

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau B

625 Broadway, 12th Floor, Albany, NY 12233-7016

P: (518) 402-9768 | F: (518) 402-9773

www.dec.ny.gov

May 19, 2017

Shawn J. Tollin
Manager, Environmental Remediation
FMC Corporation
FMC Tower at Cira Centre South
2929 Walnut Street
Philadelphia, PA 19104

Dear Mr. Tollin:

Re: FMC Corporation, Middleport, NY
EPA ID No. NYD002126845
AOC Docket No. II-RCRA-90-3008(h)-0209
DER Site No. 932014
RCRA Facility Investigation (RFI) Report Volume IX.b Eastern Parcel
(Operable Unit 11) dated October 17, 2016

The United States Environmental Protection Agency (USEPA) and the New York State Department of Environmental Conservation (NYSDEC), hereafter referred to as "the Agencies", in consultation with the New York State Department of Health (NYSDOH), have reviewed the above document and find that our previous comments have been satisfactorily addressed and therefore accept the RFI Report for Operable Unit 11 (OU11).

The Agencies have determined that a Corrective Measures Study (CMS) is necessary to address FMC related soil contamination and that FMC must perform a CMS in accordance with the requirements set forth in Attachment II of the above referenced AOC. The CMS should evaluate a range of alternatives to address the contamination identified in OU11, and at minimum evaluate the options below. Alternatives may be a combination of various options (e.g., hot spot removal with a cover system).

- Excavation of Contaminated soils to pre-existing conditions
- Installation of a Cover System
- Excavation of contaminated soils to meet CP-51 industrial soil cleanup objectives
- Contaminated soil Hot Spot Soil Removal

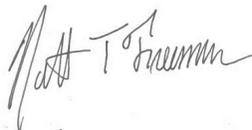
The alternatives should also address all closure and post closure requirements (Part 373) for the Eastern Surface Impoundment.

In accordance with Section VI.2 of the above referenced AOC, the Agencies are requesting that a CMS Workplan be submitted within sixty (60) days from the date of this letter.

The Final RFI must be made available for public review and comment in accordance with the AOC. The Agencies intend to public notice the Final RFI at the same time the Draft RCRA 373 Permit is made available to the public.

If you have questions concerning this letter, you may contact Mr. Nathan Freeman (NYSDEC) at (518) 402-9767 or Mr. Michael Infurna (USEPA) at (212) 637-4177.

Sincerely,



Nathan T. Freeman
NYSDEC Project Coordinator
Division of Environmental Remediation



Michael Infurna
USEPA Project Coordinator
Emergency and Remedial Response Division

ec: R. Schick/M. Ryan, DER
G. Burke/S. Dewes/N. Freeman, DER
A. Guglielmi OGC
M. Hinton NYSDEC Region 9 Buffalo
M. Infurna/S. Badalamenti, USEPA
S. Selmer/C. Bethoney, NYSDOH
W. Lachell, AMEC
D. Wright, Arcadis



FMC Corporation
2929 Walnut Street
Philadelphia, PA 19104
USA

215.299.6000
fmc.com

Transmitted Via Email and U.S. Mail

October 17, 2016

Mr. Nathan Freeman
NYSDEC Project Coordinator
Division of Environmental Remediation, Remedial Bureau B
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, NY 12233-7016

Mr. Michael Infurna
USEPA Project Coordinator
Emergency and Environmental Remediation Division
United States Environmental Protection Agency, Region II
290 Broadway, 22nd Floor
New York, NY 10007-1866

Re: FMC Corporation, Middleport, NY
EPA ID No. NYD002126845
AOC Docket No. II-RCRA-90-3008(h)-0209
DER Site No. 932014
*RCRA Facility Investigation (RFI) Report Volume IX.b Eastern Parcel
(Operable Unit 11), October 2016*

Dear Messrs. Freeman and Infurna:

FMC Corporation (FMC) is submitting the revised *RCRA Facility Investigation (RFI) Report Volume IX.b Eastern Parcel (Operable Unit 11)* (Eastern Parcel RFI Report) for FMC's Middleport, New York facility to the New York State Department of Environmental Conservation (NYSDEC) and United States Environmental Protection Agency (USEPA) (jointly "Agencies"), in accordance the above referenced Administrative Order on Consent (AOC). By letter dated September 2, 2016, the Agencies, in consultation with the New York State Department of Health (NYSDOH), provided FMC with comments on FMC's March 2014 draft Eastern Parcel RFI Report. By letter dated September 16, 2016, FMC provided responses to the Agencies' comments and indicated that the revised report would be submitted to the Agencies by October 17, 2016.

If you have questions or would like additional information, please contact me directly by telephone at (215) 299-6554 or by email at shawn.tollin@fmc.com.

Sincerely,

Shawn J. Tollin
Manager, Environmental Remediation

Enclosure – Eastern Parcel RFI Report, October 2016

cc:

S. Dewes, NYSDEC
M. Hinton, NYSDEC
S. Selmer, NYSDOH
C. Kaba, FMC Philadelphia
V. Hollinger, Esq., FMC Philadelphia
R. Kennedy, Esq., Hodgson Russ
W. Lachell, GEI Consultants
D. Wright, Arcadis

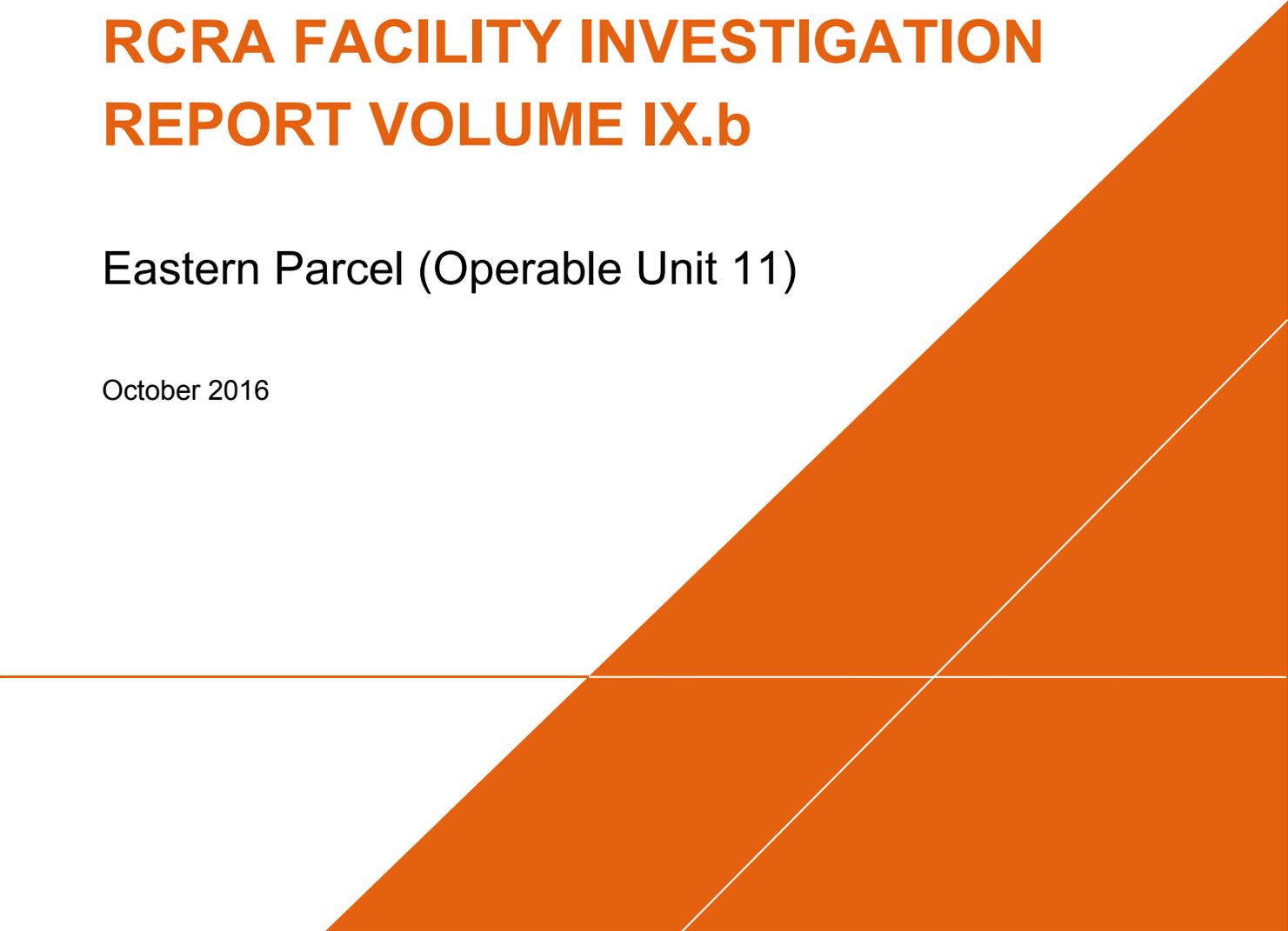


FMC Middleport
Middleport, New York

RCRA FACILITY INVESTIGATION REPORT VOLUME IX.b

Eastern Parcel (Operable Unit 11)

October 2016

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**RCRA FACILITY
INVESTIGATION
REPORT VOLUME IX.b**

Eastern Parcel (Operable Unit 11)

Prepared for:

FMC Corporation

Prepared by:

Arcadis of New York, Inc.

6723 Towpath Road

P.O. Box 66

Syracuse

New York 13214-0066

Tel 315 446 9120

Fax 315 449 0017

Our Ref.:

B0037787

Date:

October 2016

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ATTACHMENT (ON ATTACHED CD)

- 1 Correspondence

ACRONYMS AND ABBREVIATIONS

Agencies	NYSDEC and USEPA
AOC	Administrative Order on Consent
CAMU	Corrective Action Management Unit
CMS	Corrective Measures Study
CRA	Conestoga-Rovers & Associates, Inc.
CSI	Central Surface Impoundment
ESI	Eastern Surface Impoundment
ETU	ethylene thiourea
FMC	FMC Corporation
HDPE	high-density polyethylene
ID	Identification
IRM	Interim Remedial Measure
mg/kg	milligrams per kilogram
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU	Operable Unit
PCBs	polychlorinated biphenyls
PID	photoionization detector
ppm	parts-per-million
QA/QC	quality assurance / quality control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
Roy-Hart	Royalton-Hartland
SCOs	Soil Cleanup Objectives
SSLs	Soil Screening Levels
SSPL	Site-Specific Parameter List
SWMU	Solid Waste Management Unit
SVOCs	semi-volatile organic compounds

RCRA FACILITY INVESTIGATION REPORT VOLUME IX.b

UCL	upper confidence level
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds
WSI	Western Surface Impoundment

1 INTRODUCTION

FMC Corporation (FMC) owns and operates an agricultural formulation facility located in Middleport, New York (herein the “Facility” or “Site”; see Figure 1.1). FMC has been implementing a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the Facility and off-Site areas to delineate and evaluate the presence of Site-related constituents in soil and other environmental media. The Eastern Parcel RFI is one of several related investigation and remediation programs being implemented by FMC to satisfy RCRA requirements and the terms and conditions of the Administrative Order on Consent (AOC) (Docket No. II RCRA-90-3008(h) 0209) entered into by FMC and the Agencies, effective July 2, 1991.

In September 2012, the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA) (together the “Agencies”) requested that FMC complete the RFI for soil in the eastern portion of the Facility (Eastern Parcel; Figure 1.1), which has been designated as Operable Unit 11 (OU-11). The Eastern Parcel comprises the approximate 24-acre parcel identified with the Niagara County Assessors’ office as parcel # 86.00-3-9. The Eastern Parcel Soil Investigation Work Plan (Work Plan) (dated May 2013) proposed investigation activities to supplement existing data from prior investigations dating back to 1973, and was approved by the Agencies in a June 17, 2013, letter (see Attachment 1). The 2013 investigation focused on soil underlying: 1) the Eastern Surface Impoundment (ESI) Fill Area (used for placement of soil excavated as part of interim remedial actions), 2) the engineered clay soil cover (North Site Cover, constructed in 1987-1988), and 3) the stockpile of clean soil used to construct the North Site Cover.

1.1 Overview

The Facility and off-site areas are being addressed in a phased approach in which geographic areas and/or environmental media have been organized into study areas, which have been designated as OUs by the NYSDEC. In 2005, FMC and the Agencies agreed that a multi-volume RFI Report would be prepared to present and summarize RFI sampling data and results by study area. The RFI Report is organized into the following volumes:

Volume I	Background and Related Information
Volume II	Suspected Air Deposition Study Area 1 (South of the Erie Canal and West of the Niagara/Orleans County Line) and Culvert 105 Study Area South of the Erie Canal (soil; OU-2 & OU-4)
Volume III	Former FMC Research and Development (R&D) Property (soil; OU-9)
Volume IV	Culvert 105 and Flood Zone (soil; OU-5)
Volume V	Tributary One and Flood Plain South of Pearson/Stone Roads (soil & sediment; OU-6)
Volume VI	Tributary One and Flood Plain East of Stone Road to Confluence with Jeddo Creek (soil & sediment; OU-7)
Volume VII	Jeddo Creek, Johnson Creek, and Associated Flood Plains (soil & sediment; OU-8)

Volume VIII	Groundwater Investigations and Remediation Results (on-site & off-site groundwater; OU-10)
Volume IX.a	On-Site Soil, Surface Water, and Sediments (OU-1; excludes Eastern Parcel)
Volume IX.b	Eastern Parcel (soil; OU-11)
Volume X	Suspected Air Deposition Study Area 2 (North of the Erie Canal and East of the Niagara/Orleans County Line) (soil; OU-3)
Volume ES	Comprehensive Executive Summary for all volumes

To date, four of twelve RFI Report documents have been submitted and approved by the Agencies (RFI Report Volumes I, II and IV in 2009 and RFI Report Volume V in 2010). A detailed description of past operations and releases at the Facility, including activities at the Eastern Parcel, is provided in RFI Report Volume I.

1.2 RFI Objectives

This RFI was prepared to characterize the nature and extent of historical releases of FMC-related constituents from regulated units, solid waste management units (SWMUs) or groups of SWMUs, and other potential sources and to compile soil data to support a Corrective Measures Study (CMS) for the Eastern Parcel. The specific objectives of this RFI are:

1. Characterize the nature and extent of FMC-related constituents;
2. Define existing and potential migration pathways of FMC-related constituents;
3. Define physical features that affect or could affect the migration, containment, or remediation of FMC-related constituents;
4. Provide data needed to evaluate potential human health risk and ecological risk; and
5. Gather information necessary to support the development and evaluation of a corrective measure or measures to address impacted environmental media at the Eastern Parcel.

As stated in the Agencies' September 6, 2012, letter requesting an investigation work plan for the Eastern Parcel, groundwater is a separate operable unit (OU-10) and will be addressed under a separate RFI (Volume VIII). Nonetheless, this volume of the RFI Report evaluates the potential for leaching of constituents from soil to groundwater at the Eastern Parcel.

To achieve the RFI objectives for the Eastern Parcel, FMC is relying on data generated from 1973 through 2013. Soil sampling and analysis at the Eastern Parcel has been conducted for a range of constituents, along with the primary site constituent, arsenic. As discussed in Appendix A, in 2007 the Agencies advised that the appropriate criterion for delineation of potential FMC-related arsenic in Middleport area soil should be 20 milligrams per kilogram (mg/kg) (based on the weighted 95th percentile calculated in the 2001-2003 Gasport background study), but that other factors (e.g., historical land use, data variability, flood zone topography, wind patterns, ground features) may be considered. The delineation of soil containing arsenic above 20 mg/kg does not mean that soil will be required to be remediated in the future. The need for a corrective measure(s) and the nature and scope of the corrective measure(s) will be based on the outcome of a CMS for the Eastern Parcel.

1.3 RFI Findings

Findings from the Eastern Parcel soil RFI are as follows:

1. Eastern Parcel soil has been adequately evaluated for constituents that may have been released as a result of historical activities at the Eastern Parcel and operations at the Facility. Soil samples collected from surface grade to refusal on bedrock were analyzed for arsenic on an approximate 100-foot grid across the entire Eastern Parcel (total of 784 samples at 135 locations). In addition, 70 samples were analyzed for one or more of 118 constituents on the Facility's Site Specific Parameter List (SSPL).
2. Arsenic is the primary constituent for Eastern Parcel soil and ESI Fill material, based on a comparison to soil screening values. Non-arsenic constituent concentrations above screening values are within the extent of arsenic impacts.
3. Eastern Parcel soil arsenic concentrations are above the Middleport RFI soil arsenic delineation criterion of 20 mg/kg at a number of locations throughout the Eastern Parcel, extending horizontally to the property boundaries and vertically to bedrock, with exceedances primarily found on the northern portion of the Eastern Parcel (footprint of SWMU Group C).
4. The highest soil arsenic concentrations are found in the northern portion of the Eastern Parcel, but do not otherwise exhibit a horizontal or vertical distribution pattern.
5. Black material previously identified during the installation of groundwater extraction Trench A is present in approximate 1-inch to several inches thick layers in sampling locations within 30 feet west of Trench A, but not east of the trench. Beyond the Trench A area, black material was found only sporadically across the Eastern Parcel. The black material does not correspond with the highest soil arsenic concentrations.
6. An evaluation of the potential for constituents to leach from soil and fill to groundwater was conducted. The distribution of soil constituent concentrations exceeding their respective soil screening values protective of leaching to groundwater does not correlate with groundwater concentrations above groundwater standards, with the exception of arsenic near Trench A. Further, groundwater arsenic concentrations are not increasing over time, following placement of the ESI Fill material.
7. The RFI information and analytical data are sufficient to support the performance of a CMS.

1.4 Document Organization

The remainder of this document is organized as follows:

Section 2 – Property Description: Provides background information for the Eastern Parcel, including current, historical, and proposed land use.

Section 3 – Soil Sampling and Analysis: Summarizes the soil sampling conducted at the Eastern Parcel and the laboratory analysis of those samples.

Section 4 – Presentation of Data Set: Provides the soil analytical result and explains combined results.

Section 5 – Soil Screening Values: Identifies the values used to screen the soil analytical results.

Section 6 – Comparison to Industrial Land Use Screening Values: Compares the soil analytical results to industrial land use screening values.

Section 7 – Soil Leaching Evaluation: Evaluates potential constituent leaching from soil, including a comparison of the soil analytical results to soil screening values protective of groundwater (per 6 NYCRR Subpart 375-6), an evaluation of the spatial relation of the soil results to groundwater impacts, and an evaluation of analyses by the toxicity characteristic leaching procedure (TCLP) method.

Section 8 – Soil Arsenic Distribution: Evaluates the horizontal and vertical distribution of arsenic in soil.

Tables, Figures, Appendices, and Attachment: Provide supporting information referenced throughout the text.

2 PROPERTY DESCRIPTION

2.1 Historical Description

From at least 1931 through 1958, the Eastern Parcel was used as agricultural fields, with a barn located near Route 31 (aerial photographs are in RFI Report Volume I). FMC purchased the Eastern Parcel in the early 1960s, and used the northern portion of the Eastern Parcel for:

1. management of wastewater (1964 to 1977) in the unlined Eastern Process Wastewater Retention Basin (SWMU #3; gray shading on Figure 2.2), including process wastewater from approximately 1964 to 1977 and treated maintenance wastewater from approximately 1969 to 1975;
2. temporary storage of stormwater (1978 to 1988) in the unlined ESI (SWMU #50; gray dash line on Figure 2.2), which was constructed within the footprint of the closed Eastern Process Wastewater Basin in 1978 to provide additional stormwater retention capacity at the Facility, and was subsequently determined by the Agencies to be a RCRA-regulated hazardous waste storage unit;
3. placement of soil and debris (approximately 1,680 cubic yards) removed from the North Railroad Property during the NYSDEC-approved 1987-1988 Northern Ditches Interim Remedial Measure (IRM) within an engineered containment cell (i.e., 40-mil high-density polyethylene [HDPE] under and over liners fused together) immediately south of the ESI (SWMU #53; green rectangle on Figure 2.2); and
4. placement of non-hazardous soil and debris (approximately 99,450 cubic yards), generated by FMC during six interim remedial actions approved by the Agencies and conducted from 1996 to 2011, in the footprint of the former ESI (ESI Fill Area) (SWMU #54; hatch lines on Figure 2.2).

SWMUs #3, #53, and #54 together comprise SWMU Group C. SWMU #50 (former ESI), along with two other former stormwater impoundments, comprise SWMU Group N.

In addition to receiving surface water runoff from adjacent land, the ESI also received water from the Central Surface Impoundment (CSI) and/or Western Surface Impoundment (WSI) on at least one occasion. Specifically, during periods of restricted discharge of treated water from the Facility's water treatment plant, water from the WSI was pumped to the CSI, and then to the ESI to avoid overflows from the WSI. These actions were taken under direction from the NYSDEC. No records are available regarding volume quantities.

The ESI was taken out of service and drained of water in 1988, and has since only received precipitation that falls within its limits. Although FMC submitted a RCRA closure plan for the ESI in 1986, the ESI has not been closed and has been under inactive status, pursuant to the terms and conditions of the AOC, pending completion and implementation of a final corrective measure for the Eastern Parcel.

The northern portion of the Eastern Parcel, excepting the former location of the ESI, is covered with the Facility's North Site Cover (area inside purple line on Figure 2.2). The North Site Cover was designed to minimize infiltration of precipitation to the subsurface and direct runoff away from the northern portion of the Facility. The North Site Cover consists of a clay/sand/topsoil cover (2 feet minimum thickness). Clean fill approved by the Agencies for use as cover material has been stockpiled within an approximate 4-acre area on the southern portion of the Eastern Parcel, and a portion of the stockpile remains available for use.

2.2 Current Description

The Eastern Parcel is abutted to the west by an electrical substation and an overhead electrical lines easement through the Facility, to the south by Route 31 and an automobile salvage yard, to the east by an agricultural field and wooded land, and to the north by railroad tracks adjoined by an agricultural field.

Improvements to the Eastern Parcel (Figure 2.1) include gravel access roads and portions of the Facility's groundwater remediation and monitoring system components (*i.e.*, two blast-fractured bedrock groundwater recovery trenches [Trenches A and G], four extraction wells, 16 monitoring wells, and associated force main piping to transfer extracted groundwater to the Facility's water treatment plant).

The surface topography of the Eastern Parcel is characterized by fill materials from prior remediation activities placed at the Eastern Parcel and by engineered cover materials, as described in Section 2.1. Native soil beneath the fill and cover materials is a reddish, silty sand and clay, with sedimentary bedrock (shale, limestone) encountered approximately 4 to 10 feet below the starting elevation of the native soil.

2.3 Proposed Use

The Eastern Parcel is the location for the proposed Corrective Action Management Unit (CAMU) as set forth in the *Corrective Measures Study (CMS) Report – Suspected Air Deposition and Culvert 105 Study Areas* (2011) and as referenced in the Agencies' Final Statement of Basis (May 2013) for those study areas (proposed CAMU location is shown on Figure 2.2). The proposed 16.9-acre CAMU would be used for the permanent management of non-hazardous soil and debris generated in the course of remedial actions from study areas south of Pearson/Stone Roads. The northern portion of the proposed location for the CAMU includes the ESI Fill Area that is currently being used for management of remediation-derived soil and debris from Agencies-approved remedial actions (see Section 2.1), with final disposition to be determined during the remedy selection process for the Eastern Parcel.

3 SOIL SAMPLING AND ANALYSIS

Ten investigation programs have been conducted to sample and evaluate soil at, or adjacent to, the Eastern Parcel (beneath the ESI Fill and North Site Cover materials) for FMC-related constituents. An inventory of the programs is in Table 3.1. Sample locations are on Figure 3.1 and analytical data are in Appendix B. In summary, 784 soil samples at 135 locations were analyzed for arsenic and subsets of these samples were analyzed for one or more of 118 constituents on the Facility's SSPL. The SSPL was developed in 1988 to guide sampling programs for the Facility and off-Site areas (refer to RFI Report Volume I, Appendix 2a). The SSPL includes metals, chlorinated pesticides, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), herbicides, organophosphates, methyl carbamates, polychlorinated biphenyls (PCBs), ethylene thiourea (ETU) and other constituents.

A description of the soil sampling and analysis activities conducted at or adjacent to the Eastern Parcel during the ten investigation programs is provided in Sections 3.1 to 3.10, respectively. A description of remediation-derived soil placed at the Eastern Parcel (in the ESI Fill Area) and the North Site Cover materials is provided in Section 3.11.

3.1 1973 Facility Soil Arsenic Investigation

In 1973, soil borings were advanced on an approximate 100-foot grid across the entire Facility (including the Eastern Parcel), with soil samples collected from surface grade to refusal on bedrock and analyzed for arsenic. The portion of the investigation at or adjacent to the Eastern Parcel included 50 soil borings (identified by letter/number grid coordinates) across the southern portion and along the western property line of the Eastern Parcel, with 329 soil samples analyzed for arsenic. The soil analytical results are in the *1973 Site Boring Survey – Middleport Plant Site (1973)*.

3.2 1986-1987 Site Investigation

In 1986-1987, FMC conducted a Site Investigation. As part of the investigation, four soil borings ("21-86" through "24-86") were advanced to refusal on bedrock (approximately 6 to 8 feet deep) in the northern portion of the ESI and former retention basin. Six soil samples were analyzed for arsenic, lead, other metals, chlorinated pesticides, VOCs, methyl carbamates, and phenols. The soil analytical data are in the *Middleport Site Investigation Final Report (1987)*.

3.3 1987-1988 Northern Ditches Sampling

In 1987-1988, surface soil/sediment was removed from the drainage ditches along the railroad tracks north of the Facility (and the Eastern Parcel) during the Northern Ditches IRM. Soil samples were collected from the upper 6 inches of soil remaining after excavation (prior to backfilling) and analyzed for arsenic and lead. Two of the samples ("2263-1" and "2263-3") were collected near the northern property line of the Eastern Parcel. The soil analytical data are in the *Northern Ditches Restoration Construction Report (1988)*.

3.4 1990-1993 Off-Site Investigation

In 1990, as part of the Off-Site Investigation, six soil samples collected from two locations at the Eastern Parcel (“BH13” along the northern property line and “S18” along the southern property line) were analyzed for arsenic and lead, with two of the samples also analyzed for other metals, chlorinated pesticides, herbicides, organophosphates, methyl carbamates, and phenols. The soil analytical data are in the *Off-Site Investigation Report* (1993).

3.5 1993-1994 RFI Phase I Investigation

In 1993, soil sampling and analysis were conducted at the Facility’s SWMU locations. As part of this investigation, seven soil borings (“BH-C1” through “BH-C7”) were advanced within SWMU Group C, with nine samples analyzed for arsenic, lead, other metals, chlorinated pesticides, herbicides, organophosphates, methyl carbamates, phenols, ETU, ammonia, and/or PCBs. During installation of the blast-fractured groundwater recovery Trench A on the eastern portion of the Eastern Parcel in 1994, a black material was encountered in a portion of the trench alignment, and was analyzed (“East Wall”) for lead, other metals, chlorinated pesticides, and VOCs. The soil analytical data are in the *Field Investigation Summary Report – RCRA Facility Investigation* (1994).

3.6 1995-1996 RFI Phase II & III Investigations

Based on the results of the 1993-1994 analyses, additional sampling was conducted east of Trench A to further delineate the black material found during installation of Trench A and in boring BH-C5. In 1995-1996, six samples at two locations (“BH-C8” and “BH-C9”) east of Trench A were analyzed for arsenic, lead, and chlorinated pesticides, with four of the samples also analyzed for ETU. The soil analytical data are in the *Soil Sampling Report – Phase II RCRA Facility Investigation* (1996a) and in the *Supplemental Arsenic and Chlorinated Pesticide Soil Sampling Report* (1996b).

3.7 1996 Bleacher Area IRM

In 1996, prior to placement of soil excavated from the Bleacher Area IRM at the Royalton-Hartland School Property into the ESI Fill Area, six soil samples (0- to 6-inches) collected at four locations (“ESI-06” through “ESI-09B”) within the footprint of the former ESI were analyzed for arsenic, with three of the samples also analyzed for chlorinated pesticides and ETU. The soil analytical data are in the *Bleacher Area Excavation Construction Report* (1997).

3.8 2004 North Railroad Property Sampling

In 2004, as part of the pre-remediation delineation at the FMC-owned North Railroad Property, eight soil samples collected at one location (“ND03-S3”) along the northern property line of the Eastern Parcel were analyzed for arsenic, with three of the samples also analyzed for lead and chlorinated pesticides. The soil analytical data are in the *Technical Report on Data Sufficiency for the North Railroad Property* (2005).

3.9 2004 RFI Air Deposition Study Area 1 Sampling

In 2004, as part of the investigation of the suspected air deposition area south of the Erie Canal and west of the Niagara/Orleans county line, 21 soil samples were collected at eight locations (“R1b-J29” through “R1b-R29”) abutting the eastern property line, with analysis for arsenic. The soil analytical data are in the *RCRA Facility Investigation (RFI) Report Volume II – Suspected Air Deposition Study Area 1 and Culvert 105 Study Area South of the Erie Canal* (2009).

3.10 2013 RFI Sampling Program

In July 2013, sampling was conducted to further evaluate Eastern Parcel soil for FMC-related constituents, in accordance with the *Eastern Parcel Soil Investigation Work Plan* (Work Plan) (2013). The previously existing 100-foot soil arsenic sampling grid was extended through the northern portion of the Eastern Parcel. In each boring, soil samples were collected beginning beneath the ESI Fill and/or North Site Cover materials, as applicable, to refusal on presumed bedrock. A total of 391 soil samples were analyzed for arsenic. The ten samples with the highest results for total arsenic were also analyzed for arsenic by the TCLP method.

As proposed in the Work Plan, additional soil samples were analyzed for lead, other metals, chlorinated pesticides, VOCs, herbicides, organophosphates, methyl carbamates, phenols, ammonia, and/or PCBs to supplement previous results in providing geographic coverage of the Eastern Parcel. All soil samples were screened in the field for VOCs using a portable photoionization detector (PID). The PID did not detect VOCs in 457 of 476 soil samples. VOCs were detected by the PID in 19 samples ranging from 0.1 to 5.6 ppm (Appendix C of this RFI Report volume). Nine soil samples were submitted for laboratory analysis of VOCs.

One objective of the sampling plan was to further evaluate the extent of black material previously encountered during installation of Trench A and in one boring (BH-C5) near Trench A (see Sections 3.5 and 3.6). A discussion of the black material is provided in Section 8.

Appendix C describes the 2013 soil sampling, analysis, and data validation activities.

3.11 Remediation-Derived Soil and North Site Cover Materials

As discussed in Section 2.1, soil and debris excavated from previous remediation activities were placed within the Northern Ditches IRM Containment Cell (SWMU #53) and the ESI Fill Area (SWMU #54). Pre-excavation soil analytical data for the soil and debris were reported and approved in work plans and construction completion reports for the remedial actions and were used to approve placement of this material at the Eastern Parcel.

All analytical data available to FMC for soil placed within the Northern Ditches IRM Containment Cell are provided in Appendix D. Although the AOC summarizes Extraction Procedure (EP) toxicity results for soil removed from the drainage ditches along the railroad tracks north of the Facility and placed within the containment cell, FMC does not have those results.

Analytical data for soil placed within the ESI Fill Area are provided in Appendix E. Clay, sand, and topsoil used to construct the North Site Cover were tested by FMC for use, as documented in the *North Site Cover Construction Report* (1989).

4 PRESENTATION OF DATA SET

4.1 Data Summary

The number of analytical results for each constituent group is provided in Table 3.1. Table 4.1 summarizes the frequency of detection and the maximum concentration in the data set for each constituent. The specific analytical results for each sample, including duplicate and split samples, are provided in Appendix B.

4.2 Combined Results

Consistent with the approach used in all other RFI Report volumes, results for sample locations/intervals with duplicate and/or split samples (collected for QA/QC purposes) are averaged with the primary field sample result to produce a single “combined” result for that sampling location/depth interval (with the exception of TCLP analyses) for the purpose of comparing to screening values. The approach used in the RFI Report to present the data and produce the combined result is as follows:

1. If only a single analytical result exists for a sampling location/depth interval, that value is used as the combined result.
2. If two or more analytical results (e.g., sample duplicates, splits) are available for a sampling location/depth interval, the arithmetic average of all results for that sample location/depth interval is used as the combined result.
3. If an analytical result is reported as not detected, then a value of one-half the reported laboratory detection limit is used as the combined result.

5 SOIL SCREENING VALUES

For purposes of the RFI, the Eastern Parcel soil combined results are compared to soil screening values (Table 4.1). A description of the soil screening values applicable to the Eastern Parcel is provided below.

As discussed in the other RFI Report volumes, derivation of health risk based Soil Screening Levels (SSLs) for Site-related constituents, using standardized equations and assumptions from USEPA guidance and constituent toxicity data is documented in the 1999 Draft RFI Report. The SSLs applicable to Site-related constituents were used in comparison to Site data to develop RFI soil sampling programs. The industrial land use SSLs (applicable to the Eastern Parcel) are provided in Table 4.1.

In 2006, the NYSDEC promulgated regulations (6 NYCRR Subpart 375) which included constituent-specific Soil Cleanup Objectives (SCOs), with each constituent having various SCOs based on property type/usage. The SCOs were developed from ecological and human health-based criteria, and in some cases, from a state-wide background database. The SCOs applicable to industrial land use and the SCOs protective of leaching to groundwater are provided in Table 4.1.

Consistent with the RFI Report volumes for other study areas, the soil arsenic results are screened to the Middleport RFI soil arsenic delineation criterion of 20 mg/kg. Arsenic is a naturally occurring element in soil, and is also present in soil as a result of various man-made products and activities (also referred to as “anthropogenic sources”). FMC and the Agencies conducted an evaluation to estimate the amount of arsenic that may be present in Middleport soil from natural geologic conditions and non-Site-related anthropogenic sources (“2003 Gasport Background Study”). Soil samples were collected from locations of varying property types/usages in the nearby Village of Gasport, and the resulting data were used to identify a Middleport RFI soil arsenic delineation criterion. A description of this evaluation is provided in Appendix A of this RFI Report volume.

As requested by the Agencies in the June 17, 2013 Work Plan conditional approval letter, for screening purposes, the soil arsenic results are also compared to the industrial land use and protection of leaching to groundwater SCO value of 16 mg/kg in this RFI Report volume (Section 6). Table 375-6.8(b) of 6 NYCRR Subpart 375-6 specifies arsenic SCOs for protection of health within industrial land to be 16 mg/kg, which is based on a New York State-wide survey of rural soil background concentrations. Table 4.1 summarizes the number of exceedances for arsenic above 20 mg/kg and 16 mg/kg.

A comparison of analytical data for the Northern Ditches IRM Containment Cell and the ESI Fill material to the screening values is provided in Appendices D and E, respectively. The analytical data were collected prior to excavation of the soil from its original location.

6 COMPARISON TO INDUSTRIAL LAND USE SCREENING VALUES

A comparison of Eastern Parcel soil analytical results to industrial land use SSLs and SCOs is provided in Table 4.1. Samples that exceed screening values are indicated.

Arsenic

A total of 784 Eastern Parcel soil samples were analyzed for arsenic. Soil arsenic results exceed the arsenic industrial land use SSL (38.2 mg/kg) in 179 samples out of 784 samples, the arsenic RFI delineation criterion of 20 mg/kg in 248 samples out of 784 samples, and the NYSDEC industrial land use SCO of 16 mg/kg in 274 samples out of 784 samples.

Locations with a soil arsenic result above 20 mg/kg for any sample depth interval are highlighted on Figure 6.1 (83 of 135 locations). As seen in Figure 6.1, the exceedances occur primarily in the northern portion of the Eastern Parcel (footprint of SWMU Group C).

Non-Arsenic Constituents

A total of 70 Eastern Parcel soil samples were analyzed for one or more of 118 constituents other than arsenic. With respect to non-arsenic results, two samples have results that exceed an industrial land use SSL or industrial land use SCO value for any constituent other than arsenic.

<u>Sample</u>	<u>Industrial Land Use SSL Exceeded</u>	<u>Industrial Land Use SCO Exceeded</u>
"East Wall" (36 to 72-inches)	dieldrin, endosulfan I, endrin ketone, and chloroform	dieldrin
"BH-C5" (34 to 72-inches)	none	mercury

The two samples (East Wall and BH-C5) were collected (in 1993-1994) along or near the alignment of Trench A. Concentrations were below the industrial land use SSLs and SCOs in other samples collected (in 1995-1996 and 2013) for the same constituents from locations proximate to Trench A (BH-C8, BH-C9, BH-C10, J28, K28, M28).

7 SOIL LEACHABILITY EVALUATION

The Work Plan (Section 5.3 – Task 2) identified the following activities to evaluate potential constituent leachability from soil at the Eastern Parcel:

1. Compare Eastern Parcel soil analytical data to the SCOs protective of leaching to groundwater.
2. Evaluate Eastern Parcel soil analytical data for spatial relation to groundwater data (taken from the quarterly progress reports for the Facility).
3. Compare TCLP data for remediation-derived soil placed in the ESI Fill Area to data by total constituent methods (as reported in work plans and construction completion reports for the remedial actions).
4. Based on the results of the evaluation described in the three items above, analyze Eastern Parcel soil and/or ESI Fill material by the TCLP method.

This soil leachability evaluation is provided in the following sections.

7.1 Comparison to SCOs Protective of Leaching to Groundwater

Eastern Parcel Soil

A comparison of the Eastern Parcel soil analytical results to SCOs protective of leaching to groundwater is provided in Table 4.1, with the number of samples exceeding the screening values indicated. Provided below is a summary of the constituents that exceed their respective SCO protective of groundwater.

<u>Constituent</u>	<u># Samples Analyzed</u>	<u>SCO (mg/kg)</u>	<u>Maximum (mg/kg)</u>	<u># Samples Above SCO</u>	<u>% Samples Above SCO</u>
arsenic	784	16.0	4.830	274	35%
dieldrin	55	0.1	860	14	25%
beta-BHC	55	0.09	8.47	13	24%
alpha-BHC	55	0.02	4.72	8	15%
acetone	25	0.05	78	6	24%
endrin	48	0.06	41	4	8%
benzene	25	0.06	5.6	2	8%
gamma-BHC	61	0.1	1.6	2	3%
aldrin	55	0.19	0.27	1	2%
ten other VOCs	6 to 25	Varies	varies	1 each	4% to 16%

Soil concentrations above the respective SCOs for acetone, benzene, and ten other VOCs all correspond with samples collected in the 1980s and 1990s. Acetone was a common laboratory artifact during this timeframe, and the other VOCs were detected at concentrations above the respective SCOs in one or two samples each. All 476 soil samples collected from the Eastern Parcel in 2013 were screened in the field for VOCs and based on the screening results, nine samples were selected for laboratory analysis of

VOCs. Concentrations of VOCs in the nine soil samples analyzed in 2013 were all below the respective SCOs. Therefore, VOCs are not further evaluated for leachability.

ESI Fill Area and Northern Ditches IRM Containment Cell

A comparison of the pre-excavation analytical data for soil placed in the ESI Fill Area to the screening values is provided in Appendix E. Similar to Eastern Parcel soil, the SCOs protective of leaching to groundwater were exceeded most frequently for arsenic, with less frequent exceedances for lead, mercury, and chlorinated pesticides. The maximum pre-excavation soil arsenic concentration was 6,710 mg/kg and the average concentration in all soil samples placed in the ESI Fill Area is 92 mg/kg.

A comparison of the pre-excavation analytical data for soil placed in the Northern Ditches IRM Containment Cell to the screening values is provided in Appendix D.

7.2 Spatial Distribution in Soil Compared to Groundwater Data

Chlorinated Pesticides

Figure 7.1 shows (pink shading) locations where Eastern Parcel soil concentrations for any of the six chlorinated pesticides identified in Section 7.1 are above the respective SCOs (16 of 44 locations). The locations are distributed across the northern portion of the Eastern Parcel (footprint of SWMU Group C). Chlorinated pesticides are not primary constituents in groundwater, as documented in the quarterly progress reports for the Facility. Monitoring wells within or near the Eastern Parcel were previously analyzed for dieldrin, aldrin, and endrin, but the analyses were discontinued in the mid-1990s based on the low frequency of detection and low concentrations detected. Table F-1 in Appendix F provides the chlorinated pesticide results over time for these 13 monitoring wells. During the most recent bi-annual groundwater sampling event for chlorinated pesticide analysis (June 2012), alpha-BHC was detected in one well out of 13 wells within or near the Eastern Parcel, beta-BHC was detected in three wells, and gamma-BHC was not detected in any of the 13 wells (Figure F-1 in Appendix F). Based on the low frequency of detection and low concentrations in groundwater, and the lack of a relationship between soil and groundwater concentrations of these constituents, the chlorinated pesticides dieldrin, aldrin, endrin, alpha-BHC, beta-BHC, and gamma-BHC are not evaluated further for leachability from soil.

Arsenic

Figure 7.2 shows (pink shading) locations where Eastern Parcel soil arsenic concentrations are above the SCO protective of leaching to groundwater (90 of 136 locations). The locations are primarily found on the northern portion of the Eastern Parcel (footprint of SWMU Group C), and nearly all locations on the northern portion have concentrations above the SCO.

Arsenic is a primary constituent in groundwater at the Facility. Within or near the Eastern Parcel, groundwater is analyzed for arsenic in samples collected semi-annually from monitoring wells screened in the overburden, shallow bedrock, and deep bedrock and quarterly from extraction wells screened in shallow and deep bedrock. This sampling is conducted under the Groundwater Monitoring Program (GMP) Work Plan (2002) and is documented in the Facility's quarterly progress reports. Tables F-2 and F-3 in Appendix F provide the results over time for 25 monitoring wells and six extraction wells, respectively, while Table F-4 provides the annual average concentration for the extraction wells. Figure F-2 in

Appendix F shows the locations of the 31 monitoring/extraction wells and the most recent result for each well.

The distribution of groundwater arsenic concentrations above the standard does not correlate with the distribution of Eastern Parcel soil arsenic concentrations above the SCO protective of groundwater, with the exception of the area near blast-fractured bedrock Trench A. Figure F-2 shows that arsenic concentrations above the groundwater standard (25 ug/L) are not widespread over the Eastern Parcel. The highest groundwater arsenic concentrations are associated with monitoring and extraction wells located across (from west to east) the mid-section of the Eastern Parcel at Trench A extraction well A-756X and Trench E extraction well A-757X. In comparison, arsenic concentrations in the downgradient Trench G extraction wells are either not detected or below the groundwater standards.

Groundwater arsenic concentrations within or near the Eastern Parcel are not increasing over time, following placement of the ESI Fill materials (Tables F-2 through F-4). For example, overburden monitoring well 15 has been routinely sampled since 1980, and groundwater arsenic concentrations are relatively consistent over time. Further, groundwater extraction Trench G is located downgradient of the northern portion of the Eastern Parcel and the ESI Fill materials, and groundwater arsenic concentrations in Trench G wells were below the groundwater standard for the past several years.

7.3 TCLP Data

Figure 7.3 compares total arsenic and TCLP arsenic results for Eastern Parcel soil and ESI Fill materials. No TCLP data are available for the soil inside the Northern Ditches IRM Containment Cell; leaching from the cell is not expected to be a significant concern because the containment cell is constructed with 40-mil HDPE under and over liners fused together to totally enclose the soil.

A discussion of the total arsenic and TCLP arsenic results for Eastern Parcel soil and ESI Fill materials, respectively, is provided below. Per 6 NYCRR Subpart 371.3, solid wastes exhibit the characteristic of toxicity if the TCLP arsenic concentration is greater than or equal to 5 mg/L.

Eastern Parcel Soil

TCLP arsenic results were obtained for the 10 soil samples, collected from the Eastern Parcel in 2013, with the highest total arsenic concentrations. The results are provided in Table 7.1. For these 10 samples, total arsenic concentrations range from 617 to 4,830 mg/kg and TCLP concentrations range from not detected (detection limit of 0.50 mg/L) to 5.33 mg/L (with a re-analysis result of 3.67 mg/L).

ESI Fill Material

As previously reported in the work plans and construction completion reports for each remedial action, a total of 39 samples collected from soil placed in the ESI Fill Area were analyzed using both TCLP (or EP Tox) and total arsenic methods. The results are provided in Table 7.2. For these 39 samples, total arsenic soil concentrations range from 1 mg/kg to 6,710 mg/kg, and TCLP concentrations range from not detected (lowest detection limit of 0.016 mg/L) to 2.21 mg/L.

8 SOIL ARSENIC DISTRIBUTION

Arsenic in Eastern Parcel soil has been adequately delineated relative to the Middleport RFI soil arsenic delineation criterion of 20 mg/kg, the property boundaries, and bedrock.

Horizontal Distribution

Soil was analyzed for arsenic at each of 135 locations, including a grid pattern across the entire Eastern Parcel. A color-coded depiction of maximum soil arsenic concentrations, by sampling location, is presented on Figure 8.1. Higher soil arsenic concentrations are found in the northern portion of the Eastern Parcel (footprint of SWMU Group C), with no distribution pattern.

Vertical Distribution

At each of the above 135 locations, samples of soil underlying the ESI Fill and North Site Cover materials (where present) were collected on approximate 12-inch depth intervals to bedrock. North/south cross-section views of the soil arsenic concentrations (color-coded) with depth, oriented along sampling location grid lines 23 through 28, are provided in Figures 8.2 through 8.7, respectively. The figures identify the location and depth of the ESI Fill and North Site Cover materials, and bedrock.

Black Material

Black material (identified by discoloration) was encountered in approximate 1-inch to several inch thick layers in eight of 136 sampling locations (gray shade on Figure 3.1), although in some cases the black material may be organics. Near Trench A, black material was encountered in four borings (BH-C5, K28, L28, M28) within 30 feet west of Trench A, but not east (BH-C10) of Trench A. Table 8.1 provides a description of all soil samples collected from the eight borings and their corresponding soil arsenic concentrations, with samples containing black material in bold font and gray shade. As shown in Table 8.1, the presence of black material does not necessarily correlate with high arsenic concentrations. Nine of the ten Eastern Parcel soil samples with the highest soil arsenic concentrations do not contain black material.

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TABLES



TABLE 3.1
EASTERN PARCEL SOIL INVESTIGATION SUMMARY

RCRA FACILITY INVESTIGATION REPORT – VOLUME IX.b
FMC CORPORATION – MIDDLEPORT, NEW YORK

Investigation Program ¹	1973 Facility Arsenic Investigation	1986-1987 Site Investigation	1987-1988 Northern Ditches Sampling	1990-1993 Off-Site Investigation	1993-1994 RFI Phase I Investigation	1995-1996 RFI Phase II & III Investigations	1996 Bleacher Area IRM	2004 North Railroad Property Sampling	2004-2005 RFI Air Deposition Study Area 1 Sampling	2013 RFI Sampling Program ⁵		
Report Section	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10		
Locations Sampled	Grid Sampling	21-86 through 24-86	2263-1, 2263-3	BH13 & S18	BH-C1 through BH-C7 and East Wall	BH-C8, BH-C9	ESI-06, ESI-08, ESI-09, ESI-09B	ND03-S3	R1b-J29 through R1b-R29	Grid Sampling and BH-C10	TOTAL	
Number of Sample Locations²	50	4	2	2	8	2	4	1	8	63	136⁵	
Number of Samples³	329	6	2	6	10	6	6	8	21	399	793	
Number of Samples Analyzed³	Arsenic	329	6	2	6	9	6	6	8	21	391	784
	Lead	0	0	2	6	9	6	3	3	0	33	62
	Chlorinated Pesticides	0	6	0	2	8	6	3	3	0	33	61
	VOCs	0	6	0	0	10	0	0	0	0	9	25
	SVOCs	0	6	0	2	8	2	0	3	0	7	28
	Herbicides	0	0	0	2	7	0	0	0	0	7	16
	Organo-phosphates	0	0	0	2	7	0	0	0	0	7	16
	PCBs	0	0	0	0	8	0	0	0	0	7	15
	Other Metals	0	6	0	2	7	0	0	0	0	7	22
	Metals - TCLP	0	0	0	0	0	0	0	0	0	10	10
	Methyl Carbamates	0	6	0	2	9	0	0	0	0	7	24
	ETU	0	0	0	0	9	4	3	0	0	7	23
	Other Constituents⁴	0	0	0	2	7	0	0	0	0	7	16

Notes:

1. Table only includes sampling and analysis for portion of investigation program associated with the Eastern Parcel (excludes ESI Fill and North Site Cover materials).
2. Sample locations are shown on Figure 3.1.
3. Analytical data are summarized in Appendix B.
4. Other Constituents include: Carbophenothion; Cyanide; Dichlone; Dinocap; Karbutilate; Ammonia; Rotenone; Trifluralin.
5. Eight locations sampled for arsenic in the 1973 investigation were sampled for non-arsenic constituents in the 2013 investigation.

TABLE 4.1
EASTERN PARCEL SOIL ANALYTICAL RESULTS STATISTICS AND SCREENING

RCRA FACILITY INVESTIGATION REPORT – VOLUME IX.b
FMC CORPORATION – MIDDLEPORT, NEW YORK

Constituent	Frequency Detected ¹	Maximum Concentration ²	Protection of Groundwater Soil Cleanup Objective (SCO) ³	# Samples Exceeding Groundwater SCO	Industrial Soil Cleanup Objective (SCO) ⁴	# Samples Exceeding Industrial SCO	Industrial Soil Screening Level (SSL) ⁵	# Samples Exceeding Industrial SSL
Arsenic								
Arsenic	639/784	4,830	16 ⁵	274	16 ⁵	274	38.2	179
Other Metals								
Aluminum	2/2	15,000	no value	--	no value	--	1,000,000	--
Cadmium	8/16	2.66	7.5	0	60	0	2,040	0
Copper	2/2	31.5	1,720	0	10,000	0	75,600	0
Cyanide, Total	0/7	ND	40	0	10,000	0	no value	--
Iron	2/2	22,600	no value	--	no value	--	610,000	0
Lead	62/62	817	450	2	3,900	0	no value	--
Manganese	2/2	590	2,000	0	10,000	0	47,000	0
Mercury	7/16	11.3	0.73	2	5.7	1	14.7	1
Potassium	6/6	850	no value	--	no value	--	no value	--
Selenium	1/16	1.43	4	0	6,800	0	10,200	0
Sodium	6/8	680	no value	--	no value	--	no value	--
Thallium	0/16	ND	no value	--	no value	--	143	0
Zinc	16/16	295	2,480	0	10,000	0	613,000	0
Chlorinated Pesticides								
4,4'-DDD	40/55	13.1	14	0	180	0	238	0
4,4'-DDE	45/55	3.26	17	0	120	0	168	0
4,4'-DDT	41/55	16.1	136	0	94	0	168	0
Aldrin	8/55	0.27	0.19	1	1.4	0	3.37	0
alpha-BHC	19/55	4.72	0.02	8	6.8	0	9.08	0
alpha-Chlordane	20/47	0.261	2.9	0	47	0	44	0
beta-BHC	30/55	8.47	0.09	13	14	0	8.79	0
Chlordane	0/1	ND	no value	--	no value	--	no value	--
delta-BHC	14/55	0.224	0.25	0	1,000	0	9.08	0
Dieldrin	35/55	860	0.1	14	2.8	1	3.58	1
Endosulfan I	29/55	60	102	0	920	0	31.7	1
Endosulfan II	24/55	1.86	102	0	920	0	31.7	0
Endosulfan sulfate	11/48	0.496	1,000	0	920	0	31.7	0
Endrin	11/48	41	0.06	4	410	0	89.2	0
Endrin aldehyde	4/47	0.074	no value	--	no value	--	89.2	0
Endrin ketone	11/46	1100	no value	--	no value	--	89.2	1
gamma-BHC (Lindane)	17/61	1.6	0.1	2	23	0	44	0
gamma-Chlordane	26/47	0.425	no value	--	no value	--	44	0
Heptachlor	5/48	0.00601	0.38	0	29	0	4.33	0
Heptachlor epoxide	3/48	0.0416	no value	--	no value	--	6.29	0
Methoxychlor	10/48	0.091	no value	--	no value	--	128	0
Toxaphene	5/48	3.81	no value	--	no value	--	52	0
Herbicides								
2,4,5-T	0/16	ND	no value	--	no value	--	20,400	0
2,4,5-TP (Silvex)	0/14	ND	3.8	0	1,000	0	16,400	0
2,4-D	0/16	ND	no value	--	no value	--	20,400	0
Dinoseb	0/16	ND	no value	--	no value	--	2,040	0
PCBs								
Total PCBs	0/15	ND	3.2	0	25	0	no value	--
Organophosphates								
Chlorpyrifos	0/16	ND	no value	--	no value	--	6,130	0
Diazinon	0/16	ND	no value	--	no value	--	1,840	0
Dichlorvos	0/14	ND	no value	--	no value	--	197	0
Ethion	2/16	0.14	no value	--	no value	--	1,020	0
Malathion	0/16	ND	no value	--	no value	--	40,900	0
Mevinphos	0/14	ND	no value	--	no value	--	no value	--
Parathion, ethyl	1/16	0.019	no value	--	no value	--	12,300	0
Parathion, methyl	0/16	ND	no value	--	no value	--	511	0
Phorate	0/16	ND	no value	--	no value	--	409	0
Ronnel	0/16	ND	no value	--	no value	--	102,000	0

TABLE 4.1
EASTERN PARCEL SOIL ANALYTICAL RESULTS STATISTICS AND SCREENING

RCRA FACILITY INVESTIGATION REPORT – VOLUME IX.b
FMC CORPORATION – MIDDLEPORT, NEW YORK

Constituent	Frequency Detected ¹	Maximum Concentration ²	Protection of Groundwater Soil Cleanup Objective (SCO) ³	# Samples Exceeding Groundwater SCO	Industrial Soil Cleanup Objective (SCO) ⁴	# Samples Exceeding Industrial SCO	Industrial Soil Screening Level (SSL) ⁵	# Samples Exceeding Industrial SSL
Methyl Carbamates								
7-Hydroxybenzofuran	6/17	3.2	no value	--	no value	--	no value	--
Carbaryl	0/18	ND	no value	--	no value	--	204,000	0
Carbofuran	3/24	5.7	no value	--	no value	--	10,200	0
Chlorpropham	3/18	0.84	no value	--	no value	--	409,000	0
Propoxur	0/18	ND	no value	--	no value	--	8,180	0
Ziram	6/15	24.9	no value	--	no value	--	no value	--
Semi-Volatile Organics								
2-Methylphenol	1/10	0.11	0.33	0	1,000	0	71,400	0
4,6-Dinitro-2-methylphenol	0/10	ND	no value	--	no value	--	200	0
Aramite	0/14	ND	no value	--	no value	--	2,290	0
bis(2-Ethylhexyl)phthalate	5/8	1	no value	--	no value	--	4,090	0
Isodrin	1/20	0.018	no value	--	no value	--	3.4	0
Isophorone	1/8	0.2	no value	--	no value	--	17,500	0
Naphthalene	0/8	ND	12	0	1,000	0	1,800	0
Phenol	0/14	ND	0.33	0	1,000	0	47,000	0
Volatile Organics								
1,1,1-Trichloroethane	0/25	ND	0.68	0	1,000	0	4,550	0
1,1,2,2-Tetrachloroethane	0/7	ND	no value	--	no value	--	no value	--
1,1,2-Trichloroethane	0/25	ND	no value	--	no value	--	32.9	0
1,1-Dichloroethane	0/7	ND	0.27	0	480	0	no value	--
1,1-Dichloroethene	1/25	2	0.33	1	1,000	0	2.08	0
1,2-Dichlorobenzene	0/6	ND	1.1	0	1,000	0	560	0
1,2-Dichloroethane	0/25	ND	0.02	0	60	0	10.6	0
1,2-Dichloroethene (total)	0/1	ND	no value	--	no value	--	no value	--
1,2-Dichloropropane	0/7	ND	no value	--	no value	--	no value	--
1,4-Dichlorobenzene	2/22	0.036	1.8	0	250	0	1,330	0
2-Butanone	0/7	ND	0.12	0	1,000	0	no value	--
2-Chloroethyl vinyl ether	0/6	ND	no value	--	no value	--	no value	--
2-Hexanone	0/7	ND	no value	--	no value	--	no value	--
4-Methyl-2-pentanone	0/7	ND	no value	--	no value	--	no value	--
Acetone	12/25	78	0.05	6	1,000	0	11,700	0
Acrolein	0/6	ND	no value	--	no value	--	no value	--
Acrylonitrile	0/6	ND	no value	--	no value	--	no value	--
Benzene	7/25	5.6	0.06	2	89	0	26.4	0
Bromodichloromethane	0/1	ND	no value	--	no value	--	no value	--
Bromoform	0/7	ND	no value	--	no value	--	no value	--
Bromomethane (Methyl Bromide)	0/7	ND	no value	--	no value	--	no value	--
Carbon disulfide	2/7	98	no value	--	no value	--	1,970	0
Carbon tetrachloride	0/7	ND	0.76	0	44	0	no value	--
Chlorobenzene	5/25	2.3	1.1	1	1,000	0	393	0
Chloroethane	0/7	ND	no value	--	no value	--	no value	--
Chloroform	3/25	16	0.37	1	700	0	8.95	1
Chloromethane	0/7	ND	no value	--	no value	--	no value	--
cis-1,3-Dichloropropene	0/7	ND	no value	--	no value	--	no value	--
Dibromochloromethane	0/7	ND	no value	--	no value	--	no value	--
Dichlorodifluoromethane	0/6	ND	no value	--	no value	--	no value	--
Ethylbenzene	1/25	87	1	1	780	0	1,810	0
m&p-Xylene	1/9	0.00202	no value	--	no value	--	no value	--
Methylene chloride	4/25	8.5	0.05	1	1,000	0	343	0
m-xylene	0/6	ND	no value	--	no value	--	420	0
o-Xylene	0/9	ND	no value	--	no value	--	no value	--
Styrene	0/7	ND	no value	--	no value	--	no value	--
Tetrachloroethene	1/7	5.1	1.3	1	300	0	no value	--
Toluene	5/25	14	0.7	1	1,000	0	2,830	0
trans-1,2-Dichloroethene	1/6	1	0.19	1	1,000	0	3,100	0
trans-1,3-Dichloropropene	0/7	ND	no value	--	no value	--	no value	--
Trichloroethene	6/25	1	0.47	1	400	0	164	0
Trichlorofluoromethane	0/6	ND	no value	--	no value	--	no value	--
Vinyl acetate	0/7	ND	no value	--	no value	--	no value	--
Vinyl chloride	0/7	ND	0.02	0	27	0	no value	--
Xylene (total)	3/25	450	1.6	1	1,000	0	2,040	0

**TABLE 4.1
EASTERN PARCEL SOIL ANALYTICAL RESULTS STATISTICS AND SCREENING**

**RCRA FACILITY INVESTIGATION REPORT – VOLUME IX.b
FMC CORPORATION – MIDDLEPORT, NEW YORK**

Constituent	Frequency Detected ¹	Maximum Concentration ²	Protection of Groundwater Soil Cleanup Objective (SCO) ³	# Samples Exceeding Groundwater SCO	Industrial Soil Cleanup Objective (SCO) ⁴	# Samples Exceeding Industrial SCO	Industrial Soil Screening Level (SSL) ⁵	# Samples Exceeding Industrial SSL
Other Constituents								
Carbophenothion	0/6	ND	no value	--	no value	--	no value	--
Cyanide, Total	0/7	ND	40	0	10,000	0	no value	--
Dichlone	0/5	ND	no value	--	no value	--	no value	--
Dinocap	0/9	ND	no value	--	no value	--	no value	--
Ethylenethiourea	11/23	45	no value	--	no value	--	164	0
Karbutilate	0/7	ND	no value	--	no value	--	27,000	0
Nitrogen, Ammonia (as N)	11/14	894	no value	--	no value	--	no value	--
Rotenone, Commercial	4/7	16	no value	--	no value	--	8,180	0
Trifluralin	3/14	0.0033	no value	--	no value	--	7,430	0

Notes:

1. Table includes all existing (1973 - 2004) and new (2013) Eastern Parcel soil analytical data; does not include ESI fill or North Site Cover materials.
2. Concentrations are in milligrams per kilogram (mg/kg), equivalent to parts-per-million (ppm).
3. Protection of Groundwater Soil Cleanup Objectives (SCOs) listed in Table 375-6.8(b) of 6 NYCRR Subpart 375-6.
4. Industrial Remedial Program Soil Cleanup Objectives (SCOs) listed in Table 375-6.8(b) of 6 NYCRR Subpart 375-6.
5. Industrial Soil Screening Levels (SSLs) listed in Table 7.2 of the 1999 Draft RFI Report.
6. A total of 248 arsenic soil sample results exceed the Middleport RFI soil arsenic delineation criterion of 20 mg/kg.
7. ND = not detected at laboratory reporting limit.
8. -- = no value available for comparison.

TABLE 7.1
EASTERN PARCEL SOIL SAMPLES WITH TOTAL ARSENIC AND TCLP ARSENIC RESULTS

RCRA FACILITY INVESTIGATION REPORT - VOLUME IX.b
FMC CORPORATION - MIDDLEPORT, NEW YORK

Sample Location	Sample Interval (inches)	Sample Date	Soil Arsenic Concentration	
			Total (mg/kg)	TCLP (mg/L)
L27	78 - 90	7/22/2013	4,830	1.47
K28	23 - 35	7/17/2013	2,710 J	5.33 (3.67)
K27	36 - 48	7/25/2013	1,690	2.10
L27	90 - 102	7/22/2013	1,410	2.18
J26	19 - 31	7/16/2013	1,200	0.500 U
P23	174 - 186	7/24/2013	1,200	1.58
K26	25 - 37	7/22/2013	777	0.500 U
Q28	18 - 30	7/29/2013	544 J [974 J]	0.509 [0.611]
K26	37 - 49	7/22/2013	743	0.500 U
N28	102 - 114	7/18/2013	617	0.500 U

Notes:

1. () = re-analysis of same sample (K28).
2. [] = result for duplicate samples (Q28).
3. Data qualifiers:
 - U = not detected at the associated reporting limit.
 - J = concentration is estimated.
4. See Figure 7.3.

TABLE 7.2
ESI FILL MATERIAL SAMPLES WITH TOTAL ARSENIC AND TCLP ARSENIC RESULTS

RCRA FACILITY INVESTIGATION REPORT VOLUME IX.b
FMC CORPORATION – MIDDLEPORT, NEW YORK

Sample ID	Date Sampled	Depth (inches)	Total Arsenic (mg/kg)	TCLP Arsenic (mg/L)	Associated Remediation Activity
BH11	6/23/1993	0 - 6	290	0.063 U [0.086]	1996 Bleacher Area IRM
BH11	6/23/1993	12 - 18	1.0	0.063 U	
SB1	11/1/1996	18 - 21	102 (122)	0.024 (NA)	1999 Roy-Hart School ICM
E-1	4/29/1999	18 - 21	247.0	0.177 U	
E-7	4/29/1999	6 - 9	240.0	0.368 U	
E-12	4/29/1999	6 - 9	332.0	0.378 U	
F-8	4/29/1999	24 - 27	54.6	0.142 U	
F-13	4/29/1999	12 - 15	297.0	0.206 U	
H-4	4/29/1999	24 - 27	12.0	0.121 U	
S3	6/23/1993	0 - 6	43.8 [33.9]	0.063 U	
S3	6/23/1993	12 - 18	118	0.368	
A1A3-100802-JR-136	10/8/2002	0 - 3	524	0.865	
A1B3-100802-JR-158	10/8/2002	6 - 9	6,710 J	2.12	
A1D3-100802-JR-234	10/8/2002	6 - 9	81 J	0.0857 U	
A1J4-100802-JR-349	10/8/2002	6 - 9	304 J	0.141	
ND06-S1	11/11/2004	0 - 3	NA (1,460)	1.4 (NA)	2005 North Railroad Property Phase 1 ICM
2263-JA-22/23	11/11/2004	9 - 12	32.7	0.18 B	
ND12-N4(R)	11/11/2004	12 - 15	NA (10.1 EP)	0.37 B (0.232 P)	
ND15-N3	11/11/2004	12 - 15	614	0.33 B	
ND18-N4	11/11/2004	0 - 3	421	0.34 B	
ND24-N4	11/11/2004	0 - 3	374	0.31 B	
NRR-Gray	7/26/2005	24 - 30	3.30	0.32 B	
NRR-Yellow	7/26/2005	24 - 30	141	0.24 B	
NRR-Green	7/26/2005	24 - 30	15.2	0.19 B J	
NRR-White	7/26/2005	24 - 30	5.3	0.21 B	
Zone1(12-15)080805	8/8/2005	12 - 15	657	0.137 B	
Zone2(12-15)080805	8/8/2005	12 - 15	3,490	2.21	
Zone3(12-15)080805	8/8/2005	12 - 15	2,160	1.41	
Zone5(12-15)080805	8/8/2005	12 - 15	47.0	0.0346 B	
WP-1	8/14/2007	0 - 24	38.9	0.030 B	2007-2008 Early Action
WP-2	8/14/2007	24	20.1	0.040 B	
WP-3	8/15/2007	24 - 72	3.7	0.016 U	
WP-4	8/15/2007	12 - 60	2.0	0.024 U	
WP-5	8/15/2007	24 - 48	2.9	0.024 U	
WP-6	8/15/2007	24 - 72	1.8	0.0050 B	
WP-7	8/29/2007	24	3.3 J	0.024 U	
Yellow Material	9/17/2007	--	16.4	0.024 U	
AE1-H5	8/29/2011	0 - 6	230	0.032 J	2011 ICM for Properties AD1 and AE1
AE1-H6	8/29/2011	0 - 6	319	0.12	

Notes:

1. mg/kg = milligrams per kilogram; mg/L = milligrams per Liter.
2. [] = Indicated value is for a duplicate sample.
3. () = Indicated value is for a NYSDEC split sample.
4. -- = Not applicable.
5. Date sampled is for TCLP results; total arsenic results may be from sample collected at earlier date.
6. Data qualifiers:
 - U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
 - J = The compound was positively identified; however, the indicated value is an estimated concentration only.
 - B = Value is less than the contract-required detection limit, but greater than or equal to the instrument detection limit.
 - P = This flag is used when there is a greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported and flagged with a "P".
 - E = Estimated result. Result concentration exceeds the calibration range.
7. NA - Not Analyzed.
8. See Figure 7.3

TABLE 8.1
EASTERN PARCEL SOIL SAMPLING LOCATIONS WITH BLACK MATERIAL - DESCRIPTION AND ARSENIC CONCENTRATIONS

RCRA FACILITY INVESTIGATION REPORT - VOLUME IX.b
 FMC CORPORATION - MIDDLEPORT, NY

Boring ID ¹	Date	Depth ² Interval (feet bgs)	Depth ² Interval (inches bgs)	PID ³ (ppm)	Arsenic ⁴ (mg/kg)	Sample Description ⁵
BH-C5	10/29/1993	0.0' - 2.0'	0-24	FILL	FILL	Silt and Sand (North Site Cover), trace clay and roots, brown, moist
		2.0' - 2.3'	24-28	FILL	FILL	Silt (North Site Cover), some fine sand, trace gravel and roots, brown, moist
		2.3' - 2.8'	28-34	FILL	FILL	Clay (North Site Cover), little silt, very stiff, light brown and gray, moist
		2.8' - 4.0'	34-48	0.0	1,970	Silt and Sand (Fill), some clay and fine sand, some fine to coarse gravel, trace slag, brown and black, moist
		4.0' - 6.0'	48-72	0.0		Silt (Fill), some clay and fine sand, some fine to coarse gravel, trace slag, brown and black, moist
		6.0' - 8.0'	72-96	0.0	n/a	Silt and Clay (Fill), trace to some sand, trace to little fine to coarse gravel, trace slag, brown and red brown, moist
		8.0' - 12.0'	96-144	0.0	n/a	Clay (Fill), some silt, trace to little fine sand, trace gravel, brown, red brown and green gray, moist
		12.0' - 13.0'	144-156	0.0	n/a	Silt (Fill), little to some clay, trace fine sand, little gravel, brown, moist
		13.0' - 13.9'	156-167	0.0	211	Sand (Till), little silt, trace fine to coarse gravel, red brown, very moist. Green gray siltstone and Bedrock @ 13.9'
J23	7/25/2013	0.0' - 2.0'	0 - 24	FILL	FILL	Dark brown very fine to medium SAND, some Silt, trace very fine to fine Gravel, stiff, dry to moist.
		2.0' - 8.0'	24 - 36	0.0	132	Gray-brown SILT, little Clay, trace very fine to fine rounded Gravel, stiff, dry to moist. Trace black discoloration and faint odor 5.2' - 6.9'.
			36 - 48	0.0	84.9	
			48 - 60	0.0	17.3	
			60 - 72	0.0	224	
			72 - 84	4.5	19.6	
		8.0' - 9.4'	84 - 96	0.3	3.85	Brown very fine to fine SAND, little Silt, saturated.
			96 - 108	0.0	3.16	
		9.4' - 12.0'	108 - 120	0.0	3.51	Red-brown-gray SILT, trace very fine Sand, little-trace very fine to medium angular Gravel, stiff, moist.
			120 - 132	0.0	2.05	
K28	7/17/2013	0.0' - 1.9'	0 - 23	FILL	FILL	Gray-brown SILT and CLAY, trace very fine to fine Sand and very fine to fine Gravel, medium stiff, moist. Gray CLAY, little Silt, tan/orange mottling, trace fine to medium Gravel, trace rootlets 1.1' - 1.9'.
		1.9' - 11.9'	23 - 35	0.0	2,710	Gray-brown SILT and CLAY, trace very fine to fine Sand and very fine to fine Gravel, medium stiff, moist. Black discoloration and slight odor at 6.1' - 6.3' and 6.8' - 7.1'. Vein of black discoloration 1-inch thick and slight odor at 9.1' - 9.3'.
			35 - 47	0.0	96.6	
			47 - 59	0.0	83.0	
			59 - 71	0.0	42.4	
			71 - 83	0.0	175	
			83 - 95	0.0	63.6	
			95 - 107	0.0	136	
			107 - 119	0.0	25.8	
		119 - 131	0.0	112		
		131 - 143	0.0	58.3		
L25	7/25/2013	0.0' - 8.0'	0 - 96	FILL	FILL	Dark brown very fine to medium SAND and SILT, little Clay, trace very fine to fine Gravel, stiff, moist.
		8.0' - 11.0'	96 - 132	FILL	FILL	Gray CLAY. Some to little SILT, trace very fine to fine Gravel, stiff, dry to moist.
		11.0' - 16.0'	132 - 144	0.0	35.2	Red-brown SILT, some to little Clay, little to trace very fine to fine Gravel, stiff, moist. Trace black discoloration 12.0' - 12.1'.
			144 - 156	0.0	49.5	
			156 - 168	0.0	2.08	
			168 - 180	0.0	1.47	
180 - 192	0.0	1.7				
16.0' - 16.5'	192 - 198	0.0	3.37	Brown-pink/brown SILT, broken rock fragments, moist to wet.		
L28	7/17/2013	0.0' - 1.3'	0 - 15	FILL	FILL	Brown SAND and SILT, little Clay, moist.
		1.3' - 2.6'	15 - 28	FILL	FILL	Gray CLAY, trace Silt, moist to dry.
		2.6' - 11.6'	28 - 42	0.0	108	Dark brown SILT, little to trace Clay, trace medium to coarse angular Gravel, stiff, moist. Trace black discoloration veins in 3.4' - 3.5', 5.8' - 6.5' and 8.0' - 8.3' intervals.
			42 - 54	0.0	79.0	
			54 - 66	0.0	245	
			66 - 78	0.0	33.2	
			78 - 90	0.0	53.1	
			90 - 102	1.9	59.2	
			102 - 114	0.2	64.5	
			114 - 126	0.0	22.0	
126 - 139	0.0	68.1				
M28	7/18/2013	0.0' - 0.85'	0 - 10	FILL	FILL	Dark brown very fine to medium SAND and SILT, trace very fine to medium Gravel, moist.
		0.85' - 1.5'	10 - 18	FILL	FILL	Gray CLAY, stiff.
		1.5' - 8.0'	18 - 30	0.0	60.3	Dark brown-red SILT, little very fine to medium Sand, stiff, trace Clay. Little black discoloration 4.0' - 5.8'. Slight odor 5.1' - 5.8'. Soft 5.8' - 8.0'.
			30 - 42	0.0	373	
			42 - 54	0.0	471	
			54 - 66	0.0	336	
			66 - 78	0.0	69.6	
		8.0' - 12.0'	78 - 90	0.0	235	Brown SILT and CLAY, trace very fine to fine Gravel, medium soft, moist to wet. Trace black discoloration and faint odor 9.2' - 9.4' and 9.8' - 9.9'.
			90 - 102	0.0	17.5	
			102 - 114	0.0	18.7	
114 - 126	0.0		45.5			
126 - 144	0.0		396			
Q23	7/19/2013	0.0' - 9.7'	0 - 116	FILL	FILL	Brown SILT and CLAY, little very fine to fine Sand, trace very fine to very coarse Gravel, plastic, stiff, moist to wet.
		9.7' - 9.9'	116 - 128	0.0	242	Dark brown very fine to fine SAND and SILT and very fine to fine Gravel, little black discoloration, moist.
		9.9' - 14.2'	128 - 140	0.0	6.0	Red SILT and CLAY, trace very fine Sand, trace very fine to coarse angular Gravel, dense, stiff, moist.
			140 - 152	0.0	33.6	
			152 - 164	0.0	20.5	
164 - 170	0.0	15.8				
Q27	7/29/2013	0.0' - 4.0'	0 - 48	FILL	FILL	Black SILT and fine to medium Sand, some to little black slag, little coarse to very coarse, dry to moist.
		4.0' - 7.5'	48 - 90	FILL	FILL	Gray SILT and CLAY, trace very fine to fine gravel, stiff, dry to moist.
		7.5' - 12.0'	90 - 102	0.0	78.3	Black organic layer 7.45' - 7.5'. Gray SILT and CLAY, trace very fine to fine gravel, stiff, dry to moist. Black discoloration 9.45' - 9.65'.
			102 - 114	0.0	92.8	
			114 - 126	0.4	117	
			126 - 138	0.3	131	
			138 - 150	0.0	7.03	
		12.0' - 15.0'	150 - 162	0.0	13.5	Gray-brown SILT and CLAY, trace very fine to fine Gravel, medium plastic, stiff, moist.
			162 - 174	0.0	28.0	
			174 - 180	0.0	37.1	

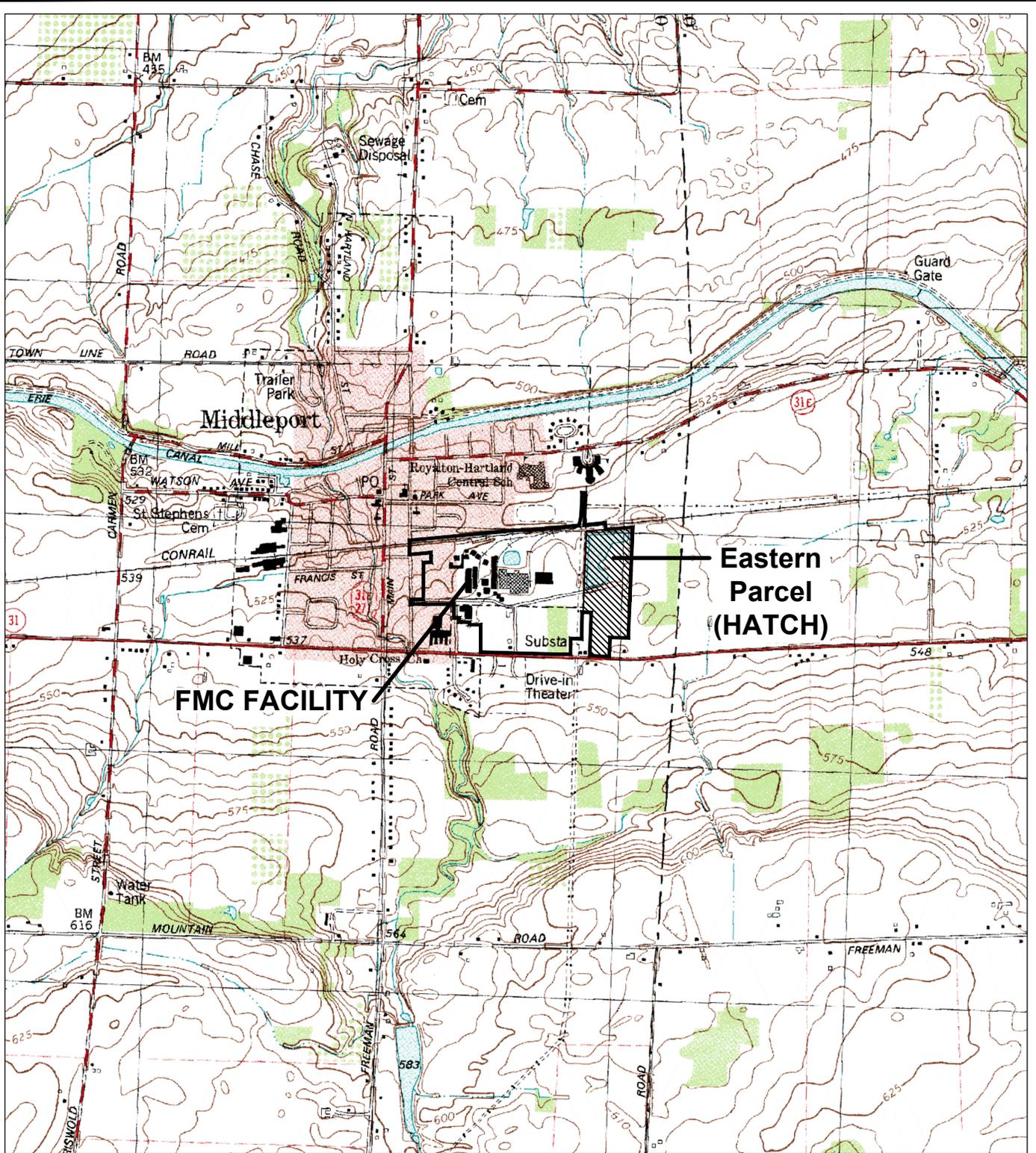
Notes:

- Table includes the eight boring locations (out of 136 total) where black material was encountered.
- bgs - below ground surface. The double-line separates ESI Fill and North Site Cover materials ("FILL") from underlying Eastern Parcel soil.
- Field screening for volatile organic compounds (VOCs) using a portable photoionization detector (PID); results in parts-per-million (ppm).
- Total soil arsenic concentrations for Eastern Parcel soil samples in milligrams per kilogram (mg/kg).
- Descriptions and arsenic results for black fill material samples in bold font with gray shading.

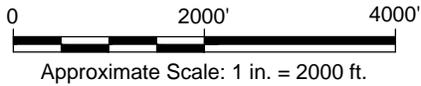
FIGURES



CITY: SYRACUSE, NY DIV: GROUP: EBC: IM: DV: DBLD: (P: LUSTER) L: ROSENAUER PM: TM: D: WRIGHT
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REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., MEDINA, NY, 1980.



NEW YORK

FMC CORPORATION - MIDDLEPORT, NEW YORK
 RCRA FACILITY INVESTIGATION REPORT
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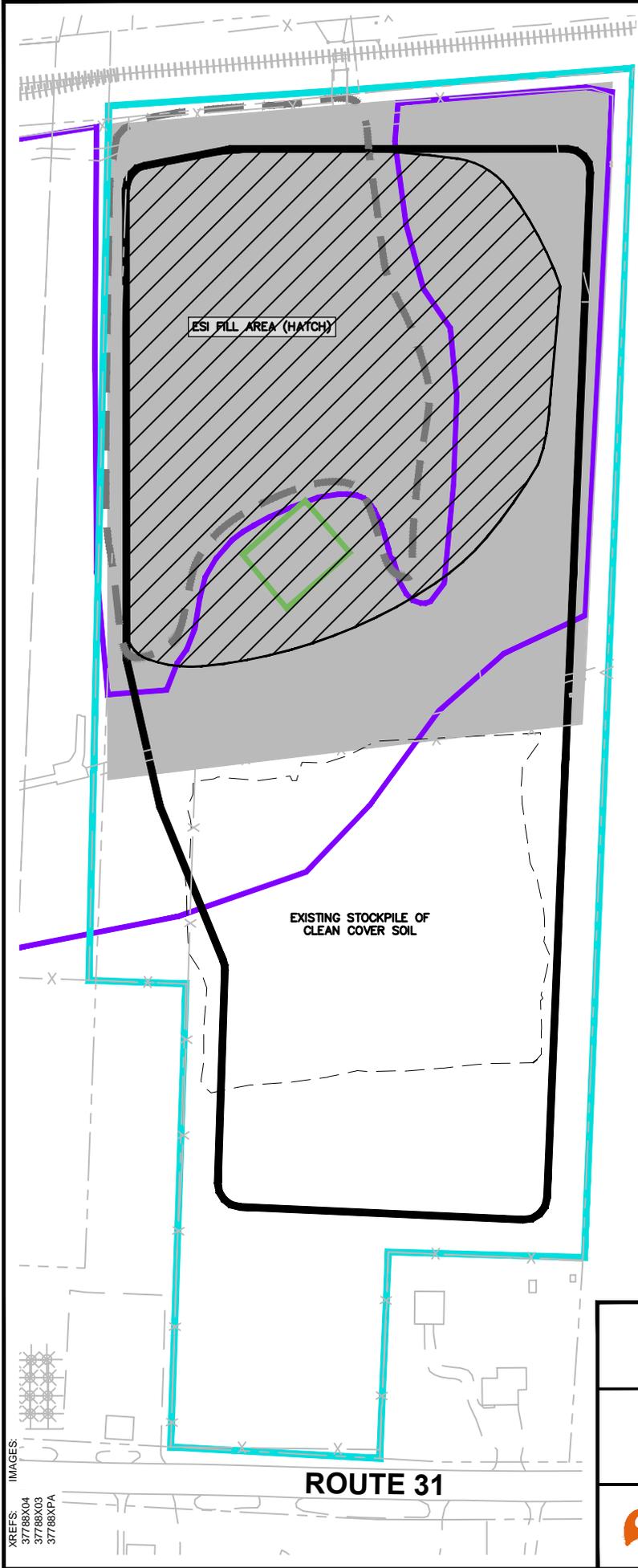
SITE LOCATION MAP



FIGURE
1.1

IMAGES:

37788X04
 37788X03
 37788XPA



LEGEND:

EXISTING FEATURES:

- EASTERN PARCEL
- APPROXIMATE LIMITS OF NORTH SITE COVER (INSTALLED 1987-1988)
- EXISTING ESI FILL AREA, (FILL EVENTS 1996, 1999, 2003, 2005, 2007, 2008, AND 2011)(SWMU #54)
- 1987-1988 NORTHERN DITCHES IRM SOIL CONTAINMENT CELL (SWMU #53)
- STOCKPILE OF CLEAN COVER SOIL (INSTALLED 1987-1988)

HISTORICAL FEATURES:

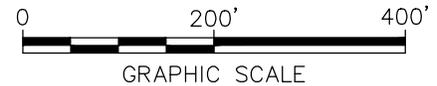
- FORMER EASTERN PROCESS WASTEWATER RETENTION BASIN, 1964-1977 (SWMU #3)
- FORMER EASTERN SURFACE IMPOUNDMENT, 1978-1988 (SWMU #50)

PROPOSED FEATURES:

- PROPOSED CORRECTIVE ACTION MANAGEMENT UNIT (CAMU)

NOTES:

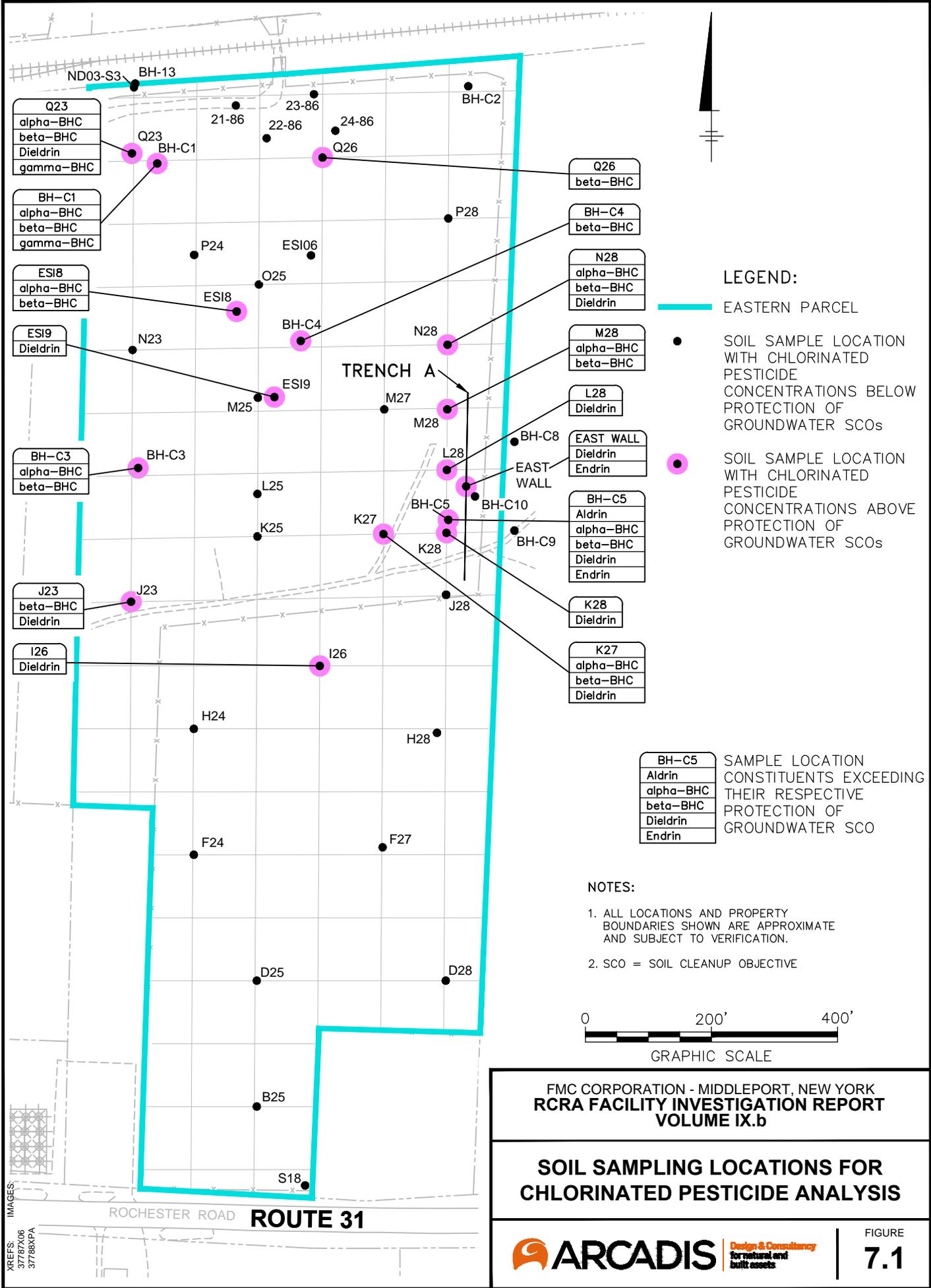
1. SWMU GROUP C COMPRISES SWMUs #3, #53, AND #54.
2. BASEMAP INFORMATION BASED ON APRIL 15, 2002 AERIAL SURVEY PROVIDED BY ABRAMS AERIAL SURVEY CORPORATION AND INFORMATION COMPILED FROM FIELD SURVEYS PERFORMED BY MCINTOSH AND MCINTOSH, P.C. ON SEPTEMBER 18, 1999; MARCH 28, 20001; APRIL 29, 2004; AUGUST 13, 2004; APRIL 7, 2005; SEPTEMBER 9, 2005; OCTOBER 12, 2005; JUNE 16, 2007; MAY 10, 2007; DECEMBER 13, 2007; OCTOBER 6, 2008; AND OCTOBER 8, 2008. THE HORIZONTAL DATUM IS NORTH AMERICAN DATUM 1983 (NAD83).



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EXISTING, HISTORICAL, AND
 PROPOSED FEATURES

CITY: SYRACUSE, NY DIV: GROUP: EBC: IM: DIV: DB: LD: (P: LUSTER) L: POSENAUER PM: TM: D: WRIGHT
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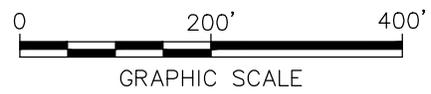
LEGEND:

- EASTERN PARCEL
- SOIL SAMPLE LOCATION WITH CHLORINATED PESTICIDE CONCENTRATIONS BELOW PROTECTION OF GROUNDWATER SCOs
- SOIL SAMPLE LOCATION WITH CHLORINATED PESTICIDE CONCENTRATIONS ABOVE PROTECTION OF GROUNDWATER SCOs

BH-C5	SAMPLE LOCATION CONSTITUENTS EXCEEDING THEIR RESPECTIVE PROTECTION OF GROUNDWATER SCO
Aldrin	
alpha-BHC	
beta-BHC	
Dieldrin	
Endrin	

NOTES:

1. ALL LOCATIONS AND PROPERTY BOUNDARIES SHOWN ARE APPROXIMATE AND SUBJECT TO VERIFICATION.
2. SCO = SOIL CLEANUP OBJECTIVE



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**SOIL SAMPLING LOCATIONS FOR
 CHLORINATED PESTICIDE ANALYSIS**

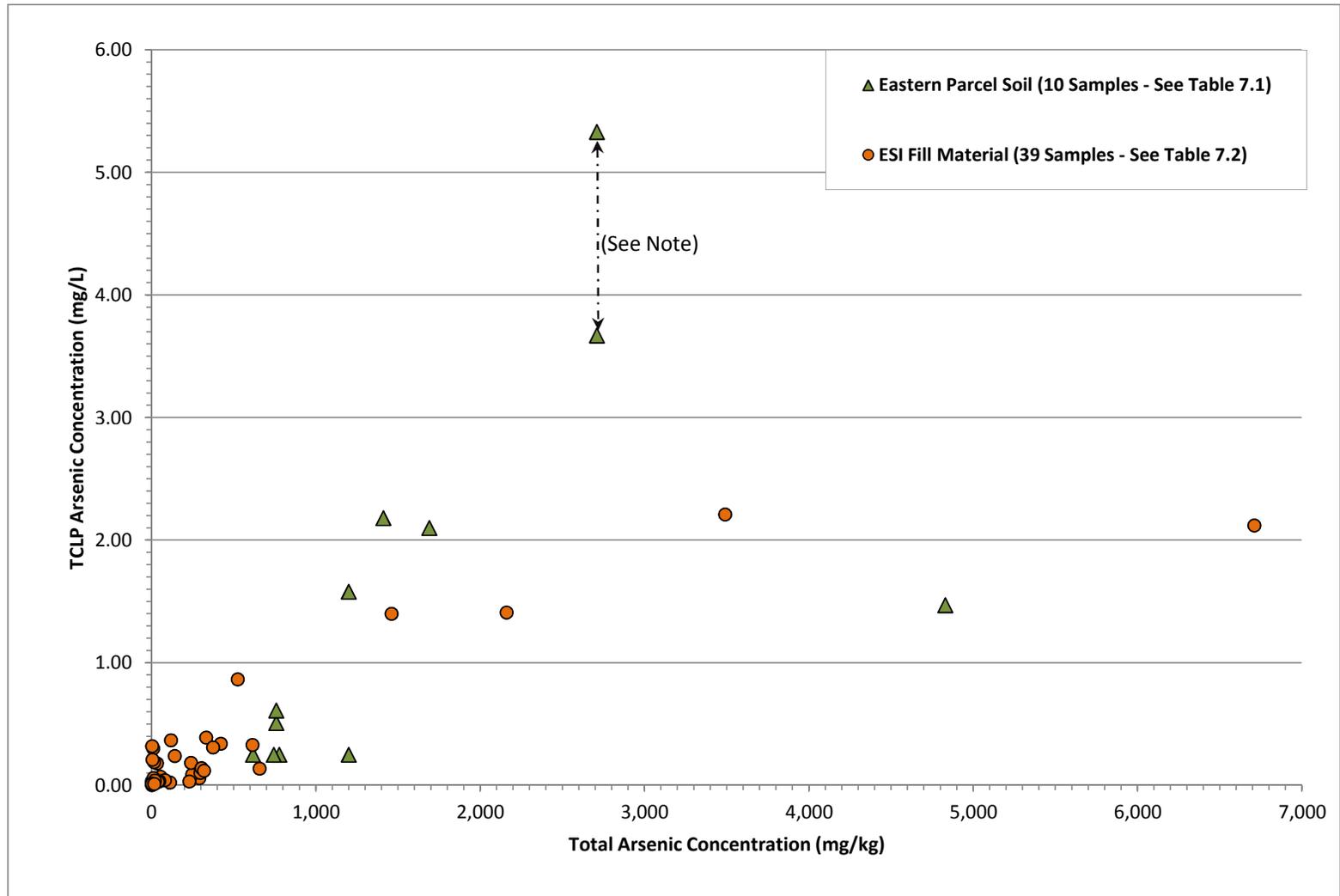
FIGURE
7.1

ROCHESTER ROAD **ROUTE 31**

IMAGES:
 XREFS:
 37787X06
 37788XPA

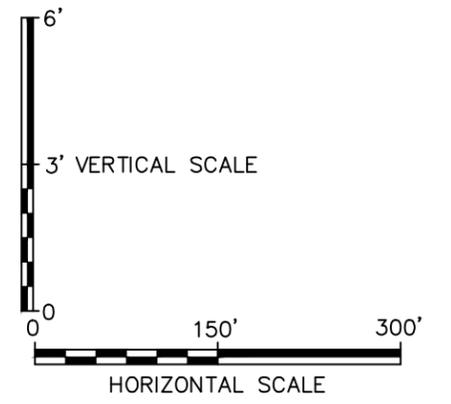
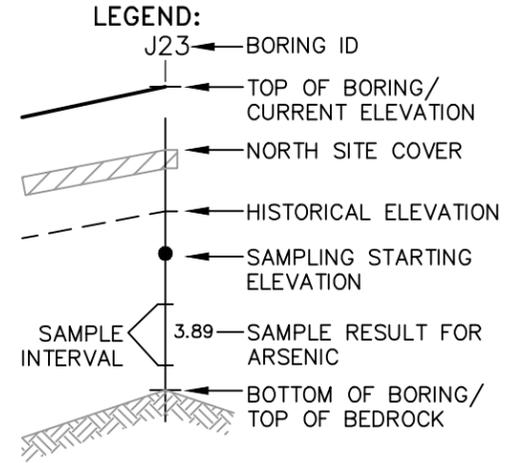
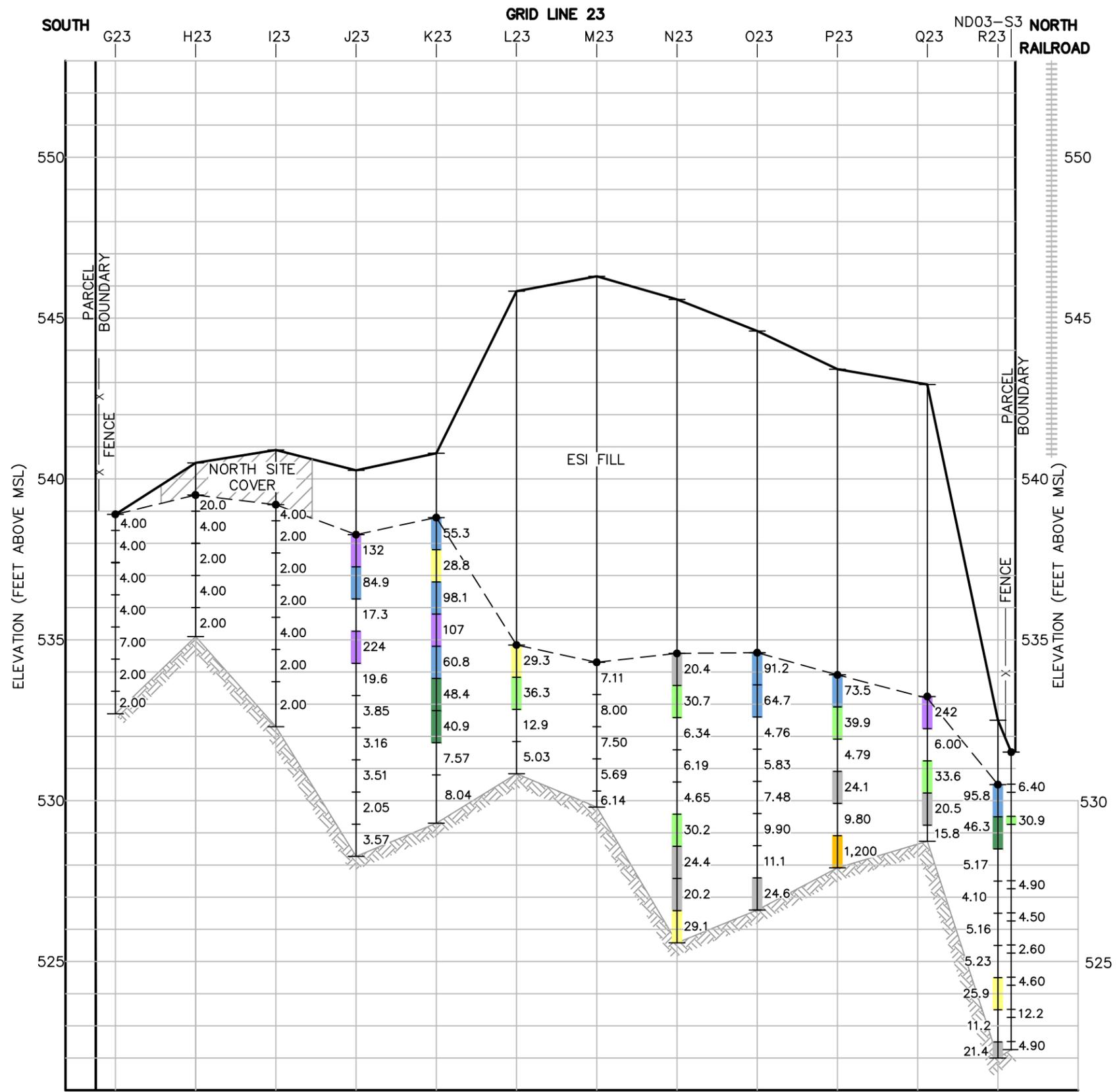
FIGURE 7.3
TOTAL ARSENIC CONCENTRATIONS COMPARED TO TCLP CONCENTRATIONS
EASTERN PARCEL (OU-11)

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Note: This sample was analyzed twice (both results shown).

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 XREFS: IMAGES 37788XLB



NOTES:

1. CURRENT TOPOGRAPHIC INFORMATION SHOWN ON THIS DRAWING WAS COMPILED FROM: SEPTEMBER 18, 1999, MARCH 28, 2001, APRIL 29, 2004, AUGUST 13, 2004, APRIL 7, 2005, SEPTEMBER 9, 2005, JULY 31, 2007, JANUARY 3, 2008, OCTOBER 6, 2008, OCTOBER 10, 2011, AND JULY 2013 FIELD SURVEYS PERFORMED BY McINTOSH AND McINTOSH, P.C.
2. HISTORICAL TOPOGRAPHIC INFORMATION SHOWN ON THIS DRAWING WAS COMPILED FROM FIELD OBSERVATIONS DURING SAMPLING.
3. FOR LOCATION OF GRID LINE, REFER TO FIGURE 8.1.
4. ALL ELEVATIONS ARE APPROXIMATE.

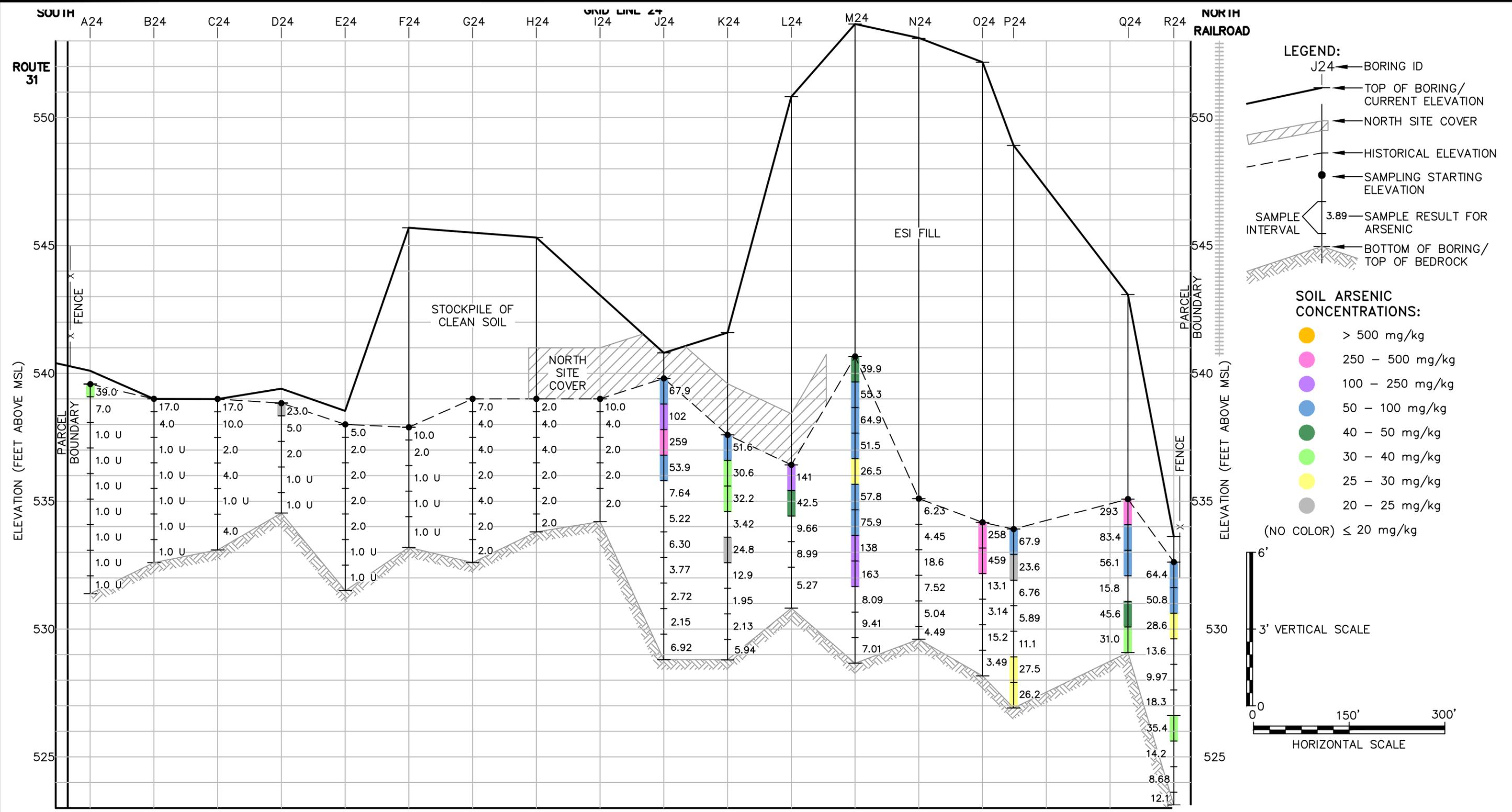
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GRID LINE 23
SOIL ARSENIC CONCENTRATIONS

ARCADIS Design & Consultancy
 for natural and built assets

FIGURE
8.2

CITY: SYRACUSE, NY DIV/GRP: EBC-INDV DB/ID: (P.LISTER) LPOSENAUER PM/TM/D/WRIGHT
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NOTES:

- CURRENT TOPOGRAPHIC INFORMATION SHOWN ON THIS DRAWING WAS COMPILED FROM: SEPTEMBER 18, 1999, MARCH 28, 2001, APRIL 29, 2004, AUGUST 13, 2004, APRIL 7, 2005, SEPTEMBER 9, 2005, JULY 31, 2007, JANUARY 3, 2008, OCTOBER 6, 2008, OCTOBER 10, 2011, AND JULY 2013 FIELD SURVEYS PERFORMED BY McINTOSH AND McINTOSH, P.C.
- HISTORICAL TOPOGRAPHIC INFORMATION SHOWN ON THIS DRAWING WAS COMPILED FROM FIELD OBSERVATIONS DURING SAMPLING.
- FOR LOCATION OF GRID LINE, REFER TO FIGURE 8.1.
- ALL ELEVATIONS ARE APPROXIMATE.
- U = INDICATES THAT ARSENIC WAS ANALYZED FOR BUT NOT DETECTED IN THE SAMPLING INTERVAL. THE ASSOCIATED VALUE IS THE QUANTITATION LIMIT.

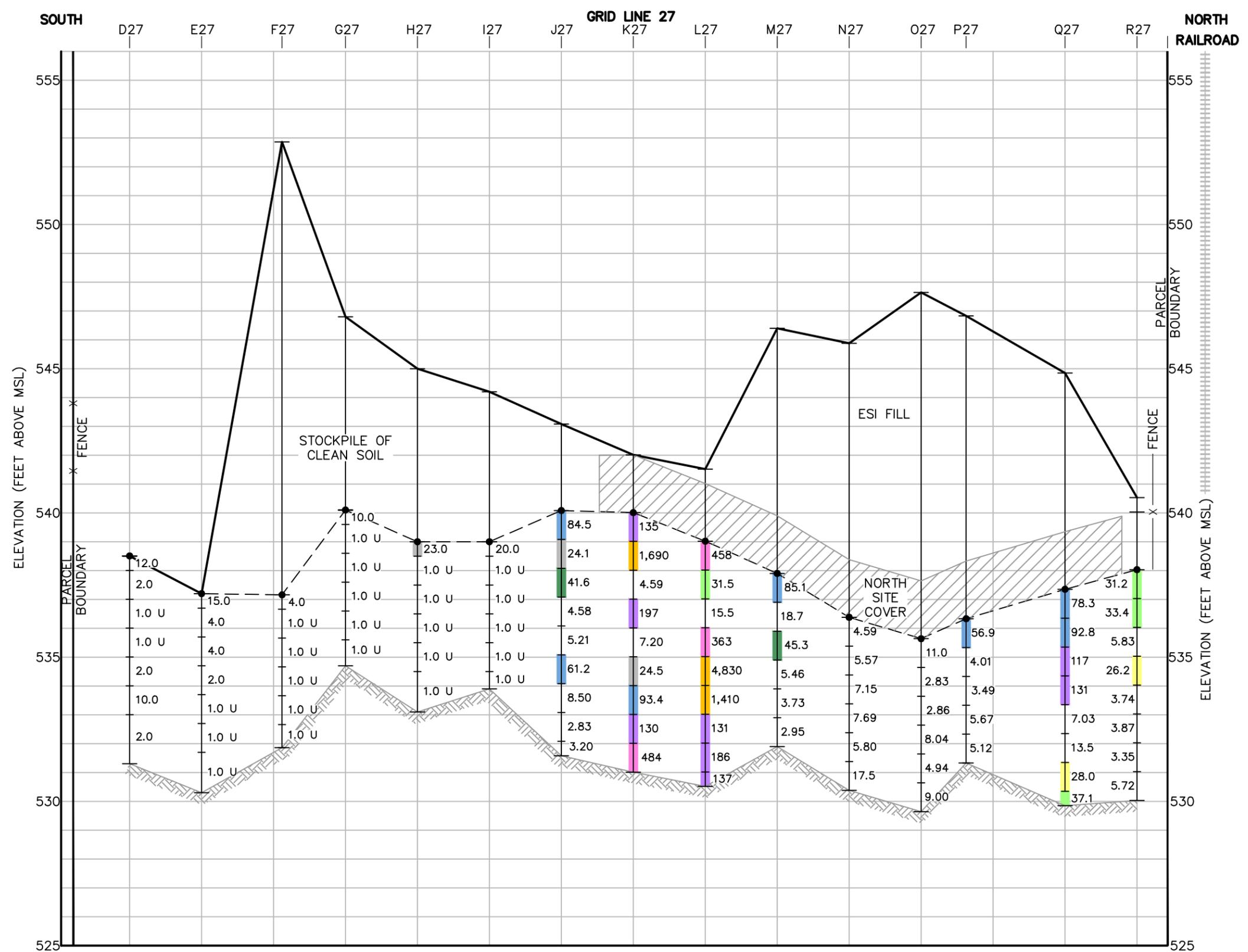
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GRID LINE 24
SOIL ARSENIC CONCENTRATIONS

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FIGURE
8.3

CITY: SYRACUSE, NY DIV/GRUP: EBC-IMDV DB/ID: (P.LISTER) LPOSENAUER PM/TMD: WRIGHT
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APPENDICES (ON ATTACHED CD)

- A Middleport Background Soil Arsenic Concentrations
- B Eastern Parcel Soil Analytical Results
- C 2013 RFI Sampling Program Summary
- D Northern Ditches IRM Containment Cell Analytical Results
- E ESI Fill Material Analytical Results
- F Groundwater Data Summary



ATTACHMENT (ON ATTACHED CD)

1 Correspondence



Arcadis of New York, Inc.

6723 Towpath Road

P.O. Box 66

Syracuse, New York 13214-0066

Tel 315 446 9120

Fax 315 449 0017

www.arcadis.com