour General Radiation Health and Safety	

Training	Required
Radiation Refresher	
DOT and Biannual Refresher	X
Other: _____	

4. MEDICAL SURVEILLANCE

4.1 MEDICAL SURVEILLANCE PROGRAM

COMPANY field personnel shall actively participate in COMPANY's medical surveillance program as described in the CHSP and shall have received, within the past year, an appropriate physical examination and health rating.

COMPANY's health and safety record (HSR) form will be maintained on site by each COMPANY employee for the duration of his or her work. COMPANY employees should inform the site safety officer (SSO) of any allergies, medical conditions, or similar situations that are relevant to the safe conduct of the work to which this SHASP applies.

Is there a concern for radiation at the site? ☐ Yes ☒ No

If no, go to 5.1.

4.2 RADIATION EXPOSURE

4.2.1 External Dosimetry

Thermoluminescent Dosimeter (TLD) Badges: _____

Pocket Dosimeters: _____

_____

Other: _____

_____

4.2.2 Internal Dosimetry

☐ Whole body count ☐ Bioassay ☐ Other

Requirements: _____

_____

4.2.3 Radiation Dose

Dose Limits: _____

_____

Site-Specific Dose Limits: _____

_____

ALARA Policy: _____

5. SITE CONTROL

5.1 SITE LAYOUT AND WORK ZONES

Site Work Zones: TBD

Site Access Requirements and Special Considerations: None.

Illumination Requirements: None.

Sanitary Facilities (e.g., toilet, shower, potable water): None available onsite. Potable water shall be brought onsite by field personnel for activities onsite, as necessary.

On-Site Communications: Cell phone will be brought on site and maintained with either team member.

Other Site-Control Requirements:

5.2 SAFE WORK PRACTICES

Daily Safety Meeting: Safety meetings will be conducted as necessary.

Work Limitations: Work shall be limited to a maximum of 12 hours per day. If 12 consecutive days are worked, at least one day off shall be provided before work is resumed. Work will be conducted in daylight hours unless prior approval is obtained and the illumination requirements in 29 CFR 1910.120(m) are satisfied.

Weather Limitations: Work shall not be conducted during electrical storms. Work conducted in other inclement weather (e.g., rain, snow) will be approved by project management and the regional safety coordinator or designee.

Other Work Limitations: No confined entry allowed or will be performed in connection with this project.

Buddy System: Field work will be conducted in pairs of team members according to the buddy system.

Line of Sight: Each field team member shall remain in the line of sight and within verbal communication of at least one other team member.

Eating, Drinking, and Smoking: Eating, drinking, smoking, and the use of tobacco products shall be strictly prohibited in the exclusion and contamination reduction areas, at a minimum, and shall only be permitted in designated areas.

Contamination Avoidance: Field personnel shall avoid unnecessary contamination of personnel, equipment, and materials to the extent practicable.

Sample Handling: Protective gloves of a type designated in Section 7 will be worn when containerized samples are handled for labeling, packaging, transportation, and other purposes.

Other Safe Work Practices: Safety glasses, steel-toed boots, and high visibility vest are required at all times while on-site.

6. HAZARD EVALUATION AND CONTROL

6.1 PHYSICAL HAZARD EVALUATION AND CONTROL

Potential physical hazards and their applicable control measures are described in the following table for each task.

Hazard	Task Number	Hazard Control Measures
Biological (flora, fauna, etc.)	**I & II**	■ Potential hazard: ■ Establish site-specific procedures for working around identified hazards. ■ Other:
Cold Stress	**I & II**	■ Provide warm break area and adequate breaks. ■ Provide warm noncaffeinated beverages. ■ Promote cold stress awareness. ■ See *Cold Stress Prevention and Treatment* (attached at the end of this plan if cold stress is a potential hazard).
Compressed Gas Cylinders	**N/A**	■ Use caution when moving or storing cylinders. ■ A cylinder is a projectile hazard if it is damaged or its neck is broken. ■ Store cylinders upright and secure them by chains or other means. ■ Other:
Confined Space	**N/A**	■ Ensure compliance with 29 CFR 1910.146. ■ See SOP for Confined Space Entry. Additional documentation is required. ■ Other:
Drilling	**N/A**	■ See SOP for Health and Safety on Drilling Rig Operations. Additional documentation may be required. ■ Landfill caps will not be penetrated without prior discussions with corporate health and safety staff. ■ Other:
Drums and Containers	**I & II**	■ Ensure compliance with 29 CFR 1910.120(j). ■ Consider unlabeled drums or containers to contain hazardous substances and handle accordingly until the contents are identified. ■ Inspect drums or containers and assure integrity prior to handling. ■ Move drums or containers only as necessary; use caution and warn nearby personnel of potential hazards. ■ Open, sample, and/or move drums or containers in accordance with established procedures; use approved drum/container-handling equipment. ■ Other:

Hazard	Task Number	Hazard Control Measures
Electrical	**I & II**	■ Ensure compliance with 29 CFR 1910 Subparts J and S. ■ Locate and mark energized lines. ■ De-energize lines as necessary. ■ Ground all electrical circuits. ■ Guard or isolate temporary wiring to prevent accidental contact. ■ Evaluate potential areas of high moisture or standing water and define special electrical needs. ■ Other:
Excavation and Trenching	**I & II**	■ Ensure that excavations comply with and personnel are informed of the requirements of 29 CFR 1926 Subpart P. ■ Ensure that any required sloping or shoring systems are approved as per 29 CFR 1926 Subpart P. ■ Identify special personal protective equipment (PPE) (see Section 7) and monitoring (see Section 8) needs if personnel are required to enter approved excavated areas or trenches. ■ Maintain line of sight between equipment operators and personnel in excavations/trenches. Such personnel are prohibited from working in close proximity to operating machinery. ■ Suspend or shut down operations at signs of cave in, excessive water, defective shoring, changing weather, or unacceptable monitoring results. ■ Other:
Fire and Explosion	**I & II**	■ Inform personnel of the location(s) of potential fire/explosion hazards. ■ Establish site-specific procedures for working around flammables. ■ Ensure that appropriate fire suppression equipment and systems are available and in good working order. ■ Define requirements for intrinsically safe equipment. ■ Identify special monitoring needs (see Section 8). ■ Remove ignition sources from flammable atmospheres. ■ Coordinate with local fire-fighting groups regarding potential fire/explosion situations. ■ Establish contingency plans and review daily with team members. ■ Other:
Heat Stress	**I & II**	■ Provide cool break area and adequate breaks. ■ Provide cool noncaffeinated beverages. ■ Promote heat stress awareness. ■ Use active cooling devices (e.g., cooling vests) where specified. ■ See *Heat Stress Prevention and Treatment* (attached at the end of this plan if heat stress is a potential hazard).

Hazard	Task Number	Hazard Control Measures
Heavy Equipment Operation	**I & II**	■ Define equipment routes, traffic patterns, and site-specific safety measures. ■ Ensure that operators are properly trained and equipment has been properly inspected and maintained. Verify back-up alarms. ■ Ensure that ground spotters are assigned and informed of proper hand signals and communication protocols. ■ Identify special PPE (Section 7) and monitoring (Section 8) needs. ■ Ensure that field personnel do not work in close proximity to operating equipment. ■ Ensure that lifting capacities, load limits, etc., are not exceeded. ■ Other:
Heights (Scaffolding, Ladders, etc.)	**N/A**	■ Ensure compliance with applicable subparts of 29 CFR 1910. ■ Identify special PPE needs (e.g., lanyards, safety nets, etc.) ■ Other:
Noise	**I & II**	■ Establish noise level standards for on-site equipment/operations. ■ Inform personnel of hearing protection requirements (Section 7). ■ Define site-specific requirements for noise monitoring (Section 8). ■ Other:
Overhead Obstructions	**N/A**	■ Wear hard hat. ■ Other:
Power Tools	**I**	■ Ensure compliance with 29 CFR 1910 Subpart P. ■ Other:
Sunburn	**I & II**	■ Apply sunscreen. ■ Wear hats/caps and long sleeves. ■ Other:
Utility Lines	**I & II**	■ Identify/locate existing utilities prior to work. ■ Ensure that overhead utility lines are at least 25 feet away from project activities. ■ Contact utilities to confirm locations, as necessary. ■ Other:
Weather Extremes	**I & II**	■ Potential hazards: ■ Establish site-specific contingencies for severe weather situations. ■ Provide for frequent weather broadcasts. ■ Weatherize safety gear, as necessary (e.g., ensure eye wash units cannot freeze, etc.). ■ Identify special PPE (Section 7) needs. ■ Discontinue work during severe weather. ■ Other:

Hazard	Task Number	Hazard Control Measures
Slips, Trips, & Falls:	**I & II**	■ Stay in good physical condition ■ Wear appropriate and properly fitting footwear ■ Stay well hydrated ■ Do not be in too much of a hurry ■ Be attentive; constantly scan the way ahead when walking
Other:		■ ■

6.2 CHEMICAL HAZARD EVALUATION AND CONTROL

6.2.1 Chemical Hazard Evaluation

Potential chemical hazards are described by task number in Table 6-1. Hazard Evaluation Sheets for major known contaminants are attached at the end of this plan.

6.2.2 Chemical Hazard Control

An appropriate combination of engineering/administrative controls, work practices, and PPE shall be used to reduce and maintain employee exposures to a level at or below published exposure levels (see Section 6.2.1).

Applicable Engineering/Administrative Control Measures: _____

_____

PPE: See Section 7. _____

6.3 RADIOLOGICAL HAZARD EVALUATION AND CONTROL

6.3.1 Radiological Hazard Evaluation

Potential radiological hazards are described below by task number. Hazard Evaluation Sheets for major known contaminants are attached at the end of this plan.

Task Number	Radionuclide	DAC (μCi/ml)	Route(s) of Exposure	Major Radiation(s)	Energy(s) (MeV)	Half-Life

6.3.2 Radiological Hazard Control

Engineering/administrative controls and work practices shall be instituted to reduce and maintain employee exposures to a level at or below the permissible exposure/dose limits (see sections 4.2.3 and 6.3.1). Whenever engineering/administrative controls and work practices are not feasible or effective, any reasonable combination of engineering/administrative controls, work practices, and PPE shall be used to reduce and maintain employee exposures to a level at or below permissible exposure/dose limits.

Applicable Engineering/Administrative Control Measures: _____

_____

PPE: See Section 7.

TABLE 6-1

CHEMICAL HAZARD EVALUATION

Task Number	Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/ Description	FID/PID	
		PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
I & II	Lead*	0.050 mg/m^3	0.01 mg/m^3	0.05 mg/m^3	Yes	Inhalation, skin absorption, ingestion	Irritated eyes, upper respiratory system, metal fume, fever	N/A	N/A	N/A
I & II	Arsenic*	0.010 mg/m^3 organic	0.002 mg/m^3	0.01 mg/m^3 inhalable	Yes	Inhalation, skin absorption, ingestion, skin and/or eye contact	Sensory irritant, lung & skin cancer, aplastic anemia and numbness	N/A	N/A	N/A
I & II	Barium	0.050 mg/m^3	0.50 mg/m^3	0.50 mg/m^3	Yes	Inhalation, skin absorption, ingestion, skin and/or eye contact	Nausea, vomiting, diarrhea, irregular heartbeat, muscle weakness, tremors, paralysis	N/A	N/A	N/A
I & II	Cadmium*	0.005 mg/m^3	LFC	0.01 mg/m^3	No	Inhalation, ingestion	Difficulty breathing, headache, chills, muscle aches, nausea, vomiting, diarrhea, loss of sense of smell	N/A	N/A	N/A
I & II	Chromium*	0.50 mg/m^3	0.50 mg/m^3	0.50 mg/m^3	Yes	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, sensitization dermatitis	Odorless	N/A	N/A
I & II	TCE*	0.10 mg/m^3	0.025 mg/m^3	0.010 mg/m^3	Yes	Inhalation, skin absorption, ingestion, skin and/or eye contact	Headaches, vertigo, visual disturbance, tremor, somnolence	Chloroform-like odor	N/A	N/A
I & II	PCB*	0.50 mg/m^3	0.001 mg/m^3	0.50 mg/m^3	Yes	Inhalation, skin absorption, ingestion, skin and/or eye contact	Eye, skin irritation; acneform dermatitis (carcinogenic) in animals; liver damage	N/A	N/A	N/A

Note: Use an asterisk (*) to indicate known or suspected carcinogens.

7. LEVEL OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT

7.1 LEVEL OF PROTECTION

The following levels of protection (LOPs) have been selected for each work task based on an evaluation of the potential or known hazards, the routes of potential hazard, and the performance specifications of the PPE. On-site monitoring results and other information obtained from on-site activities will be used to modify these LOPs and the PPE, as necessary, to ensure sufficient personnel protection. The authorized LOP and PPE shall only be changed with the approval of the regional safety coordinator or designee. Level A is not included below because Level A activities, which are performed infrequently, will require special planning and addenda to this sHASP.

Task Number	B	C	D	Modifications Allowed
I			X	
II			X	

Note: Use "X" for initial levels of protection. Use "(X)" to indicate levels of protection that may be used as site conditions warrant.

7.2 PERSONAL PROTECTIVE EQUIPMENT

The PPE selected for each task is indicated below. COMPANY's PPE program complies with 29 CFR 1910.120 and 29 CFR 1910 Subpart I and is described in detail in the CHSP. Refer to 29 CFR 1910 for the minimum PPE required for each LOP.

PPE	Task Number/LOP					
	I	**II**				
Full-face APR						
PAPR						
Cartridges:						
P100						
GMC-P100						
GME-P100						
Other:						
Positive-pressure, full-face SCBA						
Spare air tanks (Grade D air)						
Positive-pressure, full-face, supplied-air system						
Cascade system (Grade D air)						

PPE	Task Number/LOP					
	I	**II**				
Manifold system						
5-Minute escape mask						
Safety glasses	X	X				
Monogoggles						
Coveralls/clothing	X	X				
Protective clothing:						
Tyvek						
Saranex						
Other:						
Splash apron						
Inner gloves:						
Cotton	X	X				
Nitrile						
Latex						
Other:						
Outer gloves:						
Viton						
Rubber						
Neoprene						
Nitrile	X	X				
Other:						
Work gloves						
Safety boots (as per ANSI Z41)	X	X				
Neoprene safety boots (as per ANSI Z41)						
Boot covers (type: _____)						
Hearing protection (type: _____)						
Hard hat						
Face shield						
Other:						
Other:						

8. HEALTH AND SAFETY MONITORING

Health and Safety monitoring will be conducted to ensure proper selection of engineering/administrative controls, work practices, and/or PPE so that employees are not exposed to hazardous substances at levels that exceed permissible exposure/dose limits or published exposure levels. Health and safety monitoring will be conducted using the instruments, frequency, and action levels described in Table 8-1. Health and safety monitoring instruments shall have been appropriately calibrated and/or performance-checked prior to use.

9. DECONTAMINATION PROCEDURES

All equipment, materials, and personnel will be evaluated for contamination upon leaving the exclusion area. Equipment and materials will be decontaminated and/or disposed and personnel will be decontaminated, as necessary. Decontamination will be performed in the contamination reduction area or any designated area such that the exposure of uncontaminated employees, equipment, and materials will be minimized. Specific procedures are described below.

Equipment/Material Decontamination Procedures (specified by work plan): _____

Ventilation: All decontamination procedures will be conducted in a well-ventilated area.

Personnel Decontamination Procedures: _____

PPE Requirements for Personnel Performing Decontamination: _____

Personnel Decontamination in General: Following appropriate decontamination procedures, all field personnel will wash their hands and face with soap and potable water. Personnel should shower at the end of each work shift.

Disposition of Disposable PPE: Disposable PPE must be rendered unusable and disposed as indicated in the work plan.

Disposition of Decontamination Wastes (e.g., dry wastes, decontamination fluids, etc.): _____

TABLE 8-1

HEALTH AND SAFETY MONITORING

Instrument	Task Number	Contaminant(s)	Monitoring Location	Monitoring Frequency	Action Levels[a]	
☐ PID (e.g., RAE mini RAE) ☐ FID (e.g., OVA 128-) ☐ TVA 1000					**Unknown Vapors** Background to 1 ppm above background: Level D 1 to 5 ppm above background: Level C 5 to 500 ppm above background: Level B >500 ppm above background: Level A	**Contaminant-Specific**
Oxygen Meter/Explosimeter					**Oxygen** <19.5% or >22.0%: Evacuate area; eliminate ignition sources; reassess conditions. 19.5 to 22.0%: Continue work in accordance with action levels for other instruments.	**Explosivity** ≤10% LEL: Continue work in accordance with action levels for other instruments; monitor continuously for combustible atmospheres. >10% LEL: Evacuate area; eliminate ignition sources; reassess conditions.
Radiation Alert Monitor (Rad-mini or RAM-4)					<0.1 mR/hr: Continue work in accordance with action levels for other instruments. ≥0.1 mR/hr: Evacuate area; reassess work plan and contact radiation safety specialist.	
Mini-Ram or Other Particulate Monitor					**General/Unknown** Evaluate health and safety measures when dust levels exceed 2.5 milligrams per cubic meter.	**Contaminant-Specific**
HCN/H_2S (Monitox)					≥4 ppm: Leave area and consult with SSO.	
Draeger Colorimetric Tubes					**Tube** **Action Level** **Action**	
Air Monitor/Sampler Type: _____ Sampling medium: _____					**Action Level** **Action**	

TABLE 8-1

HEALTH AND SAFETY MONITORING

Instrument	Task Number	Contaminant(s)	Monitoring Location	Monitoring Frequency	Action Levels[a]
Personal Sampling Pump Type: _____ Sampling medium: _____					**Action Level** **Action**
Micro R Meter					<2 mR/hr: Continue work in accordance with action levels for other instruments. 2 to 5 mR/hr: In conjunction with a radiation safety specialist, continue work and perform stay-time calculations to ensure compliance with dose limits and ALARA policy. >5 mR/hr: Evacuate area to reassess work plan and evaluate options to maintain personnel exposures ALARA and within dose limits.
Ion Chamber					See micro R meter action levels above.
Radiation Survey Ratemeter/Scaler with External Detector(s)					**Detector** **Action Level** **Action**
Noise Dosimeter (Sound Level Meter)					≤85 decibels as measured using the A-weighed network (dBa): Use hearing protection if exposure will be sustained throughout work shift. >85 dBA: Use hearing protection. >120 dBA: Leave area and consult with safety personnel.
Other:					
Other:					

a Unless stated otherwise, airborne contaminant concentrations are measured as a time-weighted average in the worker's breathing zone. Acceptable concentrations for known airborne contaminants will be determined based on OSHA/NIOSH/ACGIH and/or NRC exposure limits. As a guideline, 1/2 the PEL/REL/TLV, whichever is lower should be used.

10. EMERGENCY RESPONSE

This section contains additional information pertaining to on-site emergency response and does not duplicate pertinent emergency response information contained in earlier sections of this plan (e.g., site layout, monitoring equipment, etc.). Emergency response procedures will be rehearsed regularly, as applicable, during project activities.

10.1 EMERGENCY RESPONSIBILITIES

All Personnel: All personnel shall be alert to the possibility of an on-site emergency; report potential or actual emergency situations to the team leader and SSO; and notify appropriate emergency resources, as necessary.

Team Leader: The team leader will determine the emergency actions to be performed by COMPANY personnel and will direct these actions. The team leader also will ensure that applicable incidents are reported to appropriate COMPANY and client project personnel and government agencies.

SSO: The SSO will recommend health/safety and protective measures appropriate to the emergency.

Other: _____

10.2 LOCAL AND SITE RESOURCES (including phone numbers)

Ambulance: 911

Hospital: Brooks Memorial Hospital

Directions to Hospital (map attached at the end of this plan): _____

Poison Control: 911

Police Department: 911

Fire Department: 911

Client Contact: _____

Site Contact: _____

On-Site Telephone Number: _____

Cellular Telephone Number: _____

Radios Available: _____

Other: _____

10.3 COMPANY EMERGENCY CONTACTS

COMPANY Operations Center (After Hours):

Corporate Health and Safety Director:

Regional Office Contact: _____ (office)
_____ (home)

Other: _____ (office)

a. COMPANY Operations Center (After Hours):

b. Corporate Health and Safety Director: (office)
(home)

c. Assistant Corporate Safety Director: (office)
(home)
(Cell)

10.4 OTHER EMERGENCY RESPONSE PROCEDURES

On-Site Evacuation Signal/Alarm (must be audible and perceptible above ambient noise and light levels): _____

On-Site Assembly Area: _____

Emergency Egress Route to Get Off Site: _____

Off-Site Assembly Area: _____

Preferred Means of Reporting Emergencies: _____

Site Security and Control: In an emergency situation, personnel will attempt to secure the affected area and control site access.

Spill Control Procedures: _____

Emergency Decontamination Procedures: _____

PPE: Personnel will don appropriate PPE when responding to an emergency situation. The SSO and Section 7 of this plan will provide guidance regarding appropriate PPE.

Emergency Equipment: Appropriate emergency equipment is listed in Attachment 1. Adequate supplies of this equipment shall be maintained in the support area or other approved work location.

Incident Reporting Procedures: _____

SITE-SPECIFIC HEALTH AND SAFETY PLAN ACCEPTANCE

Project:	
Project No.:	TDD/PAN No.:
Project Location:	
Project Manager:	Project Director:

The undersigned acknowledge that they have read and understood and agree to abide by the health and safety plan.

Name (Printed)	Name (Signature)	Date

from 190 W Lucas Ave, Dunkirk, NY 14048
to Brooks Memorial Hospital, 529 Central Ave, Dunkirk...

3 min (0.9 mile)

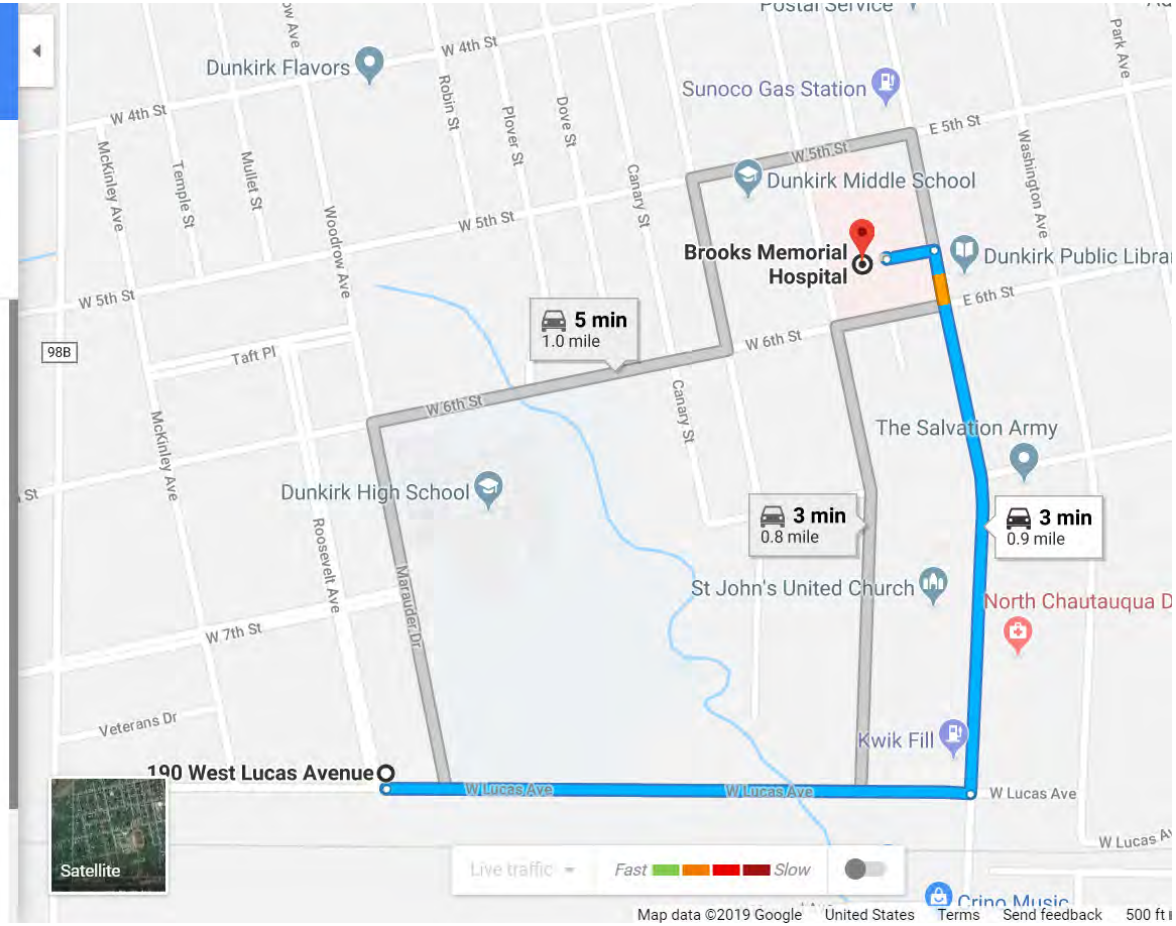
via W Lucas Ave and Central Ave

Fastest route

190 W Lucas Ave
Dunkirk, NY 14048

- Head east on W Lucas Ave toward Marauder Dr
  0.4 mi
- Turn left onto Central Ave
  0.4 mi
- Turn left
  184 ft
- Turn right
  Destination will be on the left
  3 ft

Brooks Memorial Hospital
529 Central Ave, Dunkirk, NY 14048



ATTACHMENT 1

EQUIPMENT/SUPPLIES CHECKLIST

	No.
INSTRUMENTATION	
FID	
Thermal desorber	
O_2/explosimeter w/cal. Kit	
Photovac tip	
PID (probe: _____eV)	
Magnetometer	
Pipe locator	
Weather station	
Draeger tube kit (tubes: _____)	
Brunton compass	
Real-time cyanide monitor	
Real-time H_2S monitor	
Heat stress monitor	
Noise equipment	
Personal sampling pumps and supplies	
MiniRam dust monitor	
Mercury monitor	
Spare batteries (type: _____)	
RADIATION EQUIPMENT/SUPPLIES	
Documentation forms	
Portable ratemeter	
Scaler/ratemeter	
1" NaI gamma probe	
2" NaI gamma probe	
ZnS alpha probe	
GM pancake probe	
Tungsten-shielded GM probe	
Micro R meter	
Ion chamber	
Alert monitor	
Pocket dosimeter	
Dosimeter charger	

	No.
Radiation warning tape	
Radiation decon supplies	
Spare batteries (type: _____)	
SAMPLING EQUIPMENT	
8-oz. bottles	
Half-gallon bottles	
VOA bottles	
String	
Hand bailers	
Thieving rods with bulbs	
Spoons	
Knives	
Filter paper	
Bottle labels	
MISCELLANEOUS	
Pump	
Surveyor's tape	
100' Fiberglass tape	
300' Nylon rope	
Nylon string	
Surveying flags	
Camera	
Film	
Bung wrench	
Soil auger	
Pick	
Shovel	
Catalytic heater	
Propane gas	
Banner tape	
Surveying meter stick	

	No.
Chaining pins and ring	
Logbooks (_____ large, _____ small)	
Required MSDSs	
Intrinsically safe flashlight	
Potable water	
Gatorade or equivalent	
Tables	
Chairs	
Weather radio	
Two-way radios	
Binoculars	
Megaphone	
Cooling vest	
EMERGENCY EQUIPMENT	
First aid kit	
Stretcher	
Portable eye wash	
Blood pressure monitor	
Fire blanket	
Fire extinguisher	
Thermometer (medical)	
Spill kit	
DECONTAMINATION EQUIPMENT	
Wash tubs	
Buckets	
Scrub brushes	
Pressurized sprayer	
Spray bottle	
Detergent (type: _____)	
Solvent (type: _____)	
Plastic sheeting	
Tarps and poles	
Trash bags	
Trash cans	

	No.
Masking tape	
Duct tape	
Paper towels	
Face mask	
Face mask sanitizer	
Step ladders	
Distilled water	
Deionized water	
SHIPPING EQUIPMENT	
Coolers	
Paint cans with lids, 7 clips each	
Vermiculite	
Shipping labels	
DOT labels:	
"Up"	
"Danger"	
"Inside Container Complies ..."	
Hazard Group	
Strapping tape	
Baggies	
Custody seals	
Chain-of-custody forms	
Express shipment forms	
Clear packing tape	
Permanent markers	

H Quality Assurance Project Plan

Generic Quality Assurance Project Plan (GQAPP) for the Al-Tech Specialty Steel Corporation Site (OU-1) NYSDEC Site No. 9-07-022

May 2019

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 Broadway
Albany, New York 12233

Program QA Officer _____ Date _____

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List of Abbreviations and Acronyms

AAS	atomic absorption spectroscopy
ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CLP	Contract Laboratory Program
CM	construction management
COC	chain-of-custody
CPR	cardiopulmonary resuscitation
DOT	United States Department of Transportation
DUSR	Data Usability Summary Report
ECL	Environmental Conservation Law
EDD	electronic data deliverable
ELAP	Environmental Laboratory Accreditation Program
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FSP	field sampling plan
GC/MS	gas chromatography/mass spectrometry
IATA	International Air Transport Association
ICP	inductively coupled plasma
ICS	interference check sample

List of Acronyms (Cont.)

IDW	investigation-derived waste
IIWA	immediate investigation work assignment
IRM	interim remedial measure
LCS	laboratory control sample
MDL	method detection limit
MEDD	multimedia electronic data deliverable
mL/min	milliliters per minute
MS/MSD	matrix spike/matrix spike duplicate
MSB	matrix spike blank
NELAP	National Environmental Laboratory Accreditation Program
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OVA	organic vapor analyzer
PARCC	precision, accuracy, representativeness, completeness, and comparability
PE	performance evaluation
PID	photoionization detector
PPE	personal protection equipment
PSA	preliminary site assessment
QA/QC	quality assurance/quality control
QAM	Quality Assurance Manual
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
RA	remedial action
RD	remedial design
RI	Remedial Investigation

List of Acronyms (Cont.)

RPD	relative percent difference
SARA	Superfund Amendments and Reauthorization Act of 1986
SDG	sample delivery group
SI	site inspection
SOP	Standard Operating Procedure
SOW	scope of work
SVOC	semi-volatile organic compound
TCLP	toxicity characteristic leaching procedure
TRPH	total recoverable petroleum hydrocarbon
VOA	volatile organic analysis
VOC	volatile organic compound
VTSR	verified time of sample receipt

Distribution List

Party	Affiliation and Title	Revision	Date Sent
QAPP Original Distribution			
	QA Director		
	Project Manager(s)		
	NYSDEC Contracts		
	NYSDEC QA Officer		

Revision List

Revision	Modifications	Distributed

Laboratory Distribution and Approval

All site specific contract or subcontract laboratories working on project must perform analytical services and work in compliance with this QAPP.

Party	Affiliation and Title	Revision	Date Sent
QAPP Original Distribution			

This page must be completed and returned to NYSDEC with each revision of the QAPP.

Laboratory certifies that it will conduct analytical services in compliance with QAPP unless modified by any project-specific requirements listed in the site-specific QAPP or approved laboratories exceptions or clarifications.

Executed this day of , 20

Contractor or Subcontractor Laboratory

Signature

Name

Title

1 Project Management

This generic Quality Assurance Project Plan (GQAPP) has been prepared in support of projects performed for the New York State Department of Environmental Conservation (NYSDEC).

The GQAPP is applicable to the Al-Tech Specialty Steel Corporation Site OU-1 (Site) and needs to be implemented by site monitoring personnel and is subject to regulatory oversight by NYSDEC or that must be conducted in accordance with NYSDEC regulations.

This GQAPP has been prepared in accordance with "United States Environmental Protection Agency (EPA) Requirements for Quality Assurance Project Plans," final, EPA QA/R-5 (March 2001) and incorporates NYSDEC requirements. This GQAPP presents the policies, organization, objectives, functional activities, and specific quality assurance/quality control (QA/QC) procedures that will be employed by site monitoring personnel to ensure that all technical data generated are accurate, representative, and ultimately capable of withstanding judicial scrutiny. These activities will be implemented under the requirements of site monitoring personnel's comprehensive QA program as documented in the corporate Quality Management Plan (QMP).

The GQAPP is formatted to address the four major sections listed in the EPA QAPP guidance document: Project Management, Data Generation and Acquisition, Assessment and Oversight, and Data Validation and Usability.

1.1 Project Organization

The organizational chart for the site specific environmental investigation, design, or construction project work in New York is presented as Figure 1-1. The owner and project team members are primarily responsible for implementation of the QA program on NYSDEC related projects. All project communications are directed through the site specific project manager. The site specific project manager is the primary point of contact for the NYSDEC Project Manager and technical staff. The QA Officer for the site specific work provides independent review functions to verify that the projects are implemented in accordance with applicable QA documents. The site specific project manager is responsible for independent oversight of projects involving engineering services for design and construction. The

roles and specific QA responsibilities of key project personnel are described below.

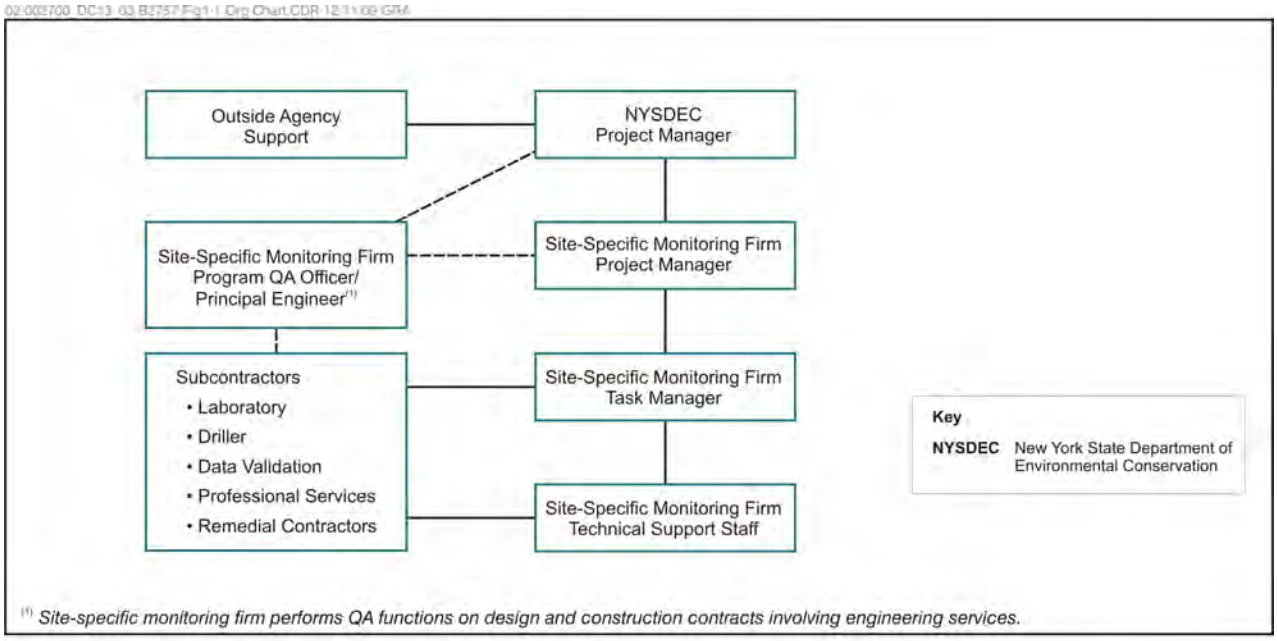

Figure 1-1 Organizational Chart

Project Manager

The site specific Project Manager is responsible for QA/QC functions for all task-specific operations on NYSDEC projects, and will coordinate with the owner on issues that impact the overall quality of performance on the site specific work.

The Project Manager will also be responsible for the overall quality of work performed under project activities as it relates to the following specific roles:

- Overseeing day-to-day performance including all technical and administrative operations;
- Interfacing frequently with the NYSDEC Project Manager and technical staff;
- Tracking schedules and budgets and managing of mobilization and contract closeout activities;
- Selecting and monitoring field staff;
- Managing the development of detailed work plans; and
- Reviewing and approving all final reports and other work products.

Corporate or Program QA Officer

The site specific monitoring firm's Corporate QA Director is responsible for ensuring compliance with the site specific QA program. The Program QA Officer is responsible for oversight of all QA/QC activities for NYSDEC projects. The QA Officer will remain independent of day-to-day, direct project involvement but will have the responsibility for ensuring that all project and task-specific QA/QC requirements are met. The QA Officer will have direct access to corporate executive staff, as necessary, to resolve any QA/QC problems, disputes, or deficiencies. The QA Officer's specific duties include:

- Reviewing and approving the QAPP;
- Conducting field and laboratory audits in conjunction and keeping written records of the audits;
- Coordinating with the NYSDEC technical staff, Project Manager, Task Managers, and laboratory management to ensure that QA objectives appropriate to the project are set and that laboratory and field personnel are aware of these objectives; and
- Recommending, implementing, and/or reviewing actions taken in the event of QA/QC failures in the laboratory or field.

Project Chemist

The Project Chemist is responsible for data validation and verification, generation of Data Usability Summary Reports (DUSRs), and independent assessment of the hard copy and electronic analytical data. The Project Chemist will report nonconformance with QC criteria (including an assessment of the impact on data quality objectives) to the appropriate managers.

Technical Support Staff

The technical support staff for this program will be drawn from the site specific pool of resources. The technical support staff will implement project and site tasks, analyze data, and prepare reports/support materials. All support personnel assigned will be experienced professionals who possess the degree of specialization and technical competence necessary to perform the required work effectively and efficiently.

Laboratories

Laboratories providing analytical services will be chosen as appropriate for the project requirements. All laboratories will be certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) for the methods that they are contracted to perform. Laboratories

performing for Superfund sites with full data packages must be certified by NYSDOH for Contract Laboratory Program (CLP) analysis.

The laboratory QA programs are reviewed and approved by the QA Officer or the Project Chemist, and will be submitted to NYSDEC for approval. Copies of the laboratory QA manuals are available on request. The laboratory must provide an experienced Project Manager and a QA Officer that is independent of the day-to-day operations of the laboratory. The specific duties of the laboratory Project Manager and QA Officer for NYSDEC activities include:

- Reviewing the GQAPP to verify that analytical operations will meet project requirements;
- Documenting review and approval of GQAPP on distribution page;
- Reviewing receipt of all sample shipments and notifying the Project Manager and Project Chemist of any discrepancies within one day of receipt;
- Rapidly notifying the site specific Project Manager and Project Chemist regarding laboratory nonconformance with the GQAPP or analytical QA/QC problems affecting project samples; and
- Coordinating with the site specific Project Manager and Project Chemist, and laboratory management to implement corrective actions approved by NYSDEC or others as applicable.

1.2 Problem Definition/Background

All work is to be carried out consistent with NYSDEC and EPA requirements, protocols, and guidance.

1.3 Project Description

The work covered by this GQAPP is defined under the site specific Site Management Plan (SMP). If necessary, site-specific QAPP information will be provided as an appendix to the field sampling plan (FSP).

1.4 Quality Objectives and Criteria

Quality objectives are qualitative or quantitative statements derived from the systematic planning process. Quality objectives are used to clarify the goals of the project and define the appropriate type of data to collect to support project decisions. General quality objectives for NYSDEC projects are summarized in Table 1-1.

Table 1-1 General Data Quality Objectives, NYSDEC Projects

Data Collection Activity	Quality Objectives	Standards[a]	Acceptability/ Performance Criteria[b]
Sampling and Analysis	To have samples and analytical results that accurately represents the nature and extent of contamination at the site. Data must be of sufficient quality to meet all regulatory requirements and allow assessment of impacts on human health by comparison to New York State criteria or background values. Data also may be used for long-term monitoring or to meet regulatory permit requirements. In these cases, data must meet the requirements of the permit.	■ NYSDEC Ambient Water Quality Standards ■ NYSDOH Soil Vapor Intrusion Guidance Values ■ NYSDEC Remedial Program Soil Cleanup Objectives	■ Data must be collected under an approved FSP using approved SOPs. Data must meet the acceptance and performance criteria documented in Section 2 of this GQAPP. ■ Reporting limits should be below risk-based screening values for 90% of target analytes and 100% of critical analytes of concern. ■ Data must be compared to standards.
Field Screening Analysis	To have samples and analytical results that effectively indicate the nature and extent of contamination at the site. Technical personnel use data to determine the best locations to collect samples for laboratory analysis.	■ None	■ Data must be collected under an approved FSP using approved SOPs. Data must meet the acceptance and performance criteria for the screening method. ■ Reporting limits should be below anticipated concentrations of critical analytes of concern.
Subsurface Logging	To provide a description of the subsurface soils that is consistent and accurate, and to record drilling and sampling procedures and well construction details.	■ Site Specific SOPs (including Geologic Logging and Monitoring Well Installation)	■ Accurate, consistent, signed, and legible documentation as described in SOPs. ■ Unconsolidated materials described according to the Unified Soil Classification System. ■ Rock/soil material described using standard geologic nomenclature.
Surveying	To relate project work locations (including sample, monitoring well, and test pit locations) to existing local benchmarks.	■ Surveying subcontract ■ Differential correction for GPS data	■ Relation of all survey points to existing/known benchmarks. ■ Accurate horizontal coordinates (∀0.5 foot for wells; ∀3 feet for GPS locations). ■ Accurate vertical elevations (∀0.01 foot) for permanent monitoring well locations.
Field Records	To document all field activities and to allow accurate representation field events in the final report. Records must be capable of withstanding legal scrutiny.	■ Section 2 of the GQAPP ■ Site Specific SOPs (Field Activities Logbooks)	■ Consistency between field and laboratory data. ■ Clear and legible documentation for sample collection and equipment decontamination for final report.

Table 1-1 General Data Quality Objectives, NYSDEC Projects

Data Collection Activity	Quality Objectives	Standards[a]	Acceptability/ Performance Criteria[b]
Outside Records	To use the most current reference values, reports, or data from outside sources in data assessments and recommendations for the site.	None	■ All versions of data or standards must be the most current values available. ■ Data or standards must be accurately incorporated into the final report.
Data Review and Assessment	To review and verify data are generated according to the GQAPP, and assign data qualifiers as necessary to indicate limitations on data usability.	■ NYSDEC DUSR Guidance ■ EPA Region 2 Data Validation SOPs ■ EPA National Functional Guidelines	■ Data must be reviewed by Project Chemist meeting minimum NYSDEC qualifications. ■ Data qualifiers or changes to data must be documented in a DUSR.

Notes:

[a] Major standards.
[b] Major or noteworthy acceptability criteria. All performance criteria must be verified using procedures listed in the GQAPP.

Key:

GPS = Global Positioning System.
NYSDEC = New York State Department of Environmental Conservation.
NYSDOH = New York State Department of Health.
GQAPP = General Quality Assurance Project Plan.
SOP = Standard Operating Procedure.

Acceptance and performance criteria establish the quality and quantity of data needed to meet the project quality objectives. General acceptance or performance criteria for the collection, evaluation, or use of environmental data for NYSDEC projects are outlined in Section 2.5, Analytical Methods. Quality objectives or acceptance and performance criteria applicable to a project are specified in the site-specific QAPP or work plan.

1.4.1 Data Assessment Definitions

Acceptance and performance criteria are often specified in terms of precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters. Numerical acceptance criteria cannot be assigned to all PARCC parameters, but general performance goals are established for most data collection activities. Numerical goals for analytical methods are presented in Section 2.4. Data assessment procedures throughout the GQAPP clearly outline the steps to be taken, responsible individuals, and implications if QA objectives are not met. PARCC parameters are briefly defined below.

Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value, usually stated in terms of standard deviation or coefficient of variation. It also may be measured as the relative percent difference (RPD) between two values. Precision includes the interrelated concepts of instrument or method detection limits and multiple field sample variance. Sources of this variance are sample heterogeneity, sampling error, and analytical error.

Accuracy

Accuracy measures the bias of the measurement system. Sources of this error are the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis. Data interpretation and reporting may also be significant sources of error. Typically, analytical accuracy is assessed through the analysis of spiked samples and may be stated in terms of percent recovery or the average (arithmetic mean) of the percent recovery. Blank samples are also analyzed to assess sampling and analytical bias (i.e., sample contamination). Background measurements similarly assess measurement bias.

Representativeness

Representativeness expresses the degree to which data represent a characteristic of a population, a parameter variation at a sampling point, or an environmental condition. Representativeness is a qualitative parameter, which is most concerned with proper design of the measurement program. Sample/measurement locations may be biased (judgmental) or unbiased (random or systematic). For unbiased schemes, sampling must be designed not only to collect samples that represent

conditions at a sample location, but also to select sample locations, which represent the total area to be sampled.

Completeness

Completeness is defined as the percentage of measurements performed that are judged to be valid. Although a quantitative goal must be specified, the completeness goal is the same for all data uses—that a sufficient amount of *valid* data be generated. It is important that critical samples are identified and plans are made to ensure that valid data are collected for them.

Comparability

Comparability is a qualitative parameter expressing the confidence with which one dataset may be compared to another. Sample data should be comparable with other measurement data for similar samples and sample conditions. This goal is achieved through the use of standard techniques to collect and analyze samples.

1.5 Special Training/Certification

The site specific monitoring firm is committed to providing vigorous training in health and safety procedures, the proper use of protective equipment, and overall policy objectives. General training requirements for NYSDEC activities are as follows:

- Site monitoring employees that participate in on-site activities must have completed the 40-hour health and safety training program and the cardiopulmonary resuscitation (CPR)/first aid certification course. To continue such participation, each employee must successfully complete a minimum of eight hours of refresher training, annually; and

- All personnel shipping samples must complete the United States Department of Transportation (DOT) hazardous materials transportation training and certification, including training in specific International Air Transport Association (IATA) regulations (air shipments).

1.6 Documentation and Records

The site monitoring firm's QA Officer will approve the site specific QAPP and maintain the most current approved version of the document. The site specific Project Manager is responsible for providing the most current copy of the site specific QAPP and other planning documents to the project team members.

In addition to the site-specific QAPP and other planning documents, the primary documentation for the project is field records and analytical data packages. Requirements for field records are documented in site monitoring firm's Standard Operating Procedures (SOPs) for Field Activities Logbooks and Geotechnical Logbooks and are described briefly below. Requirements for analytical data

packages for NYSDEC activities are also described below. The remainder of the GQAPP describes additional project documentation and record requirements for QA/QC assessments, data validation, data management, and other areas.

1.6.1 Field Documentation

Sample Identification

Samples will be identified using the format described below. Each sample will be labeled, chemically preserved (if required), and sealed immediately after collection. To minimize handling of sample containers, labels will be completed prior to sample collection as practicable. The sample label will be completed using waterproof ink and will be firmly affixed to sample containers and protected with clear tape. The sample label will give the following information:

- Date of collection;
- Unique sample number;
- Analyses requested; and
- Preservation.

Each sample will be referenced by sample number in the logbook and on the chain-of-custody (COC) record.

Individual samples will be identified by a unique alphanumeric code. Normal field samples (non-quality-control) will be numbered according to the following convention:

SSS-MC-###-Q

SSS - Three letter code for site name

MC - Matrix code as designated below
- Sequential sample number
Q - Quality control sample code such as D for duplicate, F for filtered, S for split, etc.

The matrix codes are as follows:

AS - Bulk Asbestos
BA - Indoor Air from Basement or Crawlspace
DW - Drinking Water
EB - Equipment Blank
FA - Indoor Air, First Floor (not basement)

GW - Groundwater
OA - Outdoor Air
SD - Sediment
SB - Subsurface Soil
SF - Surface Soil
SS - Sub-slab Vapor
SV - Soil Vapor
SW - Surface Water
TB - Trip Blank
WS - Waste

Samples collected with an additional volume for matrix spike/matrix spike duplicates (MS/MSD) will be designated on the COC.

Field Logs and Data Forms

Field logs and data forms are necessary to provide sufficient data to enable participants to reconstruct events that occurred during the project and to refresh the memory of field personnel should they be called upon to give testimony during legal proceedings. Field logs also should document any deviations from the work plan, GQAPP, or other applicable planning document. Procedures for recording information are specified in the Field Activities Logbook SOP. All field logs will be kept in a bound notebook containing numbered pages unless a specific field form is completed. All entries will be made in waterproof ink and the time of the entry will be recorded. The top of each page of the logbook or field form will contain the site specific project number, project name, and date that the entries on that page were recorded. No pages will be removed for any reason. Corrections will be made according to the procedures given later in this section. The field logs will include both site- and task-specific information.

Recording of information related to site activities is the responsibility of the site specific monitoring staff and will include a complete summary of the day's activities at the site and any communications outside the project team. Site information includes:

- Name of the person making the entry (signature);
- Names of team members, subcontractors, and visitors on site;
- Levels of personal protection equipment (PPE):
  - Level of protection originally used,
  - Changes in protection, if required, and
  - Reasons for changes; and
- Time spent on site.

Task-specific information may be recorded in multiple field logbooks. The task-specific information will include:

- Drilling information, including:
  - Method employed,
  - Diameter of borehole and well casing,
  - Materials used,
  - Depth of borehole, and
  - Well construction (if appropriate);

- Documentation on samples collected, including:
  - Construction of existing wells (if appropriate),
  - Sampling location and sample identification number,
  - Sampling depth for subsurface soil and surface water (if depth-specific surface water samples are collected) samples,
  - Flow rate of water from in-place plumbing (500 milliliters per minute [mL/min]) for samples of existing water supplies,
  - Sampling date, time, and personnel,
  - Sample sequence (order in which samples were collected),
  - Equipment used (including the use of fuel-powered units/motors during surface water sampling),
  - Type of sample (e.g., grab, composite, QC) and matrix,
  - Amount of each subsample or aliquot (if sample is a composite), and
  - Sample preservation and verification of preservation;

- Types of field QC samples, including when and where they were collected. The description of rinsate sample collection should include the equipment rinsed and the actual field samples collected with that equipment prior to collection of the rinsate;

- Information regarding well purging including:
  - Depth to water and total well depth,
  - Calculations used for volume purged,
  - Volume purged,
  - Equipment used,
  - Field measurements,
  - Length of purge time, and
  - Date and time well was purged;

- Drum inventory:
  - Type of drum and description of contents, and
  - Description of material in the drum and which ayers were sampled (if performed);

- Field equipment used, equipment identification numbers, and calibration information;
- On-site measurement data;
- Field observations and remarks;
- Weather conditions;
- Decontamination procedures;
- Unusual circumstances or difficulties; and
- Initials of person recording information.

Corrections to Documentation Notebook

As with any data logbooks, no pages will be removed for any reason. If corrections are necessary, they must be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside. The correction must be initialed and dated. Most corrected errors will require a footnote explaining the correction.

Photographs

Photographs will be taken as directed by the site specific Team Leader. Documentation of a photograph is crucial to its validity as a representation of an existing situation. The following information will be noted in the task log concerning photographs:

- Date, time, location, and direction photograph was taken;
- Description of the photograph taken;
- Reasons why the photograph was taken;
- Sequential number of the digital photo; and
- Camera system used.

1.6.2 Laboratory Data Reporting

The data packages for all CLP and similar Superfund analytical services are consistent with NYSDEC Analytical Services Protocol (ASP) Category B (July 2005) and, therefore, must include a full data package with all associated sample and QC results, calibrations, and raw data. The data packages for long-term monitoring events are consistent with NYSDEC ASP Category A, and therefore must consist of a case narrative, COC, summary table of sample identifications and sample

tracking information, a summary of analytical results, and a summary of QC results. The laboratory will provide a summary package of results for all data packages. The laboratory will provide a summary of the sample analyzed, methods used, and date and time of analysis. The laboratory will provide an electronic data deliverable that matches all data reported on the hard copy analytical report. Electronic data report requirements are described in Section 2.10.

Within 48 hours of sample receipt, the laboratory will provide a sample receipt file and copy of the completed COC.

The analytical summary report will include the sample aliquot analyzed, final extract volume, and dilution factor. The analytical summary data report also will include the laboratory reporting limit and method detection limit (MDL) for all target compounds. These limits will be corrected for percent moisture and all dilution factors. Any compounds found less than the reporting limit, but greater than the MDL will be reported and qualified with a "J" flag as estimated.

QC reports must provide a summary report or batch identifier clearly linking all QC results to actual field sample results. QC summary reports must include the laboratory control limits and flag any result reported outside control limits. The case narrative must include an explanation of all QC results reported outside control limits. The laboratory must provide copies of any nonconformance or corrective action forms associated with data in the laboratory report.

For Category A, the laboratory should provide copies of chromatograms for any samples for which elevated reporting limits are used because of sample matrix, but no target compounds are found above the reporting limit.

For organic analytes reported in both Category A and Category B deliverables, the laboratory must report results of the most concentrated extract analysis in order to achieve required quantitation limits.

1.6.3 Record Retention

All records related to the project must be stored in secure areas consistent with requirements in site specific QMP. All records related to the analytical effort must be maintained at the laboratory or in the office (for field screening data) in lockable filing cabinets for at least one year, except those stored in the computer (i.e., cost information, scheduling, custody transfers, and management records). All records must be maintained in a secure area for a period of six years after the end of the calendar year in which the final report is issued.

Types of records to be maintained in addition to the final technical reports for NYSDEC include the following:

- Field logbooks, sampling documents, photographs, QA/QC records, and any other supporting documentation for collection of field samples;

- Administrative records including time cards, costing, and scheduling information; and

- Client correspondence, subcontractor records, minutes of meetings, and any related project management records.

Types of records to be maintained by the laboratory in addition to the analytical report for the NYSDEC include the following:

- Complete COC records from sample receipt to destruction. Sample destruction records must contain information on the manner of final disposal;

- Supporting documentation for any nonconformance or corrective action forms supplied in the analytical report or related to the analysis of project samples;

- Computer records on disk with magnetic tape backup of cost information, scheduling, laboratory COC transfers, and laboratory management records;

- All laboratory notebooks including raw data such as readings, calibration details, and QC results; and

- Hard copies of data system printouts (i.e., chromatograms, mass spectra, and inductively coupled plasma [ICP] data files).

2 Data Generation and Acquisition

This section of the GQAPP contains descriptions of all aspects of the implementation of field, laboratory and data handling procedures to meet the requirements of NYSDEC activities. The GQAPP provides the basis for ensuring that appropriate methods are used and thoroughly documented. These procedures will be adapted, as appropriate, to meet the objectives of each NYSDEC project as described in the appropriate work plan.

2.1 Sampling Process Design

The sampling process design is documented in the work plan or in the FSP for each site. The FSP will include a project schedule and a summary table listing the type of samples collected, the sampling location, the rationale for selecting the location, sample handling procedures, analytical methods, and the number and type of QA/QC samples.

2.2 Sampling Methods

The sampling methods are documented in the work plan or in the FSP. The site specific monitoring firm's sampling SOPs serve as the basis for sampling procedures.

In general, sampling at a site will progress from clean areas to contaminated areas. This minimizes the potential for cross contamination of samples and, subsequently, eliminates data anomalies or misinterpretation of the extent of contamination. The order of sample collection at a specific location normally proceeds as follows:

1. Volatile organic compounds (VOCs) or other volatile parameters;
2. Extractable organics (including total recoverable petroleum hydrocarbons [TRPH]);
3. Oil and grease;
4. Total metals;
5. Dissolved metals;

6. Microbiological samples;

7. Other inorganics; and

8. Physical parameters (including ignitability, corrosivity, and reactivity).

This sequence helps maintain the representativeness of samples and analytical results.

The remainder of this section describes typical procedures for equipment decontamination and the handling of investigation-derived waste (IDW), and sample containers, preservatives, holding times, packing, and shipping. Specific procedures for each site are provided in the work plan or in the FSP.

2.2.1 Equipment Decontamination

Sampling methods and equipment are chosen to minimize decontamination requirements and the possibility of cross-contamination. Equipment or supplies that cannot be effectively decontaminated (e.g., sample tubing or rope) will be disposed of after sampling. Investigation/sampling equipment will be cleaned at the site prior to use, between sampling locations, and prior to transport off-site. Decontamination of field equipment will be noted in the field logbook. If it is necessary to make decontamination procedure changes in the field, the changes will be noted in the logbook. Otherwise, a notation will be made each day that decontamination was conducted as specified in the work plan or in the FSP. Rinsate blanks will be collected to verify the effectiveness of decontamination procedures. If field blanks indicate poor techniques, the QA Officer and Project Manager will ensure techniques are modified and samplers trained appropriately.

All decontamination will be performed in accordance with NYSDEC-approved procedures. Decontamination of large equipment will consist of the following:

- Removal of foreign matter; and

- High-pressure steam cleaning.

Decontamination of heavy equipment will be performed by the subcontractor and will be performed in a decontamination pad as described in the contract.

The following alternative procedures will be used for smaller equipment and may also be employed for downhole tooling such as split spoons and Geoprobe rods or routine sampling equipment:

- Initially remove all foreign matter;

- Scrub with brushes in a laboratory-grade detergent solution (e.g., Alconox);
- Rinse with potable water with a final deionized or distilled water rinse; and
- Allow to air dry.

If sampling for metals is conducted, then an additional rinse with a 10% nitric acid solution will be added between the potable and deionized water rinses.

Sensitive down-hole devices that only contact water (e.g., water level indicator and miniTROLL pressure transducer) may be decontaminated by triple rinsing with deionized or distilled water. A temporary decontamination area will be established in each work area using heavy plastic sheeting as a pad. The decontamination will be performed by the field team.

Fluids generated during decontamination will be handled according to procedures described in Section 2.2.2.

2.2.2 Investigation-Derived Waste (IDW)

Unless otherwise directed by NYSDEC staff, all IDW will be handled in a manner consistent with requirements in the work plan and applicable federal and state regulations. IDW includes disposable equipment and PPE, purge and development waters, drilling fluids, soil cuttings, and decontamination fluids. Waste streams will not be mixed and will be segregated to the maximum extent possible.

Investigation-derived soils and water will be field-screened for organic vapors with an organic vapor analyzer (OVA) or photoionization detector (PID) and visual inspected to initially determine whether these wastes are potentially contaminated. In order to minimize the generation of drummed wastes and the costs associated with storage, testing, transportation, and disposal of drums, IDW will be handled in the following manner:

- **Soil cuttings from boreholes:** as much of the soil cuttings as possible will be used as backfill. Remaining cuttings that are not significantly contaminated (OVA or PID readings of 5 parts per million [ppm] or less and lack of staining, sheen, etc.) will be spread on the ground near the site of generation if the location is in a suitably undeveloped area. If this is not possible or if contamination is suspected, the excess soil cuttings will be drummed;
- **Soil cuttings from monitoring well boreholes:** cuttings that are not significantly contaminated (OVA or PID readings of 5 ppm or less and lack of staining, sheen, etc.) will be spread on the ground near the site of generation if the location is in a suitably undeveloped area. If this is not possible or if contamination is suspected, the excess soil cuttings will be drummed;

- **Development and purge waters from monitoring wells and decontamination water:** water that is not significantly contaminated (OVA or PID readings of 5 ppm or less, lack of sheen, etc.) will be discharged to the surface in the area where it was generated only if the area is suitably undeveloped (e.g., not paved and not on residential property). If the water cannot be discharged to the surface, then it may be discharged to the municipal sanitary sewer system pending receipt of a temporary discharge permit from the local sewer department. Alternatively, significantly contaminated waters or waters that cannot be discharged will be drummed; and

- **Used sampling equipment and PPE:** unless field screening indicates that PPE and other solid wastes are contaminated to the level that they can not be disposed of as non-hazardous waste, this material will be double-bagged and disposed of off-site as non-regulated solid waste.

Wastes that need to be drummed will be placed in United States Department of Transportation (DOT) approved 55-gallon drums and stored at a central storage location selected by NYSDEC, pending analysis and disposal. Drums will be staged within secondary containment units and covered with a plastic tarp if stored outside. All drums containing IDW will be labeled as to their contents, the site name, location where the material was generated, and date the waste was generated. Composite samples of like wastes will be collected for toxicity characteristic leaching procedure (TCLP) VOCs, TCLP semivolatile organic compounds (SVOCs), TCLP pesticides/herbicides, TCLP metals, PCBs, and pH. A waste disposal firm will then be subcontracted to haul the waste off-site to an appropriate disposal facility as either solid or hazardous waste. The site specific monitoring firm will coordinate drum hauling with the NYSDEC project manager to ensure that NYSDEC or its representative or the site owner or responsible party is available to sign the waste shipping manifest(s), as legal waste generator.

2.3 Sample Handling and Custody

2.3.1 Sample Containers

The volumes and containers required for sampling activities are indicated in Table 2-1. Prewashed sample containers will be provided by the laboratory and will be wide-mouth jars with Teflon-lined caps unless otherwise indicated. The laboratory must use an approved specialty container supplier, which prepares containers in accordance with EPA bottle-washing procedures. The laboratory must maintain a record of all sample bottle lot numbers shipped in the event of a contamination problem. Trip blanks will be transported to the site inside the same box as volatile organic analysis (VOA) vials or as the air sampling canisters.

Table 2-1 Summary of Analytical Methods, Preservatives, and Holding Times, NYSDEC Projects

Parameter	Method	Containers/Preservative for Solid Samples[a]	Containers/Preservative for Aqueous Samples[a]	Holding Time for Solid Samples[a]	Holding Time for Aqueous or Air Samples[a]
Contract Laboratory Program Analysis					
TCL VOCs	OLM04.2/SOM01.0	Two pre-weighed 40-mL plus one pre-weighed 40-mL vial with stir bar and methanol and one 4-oz. glass vial with septum (if no other containers are shipped)	Three 40-mL glass vials with septa, preserved HCl < pH 2	48 hours for analysis or freezing to <7˚C and 12 days for analysis following freezing	12 days for waters with chemical preservative, and 5 days for unpreserved sample
TCL SVOCs	OLM04.2/SOM01.0	One 8-oz. glass jar	Two 1-L amber glass bottles	12 days/40 days[d]	5 days/40 days[d]
TCL Pest/PCB	OLM04.2/SOM01.0	One 8-oz. glass jar	Two 1-L amber glass bottles	12 days/40 days[d]	5 days/40 days[d]
TAL Metals/ Mercury	ILM05.3	One 8-oz. glass jar	One 1-L HDPE bottle, preserved HNO_3 to pH <2	180 days/26 days for mercury	180 days/26 days for mercury
TAL Cyanide	ILM05.3	One 8-oz. glass jar	One 1-L HDPE bottle, preserved NaOH to pH >12	180 days/12 days for cyanide	180 days/12 days for cyanide
Air/Vapor Samples					
Target VOCs	TO-15[g]	1.0, 1.4, or 6.0 L Minican (depending on lab availability	NA		30 Days
Solid Waste					
Ignitability	SW-846 Chapter 8 (8.1)	One 8-oz. glass jar	One 1-L HDPE bottle for both tests	40 days	40 days
Corrosivity (as pH)	SW-846 Chapter 8 (8.2)	One 8-oz. glass jar		28 days	28 days
Reactivity	SW-846 Chapter 8 (8.3)	One 8-oz. glass jar	Two 1-L HDPE bottles	28 days	28 days

Table 2-1 Summary of Analytical Methods, Preservatives, and Holding Times, NYSDEC Projects

Parameter	Method	Containers/Preservative for Solid Samples[a]	Containers/Preservative for Aqueous Samples[a]	Holding Time for Solid Samples[a]	Holding Time for Aqueous or Air Samples[a]
TCLP Extraction	1311	Two 8-oz. glass jars	Various (see below)	5 days for SVOCs and mercury, 7 days for VOCs, 180 days for metals	5 days for SVOCs and mercury, 7 days for VOCs, 180 days for metals
TCLP Metals/ Mercury	6010B/7471	One 8-oz. glass jar	One 1-L HDPE bottle[c]	26 days[b] for mercury, 180 days for metals	26 days[b] for mercury, 180 days for metals
TCLP Volatile Organics	8260B	One 125-mL VOA jar	Two 40-ml glass vials with septa	7 days	7 days
TCLP Base/ Neutral Acid Extractables	8270C	One 8-oz. glass jar	Two 1-L amber glass bottles	7 days, 40 days for analysis[b]	7 days, 40 days for analysis[b]
TCLP Pesticides	8081A	One 8-oz. glass jar	Two 1-L amber glass bottles	7 days, 40 days for analysis[b]	7 days, 40 days for analysis[b]
TCLP Herbicides	8151A	One 8-oz. glass jar	Two 1-L amber glass bottles	7 days, 40 days for analysis[b]	7 days, 40 days for analysis[b]
TCLP STARS Base/Neutral Extractables	8270C	One 8-oz. glass jar	Two 1-L amber glass bottles	7 days, 40 days for analysis[b]	7 days, 40 days for analysis[b]
TCLP STARS Volatile Organics	8021B or 8260B	One 125 mL VOA jar	Two 40-mL glass vials with septa	7 days[b]	7 days[b]
Additional Methods					
Hardness	130.1,130.2	NA	One 1-L HDPE bottle (can combine with metals) preserved HNO_3 to pH <2	NA	180 days
pH	150.1	NA	To be performed in the field	NA	ASAP
TDS	160.1	NA	One 1-L HDPE bottle	NA	24 hours
TSS	160.2	NA	One 1-L HDPE bottle	NA	5 days

Table 2-1 Summary of Analytical Methods, Preservatives, and Holding Times, NYSDEC Projects

Parameter	Method	Containers/Preservative for Solid Samples[a]	Containers/Preservative for Aqueous Samples[a]	Holding Time for Solid Samples[a]	Holding Time for Aqueous or Air Samples[a]
Priority Pollutant Metals	200.7	One 4-oz. glass jar	One 1-L HDPE bottle preserved HNO_3 to pH <2	180 days, 26 days for mercury	180 days, 26 days for mercury
Alkalinity	310.1, 310.2	NA	One 1-L HDPE bottle	NA	12 days
Nitrate or Nitrite	353.2/300,/9056	One 4-oz. glass jar	One 1-L HDPE bottle (can combine with pH and BOD_5)	24 hours	24 hours
Nitrate-Nitrite	353.2	One 4-oz. glass jar	One 1-L HDPE bottle preserved H_2SO_4 to pH <2	26 days	26 days
Orthophosphorus	365.2/300,/9056	NA	One 1-L HDPE bottle (can combine with pH and BOD_5)	NA	24 hours
Total Phosphorus	365.2	One 4-oz. glass jar	One 1-L HDPE bottle preserved H_2SO_4 to pH <2	26 days	26 days
Chloride, Bromide, Sulfate, Fluoride	300, 9056 or individual methods	One 4-oz. glass jar	One 1-L HDPE bottle	26 days	26 days
COD	410.1	NA	One 1-L HDPE bottle (can combine with ammonia and TKN) preserved H_2SO_4 to pH <2	NA	26 days
Oil/Grease	1664	One 4-oz. glass jar	One 1-L amber glass bottle preserved HNO_3 to pH <2	26 days	26 days
TRPH	1664	One 4-oz. glass jar	One 1-L amber glass bottle preserved H_2SO_4 to pH <2	26 days	26 days
Metals/Mercury	6010B	One 4-oz. glass jar	One 125-mL HDPE bottle preserved HNO_3 to pH <2	180 days/26 days for mercury	180 days/26 days for mercury
Chromium, Hexavalent	7196A	One 4-oz. glass jar	One 1-L HDPE bottle unpreserved or preserved pH of 9.3 to 9.7 with an ammonia sulfate buffer solution	24 hours from collection for unpreserved soils and 28 days for preserved soils	24 hours from collection for unpreserved water and 28 days for preserved water
PCBs	8082	One 4-oz. glass jar	Two 1-L amber glass bottles	12 days/40 days[d]	5 days/40 days[d]

Table 2-1 Summary of Analytical Methods, Preservatives, and Holding Times, NYSDEC Projects

Parameter	Method	Containers/Preservative for Solid Samples[a]	Containers/Preservative for Aqueous Samples[a]	Holding Time for Solid Samples[a]	Holding Time for Aqueous or Air Samples[a]
VOCs and related tests	8260B/8021B/8015B	Two pre-weighed 40-mL with deionized water and one pre-weighed 40-mL vial with stir bar and methanol and one 4-oz. glass vial with septum(if no other containers are shipped)	Three 40-mL glass vials with septa preserved HCl < pH 2	48 hours for analysis or freezing to <7˚C and 12 days for analysis following freezing	12 days for waters with chemical preservative, and 5 days for unpreserved sample
SVOCs and related tests	8270C	One 8-oz. glass jar	Two 1-L amber glass bottles	12 days/40 days[d]	5 days/40 days[d]
Chlorinated Dioxins and Furans	8280A or 8290	One 8-oz. glass jar	Two 1-L amber glass bottles	30 days/45 days[d]	30 days/45 days[d]
Cyanide	9010C/9012B	One 4-oz. glass jar	One 1-L HDPE bottle preserved NaOH to pH >12	12 days	12 days
TOX	9020B	One 4-oz. glass jar	One 1-L amber glass preserved H_2SO_4 to pH <2	7 days	7 days
pH	9045C/9040B	One 4-oz. glass jar	One 125-mL HDPE bottle	ASAP	ASAP
Total Phenols	420.1	One 4-oz. glass jar	One 1-L amber glass preserved H_2SO_4 to pH <2	26 days	26 days
Total Organic Carbon	Lloyd Kahn; 415.1; 9060	One 4-oz. glass jar	NA	26 days	26 days
Total Glycol	DEC 89-9	One 4-oz. glass jar	One 1-L glass	26 days	14 days
Specific Gravity	SM 22710 F	NA	Can combine with other analyses (requires 500 mL)	NA	40 days
TKN	351.3	One 4-oz. glass jar	One 1-L HDPE bottle (can combine with COD and ammonia) preserved H_2SO_4 to pH <2	26 days	26 days

Table 2-1 Summary of Analytical Methods, Preservatives, and Holding Times, NYSDEC Projects

Parameter	Method	Containers/Preservative for Solid Samples[a]	Containers/Preservative for Aqueous Samples[a]	Holding Time for Solid Samples[a]	Holding Time for Aqueous or Air Samples[a]
Ammonia	350.2	One 4-oz. glass jar	One 1-L HDPE bottle (can combine with COD and TKN) preserved H_2SO_4 to pH <2	26 days	26 days
BOD_5	405.1	NA	One 1-L HDPE bottle (can combine with pH and nitrates)	NA	24 hours

[a] All samples to be cooled to 4°C except for metals analysis samples shipped alone. Sample containers must have Teflon-lined lids. Holding times are based on verified times of sample receipt and are consistent with NYSDEC requirements. 0.008% Na2S2O3 to be added to water samples in the presence of residual chlorine.
[b] Time listed is from TCLP extraction.
[c] TCLP analysis of water samples assumes less than 0.5% solids.
[d] Holding time is 5 days from collection to extraction and 40 days from extraction to analysis.

Key:

ASAP = As soon as possible.
BOD_5 = Biochemical oxygen demand-5.
BTX = Benzene, toluene, xylene.
COD = Chemical oxygen demand.
EPA = U.S. Environmental Protection Agency.
HDPE = High-density polyethylene.
HNO_3 = Nitric acid.
H_2SO_4 = Sulfuric acid.
L = Liter.
mL = Milliliter.
NA = Not applicable.
NaOH = Sodium hydroxide.
oz. = Ounce.
PCBs = Polychlorinated biphenyls.
SM = Standard Methods of Analysis for Water and Wastewater.
STARS = NYSDEC Spill Technology and Remediation Series (Memorandum No. 1 [1992]).
SVOCs = Semivolatile organic compounds.
TAL = Target Analyze List.
TCL = Target Compound List.
TCLP = Toxicity characteristic leaching procedure.
TDS = Total dissolved solids.
TKN = Total Kjeldahl nitrogen.
TOX = Total Organic Halides.
TRPH = total recoverable petroleum hydrocarbon.
TSS = Total suspended solids.
VOC = Volatile organic compounds.

For air samples, laboratories will follow cleaning procedures and checking for canisters as outlined in Method TO-15 and the NYSDOH Guidance for Soil Vapor Instrusion. Laboratories are required to certify that containers are clean and provide copies of the certification in the data package.

2.3.2 Samples Preservation and Holding Times

All samples requiring preservation will be collected in containers pre-preserved by the laboratory supplier. If field preservation is necessary, preservation will be immediately after collection and transportation to the site office. A clean, disposable pipette or a premeasured, single-use, glass ampule will be used to transfer liquid preservatives to the sample container. Care will be taken to avoid contact between the pipette or ampule and the sample or sample container. Solid preservatives will be transferred to the sample container using a clean, stainless-steel spoon. The sample preservation will be checked on representative samples by pouring the sample into a clean cup and testing with pH paper to determine if a sufficient amount of preservative has been used. Preserved samples for VOA will be tested on an extra vial at a rate of approximately 10%. Use of additional preservative also will be recorded in the logbook. Field blanks, which require preservation, will be preserved with a volume of reagent equal to the volume of reagent used in the samples that the blanks represent. A list of preservatives and holding times for each type of analysis are indicated in Table 2-1. Additional preservation requirements and holding times for non-target analyses are listed in the NYSDEC ASP.

Samples for soil VOCs will be collected in accordance with Method 5035. The laboratory must supply two pre-tarred VOA vials with 5 mL of deionized water, one pre-tarred vial with methanol, and one 2-ounce container for dry weight analysis (only if no other tests are required). The laboratory also must provide one coring device per sample for collection of a 5-gram plug. Soil samples for VOCs must arrive at the laboratory within 48 hours to be frozen at -7^{o}C.

Reagents used for preservation are reagent-grade and are supplied by the laboratory or approved chemical supplier. The laboratory must maintain traceability records on preservatives in the event of potential field contamination of samples. Each bottle is received from the laboratory and must be clearly labeled with laboratory name, type of chemical, lot number, and expiration date. Field personnel should record the date used in the field, site name, and site specific project number on the label or in the site logbook. Fresh sample containers and preservatives will be obtained from laboratory stocks prior to mobilization for each sampling event. Preservatives stored on site will be disposed of after use unless containers are sealed and stored under COC in a secure area. No preservatives will be used passed the expiration date.

Sample preservation will be verified at the laboratory at receipt or prior to analysis for VOCs. The preservation or pH will be recorded in the logbook. If samples are improperly preserved, a corrective action form will be submitted to the laboratory project manager for follow-up action. The laboratory will notify the Field Leader or Project Manager to implement corrective action in the field.

Methods for the analysis of soils, sediments, or solid matrices for VOCs will be used in conjunction with Method 5035A: Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples. The recommended collection technique for Method 5035A calls for the transfer of a 5-gram aliquot of sample to a tarred empty 40-mL VOA vial. The sample is iced at 4°C for transport to the lab. The laboratory will refrigerate VOA vials at 4°C ± 2°C for 48 hours or less or preserve by freezing at < -7°C within 48 hours of receipt to extend holding time to 14 days.

2.3.3 Sample Handling

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of samples but also prevents any detrimental effects due to the possible hazardous nature of the samples. Regulations for packaging, marking, labeling, and shipping of hazardous materials are promulgated by the DOT in 49 CFR 171 through 177. The site specific monitoring firm needs to trains all staff responsible for the shipment of samples in these regulations. Procedures for sample packing and shipping are documented in the site specific monitoring firm's SOP.

Sample Packaging

Samples must be packaged carefully to avoid breakage or contamination and must be shipped to the laboratory at proper temperatures. The following sample packaging requirements will be followed:

- Sample bottle lids must never be mixed. All sample lids must stay with their original containers;
- Shipping coolers must be partially filled with packing materials and ice (when required) to prevent bottles from moving and breaking during shipping;
- Environmental samples are to be cooled. Wet ice packaged in sealable, plastic bags will be used to cool samples during shipping. Ice is not to be used as a substitute for packing materials;
- Any remaining space in the cooler should be filled with inert packing material such as bubble wrap. Under no circumstances should material such as sawdust or sand be used;

- A duplicate custody record must be placed in a plastic bag and taped to the inside of the cooler lid. Custody seals are affixed to the sample cooler; and

- All containers for a given sample will be shipped in the same cooler when possible. In cases where samples for volatile analysis would be shipped in several coolers on a single day, VOA vials will be consolidated into a single cooler to minimize the number of required trip blanks.

Shipping Containers

Environmental samples will be properly packaged and labeled for transport and dispatched to the laboratory facility. The SOP procedure will be followed to mark and label sample shipments. A separate COC record must be prepared for each shipping container. The following requirements for shipping containers will be followed.

Sample shipping containers will generally be commercially purchased coolers (e.g., Coleman coolers) or boxes provided from the laboratory for air canisters. Each container will be custody-sealed for shipment, as appropriate. The container custody seal will consist of filament tape wrapped around the package at least twice and custody seals affixed in such a way that access to the container can be gained only by cutting the filament tape and breaking a seal.

Field personnel will make arrangements for transportation of samples to the laboratory. In most cases, samples will be shipped using an overnight express carrier (e.g., Federal Express). Field monitoring personnel will provide the laboratory with a shipment schedule and notify them of deviations from planned activities. The field monitoring personnel will notify the laboratory of all of samples intended for Saturday delivery, no later than 3 p.m. (Eastern Standard Time) on Thursday.

2.3.4 Sample Custody

Formal sample custody procedures begin when the precleaned sample containers leave the laboratory or upon receipt from the container vendor. The laboratory must follow written and approved SOPs for shipping, receiving, logging, and internally transferring samples. Sample identification documents must be carefully prepared so that sample identification and COC can be maintained and sample disposition controlled. Sample identification documents include:

- Field notebooks;

- Sample labels;

- Custody seals; and

- COC records.

The primary objective of COC procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from sampling through completion of all required analyses. A sample is in custody if it is:

- In a team member's physical possession;
- In a team member's view;
- Locked up; or
- Kept in a secured area that is restricted to authorized personnel.

Field Custody Procedures

Precleaned sample containers will be relinquished by the laboratory to the Field monitoring personnel. The Field monitoring personnel will record receipt of the sample containers in the project logbook. The following field custody procedure will be used for collection of samples:

- As few persons as possible should handle samples;
- Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use;
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under COC rules;
- The sample collector will record sample data in the field logbook; and
- The Field monitoring personnel will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

Chain-of-Custody Record

The COC form must be fully completed in duplicate by the field technician designated by the site specific monitoring firm's Project Manager as responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations), the person completing the COC record should note these constraints. The custody record also should indicate any special preservation techniques necessary or whether samples need to be filtered. Copies of COC records are maintained with the project file.

Custody Seals

Custody seals are preprinted, adhesive-backed seals with security slots designed to break if the seals are disturbed. DOT-approved sample shipping containers are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. Upon receipt at the laboratory, the custodian must check and document on a cooler receipt form that seals on boxes are intact.

2.3.5 Laboratory Custody Procedures

All laboratory custody procedures must maintain a system that provides for sample log-in, sign-out and sign-in of samples to and from individual analysts, data storage and reporting, and sample disposal. These procedures must ensure continuous documentation of sample custody from receipt to disposal. Procedures used by the laboratory must meet all NYSDEC requirements. Laboratories must complete a cooler receipt form documenting the temperature and condition of samples on receipt. The form must be provided in the laboratory data package.

The laboratory must submit sample receipt documents for each set of samples received. A sample delivery group (SDG) is defined as a batch of up to 20 samples collected during one calendar week. Samples shipped on Friday will normally conclude an SDG. The sample receipt documents consist of the Sample Receipt file, a pdf of the COC, and a pdf of the laboratory log report showing the tests selected.

The laboratory must implement, practice, and maintain programs for managing waste disposal. The site specific monitoring firm's and NYSDEC markings must be removed from all sample containers prior to disposal. Waste disposal procedures must include use of a certified hauler and meet Federal and State regulations.

2.4 Analytical Method Requirements

Analytical method requirements will be documented in the appropriate work plan or FSP. The specific implementation of analytical methods will be documented in laboratory SOPs. Laboratory SOPs and the QA program will be reviewed and approved as part of the procurement process.

2.4.1 Standard Laboratory Analytical Procedures

Analytical methods in support of NYSDEC activities are referenced in NYSDEC's ASP. The protocol is based on the following methods:

1. 40 CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants under the Clean Water Act;

2. "Standard Methods for the Examination of Water and Wastewater," APHA/AWWA/WEF, 21st ed, 1992;

3. Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983;

4. "Test Methods for Evaluating Solid Waste, Physical Chemical Methods," 3rd ed, SW-846, 1998, latest update;

5. "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air," 2nd ed, EPA/625/R-96/010b, January 1999;

6. "USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration, OLM04.3, 2003or SOM01.2, 2007";

7. "EPA Contract Laboratory Program, Statement of Work for Inorganic Analysis, Multi-Media, Multi-Concentration ILM05.4, 2007; and

8. American Society for Testing and Materials (ASTM).

The laboratory must be certified by the NYSDOH ELAP for all analytical methods for which the NYSDOH provides an approval program. Laboratories also must be National Environmental Laboratory Accreditation Program (NELAP) approved by NYSDOH or related accrediting authority.

Table 2-1 lists all analyses that may be performed for NYSDEC projects. Reporting limits for any additional methods will be included in the site-specific QAPP.

The site specific monitoring firm's anticipates that laboratories will use the most current method available and/or recommended by EPA. For example, EPA has promulgated the use of Standard Methods references instead of the water method reference listed above. The actual methods for the project will be reviewed and approved as part of the project planning process.

2.5 Quality Control

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of glassware and reagents. Field QC will include duplicates, trip blanks, field equipment blanks, and miscellaneous field QC samples. Field QC samples will be preserved, documented, and transported in the same manner as the samples they represent. Laboratory-based QC will consist of standards, replicates, spikes, and blanks. Method QC limits for analyses need to be provided by the site specific monitoring firm's laboratory or are included in NYSDEC ASP 2005. Quality control limits for any additional methods will be included in the site-specific work plan or FSP.

2.5.1 Field Quality Control Samples

The collection of field QC samples and the conditions, under which the samples were collected, will be documented in the field logbook. Unless otherwise directed by NYSDEC, the field QC samples listed below will be collected and analyzed at the frequency listed in Table 2-2.

Table 2-2 Field Quality Control Guidelines, NYSDEC Projects

QC Sample	Description
Field Duplicate	One per matrix per 20 samples for each analysis.
Field Equipment Blank	One per equipment per 20 samples for each analysis. Only equipment sets that are subject to decontamination require equipment blanks. Dedicated or disposal equipment does not require equipment blanks.
Field Background Samples	Per sampling day for indoor air samples as specified in the guidance for soil vapor intrusion.
Trip Blank	One per shipment for each cooler in which aqueous samples for VOC analysis are shipped or one per shipment batch for air samples. Trip blanks are analyzed for all VOC methods designated for samples. Trip blanks are shipped only for aqueous matrix.

Duplicate Samples

Duplicate samples will be collected at the rate one duplicate per 20 project samples of the same matrix. Duplicate soil samples will be prepared by collecting equal aliquots from the same sample source and placing them in separate sample bottles. Duplicate water samples will be prepared by collecting successive volumes of water and placing them in separate bottles. Duplicate air samples will collected with a tubing splitter. Duplicate samples will be shipped with the samples they represent and will be analyzed in the same manner.

The RPD between the concentration in the original and duplicate sample measures the overall precision of the field sampling and analytical method. Field duplicates are evaluated by using two times the laboratory QC criteria for duplicates (i.e., RPDs of 40% for water and air and 70% for soils). If all other laboratory QC criteria are met, RPD results outside control limits indicate potential matrix effects. Significant deviations in RPD results of field duplicates are assessed to evaluate whether data met all quality objectives for the project.

Trip Blanks

Trip blanks are collected to establish that the transport of sample bottles to and from the field does not result in contamination of the sample from external sources. Trip blanks will be collected for, and in conjunction with, only VOA for aqueous samples. If the 40-mililiter (mL) VOA vials are shipped to the field team by the laboratory sample custodian, a representative number of vials filled with analyte-free water (preserved, capped, and labeled) will accompany the shipment

to and from the laboratory. Trip blanks will be treated in the same manner as the VOA samples they represent and will be taken to representative field sample sites, but remain unopened. Trip blanks will be sent with each sample-shipping container that contains aqueous samples for VOA.

Field Equipment Blanks

Field equipment blanks are blank samples (also called rinsate blanks) designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use and that cleaning procedures between samples are sufficient to minimize cross-contamination. Field equipment blanks will be prepared in the field using an approved water source. Sampling of the water source may also be required if analyte-free water is not obtained from the lab. The field equipment blank will be preserved, documented, shipped, and analyzed in the same manner as the samples it represents. Equipment blanks will be collected at the rate of one sample per day, per equipment set.

An equipment set is all sampling equipment required to collect one sample. For example, one soil sample equipment set may include a stainless-steel bowl, a stainless-steel trowel, and a bucket auger. Samples collected with dedicated or disposable equipment do not require equipment blank samples.

Field equipment and trip blanks serve to demonstrate contamination-free procedures in the field and during sample transport. The goal is for field blanks to be free of contamination. Low-level contamination may be present, but must be less than five times the level found in associated samples. If contamination is greater, the sample results are qualified as non-detect at an elevated-reporting limit. If field blank contaminants are also present in the method blank, or are typical laboratory contaminants, or are not present in project samples, then no further action is required. All other sources of contamination must be investigated as part of the corrective action process. Sample results that do not meet quality objectives after qualification, re-sampling may be required. The QA Officer, Project Chemist, and Project Manager must determine potential changes in field procedures to eliminate contamination sources prior to re-sampling.

Miscellaneous Field QC Samples

This type of QC sampling involves analysis of investigation water sources and monitoring well drilling fluids (if used). Because the water supply source is used in decontamination and well drilling activities, it may be necessary to determine the possibility for the introduction of outside contaminants. Drilling fluids (muds) that are used during well installation may also be analyzed in order to assess the possibility of such constituents affecting groundwater samples.

Field background samples are required for air sampling events. Results of the background sample are used in the assessment process to determine whether contamination is site-related or significant.

2.5.2 Laboratory Quality Control Analyses

Analytical performance is monitored through QC samples and spikes, such as laboratory method blanks, surrogate spikes, QC check samples, matrix spikes, matrix spike duplicates, duplicate samples, and duplicate injections (see Table 2-3). All QC samples are applied on the basis of a laboratory batch. Batches do not exceed 20 samples excluding associated field and laboratory QC samples. The QC samples associated with sample preparation include method blanks, laboratory control samples (LCSs) (also called matrix spike blanks [MSB] by NYSDEC), matrix spikes, and duplicates. The run batch represents all samples analyzed together in the run sequence. The run sequence is typically limited to 24 hours unless defined differently for the analytical method. For some analyses, such as volatile organics, the run batch is equivalent to the preparation batch. The QC samples associated with the run sequence include calibration standards, instrument blanks, and reference standards. Unless otherwise directed by NYSDEC staff, the laboratory QC samples listed below will be collected and analyzed at the frequency listed in Table 2-3.

Instances may arise where high sample concentrations, nonhomogeneity of samples, or matrix interferences preclude achieving detection limits or associated QC target criteria. In such instances, data will not be rejected *a priori* but will be examined on a case-by-case basis. The laboratory will report the reason for deviations from these detection limits or noncompliance with QC criteria in the case narrative.

Table 2-3 Laboratory Quality Control Sample Guidelines, NYSDEC Projects

QC Sample	Description
MB	One per matrix per preparation batch for each analysis.
LCS/MSB	One per matrix per preparation batch for each analysis. The LCS/MSB must contain all target analytes of concern at the site.
Surrogate Spikes	All samples analyzed for organic methods.
Internal Standards	All samples analyzed by GC/MS methods.
MS/MSD	One per matrix per SDG for each analysis. The spike solution must contain a broad range of the analytes of concern at the site. The overall frequency of MS/MSD on project samples must be at least one set per 20 samples.
MS/MD	One per matrix per SDG for metals and general chemistry methods. The spike solution must contain a broad range of analytes of concern at the site. The overall frequency of MS/MD on the project samples must be at least one set per 20 samples.

Table 2-3 Laboratory Quality Control Sample Guidelines, NYSDEC Projects

QC Sample	Description
Serial Dilution/Post Digestion Spike	All samples analyzed for metals.

Key:
SDG = Sample Delivery Group.
LCS = Laboratory Control Samples.
MSB = Matrix Spike Blank.
MS/MD = Matrix Spike/Matrix Duplicate.
MS/MSD = Matrix Spike/Matrix Spike Duplicate.
MB = Method Blank.
TAL = Target Analyte List.

Laboratory Method Blank

Laboratory method blanks serve to demonstrate a contamination-free environment in the laboratory. The goal is for method blanks to be free of contamination. Low-level contamination may be present, but must be less than the reporting limit. If contamination is greater, samples are reanalyzed. If contaminants are present in the method blank but not in project samples, no further action is required. All sources of contamination that are not common laboratory contaminants as defined in the method SOPs must be investigated as part of the corrective action process. Sample results must not be blank subtracted unless specifically required by the analytical method.

Surrogate Standards

Surrogate recoveries must be within QC criteria for method blanks and LCSs to demonstrate acceptable method performance. If surrogate recoveries are outside QC criteria for method blanks or LCSs, corrective action is required and the Project Chemist should be notified. Surrogate recoveries in the samples indicate the method performance on the particular sample matrix. Surrogate recoveries that are outside QC criteria for a sample indicate a potential matrix effect. Matrix effects must be verified based on review of recoveries in the method blank or LCS, sample reanalysis, or evaluation of interfering compounds. Sample clean-up procedures are required by the NYSDEC ASP must be implemented to alleviate potential matrix problems.

Laboratory Control Sample

LCS recoveries must be monitored on control charts for all non-CLP methods. Laboratory QC criteria must be established for each method and matrix using a minimum of 30 points. QC criteria should be updated annually for all non-CLP methods. The LCS recovery must be within the control limits to demonstrate acceptable method performance. Sporadic marginal failures of a few target analytes reported when greater than five target analytes are required are allowed as part of the data review guidance. If LCS recoveries are outside QC criteria for more than a few target analytes, recoveries are significantly low, or the compounds were detected in the samples, then corrective action is required. After corrective action is complete, sample re-analysis is required for failed parameters. If LCS recoveries

exceed the QC criteria, and that parameter is not found in any samples, re-analysis is not necessary. For any other deviations from LCS control limits that can not be resolved by sample re-analysis within holding times, the Project Chemist must be notified immediately. If critical samples are affected, the Project Manager may determine that re-sampling is required.

Matrix Spike Sample

MS recoveries are a measure of the performance of the method on the sample being analyzed. Field and trip blanks must not be chosen for spiking. MS recoveries outside the control limits applied to the LCS indicate matrix effects. Sample clean-up procedures may be warranted for samples with severe matrix effects. The laboratory should notify the Project Chemist of these instances to determine an appropriate corrective action.

Matrix Spike Duplicate Sample

The MSD sample is commonly prepared in conjunction with the MS sample. The MSD is prepared from a separate portion of the sample and processed with the same additions as the MS. The MSD is prepared for methods that do not typically show concentrations of target analytes above MDLs, such as organic methods. The RPD between the recoveries in the MS and MSD measures the precision of the analytical method on actual project samples. QC criteria for RPDs are 20% for waters and 35% for soils unless the laboratory provides additional statistical criteria.

Duplicate Sample

The duplicate is prepared for methods that typically show concentrations of target analytes above MDLs, such as metals and wet chemistry methods. The RPDs between recoveries in the original and duplicate measures the precision of the analytical method on the actual project samples. QC criteria for RPDs are 20% for waters and 35% for soils unless the laboratory provides additional statistical criteria.

If all other QC criteria are met, RPD results outside control limits indicate potential matrix effects. The laboratory should investigate significant deviations in the RPD results by observing the sample to determine any visual heterogeneity or reviewing sample chromatograms for matrix interference. If visual observation does not indicate a potential problem, the sample may be reanalyzed. Potential matrix effects are reported in the case narrative.

Instrument Blanks

Instrument or reagent blanks are analyzed in the laboratory to assess laboratory instrument procedures as possible sources of sample contamination. Instrument blanks are part of the laboratory corrective action if method blanks show contamination or the analyst suspects carryover from a high concentration sample. Instrument blank results are reported on a laboratory corrective action form.

QC Check Standards

A QC check standard is obtained from a different source or at a minimum a lot different from that of the calibration standard. A check standard result is used to validate an existing concentration calibration standard file or calibration curve. The check standard provides information on the accuracy of the instrumental analytical method, independent of various sample matrices. Check standards are analyzed with each new calibration curve.

Internal standard area counts for water and solid sample analysis for all samples must be in the inclusive range of 50% to 200%, and retention time must not marry more than +/- 30 seconds of its associated 12-hour calibration standard (i.e., opening Continuing Calibration Verification or mid-point standard from Initial Calibration).

The serial dilution analysis (a five-fold dilution) must agree within a 10% difference of the original determination after correction for the dilution if the analyte concentration is sufficiently high (concentration in the original sample is >50 times [50x] the MDL).

The post-digestion spike (%R) must be within the acceptance limits of 75% to 125%. However, spike recovery limits do not apply when the sample concentration is greater than 4x the spike added.

Other Laboratory QC Samples

The laboratory performs analysis of other QC samples or standards, depending on the analytical method. Method-specific QC samples or standards include internal standard spikes for gas chromatography/mass spectrometry (GC/MS) methods; post-digestion spikes and serial dilutions for metals analysis; and interference check samples (ICSs) for ICP analysis.

Blind QC Check Samples

Types of blind QC check samples include external performance evaluation (PE) samples provided by an outside certifying agency and internal QC samples submitted for routine analysis by the laboratory QA officer. The laboratory must pass NYSDOH samples as part of the approval process. If methods are used that are not included in NYSDOH approval process, blind QC samples may be submitted to the laboratory to evaluate method performance.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance

All laboratory and field instruments and equipment used for sample analysis must be serviced and maintained only by qualified personnel. Laboratory instrument maintenance procedures will be evaluated to verify that there will be no impacts

on analysis of project samples due to instrument malfunction. For example, the laboratory must have duplicate instrumentation and/or major laboratory instruments (e.g., GC/MS, ICP, atomic absorption spectroscopy [AAS]) maintained under service agreements with the manufacturer that require rapid respond by manufacturer-approved service agents.

Field instruments will be rented through approved suppliers that have manufacturer-approved maintenance programs.

2.6.1 Field Equipment Maintenance

Field equipment will be checked upon receipt to verify that instruments are in working condition and that the rental company provided appropriate calibration records or certifications. On-site operation will be performed in accordance with manufacturer manuals. If any problems occur, the instrument will be replaced immediately. Equipment purchased for the contract will be maintained in accordance with manufacturer guidance.

2.6.2 Laboratory Equipment Maintenance

The laboratory must maintain a stock of spare parts and consumables for all analytical equipment. Routine preventive maintenance procedures should be documented in site specific monitoring firm's SOPs. Maintenance performed on each piece of equipment must be documented in a maintenance logbook. Daily checks of the laboratory deionized water and other support systems are required. The laboratory must operate backup instrumentation for most of its analytical equipment in the event of major instrument failure or have an alternative approached to ensure analytical work proceeds within holding times with no adverse impacts on data quality.

2.7 Instrument/Equipment Calibration and Frequency

All instruments and equipment used during sampling and analysis will be operated and calibrated according to the manufacturer's guidelines and recommendations, as well as criteria set forth in applicable analytical methodology references. Personnel properly trained in these procedures will perform operation and calibration of all instruments. Documentation of all field maintenance and calibration information will be maintained in the field logbook. Table 2-4 lists typical monitoring equipment used during fieldwork. This equipment is representative of instruments typically required for NYSDEC projects. All equipment used for the NYSDEC projects will be NYSDEC-owned or rented. All field personnel receive annual refresher training on the field operation of all health and safety related equipment, which includes calibration procedures. Brief descriptions of calibration procedures for major field instruments are listed on Table 2-4.

Table 2-4 General Field Equipment and Calibration Procedures

Instrument or Equipment	Description[a]	Field Calibration Procedure	Acceptability/ Performance Criteria	Responsible Personnel
Organic Vapor Analyzer (OVA)	Flame Ionization Detector to provide continuous data on organic vapor concentrations. Unit must be Class I, Division 1, Grade A,B,C,D. Unit must have rechargeable battery, range of 0 to 1,000 ppm, and ultra-high purity hydrogen as fuel source.	Units are factory calibrated to remain with performance specification for an excess of 6 months. During field use, a carbon filter is used with the OVA to distinguish methane from other organics. The unit is checked daily with calibration gas to ensure the response is consistent. If needed, the unit will be re-calibrated to manufacturer specifications. When the OVA is used to screen samples (except samples for headspace analysis), periodic ambient air readings will also be recorded in the logbook.	A carbon filter must remove sources of organic vapors other than methane (i.e., marker). Instrument must detect organic vapors without filter. Response should be checked daily with calibration gas. The accuracy will depend on the application.	Site Safety Officer, Project Geologist
O_2 Explosimeter	Gas monitor designed to simultaneously monitor areas for oxygen deficiency and dangerous levels of combustible gas. Units must be equipped with sample pumps and hoses to measure gases in a confined space. Range O_2 - 0 to 25%, LEL - 0 to 100%, H_2S - 0 to 200 ppm, and CO - 0 to 999 ppm. Not all units have the additional capability to detect hydrogen sulfide or H_2S or carbon dioxide.	Procedures for field calibration of the O_2/explosimeter are as follows: ■ Inspect instrument to ensure entry and exit ports are clear; ■ Turn the switch to ON position; ■ Allow the meters to stabilize and then press the reset button; ■ Check the battery level; ■ Calibrate the oxygen meter to 20.8% by using the calibrate knob; ■ Adjust the explosimeter to zero by using the zero knob; and ■ Check alarm levels by adjusting the calibrate knob for oxygen levels and the zero knob for explosimeter levels and note the readings when the alarm sounds. Return readings to normal and depress the reset button.	Alarm must sound during calibration procedure. Battery must have sufficient charge for operation. Blocking the sample line probe and observing the drop of the flow indicator float checks flow system. If flow system is not functioning, return unit for repairs.	Site Safety Officer, Project Geologist

Table 2-4 General Field Equipment and Calibration Procedures

Instrument or Equipment	Description[a]	Field Calibration Procedure	Acceptability/ Performance Criteria	Responsible Personnel
pH/Conductivity, Temperature, Dissolved Oxygen (DO), Oxidation Reduction (REDOX) Meter	Meter designed for field use with battery operation. The unit must contain separate pH, temperature, conductivity, DO, and ORP probes in one unit.	Before use, pH, specific conductance, DO, and ORP probes need to be calibrated or tested for responsiveness. The pH probe will be calibrated first. This is done by placing the probe in pH 7, then pH 4, standard solutions and adjusting the pH calibration knobs until the correct measurement is obtained. The ORP probe is then calibrated with the ORP standard solution (Zobell), and the DO probe is checked in accordance with manufacturer guidelines. The probes should be rinsed with deionized water between each calibration solution and following calibration. Used calibration solution is to be discarded. Finally, the conductivity probe is checked with a solution of known conductivity.	Turbidity and DO ∀ 10% pH ∀ 0.01 pH Conductivity at ∀ 2% FSD The instrument will be checked with a pH standard every 4 hours and at the end of the sampling day. If the response is greater than 0.2 units more or less than the standard, complete calibration will be conducted.	Project Geologist, Sampler
Turbidity Meter	Nephelometer designed for field use with battery operation. Range 0.01 to 1,000 NTU.	The unit is factory calibrated. Field procedures involve checking the unit's responsiveness at least once a day using factory supplied standards. The responsiveness should be checked on the 0 to 10 range, 0 to 100 range, and 0 to 1,000 range.	∀ 10%	Sampler

Table 2-4 General Field Equipment and Calibration Procedures

Instrument or Equipment	Description[a]	Field Calibration Procedure	Acceptability/ Performance Criteria	Responsible Personnel
PID Meter	The PID is a portable, non-destructive trace gas analyzer. Units for site characterization must have a range of 0 to >2,000 ppm and a 10.6 or 11.7 eV lamp (e.g., MiniRAE 2000). Units for indoor air monitoring must have a range of 1 ppb to 2,000 ppm and a 10.6 eV lamp (e.g., ppb RAE Plus).Calibration check gas (e.g., isobutylene) must be provided with unit.	In the field, PIDs will be calibrated at the start of each field event by the manufacturer. Initial calibration must be verified by a certificate of calibration from the rental company or field calibration is required. There is no field calibration for a Mini-Rae 2000. If a significant change in weather occurs during the day (i.e., change in humidity or temperature) or if the unit is turned off for an extended period, then there is a field test, called a Bump Test. It consists of having the unit sniff 100ppm cal gas and determine the reading. If the unit is reading 100 ppm or close to it, then it is OK. If not, depending on how far off it is, either dry out the unit on a heater (due to potential fogging of the lamp), or send the unit back to the rental company for in-house calibration.	Meter must give consistent background readings.	Site Safety Officer, Project Geologist

[a] Description is for typical equipment; equivalent units may be used.

The site specific monitoring firm requires laboratories to use the most current method available for calibration criteria. For example, EPA no longer allows the use of the grand mean to evaluate calibration linerity for organic methods. The site specific monitoring firm requires that the most stringent method criteria be met for all compounds of concern at site. Unless modified by the method, the site specific monitoring firm requires at least a five point curve for all calibrations for organics and a minimum of three calibration points for inorganics; exclusion of points is not allowed to meet criteria without technical justification. Any manual integration performed for calibrations needs to be documented with the rationale and included in the data package. Manual integrations of internal standards or surrogates in calibrations are not allowed.

2.8 Inspection/Acceptance of Supplies and Consumables

Measures are established by the site specific monitoring firm's QMP to assure that purchased material, equipment, and services whether purchased directly or through contractors or subcontractors conform to procurement documents.

2.9 Non-Direct Measurements

For data acquired from non-direct measurement sources include the following:

- Physical information such as descriptions of sampling activities and geologic logs;
- State and local environmental agency files;
- Reference computer databases and literature files; and
- Historical reports on a site and subjective information gathered through interviews.

Data from non-direct measurements will be reviewed and used as indicated in the work plan. Data from all non-direct measurement sources are stored as indicated in Section 1.6.

2.10 Data Management

Data management procedures track samples and results from work plan generation to the final report. The field data include approved work planning tables, labels, field sampling forms, COC forms, and logbooks. The surveyor will provide coordinates for all sample locations. The field team leader of the monitoring firm will review all field data for accuracy. Any field data not provided by the laboratory will be entered into a database or spreadsheet.

Electronic data will be provided in accordance with the most recent version of EPA Region 2's standardized electronic data deliverable (EDD) format. The for-

mat is based on the Multimedia Electronic Data Deliverable, or MEDD format. Further information on MEDD is available at the Web site http://www.epa.gov/region02/superfund/medd.htm. Currently this is the EPA Region 2 EDD dated December 2003. If required for the project, the laboratory also may provide an alternative EDD consistent with the Corporate EDD or other approved format.

The site specific monitoring firm will process the EDD to verify that criteria established in this GQAPP are met. The Project Chemist will review all laboratory and field data to verify the results against the hard copy and check for transcription errors. The Project Chemist will verify qualifiers added by data processing and add any data qualifiers. The individual SDG EDD files will be processed to a centralized data management system to store all reviewed and approved data. Data that will appear on data tables for the report will be generated from the centralized database, which will serve as the central, protected data source for all data handling operations.

The central database will be stored in a secure area on site specific monitoring firm's network with access limited to data management specialists designated by the Project Manager. Data users may enter additional electronic data such as risk-based criteria for comparison of results. This data will be stored in separate tables in the database and linked to the actual results. Any data from outside sources will include a description of the data, a reference to the source, and the date updated. Outside data will be checked prior to use verify that current values are used. The central database will be used to create tables for the final report.

3 Assessment and Oversight

The site specific monitoring firm's assessment and oversight procedures will be implemented in accordance with the QMP. The QMP outlines general roles and responsibilities for the project team.

3.1 Assessment and Response Actions

The site specific monitoring firm's overall assessment activities include management assessments, development of SOPs, and performance evaluations. Management assessments include weekly meetings and conference calls to evaluate project readiness and staff utilization. Assignment of qualified personnel, maintenance of schedules and budgets, and quality of project deliverables are verified as part of these assessments. The development of SOPs and performance evaluations are used to provide trained and qualified personnel for the project.

The site specific monitoring firm's technical assessment activities include peer review, data quality reviews, and technical system audits (i.e., laboratory and field). Procedures for assessment and audit of data quality are described in Section 4 of this GQAPP. Procedures for peer review and technical assessments are summarized briefly below.

Both overall and direct technical assessment activities may result in the need for corrective action. The site specific monitoring firm's approach to implementing a corrective action response program for both field and laboratory situations is summarized briefly below. The NYSDEC QA Officer has stop work authority on all NYSDEC projects that may have negative quality impacts prior to completion of corrective actions.

3.1.1 Peer Review

The site specific monitoring firm's implements peer review for all project deliverables including work plans, GQAPPs, draft and final reports, and technical memoranda. The peer review process provides for a critical evaluation of the deliverable by an individual or team to determine if the deliverable will meet established criteria, quality objectives, technical standards, and contractual obligations. The Project Manager will assign peer reviewers, when the publications schedule is established. The publications staff will be responsible for ensuring all peer reviewers participate in the review process and approve all final deliverables. For tech-

nical memoranda and other project documents, the Project Manager will be responsible for obtaining principal review and approval.

3.1.2 Technical Systems Assessments

The entire project team is responsible for ongoing assessment of the technical work performed by the team, identification of nonconformance with the project objectives, and initiation, implementation and documentation of corrective action. Independent performance and systems audits are technical assessments that are a possible part of the QA/QC program. The following describes types of audits conducted, frequency of these audits, and personnel responsible for conducting audits.

Field Audits

Field audits are performed under the direction of the QA Officer. The need for field audits will be determined during project planning and indicated in the work plan. Field audits will be documented on the site specific monitoring firm's field audit checklists. Field audits will be typically performed during the early field programs.

Field Inspections

The Project Manager will be responsible for inspecting all field activities to verify compliance of activities with project plans.

Laboratory Audits

The laboratory must implement a comprehensive program of internal audits to verify compliance of their systems with SOPs and QA manuals.

NYSDOH must certify the laboratory and will perform external systems audits at an approximate frequency of once a year. External audits include reviews of analytical capabilities and procedures, COC procedures, documentation, QA/QC, and laboratory organization. These audits also include analysis of blind PE samples.

The QA Officer or designee may also audit laboratories. These audits are typically performed to verify laboratory capabilities and implementation of any complex project requirements or in response to a QC nonconformance identified as part of the data review process.

3.1.3 Corrective Action

Corrective actions will be implemented as needed. In conjunction with the QA Officer and Laboratory QA Coordinator, the Project Manager is responsible for initiating corrective action and implementing it in the field and office, and the laboratory project manager is responsible for implementing it in the laboratory. It is their combined responsibility to see that all sampling and analytical procedures are followed as specified and that the data generated meet the prescribed ac-

ceptance criteria. Specific corrective actions necessary will be clearly documented in the logbooks or analytical reports.

Field Situations

The need for corrective action in the field may be determined by technical assessments or by more direct means such as equipment malfunction. Once a problem has been identified, it may be addressed immediately or an audit report may serve as notification to project management staff that corrective action is necessary. Immediate corrective actions taken in the field will be documented in the project logbook. Corrective actions may include, but are not limited to:

- Correcting equipment decontamination or sample handling procedures if field blanks indicated contamination;
- Recalibrating field instruments and checking battery charge;
- Training field laboratory personnel in correct sample handling or collection procedures; and
- Accepting data with an acknowledged level of uncertainty.

After a corrective action has been implemented, its effectiveness will be verified. If the action does not resolve the problem, appropriate personnel will be assigned to investigate and effectively remediate the problem. Corrective actions recommended by NYSDEC personnel will be addressed in a timely manner.

Laboratory Situations

Out-of-control QC data, laboratory audits, or outside data review may determine the need for corrective action in the laboratory. Corrective actions may include, but are not limited to:

- Reanalyzing samples, if holding times permit;
- Correcting laboratory procedures;
- Recalibrating instruments using freshly prepared standards;
- Replacing solvents or other reagents that give unacceptable blank values;
- Training additional laboratory personnel in correct sample preparation and analysis procedures; and
- Accepting data with an acknowledged level of uncertainty.

The laboratory corrective actions must be defined in analytical SOPs. Any deviations from approved corrective actions must be documented and approved by the Project Chemist.

Whenever corrective action is deemed necessary by the Project Chemist or NYSDEC technical staff, the laboratory project manager will ensure that the following steps are taken:

- The cause of the problem is investigated and determined;
- Appropriate corrective action is determined;
- Corrective action is implemented and its effectiveness verified by the laboratory QA officer; and
- Documentation of the corrective action verification is provided to the Project Chemist and NYSDEC staff in a timely manner.

3.2 Reports to Management

For reports to management include the following:

- **Audit Reports** - Audit reports are prepared by the audit team leader immediately after completion of the audit. The report will list findings and recommendations and will be provided to the Project Manager and QA Officer.
- **Data Usability Summary Report** - A DUSR will be completed by the Project Chemist and provided to the NYSDEC technical staff in the appendix of the report. Impacts on the usability of data will be tracked by adding qualifiers to individual data points as described in Section 4.

Upon completion of a project sampling effort, analytical and QC data will be included in a comprehensive technical report that summarizes field activities and provides a data evaluation. A discussion of the validity of results in the context of QA/QC procedures will be made and the DUSR will be provided.

Serious analytical problems will be reported immediately to NYSDEC personnel. Time and type of corrective action (if needed) will depend on the severity of the problem and relative overall project importance. Corrective actions may include altering procedures in the field, conducting an audit, or modifying laboratory protocol.

4 Data Validation and Usability

The site specific monitoring firm will implement procedures for data validation and usability described below. These procedures will be adapted, if necessary, to meet project-specific requirements as determined in the work plan or FSP. A generic data usability validation checklist report form is provided in Appendix A of the GQAPP.

4.1 Data Review, Validation, and Verification Requirements

All data generated will be reviewed by comparing accuracy and precision results for the QC samples to QC criteria listed in NYSDEC ASP 2005. The following types of data will be reviewed:

- Analytical reporting limits and target compounds will be compared to limits listed in the site-specific QAPP;
- Holding times will be verified against Table 2-1;
- QC summary data for surrogates, method blanks, LCS, and MS/MSD samples will be compared to criteria listed in the site-specific QAPP;
- Field QC results for duplicates and blanks will be compared to criteria listed in Section 2.5.1;
- Calibration summary data will be checked by the laboratory to verify that all positive results for target compounds were generated under an acceptable calibration as defined by the analytical method. Any deviations will be noted in the case narrative and reviewed by the Project Chemist;
- Field data such as sample identifications and sample dates will be checked against the laboratory report; and
- Any raw data files from the field and laboratory will not be reviewed unless there is a significant problem noted with the summary information.

4.2 Validation and Verification Methods

The data review scheme for analytical results from the receipt of the analytical data through the validated report is described below. The laboratory is responsible for performing internal data review. The laboratory data review must include 100% analyst review, 100% peer review, and 100% review by the laboratory project manager or designated QC reviewer to verify that all project-specific requirements are met. All levels of laboratory review must be fully documented and available for review if requested or if a laboratory audit is performed.

After receipt from the laboratory, project data will be validated using the following steps:

Evaluation of Completeness

The Project Chemist checks the electronic files for compliance with required format and the project target compounds and units. If errors in loading are found, the EDD files will be returned to the laboratory and the Project Chemist will request resubmission via SubLab. The Project Chemist also verifies that the laboratory information matches the field information and that the following items are included in the data package:

- COC forms and laboratory sample summary forms;
- Case narrative describing any out-of-control events and summarizing analytical procedures;
- Data report forms (i.e., Form I);
- QA/QC summary forms; and
- Chromatograms documenting any QC problems.

If the data package is incomplete, the Project Chemist will request resubmission. The laboratory must provide all missing information within one day.

Evaluation of Compliance

The Project Chemist will review all processed files and add data qualifiers for outliers. If QC data are provided in the EDD, the results will be used to verify compliance electronically. If no QC data are provided in the EDD, the reports will checked manually. Additional compliance checks on representative portions of the data are briefly outlined below:

- Review chromatograms, mass spectra, and other raw data if provided as back-up information for any apparent QC anomalies;

- Review of calibration summaries or any other QC samples not provided in the EDD by the laboratory;

- Ensure that all analytical problems and corrections are reported in the case narrative and that appropriate laboratory qualifiers are added;

- For any problems identified, review concerns with the laboratory, obtain additional information if necessary, and check all related data to determine the extent of the error;

- Project chemists will follow qualification guidelines in EPA Region 2 data validation SOPs or *EPA CLP National Functional Guidelines for Organic Data Review, EPA 540/R-99-008* (October 1999) or *EPA CLP National Functional Guidelines for Inorganic Data Review*, EPA 540-R-04-004 (October 2004), but will use the specific method criteria for evaluation. The DUSR will be completed as specified in NYSDEC *Guidance of the Development of DUSRs* (July 1999); and

Data Review Reporting

The Project Chemist will perform the following reporting functions:

- Alert the Project Manager to any QC problems, obvious anomalous values, or discrepancies between the field and laboratory data, that may impact data usability; and

- Discuss QC problems in a DUSR for each laboratory report. DUSR will include a short narrative and print out of qualified data;

- Prepare analytical data summary tables of qualified data that summarize those samples and analytes for which detectable concentrations were exhibited including field QC samples; and

- At the completion of all field and laboratory efforts, summarize planned versus actual field and laboratory activities and data usability concerns in the technical report.

4.3 Reconciliation with User Requirements

For routine assessments of data quality, the site specific monitoring firm's will implement the data validation procedures described in Section 4.2 and assign appropriate data qualifiers to indicate limitations on the data. The Data Validation Chemist will be responsible for evaluating precision, accuracy, representativeness, comparability, and completeness of data using procedures described in Section 2.5 of this GQAPP. Any deviations from analytical performance criteria or quality

objectives for the project will be documented in the DUSR provided to the data users for the project.

The QA Officer or Project Chemist will work with the final users of the data in performing data quality assessments. The data quality assessment may include some or all of the following steps:

- Data that are determined to be incomplete or not usable for the project will be discussed with the project team. If critical data points are involved which impact the ability to complete project objectives, data users will report immediately to the Project Manager. The Project Manager will discuss resolution of the issue with NYSDEC technical staff and implement necessary corrective actions (for example re-sampling);

- Data that are non-detect but have elevated reporting limits due to blank contamination or matrix interference will be compared to screening values. If reporting limits exceed the screening values, then results will be handled as incomplete data as described above; and

- Data that are qualified as estimated will be used for all project decision making. If an estimated result is close to a screening value, then there is uncertainty in any conclusions as to whether the result exceeds the screening value. The data user must evaluate the potential uncertainty in developing recommendations for the site. If estimated results become critical data points in making final decisions on the site, the Project Manager and NYSDEC technical staff should evaluate the use of the results and may consider the data point incomplete.

The assessment process involves comparing analytical results to screening values and background concentrations to determine if the contamination present is site-related (i.e., above background levels) or significant (i.e., above screening values). Additional data assessment may be performed on a site-by-site basis.

A Data Usability Summary Report Model

Attachment A – Sample Data Usability Summary Report

The analytical data provided by the laboratory were reviewed for precision, accuracy, and completeness per NYSDEC Division of Environmental Remediation Guidance for the Development of DUSRs (March 2010). Specific criteria for QC limits were obtained from the project QAPP. Compliance with the project QA program is indicated on the in the checklist and tables. Any major or minor concerns affected data usability are summarized listed below. The checklist and tables also indicate whether data qualification is required and/or the type of qualifier assigned.

Reference:

ProjectID	Lab Work Order
DHOC	L1227

Table 1 Sample Summary Tables from Electronic Data Deliverable

Work Order	Matrix	Sample ID	Lab ID	ID Corrections
L1227	GW	TB1-060112	L1227-01	
L1227	GW	ES1-5-R-060112	L1227-02	
L1227	GW	MP1-8S-R-060112	L1227-03	
L1227	GW	RB1-060112	L1227-04	
L1227	GW	MP1-9S-R-060112	L1227-05	
L1227	GW	MP1-13B-R-060112	L1227-06	
L1227	GW	MP1-13B-R-060112/Q	L1227-07	

General Sample Information	
Do Samples and Analyses on COC check against Lab Sample Tracking Form?	Yes
Did coolers arrive at lab between 2 and 6°C and in good condition as indicated on COC and Cooler Receipt Form?	Yes
Frequency of Field QC Samples Correct? Field Duplicate - 1/20 samples Trip Blank - Every cooler with VOCs waters only Equipment Blank - 1/ set of samples per day?	Yes – Project QC goals have been met.
All ASP Forms complete?	Yes
Case narrative present and complete?	Yes
Any holding time violations (See table below)?	No

The following tables are presented at the end of this DUSR and provided summaries of results outside QC criteria.

- Method Blanks Results (Table 2)
- Surrogates Outside Limits (Table 3)
- MS/MSD Outside Limits (Table 4)
- LCS Outside Limits (Table 5)

- Re-analysis Results (Table 6)
- Field Duplicate Results (Table 7)

Go to Tables List

Volatile Organics by GCMS	
Description	**Notes and Qualifiers**
Any compounds present in method, trip and field blanks (see Table 2)?	Yes. One organic compound was detected in the trip blank for this SDG.
For samples, if results are <5 times the blank or < 10 times blank for common laboratory contaminants then "U" flag data. Qualification also applies to TICs.	Results qualified as shown in Table 2B.
Surrogate for method blanks and LCS within limits?	Yes
Surrogate for samples and MS/MSD within limits? (See Table 3). All samples should be re-analyzed for VOCs? Samples should re-analyzed if >1 BN and/or > AP for BNAs is out. Matrix effects should be established.	Yes
Laboratory QC frequency one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Yes
MS/MSD within QC criteria (see Table 4)? If out and LCS is compliant, then J flag positive data in original sample due to matrix?	Yes
LCS within QC criteria (see Table 5)? If out, and the recovery high with no positive values, then no data qualification is required.	Yes
Were any samples re-analyzed or diluted (see Table 6)? For any sample re-analysis and dilutions is only one reportable result by flagged?	No.
For TICs are there any system related compounds that should not be reported?	No.
Do field duplicate results show good precision for all compounds except TICs (see Table 7)?	Yes. Samples MP1-13B-R-060112 and MP1-13B-R-060112/Q are a field duplicate sample pair – see Table 7.

Summary of Potential Impacts on Data Usability
Major Concerns
None
Minor Concerns
Result qualified due to trip blank contamination.

Table 2 - List of Positive Results for Blank Samples

Method	Sample ID	Samp Type	Analyte	Result	Qual	Anal Type	Units	MDL	PQL
SW8260	TB1-060112	BLK	Methylene chloride	1.3	J	W	µg/L	0.41	5.0

Table 2A - List of Samples Qualified for Method Blank Contamination
None

Table 2B - List of Samples Qualified for Field Blank Contamination

Method	Trip Blank	Matrix	Analyte	Blank Result	Sample Result	Lab Qual	PQL	Affected Samples	Sample Flag
SW8260	TB1-060112	GW	Methylene chloride	1.3	2.1	J	5.0	RB1-060112	U Qualified

Table 3 - List of Samples with Surrogates outside Control Limits
None

Table 4 - List MS/MSD Recoveries and RPDs outside Control Limits
None.

Table 5 - List LCS Recoveries outside Control Limits
None.

Table 6 –Samples that were Reanalyzed
None.

Table 7 – Summary of Field Duplicate Results

Method	Analyte	MP1-13B-R-060112	MP1-13B-R-060112/Q	RPD	Rating	Sample Qualifier
SW8260	Tetrachloroethene	3.6 J	3.6 J	0	Good	None
SW8260	Trichloroethene	0.80 J	0.81 J	1.24	Good	None

Key:
A = Analyte
NC = Not Calculated
ND = Not Detected
PQL = Practical Quantitation Limit
RPD = Relative Percent Difference
T = Tentatively Identified Compound

Site Management Forms

Inspection Form

New York State Department of Environmental Conservation
Inactive Hazardous Waste Site

Site Name: Al-tech Specialty Steel Corporation Site		**NYSDEC Site Number: 907022**	**NYSDEC PM:**
Site Location: City of Dunkirk, County of Chautauqua		**Site Classification # (circle):** 1 2 2a 3 4	**Primary Site Contact:**
Site Inspection Date:	**Purpose of Inspection:**		
Name of Inspector:	**Title:**	**Agency/Company:**	**Address:**
Phone Number:			

Site Cover System				
Vegetative Cover Condition	*Good*	*Poor*	*NA*	**Cover System Observations:**
Evidence of Vegetative Stress	*Yes*	*No*	*NA*	
Mowing Required	*Yes*	*No*	*NA*	
Presence of Debris	*Yes*	*No*	*NA*	
Evidence of Ponded Water	*Yes*	*No*	*NA*	
Exposed Geotextile	*Yes*	*No*	*NA*	
Evidence of Settlement	*Yes*	*No*	*NA*	
Evidence of Cracked/Damaged Pavement	*Yes*	*No*	*NA*	
Evidence of Erosion	*Yes*	*No*	*NA*	
Presence of Woody Growth	*Yes*	*No*	*NA*	
Animal Burrows	*Yes*	*No*	*NA*	
Environmental Monitoring Locations				
Monitoring Well RFI-18	*Good*	*Poor*	*NA*	**Monitoring Network Observations:**
Monitoring Well RFI-36	*Good*	*Poor*	*NA*	
Monitoring Well RFI-35	*Good*	*Poor*	*NA*	
Monitoring Well AL-1	*Good*	*Poor*	*NA*	
Monitoring Well AL-2	*Good*	*Poor*	*NA*	
Monitoring Well AL-3	*Good*	*Poor*	*NA*	
Monitoring Well TW-14	*Good*	*Poor*	*NA*	
Monitoring Well TW-8	*Good*	*Poor*	*NA*	
Monitoring Well TW-15	*Good*	*Poor*	*NA*	
Monitoring Well TW-7	*Good*	*Poor*	*NA*	
Monitoring Well TW-13	*Good*	*Poor*	*NA*	
Monitoring Well TW-12	*Good*	*Poor*	*NA*	
Monitoring Well TW-6	*Good*	*Poor*	*NA*	
Monitoring Well MW-2008	*Good*	*Poor*	*NA*	
Monitoring Well RFI-34	*Good*	*Poor*	*NA*	
Monitoring Well RFI-26	*Good*	*Poor*	*NA*	
Monitoring Well RFI-05	*Good*	*Poor*	*NA*	
Monitoring Well AL-4	*Good*	*Poor*	*NA*	
Monitoring Well LAE-4	*Good*	*Poor*	*NA*	
Monitoring Well RFI-31	*Good*	*Poor*	*NA*	
Monitoring Well RFI-32	*Good*	*Poor*	*NA*	
Monitoring Well RFI-33	*Good*	*Poor*	*NA*	
List other applicable location types and their overall condition				
Stormwater Collection and Drainage				
Stormwater Channels	*Good*	*Poor*	*NA*	**Stormwater Collection and Drainage Observations:**
Drainage Grates	*Good*	*Poor*	*NA*	
Other Drainage Structures/Pipes	*Good*	*Poor*	*NA*	

Inspection Form

New York State Department of Environmental Conservation
Inactive Hazardous Waste Site

Interviews/Additional Contacts			
Name/Title	**Phone:**	**Company/Entity**	**Contact Information**

Additional Observation Notes:

Photograph Log:
Photograph 1
Photograph 2
Photograph 3
Photograph 4
Photograph 5
Photograph 6
Photograph 7
Photograph 8
Photograph 9
Photograph 10

Performance Monitoring

Were check samples collected during this visit? Yes No

Sample type collected *(circle or write in other)*: Groundwater Soil Air Surface Water

List Parameters/Methods Collected Per Media:

Analytical Laboratory/Location:

Sample Observations:

Summary of Green Remediation Metrics for Site Management

Site Name: _____ Site Code: _____
Address: _____ City: _____
State: _____ Zip Code: _____ County: _____

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: _____

Current Reporting Period
Reporting Period From: _____ To: _____

Contact Information
Preparer's Name: _____ Phone No.: _____
Preparer's Affiliation: _____

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	**Total to Date (tons)**
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		
Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Other:

CERTIFICATION BY CONTRACTOR
I, _____ (**Name**) do hereby certify that I am _____ (**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including that last day of the period covered by this application. _____ **Date** **Contractor**

J

Soils Management Plan

Soils Management Plan
for the Al-Tech Specialty Steel Corporation Site (OU-1)
NYSDEC Site No. 9-07-022
Dunkirk, New York
May 2019

Prepared by: Ecology and Environment Engineering, P.C.

Reviewed by: NYSDEC

Accepted for Use:

Revisions:

Dated	Revisions	By

1.0 Introduction

This Soils Management Plan (the Plan) has been prepared for use in conjunction with the Al-Tech Specialty Steel Corporation OU-1 (Al-Tech) Site Management Plan (SMP). The purpose of this Plan is to provide guidance for the proper handling and final disposition of potentially contaminated soils, subsurface debris, and miscellaneous materials excavated in and around the site boundaries (see Figure 1-2 of the SMP). Any excavation of existing soils, including sub-base materials; decommissioning of monitoring wells/piezometers and other subsurface utilities, and the import or export of soil to or from the site shall adhere to this Plan.

All soil disturbance activities must be performed in accordance with this Plan, the Community Protection Plan (CPP), the Generic Health and Safety Plan (HASP), the Institutional and Engineering Controls (IC/EC) presented in the Al-Tech SMP, and the New York State Department of Environmental Conservation (NYSDEC) Department of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation (NYSDEC 2010).

2.0 Disclaimer

A site-specific work plan must be prepared that addresses the methods of excavation or maintenance to be performed, precipitation runoff, surface water and groundwater control, handling and storing of the contaminated soils, debris, miscellaneous materials, and dewatering fluids, on site, and the proper transportation and disposal of the sediment or excavated material. The testing and analytical requirements must be described in detail as part of the work plan. In addition, a HASP and specifications and drawings must be prepared and submitted to the NYSDEC for their comment and approval prior to performing any maintenance activities or excavations within these potentially contaminated areas.

3.0 Personal Protective Equipment

Personal protective equipment (PPE) must be used to prevent exposure to potentially contaminated soil when excavation or maintenance activities are planned in the designated areas of the Al-Tech Site, where soils, subsurface debris, or miscellaneous materials may be contaminated in accordance with the HASP.

4.0 Sample Guidelines

Samples shall be collected from on-site soil that is intended to be reused on the site, and soil that is imported to or exported from the site, pursuant to the NYSDEC DER-10 Table 5.4(e)4 "Reuse of Soil" and Table 5.4(e)10 "Recommended Number of Soil Samples for Soil Imported To or Exported From a Site". Soil cleanup goals shall be in accordance with NYSDEC DER-10 Appendix 5 Allowable Constituent Levels for Imported Fill or Soil Subdivision 5.4(e).

Soil analytes that exceed the Restricted Use SCOs and the Commercial Use SCOs at the site after completion of the remedial action include the following: metals (arsenic, chromium, barium, lead, and cadmium); VOCs (TCE); and PCBs. Soil samples exceeded SCOs for arsenic in 17 out of 124 documentation samples (approximately 14 percent) with a maximum value of 37 ppm located 6-feet below grade on the floor in Area D. Soil samples exceeded SCOs for barium in 4 out of 124 documentation samples (approximately 3 percent) with a maximum value of 3,300 ppm located 2.0-feet below grade along a side wall in Area G. Soil samples exceeded SCOs for cadmium in 7 out of 124 documentation samples (approximately 6 percent) with a maximum value of 84.8 ppm located 8.0-feet below grade along a side wall in Area N. Soil samples exceeded SCOs for chromium in 14 out of 124 documentation samples (approximately 11 percent) with a maximum value of 8,820 ppm located 6-feet below grade on the floor in Area C. Soil samples exceeded SCOs for lead in 10 out of 124 documentation samples (approximately 8 percent) with a maximum value of 10,400 ppm located 0.5-feet below grade along a side wall in Area E. Soil samples exceeded SCOs for PCBs in 7 out of 124 documentation samples (approximately 6 percent) with a maximum value of 60.7 ppm located 2.0-feet below grade along a side wall in Area J. Soil samples exceeded SCOs for TCE in 2 out of 124 documentation samples (approximately 2 percent) with a maximum value of 1,930 ppm located along a side wall in Area N.

5.0 Excavated Material

This section describes the minimum requirements that must be followed when handling contaminated excavated materials in the designated areas of the Al-Tech Site. Additional requirements may be added as necessary by NYSDEC. If site disturbance is over one acre, NYSDEC Erosion and Sediment Control requirements are mandatory.

Soils, subsurface debris and miscellaneous materials excavated from below 6 feet below ground surface (BGS) at the Al-Tech Site may be considered to be contaminated and shall be evaluated for the potential to expose site contaminants to the environment. Soils above 6 feet BGS still should be considered to be potentially contaminated and necessary precautions to prevent against exposure to this potential contamination should be taken.

a. All maintenance activities and excavations should be completed during non-precipitation events unless these activities must be performed immediately. A water-handling and

treatment plan must be developed for inclusion into the Plan as a contingency in the event that emergency maintenance or excavation activities must be performed during a precipitation event. Contaminated surface and groundwater can be discharged through the treatment system equalization tank if filtered prior to discharge to the tank. Filtrate materials shall be disposed of along with any site soils if they meet the requirements of the receiving landfill.

b. Prior to performing any maintenance or excavation activity, samples of the affected soils, subsurface debris, and excavated miscellaneous materials (either new or from an existing stockpile) must be submitted to a pre-approved laboratory for analysis (a) to determine the appropriate disposal method, and (b) for waste characterization and profiling for disposal. The analysis must be performed by a laboratory certificated by the National Voluntary Laboratory Accredited Program (NVLAP). If, in the opinion of NYSDEC, the materials are considered free of contamination, then the materials may be handled by standard construction means and methods and in conformance with NYSDEC disposal requirements.

c. Transport of excavated materials (if deemed necessary) must be performed using approved weathertight containers. Dump trucks may be used if their beds are lined with 40-mil polyethylene or an approved equivalent.

d. Weathertight containers, such as roll-offs and drums, should be used to store excavated materials. However, as an option for small quantities of materials, excavated materials may be stored on a 40-mil polyethylene base sheet and covered with a waterproof cover when not being added to or removed.

e. Non-contaminated drainage from the waterproof cover must be directed away from the stockpiled soils suspected of being contaminated and collected in a designed water-tight sump or containers for observation or analysis prior to being manually discharged to an on-site ditch or drainageway or the treatment system equalization tank.

f. Uncontaminated soils and subsurface debris must not come into contact with excavated materials. If the contaminated soils come into contact with the stored excavated materials, these soils must also be considered contaminated.

g. Contaminated materials should be stored on site for as short a period as possible prior to disposal. In no event should the materials be stored for longer than 90 days.

h. Transport of contaminated excavated materials (if deemed necessary) shall be provided by a certified transportation company that can ship either hazardous waste or solid wastes.

i. Disposal of contaminated excavated soils, subsurface debris, and miscellaneous materials shall be at an approved disposal facility. Sampling and analysis for disposal requirements (i.e. TCLP) shall be performed as described in the Altech SMP. Additional requirements of the disposal company receiving the waste (if deemed necessary) shall also be followed.

6.0 Backfill Material

All backfill materials shall be obtained from an approved source, free of all contaminants per the NYSDEC DER-10 requirements, and suitable for the intended purpose (NYSDEC 2010). Location of the source materials and analytical results are to be provided to demonstrate

acceptability of the materials. Uncontaminated on-site soils should be used as on-site backfill when feasible. The following stipulations shall be adhered to when using backfill materials.

a. Backfill materials used around sewers and other below-grade features shall be placed and compacted such that no voids will result and full support will be provided to the below-grade feature and the pavement structure in the vicinity of the below-grade feature.

b. Backfill material used under floor slabs must be well-graded crushed stone and placed and compacted to support the anticipated loadings within buildings.

c. Backfill used in other areas shall be material appropriate for that area's use.

d. Backfill used beneath pavements shall be placed on a prepared subgrade in 6-inch lifts and compacted to 95% of the maximum dry density per American Society for Testing and Materials 1557 for modified Proctor. The combined thickness of the lifts shall be at least the same as the thickness of the existing fill.

e. Backfill used in unpaved areas must be compacted as necessary and be suitable for the intended use of the area being backfilled.

7.0 Investigation-Derived Waste

At least one waste stream type of investigation derived waste (IDW) is anticipated to be generated: Personal Protective Equipment (PPE). NYSDEC will determine, on a case by case basis, what other wastes will require disposal. Waste streams will be segregated and not mixed. Existing data indicates that there are no direct contact exposure concerns, so decontamination waters will be disposed of by discharging onto the ground in an unpaved area. In the event that evidence of significant contamination is present (e.g., strong odors, sheen, product), the waste will be containerized in steel drums and stored on site pending analysis and potential off-site disposal. All expendable materials generated during the investigation (including, but not limited to, gloves and plastic sheeting) will be bagged and disposed of off-site as non-regulated solid waste.

8.0 References

New York State Department of Environmental Conservation (NYSDEC). 2010. *Final Technical Guidance for Site Investigation and Remediation*, DER-10, 3 May 2010.

K

Field Sampling Plan for Groundwater Monitoring Wells

Field Sampling Plan
for Groundwater Monitoring Wells
for the Al-Tech Specialty Steel Corporation Site (OU-1)
NYSDEC Site No. 9-07-022
Dunkirk, New York

May 2019

Prepared by: Ecology and Environment Engineering and Geology, P.C.

Reviewed by: NYSDEC

Accepted for Use:

Revisions:

Dated	Revisions	By

1.0 Objective

To perform a sampling/analytical program to evaluate trends on groundwater concentrations of lead, arsenic, barium, cadmium, chromium, TCE, and PCB at the site. The Al-tech Specialty Steel Corporation Site OU-1 (the site) is located at 100-190 West Lucas Avenue in the City of Dunkirk, County of Chautauqua, New York (see Figure 1-1 of the Site Management Plan [SMP]).

2.0 Site Access and Coordination

2.1 Access to the Al-Tech Site

Access to the site should be coordinated with the site Owner prior to a sampling event. The sampling team and/or the work assignment Project Manager shall call at least one week in advance to notify the Owner of the date of groundwater monitoring well sampling. The site owner, as of the date of this plan, is RealCo Inc. All sampling will be conducted in accordance with the American Society for Testing and Material (ASTM) Standard Guide for sampling Groundwater Monitoring Wells D-4448-85a or most recent revision (ASTM 1986).

2.2 NYSDEC Coordination

The NYSDEC Project Manager should be informed of all sampling events at the Site and can be contacted at NYSDEC's central office in Albany, New York, at the number shown on the Contact List in Appendix B of the SMP.

3.0 Site Monitoring Wells

3.1 Monitoring Well Description

There are a total of 23 active groundwater monitoring wells locations on site at the Al-Tech Site property (AL-1, AL-2, AL-3, AL-4, LAE-4, RFI-05, RFI-18, RFI-26, RFI-27, RFI-31, RFI-32, RFI-33, RFI-34, RFI-35, RFI-36, MW-2008, TW-6, TW-7, TW-8, TW-12, TW-13, TW-14, and TW-15). The locations of the onsite and offsite wells are shown in Figure 4-1. Two monitoring wells (MW-21 and RW-1) were decommissioned and four monitoring wells (AL-1, AL-2, AL-3 and AL-4) were installed during the remedial effort. These wells allow for the evaluation of local groundwater contaminant trends. Available groundwater monitoring well construction logs are provided in Appendix D of the SMP.

3.2 Monitoring Well Inspection

During the sampling of each monitoring well, an inspection of the well's physical condition will be performed. Minor well repairs, including well labeling, will be made as needed. The need for more extensive repairs will be noted, if necessary. More extensive well repairs will be noted on the Monitoring Well Inspection Checklist (see Attachment A). The SMP should be consulted for information regarding monitoring well decommissioning, abandonment, and repairs. The NYSDEC Project Manager will approve all activities prior to implementation as required in the SMP.

3.3 Groundwater Monitoring Well Decommissioning

When monitoring wells have been rendered unusable, they will be decommissioned and replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "CP-43: Groundwater Monitoring Well Decommissioning Procedures" (NYSDEC 2009). The NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement.

4.0 Groundwater Sampling

4.1 Analytical Plan

Groundwater monitoring wells will be sampled and analyzed for Target Compound List Compounds in accordance with NYSDEC Analytical Services Protocol, SW – 846 United States Environmental Protection Agency (EPA) Methods 6010, 8260B, and 8081/8082 to analyze for lead, arsenic, barium, cadmium, chromium, TCE, and PCB. Groundwater sampling will be performed using the equipment and procedures described in Sections 4.2 and 4.3, respectively.

4.2 Equipment and Supplies

- Water level indicator;
- Appropriate keys for well cap locks;
- Stopwatch, logbook, calculator;
- Typhoon pump with power source and dedicated polyethylene tubing;
- pH/temperature/specific conductance meter;

- Turbidity meter;
- Sample bottles, labels, custody seals, chain-of-custody forms; and
- Packing material and cooler with ice.

4.3 Groundwater Monitoring Well Sampling Procedures

All wells will be purged prior to sampling (Gibb 1980). Refer to the instructions below and the Well Purge and Sample Record Form provided in Attachment B.

- Prior to purging, record the static depth to water and total well depth as measured from the top of inner casing (PVC) to within ±0.01 foot in each well. The volume of standing water will be calculated in gallons or liters.
- Purge each well of three to five times the volume of water standing in the well using the Typhoon pump and dedicated tubing. Purge at a rate that minimizes drawdown of the water level in the well. After stabilization, the depth to water should not change by more than 0.1 foot. Purged water will be handled as described in Section 9. Temperature, pH, specific conductance, and turbidity will be measured and recorded, at a minimum, initially, after each well volume, and just prior to sampling. Purging will be performed until pH, specific conductance, temperature, and turbidity have stabilized. Stabilization shall be considered to be achieved after three consecutive readings are within ±0.1 pH units, 5% for temperature and specific conductance, and 10% for turbidity.
- After completion of purging, slow the flow rate of the pump down to as low a rate as practicable for sampling. Fill bottles, leaving minimum headspace. The proper collection of a sample for dissolved VOCs requires minimal disturbance of the sample to limit volatilization and subsequent loss of volatiles from the sample. The following procedures should be followed when collecting volatile organic analysis (VOA) samples (Korte 1985):
    - Open the vial, set the cap in a clean place, and place the proper amount of preservatives (HCl) in the vial;
    - Fill the vial to the top until a convex meniscus forms on the top of the vial. Do not overfill the vial;
    - Check that the cap has not been contaminated, and carefully cap the vial. Place the cap directly over the top and screw down firmly. Do not over tighten and break the cap;
    - Invert the vial and tap gently. If an air bubble appears, discard the sample and begin again. It is imperative that no entrapped air remains in the sample vial; and
    - Place the VOA vial in a cooler, oriented so that it is lying on its side, not straight up.
- Label sample bottles as specified in Section 6. All samples requiring preservation must be preserved as soon as practically possible, ideally immediately at the time of sample collection. Upon collection, immediately place the samples in a cooler maintained with

ice at 4°C. Prepare chain-of-custody pending shipment in accordance with the procedures specified in Section 6.

5.0 Field Quality Control Samples

Field quality control (QC) samples help determine whether project data quality objectives are being met. Analyzed in the laboratory as ordinary field samples, they are used to assess sampling and transport procedures as possible sources of sample contamination and to document overall sampling and analytical precision. One duplicate sample will be collected per 20 samples per sampling round and analyzed for all contaminants stated in Section 4.1. Additional volume will be collected for matrix spike/matrix spike duplicate (MS/MSD) analyses at the rate of one MS/MSD sample set per 20 samples during each sampling round. Rinsate blank samples will not be required.

6.0 Sample Containers, Labeling, Packaging and Shipping, and Custody

The volumes and containers for aqueous samples, as well as sample preservation are presented in Table 2-1 of the SMP. Sample containers pre-washed and prepared in accordance with EPA bottle washing procedures will be provided by the laboratory. During the holding period prior to delivery to the laboratory, the samples will be chilled using wet ice with the goal of achieving 4±2°Celsius.

6.1 Sample Labeling

All samples will be assigned a unique sample identifier. Labels for each sample will contain the sample identifier, date of sample collection, analytical parameters, and type of preservation used. Any change in the label information prepared prior to the sample collection will be initialed by the sampler.

An example of the sample identifier is ATS-MW01-MMMYY, where:

ATS = Al-Tech Site
MW01 = groundwater monitoring well number as listed in Section 3.1
MMMYY = abbreviated month and year of sample collection

6.2 Sample Shipment

Sample containers will be placed inside sealed plastic bags as a precaution against cross-contamination caused by leakage or breakage. The bags will be placed in coolers in such a manner as to minimize the chance of breakage during shipment. Ice in plastic bags will be placed in the coolers to chill the samples with the goal of achieving 4±2°C throughout the shipment.

Sample shipment will be performed in strict accordance with all applicable U.S. Department of Transportation (DOT) regulations. The samples will be shipped to a NYSDEC-approved laboratory.

6.3 Sample Custody

A sample is considered to be in custody under the following situations:

- The sample is directly in your possession;
- The sample is clearly in your view;
- The sample is placed in a locked location; or
- The sample is in a designated secure area.

In order to demonstrate that the samples and coolers have not been tampered with during shipment, adhesive custody seals will be used. The custody seals will be placed either around the cap of each sample container or across the cooler lids in such a manner that they will be visibly disturbed upon opening of the sample container or cooler. The seals will be signed or initialed and dated by field personnel when affixed to the container and cooler.

Documentation of sample chain-of-custody is necessary to demonstrate that the integrity of the samples has not been compromised between collection and delivery to the laboratory. Each sample cooler will be accompanied by a chain-of-custody record to document the transfer of custody from the field to the laboratory. All information requested in the chain-of-custody record will be completed. A standard turnaround time will be requested for sample analysis. One copy of the chain-of-custody documents will be completed. It is the responsibility of the laboratory to document the condition of custody seals and sample integrity upon receipt.

6.4 Turnaround Time for Analysis

All groundwater samples will be analyzed at the approved laboratory within a turnaround time of fourteen days.

7.0 Health and Safety

Health and safety procedures will be as described in the site-specific Health and Safety Plan (sHASP) and its amendment for these groundwater sampling tasks. Care will be taken when opening any well to avoid breathing of vapors, particularly methane, that have potentially accumulated in the headspace inside the well. In addition, smoking is strictly prohibited during sampling due to the potential for methane buildup in the headspace inside the well. Wasps/bees in well casings are also concerns. All work is expected to be completed in Level D personal protective equipment (PPE).

The generic Health and Safety Plan for this work plan is provided as Appendix I of the SMP.

8.0 Decontamination Procedures

All decontamination will be performed in accordance with NYSDEC-approved procedures. Sampling methods and equipment have been chosen to minimize decontamination requirements and prevent the possibility of cross-contamination. Any non-dedicated sampling equipment will be decontaminated using the procedure above or by the following procedure:

- Initially remove all foreign matter;
- Wash in a laboratory-grade detergent solution (e.g., Alconox);

- Rinse with deionized or distilled water; and
- Allow to air dry.

Fluids generated during decontamination will be handled according to the procedures outlined in Section 9.

9.0 Investigation-Derived Waste

At least two waste stream types of investigation-derived waste (IDW) will be generated: groundwater from purging and PPE. NYSDEC will determine, on a case-by-case basis, what other wastes will require disposal. Waste streams will be segregated and not mixed. Existing data indicates that there are no direct contact exposure concerns, so purge and decontamination will be disposed of by discharging onto the ground in an unpaved area. In the event that evidence of significant contamination is present (e.g., strong odors, sheen, product), the waste will be containerized in steel drums and stored on site pending analysis and potential off-site disposal. All expendable materials generated during the investigation (including, but not limited to, gloves and plastic sheeting) will be bagged and disposed of off-site as non-regulated solid waste.

10.0 Report

A brief report summarizing all field activities and providing a summary of the analytical results will be provided to the NYSDEC Project Manager upon receipt and review of the analytical report from the laboratory. Groundwater sampling results electronic data must be provided in accordance with the most recent version of NYSDEC standardized electronic data deliverable (EDD) format. Further information on EDD is available at: http://www.dec.ny.gov/chemical/62440.html.

11.0 Schedule

Monitoring well evaluation and sampling is expected to be performed on an annual basis. Sampling is to be performed in approximately May of each year.

12.0 References

American Society for Testing and Material (ASTM). 1986. *Standard Guide for Sampling Groundwater Monitoring Wells*, D-4448-85a, Philadelphia, Pennsylvania.

Gibb, J.P., Schuller, R.M., and Griffin, R.A. 1980. *Monitoring Well Sampling and Preservation Techniques*, EPA-600/9-80-010.

Korte, N. and P. Kearl. 1985. *Procedures for the Collection and Preservation of Groundwater and Surface Water Samples and for the Installation of Monitoring Wells*, Second Edition, U.S. Department of Energy, GJ/TMC-08, Technical Measures Center, Grand Junction Projects Office.

New York State Department of Environmental Conservation (NYSDEC). 2009. Commissioner Policy 43: *Groundwater Monitoring Well Decommissioning Policy*. November 2009.

Attachment A

Monitoring Well Inspection Checklist

Monitoring Well Inspection Checklist
Al-tech Specialty Steel Corporation Site, Dunkirk, NY
NYSDEC Site No. 907022

Well Number	Water Level (feet TOIC)	Current Depth (feet TOIC)	Well Completion (A/F)	Well Paint (G/F/P)	Casing Lock (G/F/P)	Protective Cover (G/F/P)	Inner Well Cap (G/F/P)	Equipment in Well (B/U/H)	Obstruction in Well (Y/N)	Water in Annulus (Y/N)	Concrete Pad (G/F/P)	Inspection Date	Comments/Needs
AL-1													
AL-2													
AL-3													
AL-4													
LAE-4													
RFI-05													
RFI-18													
RFI-26													
RFI-27													
RFI-31													
RFI-32													
RFI-33													
RFI-34													
RFI-35													
RFI-26													
MW-2008													
TW-6													

Monitoring Well Inspection Checklist
Al-tech Specialty Steel Corporation Site, Dunkirk, NY
NYSDEC Site No. 907022

Well Number	Water Level (feet TOIC)	Current Depth (feet TOIC)	Well Completion (A/F)	Well Paint (G/F/P)	Casing Lock (G/F/P)	Protective Cover (G/F/P)	Inner Well Cap (G/F/P)	Equipment in Well (B/U/H)	Obstruction in Well (Y/N)	Water in Annulus (Y/N)	Concrete Pad (G/F/P)	Inspection Date	Comments/Needs
TW-7													
TW-8													
TW-12													
TW-13													
TW-14													
TW-15													

Attachment B

Groundwater Well Purge and Sample Record Form

WELL PURGE AND SAMPLE RECORD

Site Name/Location: _____ Well ID: _____

Project No.: _____ Date: _____

Initial Depth to Water: _____ feet TOIC Start Time: _____

Total Well Depth: _____ feet TOIC End Time: _____

Depth to Pump: _____ feet TOIC ☐ Bailer ☐ Pump

Initial Pump Rate: _____ Lpm / gpm Pump Type: _____

adjusted to: _____ at _____ minutes Well Diameter: _____ inches

adjusted to: _____ at _____ minutes 1x Well Volume: _____ gallons

Time	Purge Volume (gallons/liters)	pH (s.u.)	Temp. (°C/°F)	ORP (mV)	Conductivity (µS/cm mS/cm)	DO (mg/L)	Turbidity (NTU)	Water Level (feet)
Final Sample Data:								

Sample ID: _____ Duplicate? ☐ Dupe Samp ID: _____

Sample Time: _____ MS/MSD? ☐

Analyses:	Methods:
☐ VOCs	☐ CLP
☐ SVOCs	☐ SW846
☐ PCBs	☐ Drink. Wtr.
☐ Metals	☐ _____
☐ _____	☐ _____

Comments: _____

Sampler(s): _____