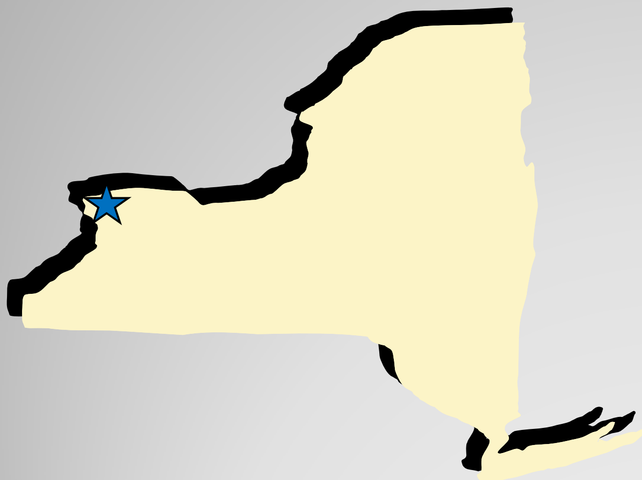
FINAL
Remedial Investigation Report
Lackawanna Incinerator Site (915206)
Erie County, Lackawanna, New York



Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation

Prepared by:

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/L	Microgram(s) per liter
amsl	Above mean sea level
ASP	Analytical Services Protocol
bgs	Below ground surface
COC	Contaminant of concern
COPC	Contaminant of potential concern
COPEC	Contaminant of potential ecological concern
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DER	Division of Environmental Remediation
DPW	Department of Public Works
DUSR	Data Usability Summary Report
EA	EA Engineering, P.C., and its affiliate EA Science and Technology
EDR	Environmental Data Resources, Inc.
EPA	U.S. Environmental Protection Agency
FS	Feasibility study
ft	Foot (feet)
in.	Inch(es)
mi	Mile(s)
mg/kg	Milligram(s) per kilogram
mg/L	Microgram(s) per liter
ND	Not detected
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photoionization detector
ppbRAE	Parts per billion RAE model
PVC	Polyvinyl chloride

QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
RI	Remedial investigation
SCG	Standards, criteria, and guidance
SCO	Soil Cleanup Objective
SSC	Site-specific sediment criteria
SVI	Soil vapor intrusion
SVOC	Semivolatile organic compound
TAL	Target analyte list
TCL	Target compound list
TCLP	Toxicity characteristic leaching procedure
TOC	Total organic carbon
VOC	Volatile organic compound
yd^3	Cubic yard

EXECUTIVE SUMMARY

EA Engineering, P.C. and its affiliate EA Science and Technology (EA), under contract to the New York State Department of Environmental Conservation (NYSDEC) (Work Assignment No. D007624-10) was tasked to perform a remedial investigation (RI) and feasibility study (FS) at the Lackawanna Incinerator site (NYSDEC Site No. 915206) located at 2960 South Park Avenue in the city of Lackawanna, Erie County, New York.

ES.1 SITE OVERVIEW

The Lackawanna Incinerator site is listed as a Class “2” site in the State Registry of Inactive Hazardous Waste Sites (State Superfund); meaning that the site represents a significant threat to public health or the environment, and that action is required. The site is situated on 1.57 acres, which is part of a 12-acre parcel of city-owned land, located in a mixed-use area including industrial, commercial, and residential properties. Numerous single-family residential properties are located south and southwest of the site. The site is bounded to the north by the north branch of Smokes Creek. Beyond Smokes Creek, further north, lies the Holy Cross Cemetery.

The site is partially bounded by a perimeter fence with main access from Reddon Street. The site’s main features are two brick multi-story buildings that housed municipal solid waste incinerators (the southern and northern buildings), and a large soil ramp that was used to access the third floor of the northern building. The southern incinerator operated from 1927 through 1950, when the northern incinerator began operation. The northern incinerator was in use until 1980. The remainder of the site is generally unpaved and sparsely vegetated. The southern portion of the property consists primarily of a road salt storage barn and an unpaved area with a framed shed that is currently used to house equipment for the city of Lackawanna Department of Public Works.

ES.2 PREVIOUS SITE INVESTIGATION

In April 2005, Malcolm Pirnie conducted an investigation for the city that was intended to serve as the initial step of a Site Investigation/Remedial Alternatives Report, in accordance with the U.S. Environmental Protection Agency Brownfields Assessment Program (Malcolm Pirnie 2005). Specifically, the purpose of this field sampling was to determine the level of overall contamination and environmental conditions at the site. Environmental samples collected during the investigation included sediment samples from Smokes Creek, soil borings to determine thickness and composition of fill material, incinerator ash and subsurface soil/fill samples, and groundwater samples from shallow monitoring wells. In addition, building characterization sampling was conducted including lead-based paint samples and asbestos samples in the incinerator buildings. The investigation results indicated that there were: (1) elevated concentrations of metals in the incinerator ash stored in the first level of the southern incinerator building, (2) elevated concentrations of metals and polycyclic aromatic hydrocarbons in soil/fill, (3) potentially site-related metals contamination to sediment at a stormwater outfall, and (4) asbestos-containing materials in the incinerator buildings.

ES.3 REMEDIAL INVESTIGATION

The objective of this RI was to evaluate the on-site and off-site nature and extent of site-related contamination, identify potential risks to human health and the environment, and provide a basis for an evaluation of remedial alternatives. The remedial field investigation was conducted using a phased approach, consisting of two initially planned mobilizations focused towards on-site and immediately adjacent off-site locations, followed by three subsequent mobilizations to complete off-site delineation of site-related contamination. The remedial field investigation activities included:

- Completion of 59 soil borings, including seven borings for monitoring well installation.
- Collected soil, groundwater, surface water, and sediment samples for laboratory analysis.
- Evaluation for potential vapor intrusion at the northern incinerator building during the 2012–2013 winter heating season.

Following the receipt of laboratory analytical results from each investigation phase, the results were evaluated by an independent data validator to determine data usability.

ES.4 NATURE AND EXTENT OF CONTAMINANTS OF POTENTIAL CONCERN

To evaluate the nature and extent of contaminants of potential concern, environmental media sampling results were compared to the relevant standards, criteria, and guidance values. The standards, criteria, and guidance for each area were selected based on the current and reasonably ascertainable future land use and potential human and ecological receptors, and included:

- New York Code of Rules and Regulations (NYCRR) Part 375 Environmental Remediation Programs – Soil Cleanup Objectives (SCOs)
- NYCRR Part 703.5 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended
- NYSDEC Screening and Assessment of Contaminated Sediment, Draft, January 24, 2013.

The RI Study Area included four distinct areas of concern: (1) On-site Area, (2) Stadium Property, (3) Baker Hall Property, and (4) Smokes Creek Corridor. Currently, these areas of concern are considered one operable unit. Data comparisons to Unrestricted Use SCOs were used to evaluate current conditions relative to “pre-disposal” conditions. The data were also compared to supplemental SCOs selected, based on land use, for each area of concern:

Area of Concern	Applicable SCO (Based on Current Land Use)
On-site Area	Commercial Use
Stadium Property	Restricted Residential Use
Baker Hall Property	Restricted Residential Use
Smokes Creek Corridor	Protection of Ecological Resources

Soil contaminated with elevated concentrations of inorganic constituents extends from the primary On-site Area sources (the ramp and the fill material located north of the northern incinerator) to the east throughout the northern portion of the Baker Hall Property and, primarily, to the east along the recreational path within the Smokes Creek Corridor. There is no evidence of significant site-related contamination in the Stadium Property, located to the west of the On-site Area.

Elevated concentrations of arsenic and lead detected in groundwater along the downgradient On-site Area boundary, north of the ramp, may indicate that a limited amount of leaching of inorganic constituents is occurring from the On-site Area contaminated soil.

Surface water and sediment samples collected within the Smokes Creek channel do not appear to be contaminated. However, stormwater samples collected from the two outfalls located north of the incinerator site may provide a conduit for transport of impacted soil from the On-site Area to the floodplain above Smokes Creek.

Low-level detections of various volatile organic compounds (VOCs) were observed in the indoor air and/or sub-slab soil vapor samples; however, based on the levels of VOCs detected, no action was required beyond taking steps to identify and reduce potential indoor air sources of VOCs.

Contamination associated with the operation of the two municipal waste incinerators include the remaining incinerator buildings, on-site ash fill material, as well as ash fill material along the southern side of Smokes Creek, and extending to the east onto the adjacent Baker Hall Property. The on-site soil contamination appears to be related to the integration of ash in the ramp and transport of ash from the incinerator buildings. Due to historical site use, runoff, and erosion, the ash has been reworked and distributed to off-site areas, resulting in site-related contamination to the north and east along the southern bank of Smokes Creek and the paved recreational path, and to the east in the northern portion of the Baker Hall Property.

The primary contaminants of potential concern identified for the RI Study Area include inorganic constituents, specifically arsenic and lead. Based on the qualitative human health exposure assessment, a complete exposure pathway exists for contaminated soil/fill in the On-site Area and at the Baker Hall Property, via dermal contact or incidental ingestion by on-site workers or trespassers. Based on the fish and wildlife resources impact analysis, a complete exposure pathway also exists for contaminated soil/fill or surface water at the On-site Area and at the Baker Hall Property, via direct/dermal contact by ecological receptors.

1. INTRODUCTION AND PROJECT OVERVIEW

1.1 PURPOSE AND SCOPE

The New York State Department of Environmental Conservation (NYSDEC) issued a Work Assignment to EA Engineering, P.C. and its affiliate EA Science and Technology (EA) to perform a remedial investigation (RI) and feasibility study (FS) at the Lackawanna Incinerator site (NYSDEC Site No. 915206) in Lackawanna, Erie County, New York (Figure 1-1). The Work Assignment is being conducted under a NYSDEC Standby Engineering Services Contract (Work Assignment No. D007624-10).

This RI Report has been prepared to summarize field investigation and monitoring activities, discuss the findings of the RI, present the conclusions of those findings, and evaluate the potential for impact to public health and the environment at the Lackawanna Incinerator site. The information obtained during this RI will be used in the evaluation, development, and selection of potential remedial alternatives to be included in the FS for the site.

The objectives of this RI were as follows:

- Further define the nature and extent of contamination from historical incinerator and associated operations

- Further define the nature and extent of contamination in sediment of Smokes Creek adjacent to the northern boundary of the site

- Evaluate groundwater flow patterns across the site and assess overburden groundwater quality

- Quantify the volume of fill material throughout the site

- Collect data sufficient to conduct a Qualitative Human Health Exposure Assessment

- Complete a NYSDEC Fish and Wildlife Resources Impact Analysis through Step 2A.

The primary focus of the RI was to evaluate existing on-site and off-site conditions, including hydrogeologic characteristics, the nature and extent of groundwater and soil contamination, and possible human exposure to the contaminants, to develop a remedial approach to address site contamination. Remedial field investigation activities included:

- Utility clearance/geophysical survey
- Site survey (preliminary and post-sampling)
- Soil, groundwater, surface water, and sediment sampling and analysis
- Evaluation of indoor air and the potential for vapor intrusion

1.2 REPORT ORGANIZATION

This RI Report presents the overall approach and details specific activities that were performed during the RI. The report is organized into the following chapters:

- ***Chapter 1 – Introduction and Project Overview***—Provides a description of the site background including site history, physical characteristics of the site, and a summary of the previous investigation conducted at the site.

- ***Chapter 2 – Field Investigation Activities***—Provides a summary of the procedures and techniques used to complete the RI field investigation activities.

- ***Chapter 3 – Environmental and Physical Setting***—Presents the field observations, and geologic and hydrogeologic results of the RI field activities.

- ***Chapter 4 – Results of the RI***—Presents a summary and discussion of the findings of the RI.

- ***Chapter 5 – Fate and Transport***—Identifies the potential and actual fate and transport mechanisms that influence the distribution of contaminants of potential concern (COPCs).

- ***Chapter 6 – Qualitative Human Health Exposure Assessment***—Presents a qualitative human exposure assessment based on current and future site use scenarios.

- ***Chapter 7 – Fish and Wildlife Resource Impact Analysis***—Documents the results of the fish and wildlife resources impact analysis.

- ***Chapter 8 – Summary and Conclusions***—Summarizes the findings and conclusions of this RI.

1.3 BACKGROUND

1.3.1 Site Overview

The site is listed as a Class "2" site in the State Registry of Inactive Hazardous Waste Sites (list of State Superfund sites), meaning that the site represents a significant threat to public health or the environment, and that action is required. At the time of this report, the site consisted of one operable unit. An operable unit represents a portion of a remedial program for a site that, for technical or administrative reasons, can be addressed separately to investigate, eliminate, or mitigate a release; threat of release; or exposure pathway resulting from the COPCs. A second operable unit (Operable Unit 2) may be created for sediment and stream impacts if deemed necessary.

The site is located at 2960 South Park Avenue in the City of Lackawanna, Erie County, New York (Figure 1-1). The incinerator area is a 1.57-acrea area, partially bounded by a perimeter fence, situated within a larger, city-owned parcel of land. Main access to the site is located on Reddon Street, off of South Park Avenue. The site's main features are two brick multi-story buildings that housed municipal solid waste incinerators (the southern and northern buildings) and a large soil ramp that was used to access the third floor of the northern building. The remainder of the site is generally open space. The southern portion of the property consists primarily of a road salt storage barn and an unpaved area with a framed shed that is currently used to house equipment for the City of Lackawanna Department of Public Works (DPW).

1.3.2 Current Land Use

The site is located in a mixed-use area including industrial, commercial, and residential properties (Figure 1-2). The property is bounded to the west by the Lackawanna Veterans' Stadium, to the south by the DPW, to the east by a parcel (the northern area of which is undeveloped) owned by the Baker Hall Victory Services, and to the north by a paved walking path open to the public that runs parallel to the southern side of Smokes Creek. Numerous single-family residential properties are located south and southwest of the site. Holy Cross Cemetery is located north of the site, on the northern side of Smokes Creek.

1.3.2.1 On-site Area

The current primary use of the site is for materials staging and equipment/vehicle storage for the City of Lackawanna's DPW facilities, which adjoins the property to the south. Piles of waste road material, soil, and mulch, as well as excess piping, chain-link fencing, brick, cinder blocks, and scrap metal, are located throughout the site. A small shed structure had been occasionally used for the temporary storage of household hazardous wastes (e.g., propane tanks, paint cans, and fertilizer) and electronics[1]. A DPW vehicle fueling station, including two underground storage tanks and associated pumps, is located just north of the DPW building. According to an environmental database search, there are two 6,000-gallon capacity registered underground storage tanks; one tank contains gasoline/ethanol, while the other contains diesel (Environmental Data Resources, Inc. [EDR] 2012).

The main (second) floor of the southern incinerator was used as a woodworking shop until 2012, when the City of Lackawanna Department of Buildings and Codes condemned the southern incinerator, due in part to brick failure on the incinerator stack. The first floor of the northern incinerator is currently used by the City Animal Control Officer for the temporary caging of animals. The second floor contains the intact incinerator equipment for two incinerator trains, in addition to some automotive parts and scrap metal. The third floor currently contains truck parts, automotive repair tools, and approximately a dozen barrels with unknown contents which remain from a former period of use as an autobody shop. Various chemicals and cleaners are stored throughout the northern building.

[1] Following a NYSDEC Region 9 Materials Management inspection (July 12, 2012) and a follow up letter from the Regional Materials Management Engineer (August 2, 2012), the practice has been discontinued.

1.3.2.2 Stadium Property

The Lackawanna Veterans' Stadium, which is owned by the City of Lackwanna, includes an asphalt-paved parking lot containing 70+ spaces located off South Park Avenue, a stadium building in the northern portion of the property, and an associated grass athletic field. The Stadium Property adjoins the site to the east, and is bounded to the north by the paved creek path and to the south by Reddon Street. The property is used frequently by various community members for sporting and other community-sponsored events.

1.3.2.3 Baker Hall Property

The Baker Hall Property is located at 150 Martin Road, immediately east and southeast of the site. The northern portion of the Baker Hall Property is currently an overgrown vacant field and emergent woods, while the southern portion of the property includes residential group homes.

1.3.2.4 Smokes Creek Corridor

The Smokes Creek Corridor is adjacent to the north of the Stadium Property, On-site Area, and Baker Hall Property; and is separated from these areas by chain-link fencing. Smokes Creek Corridor encompasses the southern bank of the North Branch of Smokes Creek and a paved walking path runs along the southern bank of Smokes Creek. Public access to the paved walking path is at its western extent, near the Lackawanna Veterans' Stadium entrance, and at its eastern extent, through the a park, owned by the City of Lackawanna, located behind the Senior Citizens Center at 230 Martin Road. Holy Cross Cemetery is located across Smokes Creek to the north of the RI study area.

1.3.3 Historical Land Use

To support the development of a conceptual site model, a file search and database review were conducted. Key findings regarding historical land use of the RI Study Area, based on historical and environmental records, the Site Investigation (Malcolm Pirnie, 2005), Sanborn fire insurance maps, topographic maps, and aerial photographs, are briefly summarized below.

1.3.3.1 On-site Area

Incinerators

The incinerators were primarily used to burn municipal trash, although some medical waste from Our Lady of Victory Hospital was intermittently burned (Malcolm Pirnie 2005). Operations at the site began in 1927 at the southern incinerator building. The 1927 Sanborn fire insurance map (EDR 2012) shows the building as a two-story, concrete and brick wall structure; with concrete floors, two burners, a coal bin and storage area with fireproof construction and reinforced concrete throughout, and an iron chimney with a concrete base. Additional on-site features included a barn, storage sheds, and a forge shop in the southern portion of the site; and a fill mound south of the incinerator building. The southern incinerator was decommissioned in 1950, and operations shifted to a newly constructed replacement incinerator located in the north-central portion of the site. The first floor of the southern incinerator was filled with ash material from the northern incinerator when it began operation in 1950.

The northern incinerator building is three stories tall. It is shown on the 1950 Sanborn map as non-combustible, with an exposed steel frame, concrete floors, and concrete and brick-faced walls (EDR 2012). During operation, garbage trucks entered the third floor, via two overhead garage doors, and dumped material into the incinerators located on the second floor. Following combustion, ash from the incinerators was loaded into dump trucks that entered the ground floor on the western side of the building and exited to the east. Dump trucks accessed the third floor of the incinerator via a soil ramp. Initially, the ramp was constructed from a mix of soil and steel foundry slag. The ramp was widened through the addition of street sweepings and discarded refractory brick from the incinerator chimneys following routine repair and maintenance activities (Malcolm Pirnie, 2005). Operation of the northern incinerator ceased in 1980.

Department of Public Works

Based on a review of available Sanborn fire insurance historical maps (1927, 1950, and 1981) (EDR 2012), the first DPW building was present in the southern portion of the site by 1927. The building included a tractor shed, room for trucks, a restroom, a stable and harness room, a black smith shop, a carpenter shop, and an office. In 1947, the DPW garage was built off the eastern end of Reddon Street. The building consisted of an office, locker rooms, voting machine, store room, and a garage area. By 1950, the first DPW building constructed was revamped and primarily used as a storage building. The building included a dog pound, but no stables. According to the 1950 Sanborn map, a gasoline tank was located outside of the building to the south and a 6-inch (in.) diameter water pipe ran between the DPW garage and the revamped original DPW building. Based on the 1981 Sanborn map, the older DPW storage building and the associated gasoline tank were not present. The DPW garage was still intact, with a small addition off the eastern end of the building. Currently, the DPW garage and storage buildings located at 30-32 Reddon Street appear in the same layout as that shown on the 1981 Sanborn map.

1.3.3.2 Stadium Property

Based on the Sanborn maps (EDR 2012), an athletic field and civic stadium were constructed in 1936 adjacent to the west of the site. The property includes stadium seating on the northern side of the field, with a press box and dressing rooms located underneath the seating. Prior to becoming known as the Lackawanna Veterans' Stadium, it was formerly known as the Ron Jaworski Stadium and the South Park Stadium.

1.3.3.3 Baker Hall Property

Baker Hall properties are located to the immediate east and southeast of the site, and include the Baker Victory Services Orphan Home and Intermediate Care Facilities for the developmentally disabled, as well as approximately 12 acres of undeveloped land consisting of an overgrown vacant field and emergent woods. The Baker Hall program was established in 1956, and provided residential care for emotionally troubled boys throughout western New York (Hartel 2006). The program originally operated out of the orphanage, but moved in 1962 to four cottages built on the Martin Road land that had once been the Our Lady of Victory Institutes' farm. The Institutes ran a dairy and stock farm that provided vegetables, meat, eggs, and milk until the 1940s, when it ceased being profitable, and was gradually phased out during the 1950s.

On August 6, 1993, the Diocese of Buffalo sold the parcel of land that was once the Institutes' farm (150 Martin Road) to Baker Hall (City of Lackawanna 2012). Around 2006, Baker Victory Services continued to expand its facilities, adding more cottages and a swimming facility on Martin Road. According to Baker Hall Victory Services, future development of the northern portion of the property, adjacent to the site, is planned for additional residential housing.

1.3.3.4 Smokes Creek Corridor

The current configuration of Smokes Creek, located north of the site, is a result of channelization as illustrated by historical topographic maps and aerial photographs from 1901 through 2006 (EDR 2012). In 1901, prior to the construction of the incinerators, Smokes Creek meandered naturally through the area. By 1948, the creek was channelized north of the site and a wetland was present to the northeast of the channelized section. In July 1953, a channelization project was authorized under Section 13 of the 1946 Flood Control Act in order to remove snags, shoals, and debris approximately 4 miles (mi) upstream of the mouth of Smokes Creek in Lake Erie. Between 1965 and 1966, a series of meanders along the north side of the existing Smokes Creek, from north of Veterans Stadium to the northeast corner of the City of Lackawanna property, were graded to become part of the Holy Cross Cemetery. An improved channelization project was authorized under the July 1960 Flood Control Act. The project, which increased the channel capacity of the North Branch of Smokes Creek to 2,500 cubic ft/second, was completed in 1970.

Based on historical aerial photographs (EDR 2012), the paved walking path was present along the south bank of Smokes Creek by 2002. At that time, the western entrance to the paved path was located just west of the stadium building and, by 2005, had been relocated to the northeastern corner of the stadium parking lot.

1.4 PREVIOUS INVESTIGATIONS

In April 2005, Malcolm Pirnie conducted an investigation intended to serve as the initial step of a Site Investigation/Remedial Alternatives Report, in accordance with the U.S. Environmental Protection Agency (EPA) Brownfields Assessment Program. The purpose of the site investigation was to evaluate environmental conditions at the site to determine the level of chemical contamination. Three sediment samples, three incinerator ash samples from the basement of the southern incinerator building, and seven subsurface soil/fill samples were collected to characterize the physical and chemical conditions of the on-site materials (Figure 1-3). Three shallow groundwater monitoring wells (MW-01, MW-02, and MW-03) were also installed and groundwater samples were collected. Building assessment activities included lead-based paint and asbestos sampling within the incinerator buildings.

Ash samples were analyzed for target analyte list (TAL) inorganics and dioxins. No dioxins were detected in any of the samples. Seven metals were detected at concentrations above the 6 New York Code of Rules and Regulations (NYCRR) Part 375 Environmental Remediation Programs - Unrestricted Use - Soil Cleanup Objectives (SCOs) for surface and subsurface soil in the ash samples (NYSDEC 2006). The eight metals identified included arsenic, barium, cadmium, chromium, copper, lead, nickel, and zinc. However, only copper, lead, and zinc detections in ash exceeded the Restricted Use - Industrial SCOs.

Constituent	Range of Detections	Unrestricted Use SCO[(a)]	Industrial SCO[(a)]
Arsenic	7.28–*13.3*	13	16
Barium	106–*798*	350	10,000
Cadmium	0.586–*7.31*	2.5	60
Chromium	26.3–*51.9*	30	6,800
Copper	*72*–***56,400***	50	10,000
Lead	*238*–***23,600***	63	3,900
Nickel	20.6–*42.1*	30	10,000
Zinc	*451*–***146,000***	109	10,000

(a) NYSDEC 2006.

NOTE: Concentrations in milligrams per kilogram (mg/kg).
Inorganic constituents analyzed by EPA Method 6000/7000 series.
Range of detected concentrations based on 3 ash samples.
Table includes only those analytes that exceeded SCOs.
Italicized value indicates exceedance of Unrestricted Use SCOs.
Bold value indicates exceedance of Restricted Use – Industrial SCOs.

Each of the subsurface soil samples contained one or more analytes at concentrations that exceeded SCOs. Four polycyclic aromatic hydrocarbons (PAHs) exceeded the Unrestricted Use SCOs. However, only benzo(a)pyrene was detected above the Restricted Use - Industrial SCOs. Each of the subsurface soil samples contained one or more metals at concentrations above Unrestricted Use SCOs and only one metal that exceeded the Restricted Use – Industrial SCOs as presented in the table below.

Constituent	Range of Detections	Unrestricted Use SCO[(a)]	Industrial SCO[(a)]
Arsenic	4.41–***38.9***	13	16
Barium	118–*727*	350	10,000
Cadmium	0.298–*6.2*	2.5	60
Chromium	13.1–*101*	30	6,800
Copper	16.1–*703*	50	10,000
Lead	60.8–*1,820*	63	3,900
Manganese	*750–2,500*	1,600	10,000
Mercury	0.023–*0.453*	0.18	5.7
Nickel	10.1–*181*	30	10,000
Selenium	0.46–*6.45*	3.9	6,800
Silver	0.236–*8.2*	2.0	6,800
Zinc	*109–2,300*	109	10,000

(a) NYSDEC. 2006.

NOTE: Concentrations in mg/kg.
Inorganic constituents analyzed by EPA Method 6000/7000 series. Range of detected concentrations from seven locations: MW-01, MW-02, MW-03, SB-01, SB-02, SB-03, and SB-04.
Table includes only those analytes that exceeded SCOs.
Italicized value indicates exceedance of Unrestricted Use SCOs.
Bold value indicates exceedance of Restricted Use - Industrial SCOs.

Groundwater sample data were compared to NYSDEC Class GA groundwater standards and guidance values (6 NYCRR Part 703.5 Water Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended). No organics (volatile organic compounds [VOCs], semivolatile organic compounds [SVOCs], pesticides, and polychlorinated biphenyls [PCBs]) were detected above laboratory reporting limits. Five metals were detected in one or more of the groundwater samples collected at the site in excess of NYSDEC Class GA groundwater standards or guidance values. The highest detections of iron, magnesium, and sodium, which exceeded groundwater standards or guidance values at all three locations, were observed in groundwater samples collected from MW-01, located near the northwestern corner (and downgradient) of the site.

Constituent	Range of Detections	Class GA Standards and Guidance Values[(a)]
Arsenic	13.4–**43.6**	25
Iron	**719–4,600**	300
Magnesium	**39,200–102,000**	35,000
Manganese	149–**750**	300
Sodium	**39,400–441,000**	20,000
Thallium	**3.61**	0.5

(a) 6 NYCRR Part 703.5 Class GA Groundwater Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended.

NOTE: Concentrations in micrograms per liter (µg/L).
Inorganic constituents analyzed by EPA Method 6000/7000 series.
Range of concentration detections from three locations: MW-01, MW-02, and MW-03.
Table includes only those inorganic constituents that exceeded groundwater standards or guidance values.
Bold value indicates exceedance of Class GA groundwater standards or guidance values.

Sediment samples were compared to NYSDEC Technical Guidance for Screening Contaminated Sediments (NYSDEC 1998). SVOCs were the only organic compounds detected above the laboratory reporting limits. No organic compounds were detected above the screening criteria. Eleven metals were detected above the NYSDEC lowest effect level sediment screening criteria, and six metals were detected above the severe effect level in at least one of the three samples collected. The samples taken from the outfall sampling point (SD-02) had greater concentrations of metals than both the upstream and downstream metals concentrations.

Constituent	Range of Detections	Lowest Effect Level[(a)]	Severe Effect Level[(a)]
Antimony	*3.88*–**53.7**	2.0	25.0
Arsenic	5.15–**35.0**	6.0	33.0
Cadmium	*1.25–1.28*	0.6	9.0
Chromium	12.2–*45.7*	26.0	110
Copper	*25.1*–160	16.0	110
Iron	15,500–**99,000**	20,000	40,000
Lead	22.7–**3,580**	31.0	110
Manganese	**546–1,300**	460	1,100
Nickel	*21.5–34.2*	16.0	50.0
Silver	*1.37–1.47*	1.0	2.2
Zinc	113–**671**	120	270

(a) NYSDEC 1999.

NOTE: Concentrations in mg/kg.
Inorganic constituents analyzed by EPA Method 6000/7000 series.
Range of detected concentrations from three locations: SD-01, SD-02, and SD-03.
Table includes only those inorganic constituents that exceeded sediment screening criteria.
Italicized values indicate exceedance of lowest effect level sediment screening criteria.
Bold values indicate exceedance of Severe Effect Level.

The 2005 site investigation (Malcolm Pirnie) results indicated that there were:

- Elevated concentrations of metals in the incinerator ash
- Elevated concentrations of metals and PAHs in soil/fill
- Potentially site-related metals impacts to sediment at a stormwater outfall
- Presence of asbestos-containing materials in the incinerator buildings.

1.5 PHYSICAL PROFILE

1.5.1 Physiography

The site is located within the Erie-Ontario Lowlands physiographic province, and is within the U.S. Geological Survey Buffalo SE, New York 7.5-minute topographic quadrangle map, dated 1965 (Figure 1-4). Elevations of the site range from approximately 590 to 615 ft above mean sea level (amsl). A ramp, ranging in elevation from about 593 to 615 ft amsl, dominates the topography of the eastern portion of the site. The natural grade at the site prior to ramp construction was likely generally level, with elevations ranging from about 590 to 593 ft amsl, based on historical topographic maps. The nearest surface water feature is Smokes Creek, which is adjacent to the paved walking path north of the site. Smokes Creek flows west approximately 2.7 mi downstream to Lake Erie.

1.5.2 Climate

The City of Lackawanna is located in Erie County in Western New York State. Western New York has a humid climate that is heavily influenced by Lake Erie to the west and Lake Ontario to the north. Winters are typically long and cold, often lasting from late-October to mid-April, but are changeable and include frequent thaws as well rain. Western New York receives a large amount of lake effect snow from the bordering Great Lakes. On average, Western New York receives approximately 40 in. of precipitation per year. Spring and fall in Western New York are usually short and changeable. Breezes blowing over Lake Erie are usually cooler than the air temperature in the summer. Western New York generally has cooler summers than other regions in the same climatic zone.

1.5.3 Geology/Hydrogeology

According to the surficial geology map for this region, the site is underlain by lacustrine silt and clay, which is generally described as laminated silt and clay that was deposited in proglacial lakes (Caldwell 1988). These surficial deposits are underlain by bedrock, of the Middle Devonian Levanna Shale Member of the Skaneateles Formation (Rickard et al. 1970), which consists of dark to medium-gray fossiliferous shale and mudrock.

Previous geologic data for the site were obtained during the 2005 investigation (Malcolm Pirnie 2005). The site geology is characterized as fill material underlain by glaciolacustrine deposits of fine-grained silt and clay. Fill materials, ranging in thickness from not present to greater than 20 ft, consisted of reworked silty clay intermixed with varying amounts of slag and gravel, as well as trace amounts of glass, cinders, brick, and ash. Bedrock was not encountered during the previous site investigation. However, based on regional mapping, shale bedrock is anticipated to be present at approximately 50 ft below ground surface (bgs).

The Soil Survey of Erie County, New York, identified surface soil underlying the majority of the site as Dumps (Dp), a miscellaneous area filled with rubbish and debris (U.S. Department of Agriculture-Soil Conservation Service 1986). The area north of the site is underlain by a moderately well-drained silt loam floodplain summit soil formed over silty alluvium. The northwestern corner of the site and the Stadium Property is underlain by a moderately well-drained silt loam to stratified very fine sandy loam floodplain soil that formed over silty alluvium. The southernmost portion of the RI Study Area is underlain by somewhat poorly-drained silt loam lake plain soils that formed over silty and clayey glaciolacustrine deposits, or poorly-drained silt loam lake plain soil that formed over glaciolacustrine silt and very fine sand.

Based on topography and the findings of the previous investigation, shallow groundwater flow at the site is generally to the north toward Smokes Creek. The local water table exists within the overburden from 586 to 589 ft amsl (6–10 ft bgs, excluding the area of the fill mound). In the ramp area, groundwater may be present in perched zones and would be anticipated to flow radially.

1.5.4 Hydrology

The site is located approximately 2.5 mi east of the eastern shore of Lake Erie. Smokes Creek flows generally west approximately to its discharge point at Lake Erie. Surface water runoff at the site flows radially from the elevated fill ramp to drainage ditches and two stormwater catch basins, which drain northward into Smokes Creek. Several discharge points are located in this reach along both the north and south banks of Smokes Creek. Two outfall pipes, which are likely associated with the on-site storm sewer system, are located north of the site: one near the northwestern corner of the site and another near the northeastern corner of the site. These discharge points are approximately 0.5–1.0 ft above the elevation of the creek, in the floodplain. A third outfall, associated with the storm sewer that runs from south to north on the Baker Hall Property, is located immediately east of the site.

Based on information obtained during the initial site visit, the northern incinerator building had a French drain that may be connected to this stormwater system. Historically, the incinerators were quenched with water after a batch-combustion took place. The associated wastewater reportedly ran into a drain system, potentially entering the storm sewer network and eventually Smokes Creek.

1.5.5 Potential Receptors

Access to the site is controlled by a perimeter fence and posted signage. City workers currently use the site for various operations, primarily related to municipal trash pickup, plowing, vehicle fueling, and animal control. Visitors may access the property during hours of operation. Trespassers and wildlife may access the site through gaps in the fence. The Stadium Property and the paved creek path along the southern bank of Smokes Creek are open to the public.

The Baker Hall Property is currently developed in the area southeast of the site, while the northern portion is vacant, with emergent vegetation and some wooded and ponded areas in the area adjoining the Smokes Creek Corridor. Partial fencing is present along the portion of the western property boundary adjoining the site and the Smokes Creek Corridor. The athletic field and residential group home area in the southern portion of the property is also fenced.

Groundwater and stormwater from the site flow to Smokes Creek. NYSDEC classifies Smokes Creek as a Class C water body, meaning its best usage is for fishing. Smokes Creek may be accessed for recreational purposes via the paved path. Public drinking water at the site and in the surrounding area is obtained from the Erie County Water Authority. No public water supply systems are located within a 1-mi radius of the site (EDR 2012).

According to the National Wetlands Inventory (2012), there are two mapped federal wetlands located approximately 0.25–0.5 mi east of the site. State wetlands are present approximately 0.5–1 mi southwest of the site.

The eastern portion of the site itself offers limited habitat, with minor wooded areas. The vacant land east of the site offers better quality habitat for small mammals and birds, with hardwood trees in the northern portion and grasses and emergent vegetation covering the remainder of the vacant land. Potential exposure to COPCs in creek sediment, surface water, and biota may be possible. During the previous investigation, a review of New York Natural Heritage Program records indicated that there are no known occurrences of rare or state-listed animals and plants, significant natural communities, or other significant habitats on or in the immediate vicinity of the site (Malcolm Pirnie 2005). An ecological habitat visual survey was conducted on May 24, 2005, and tracks of raccoon (*Procyon lotor*), Eastern wild turkey (*Meleagris gallopavo*), and whitetail deer (*Odoceoleus virginiana*) were observed in sediment along the water's edge. These observations are generally consistent with those made during the RI.

2. FIELD INVESTIGATION ACTIVITIES

The primary purpose of the RI field activities was to: (1) delineate the nature and extent of contamination in fill material and subsurface soil, and (2) quantify the volume of fill material throughout the site. The RI study area initially included sampling locations at the incinerator site, and at adjacent properties (i.e., the Stadium Property to the west, Smokes Creek Corridor to the north, and the Baker Hall Property to the east), to determine whether they had been contaminated by incinerator operations. The study area expanded during subsequent RI phases, as needed, to delineate the extent of site-related contamination.

RI field activities were conducted during five phases:

- ***Phase I***—October–November 2012: Initial investigation of surface soil, subsurface soil, groundwater, sediment, and stormwater from outfalls

- ***Phase II***—April 2013: Collection of additional surface/subsurface soil, sediment, and surface water, as well as a second groundwater sampling event

- ***Phase III***—July 2013: Collection of additional surface/subsurface soil to further delineate the extent of site-related metals contamination

- ***Phase IV***—August 2013: Collection of additional surface/subsurface soil to further delineate the extent of site-related metals contamination

- ***Supplemental Delineation*****—**October–November 2013: Collection of additional surface/subsurface soil to determine the estimated volume of contaminated soil/fill at the Baker Hall Property. The results of this additional effort are provided in Appendix A.

- ***Phase V***—February 2014: Collection of additional surface/subsurface soil to further delineate the eastern extent of site-related metals contamination.

Field investigation activities were conducted in accordance with the RI/FS Work Plan (EA 2012), with the exception of deviations specifically identified in the following sections. Field investigation activities and sampling procedures were conducted in a manner consistent with the EA Generic Health and Safety Plan (EA 2011a) and Generic Field Activities Plan (EA 2011b) developed for Work Assignments conducted under Standby Engineering Services Contract D007624, and the associated site-specific addenda. Daily field reports for remedial field investigation activities are provided in Appendix B. Tables 2-1A through 2-1E summarize the field sampling and laboratory analyses performed on various environmental media during the RI.

In accordance with the site-specific Health and Safety Plan (EA 2012), health and safety officer responsibilities were assigned to one team member throughout the field program to ensure that the personnel were protected from both physical and chemical health hazards. Appropriate protective clothing was worn by field personnel while performing each intrusive activity for protection against contamination and to prevent cross-contamination between sample locations and matrices.

2.1 PRE-INVESTIGATION FIELD ACTIVITIES

2.1.1 Utility Clearance

Prior to the start of each phase of RI field activities, sampling locations were marked out in the field by EA personnel and Dig Safely New York was contacted for utility clearance. In addition, geophysical surveys were conducted on October 4, 2012 and April 12, 2013 by NOVA Geophysical Services to ensure that selected sampling locations did not overlie subsurface utilities at the site. Where conflicts were identified, sampling locations were adjusted in the field. Copies of the geophysical reports are provided in Appendix C.

2.1.2 Preliminary Site Survey

Popli Design Group of Penfield, New York, a New York State-licensed Land Surveyor completed an initial site survey and base map on October 18, 2012. All structures at or near the site, all property boundaries, Smokes Creek, nearby roadways, and utilities (i.e., manholes, fire hydrants, utility poles, gas lines, etc.) were added to the base map based upon field observations of the crew and available historical documentation. The base map survey area was extended on April 23, 2013. A copy of the site survey base map is included in Appendix D.

2.2 AIR MONITORING PROGRAM

A Community Air Monitoring Plan was implemented in accordance with the work plan (EA 2012) during intrusive activities (i.e., soil borings and monitoring well installation) to identify potential impacts of site activities to surrounding air quality. VOCs were monitored periodically at the upwind and downwind perimeter of the immediate work area with a photoionization detector (PID) to establish background conditions. Particulate concentrations were monitored continuously at the upwind and downwind perimeters of the work area at temporary particulate monitoring stations. The particulate monitoring was performed using a Thermo MIE pDR-4000 DataRam or equivalent. No readings above background levels were detected.

2.3 SOIL SAMPLING PROGRAM

2.3.1 Surface Soil

During the RI, surface soil samples were collected from a total of 61 locations, including six surface soil samples collected to represent background conditions (Figure 2-1). Three field duplicate surface soil samples were also collected. Table 2-1A lists the surface soil samples collected and the laboratory analyses completed during the RI.

RI Phase I (October–November 2012)

A total of 16 surface soil samples were collected in October and November 2012. Ten surface soil samples were collected at the following on-site locations:

- Southeast and northwest corners: SS-01 and SS-02
- Ramp: SS-11, SS-12, and SS-13
- Northeast and northwest sides of the northern incinerator building: SS-14 and SS-15
- West side of the northern incinerator access road: SS-16, SS-17, and SS-18.

Six additional samples were collected from the Lackawanna Veterans' Stadium field to the west of the site and the Baker Hall Property to the east of the site to identify potential site-related impacts:

- Stadium Property: SS-05 through SS-07
- Baker Hall Property: SS-08 through SS-10.

RI Phase II (April 2013)

Ten additional surface soil samples were collected April 15–17, 2013 at the following locations:

- Stadium Property: SS-03, SS-04, SS-20, and SS-21
- Baker Hall Property: SS-22 through SS-27
- Smokes Creek Corridor: SS-19.

Six surface soil samples were also collected and analyzed for SVOCs and metals to evaluate background concentrations of site-related COPCs at the following locations:

- Stadium Property (western side): SS-28 and SS-29
- Stadium Property (southwest corner): SS-30
- City Park located east of Baker Hall Property: SS-31 through SS-33.

RI Phase III (July 2013)

Additional surface soil samples were collected on July 1–2, 2013 at the following 19 locations:

- Baker Hall Property: SS-40 through SS-48

- Holy Cross Cemetery Property, unpaved path along north bank of Smokes Creek to evaluate the potential presence of site-related impacts: SS-37, SS-38, SS-39, and SS-39A

- Smokes Creek Corridor, paved path (northeast): SS-40, SS-43, and SS-46

- Smokes Creek Corridor, paved path (northwest): SS-34, SS-35, and SS-36.

RI Phase IV (August 2013)

Additional surface soil samples were collected on August 13, 2013 at the following six locations:

- City of Lackawanna Property (east of Baker Hall Property): SS-49
- Smokes Creek Corridor, paved path (northeast): SS-50, SS-51, SS-52, SS-53, and SS-54.

RI Phase V (February 2014)

Additional surface soil samples were collected on February 24, 2014 at the following six locations along the Smokes Creek Corridor (east of paved path): SS-55, SS-56, SS-57, SS-58, SS-59, and SS-60.

Methods

Surface soil samples were collected from 0 to 2 in. bgs using clean, disposable plastic scoops. The surface soil samples were visually inspected and described on a surface soil sample form. Texture, composition, color, consistency, moisture content, recovery, odor, PID readings, and staining were recorded consistent with the Unified Soil Classification System. Copies of the completed surface soil sampling forms are provided in Appendix E.

Surface soil for VOC analysis was collected as discrete grab samples from the approximately 1-ft^2 area. Surface soil for the remaining analyses was homogenized by placing each sample into a stainless steel mixing bowl equipped with a clean, dedicated plastic liner and stirring the sample with a dedicated plastic scoop until the sample appeared consistent throughout. Surface soil samples were placed in appropriate sample containers, sealed, packed on ice, and submitted under standard chain-of-custody to Chemtech Consulting Group of Mountainside, New Jersey. Quality assurance (QA)/quality control (QC) samples were collected at the frequency detailed in EA's Generic Quality Assurance Project Plan (QAPP) and site-specific QAPP Addendum (EA 2011c, 2012). Samples were analyzed in accordance with the NYSDEC Analytical Services Protocol (ASP). A total of three duplicate field samples were analyzed specifically for surface soil samples during the RI Phase I and II activities. During subsequent phases, fewer surface soil samples were collected at one time (i.e., 6–8 samples); therefore, those samples were included in sample delivery groups with subsurface soil and associated QA/QC samples.

Laboratory Analysis

RI Phase I (October–November 2012)

During the initial phase, each surface soil sample was submitted for analysis of the following:

- Target compound list (TCL) VOCs by EPA Method 8260C
- TCL SVOCs by EPA Method 8270B
- TAL metals including mercury by EPA Method 6010B/7470A/7471A

- TCL pesticides by EPA Method 8081A
- TCL PCBs by EPA Method 8082
- Cyanide by EPA Method 9010B.

RI Phase II (April 2013)

Each surface soil sample collected in April 2013 was submitted for analysis of TAL metals including mercury. In addition, the six surface soil samples collected from the Baker Hall Property and six background surface soil samples collected from off-site locations were analyzed for TCL SVOCs.

RI Phase III, IV, and V (July–August 2013 and February 2014)

Each surface soil sample collected after April 2013 was submitted for analysis of TAL metals, including mercury.

2.3.2 Subsurface Soil

During the RI, subsurface soil sampling was conducted at a total of 59 soil boring locations, including 7 borings that were converted to monitoring wells and 4 shallow soil borings at floodplain locations (Figure 2-1). A total of 193 primary field samples were submitted for laboratory analysis as detailed in the table below:

RI Phase	Soil Borings	Floodplain Soil Borings	Soil Borings Converted to Monitoring Wells	Subsurface Soil Samples Analyzed [(a)]
I	14	1	7	100
II	7	3	0	27
III	15	0	0	36
IV	6	0	0	13
V	6	0	0	17
Totals	48	4	7	193
(a) Sample counts exclude QA/QC and waste characterization samples.				

A total of 15 duplicate field subsurface soil samples were also collected and submitted for laboratory analysis during the RI (Table 2-1B). Floodplain soil boring samples were submitted in sample delivery groups with creek sediment and the associated QA/QC samples.

RI Phase I (October–November 2012)

During the initial investigation, a total of 100 primary field subsurface soil samples and 8 duplicate field samples were collected from October 18, through November 6, 2012 (Figure 2-1).

A total of 68 subsurface soil samples were collected from eight on-site soil borings and five monitoring well locations:

- Ramp: SB-11, SB-12, and SB-13

- North of the northern incinerator building: MW-02A, MW-07, SB-14, and SB-15

- West side of the northern incinerator access road: MW-03A, MW-06, SB-16, SB-17, and SB-18

- Southeast of the site on the DPW property: MW-04.

A total of 32 subsurface soil samples were also collected from seven off-site soil borings and two off-site monitoring well locations:

- Stadium Property: SB-05, SB-06, and SB-07
- Baker Hall Property: MW-05, SB-08, SB-09, and SB-10
- Smokes Creek Corridor: MW-08 and floodplain shallow soil sample SD-06FP.

RI Phase II (April 2013)

An additional 27 primary field subsurface soil samples and 2 duplicate field samples were collected April 15–17 2013 at 10 off-site soil boring locations:

- Stadium Property: SB-20 and SB-21
- Baker Hall Property: SB-22 through SB-25
- Smokes Creek Corridor: SD-10FP, SD-11FP, SD-12FP, and SB-19.

Three shallow soil samples (0–6 in.) were collected from the floodplain south of Smokes Creek, with two samples (SD-10FP and SD-11FP) collected in the area between stormwater outfall sampling locations SD-03 and SD-04, and one sample (SD-12FP) collected near a RI Phase I sediment sampling location (SD-07A).

In addition, a waste characterization sample (SB-WC) was collected from the ramp. The boring was located adjacent to SB-13, which was installed during the RI Phase I field activities.

RI Phase III (July 2013)

An additional 36 primary subsurface soil samples and 3 duplicate field samples were collected on July 1–2, 2013, from the following 15 locations:

- Baker Hall Property: SB-41, SB-42, SB-44, SB-45, SB-47, and SB-48
- Smokes Creek Corridor, paved path (northwest): SB-34, SB-35, and SB-36
- Holy Cross Cemetery Property, north of Smokes Creek: SB-37, SB-38, and SB-39
- Smokes Creek Corridor, paved path (northeast): SB-40, SB-43, and SB-46.

The soil borings were terminated at 2 ft bgs, with the exception of SB-34, SB-35, and SB-36, which was terminated at 4 ft bgs.

RI Phase IV (August 2013)

An additional 13 primary field subsurface soil samples and 1 duplicate field sample were collected on August 13, 2013 from the following seven locations:

- City of Lackawanna Property, east of Baker Hall Property: SB-49
- Smokes Creek Corridor, paved path (northwest): SB-43
- Smokes Creek Corridor, paved path (northeast): SB-50, SB-51, SB-52, SB-53, and SB-54.

Each soil boring was terminated at 2 ft bgs. Soil boring SB-43, originally sampled during the Phase III field activities, was resampled to obtain a soil sample from 2 to 3 ft bgs for vertical delineation purposes. Soil boring SB-49 was completed to laterally delineate an exceedance observed on Baker Hall Property at SB-48.

RI Phase V (February 2014)

An additional 17 primary field subsurface soil samples and 1 duplicate field sample were collected on February 24, 2014 from the following six locations along the Smokes Creek Corridor, east of paved path: SB-55, SB-56, SB-57, SB-58, SB-59, and SB-60. Each soil boring was terminated at 4 ft bgs, with the exception of SB-55, which was terminated at 12 ft bgs.

Methods

Direct Push

Direct-push soil borings were advanced to depths ranging from 4 to 28 ft bgs, by GeoLogic NY, Inc., of McGraw, New York, using a track-mounted Geoprobe® (Figure 2-1). Subsurface soil/fill samples were collected continuously at each boring location using a 4-ft dedicated acetate sleeve liner and screened in the field using a PID. Each soil boring was advanced through the soil/fill materials to natural overburden deposits for the purposes of geologic logging and subsurface soil/fill sample collection. The target completion depth for most soil borings was to native material, i.e., past the vertical extent of fill materials and obvious indications of contamination (e.g., elevated PID readings, staining, odors, etc.), or 4 ft bgs.

An on-site geologist examined each interval to describe soil sample texture, composition, color, consistency, moisture content, recovery, odor, PID readings, and staining using the Unified Soil Classification System. Boring logs are provided in Appendix F.

Hollow Stem Auger

Seven soil borings were completed by GeoLogic using 4.25-in. inner diameter hollow stem augers prior to installation of monitoring wells (MW-02A, MW-03A, and MW-04 to MW-08) (Figure 2-1). Monitoring well boreholes were drilled to depths ranging from 27 to 30 ft bgs. The target completion depth for borings at monitoring well locations was at least 5 ft below the water table.

Soil from SB-11 was collected continuously using a macro-core sampler adapted for a hollow stem auger rig. Soil from the seven monitoring well locations was collected continuously utilizing 2-ft long, 2- or 3-in. outer diameter split-spoon samplers. An on-site geologist examined each interval to describe soil sample texture, composition, color, consistency, moisture content, recovery, odor, PID readings, and staining using the Unified Soil Classification System. Boring logs are provided in Appendix F.

Equipment Decontamination

Non-dedicated equipment and tools used to collect subsurface soil samples for chemical analysis was decontaminated prior to and between each sample interval. Drilling augers were steam-cleaned following completion of each boring in order to avoid cross-contamination. Split-spoon and macro-core samplers were decontaminated using a non-phosphate detergent and potable water rinse.

Sample Collection

Subsurface soil samples were continuously collected for laboratory analysis, generally in 1 to 2 ft intervals, to the extent practicable from ground surface to the termination depth (Table 2-1B). Sampling intervals were adjusted to accommodate observed sample variation (e.g., where more than one geological material existed), or to target an impacted interval based upon PID readings and/or visual and olfactory evidence.

Subsurface soil samples collected from the soil and monitoring well borings were collected by hand, directly from the acetate liners using dedicated nitrile gloves. Subsurface soil/fill samples were placed in the laboratory-provided sample containers, sealed, labeled, and placed in a cooler packed with ice. The subsurface/fill samples were then submitted under standard chain of custody to Chemtech Consulting Group[2]. QA/QC samples were collected at the frequency detailed in the QAPP Addendum (EA 2012). Samples were analyzed in accordance with the NYSDEC ASP.

[2] Due to an extended power outage at Chemtech Consulting Group's laboratory, soil samples from MW-02A, MW-03A, and MW-04 to MW-08 were submitted to Hampton Clarke-Veritech of Fairfield, New Jersey.

Laboratory Analysis

RI Phase I (October–November 2012)

During the initial mobilization, a total of 100 primary subsurface soil samples and 8 duplicate field samples were submitted for analysis of TAL metals including mercury by EPA Method 6010B/7470A/7471A and TCL SVOCs by EPA Method 8270C. A total of 20 primary subsurface soil samples and 8 duplicate field samples were also submitted for analysis of TCL VOCs by EPA Method 8260B, TCL pesticides by EPA Method 8081A, TCL PCBs by EPA Method 8082, and cyanide by EPA Method 9010B. Samples were analyzed in accordance with the NYSDEC ASP.

The samples submitted for expanded list of parameters included sampling multiple vertical intervals at the 10 on-site and 5 off-site at the locations listed below.

- On-site
  - Ramp: SB-11
  - Northwest side of the northern incinerator building: SB-15
  - West side of the northern incinerator access road: SB-17.
  - North/northeast of northern incinerator building: MW-02A and MW-07.

- Off-site
  - Stadium Property: SB-05 and SB-06
  - Baker Hall Property: SB-08 and SB-10
  - Smokes Creek Corridor, northwest of site: MW-08
  - DPW Property (southeast corner): MW-04.

RI Phase II (April 2013)

During the Phase II investigation, 8 subsurface soil samples collected from soil borings on the Stadium Property, 16 subsurface soil samples collected from soil borings on the Baker Hall Property, and 3 floodplain soil/unsubmerged sediment samples collected from the Smokes Creek Corridor were submitted for analysis of TAL metals and mercury by EPA Method 6010B/7470A/7471A. The 16 subsurface soil samples collected from soil borings on the Baker Hall Property were also submitted for analysis of SVOCs by EPA Method 8270C. The three shallow floodplain soil samples collected from the Smokes Creek Corridor were also submitted for total organic carbon (TOC) by Lloyd Kahn and cyanide by EPA Method 9010. Four subsurface soil samples collected from on-site boring SB-WC (adjacent to RI Phase I location SB-13) were submitted for toxicity characteristic leaching procedure (TCLP) metals analysis. Samples were analyzed in accordance with the NYSDEC ASP.

RI Phase III, IV, and V (July/August 2013 and February 2014)

Each of the 67 primary field subsurface soil samples and 5 duplicate field samples collected after April 2013 were submitted for analysis of TAL metals including mercury. Samples were analyzed in accordance with the NYSDEC ASP.

2.4 GROUNDWATER SAMPLING PROGRAM

The RI groundwater evaluation activities included the installation of seven groundwater monitoring wells (MW-02A, MW-03A, and MW-04 through MW-08) and the completion of groundwater sampling events. The first groundwater sampling event was conducted on November 28-29, 2012 and the second event was conducted on April 16–17, 2013. The purpose of the groundwater evaluation program was to evaluate local groundwater flow patterns and overall groundwater quality with respect to NYSDEC Ambient Water Quality Standards. The objective of the groundwater sampling protocol was to obtain samples that are representative of the aquifer in the well vicinity, so that analytical results reflect the composition of the groundwater as accurately as possible.

2.4.1 Monitoring Well Installation

The monitoring well drilling program included the installation of seven, 2-in. diameter overburden groundwater monitoring wells during the Phase I investigation (Figure 2-1 and Table 2-1C). Two of the seven monitoring wells were installed as replacements for previously installed wells MW-02 and MW-03. Replacement wells were indicated by the “A” suffix (i.e., MW-02A and MW-03A). Previously installed monitoring well MW-02 was the only previously installed well that could be located. Due to damage to the well, MW-02 was decommissioned in accordance with Division of Environmental Remediation (DER) guidance (pulled and grouted) (NYSDEC 2010).

Each monitoring well boring was advanced to 5 ft below the water table. Once the desired depth was reached, the inner bit was removed and the well material was placed within the augers. Each 2-in. diameter monitoring well was constructed with 10 ft of 0.01-in. slot well screen and the appropriate length of schedule 40 polyvinyl chloride (PVC) flush-joint casing to ground surface. Once the well material had been set, the annular space between the augers and the well screen was backfilled with No. 0 Morie Sand to approximately 2 ft above the top of the screened interval. Augers were withdrawn simultaneously with the installation of the sandpack. A 2-ft thick layer of bentonite chips was placed on top of the sand pack and hydrated. The remaining annular space was backfilled to grade with a cement/bentonite grout mixture. The remaining augers were then withdrawn and grout within the borehole was topped off as necessary. Monitoring wells were completed with an at-grade curb box or above grade protective casing, dependent on their site location. Each well was installed with a vented cap and a locking cover. A cement pad was installed to channel surface water away from the well.

The monitoring wells were set at depths ranging between 23 and 30 ft bgs. Monitoring well construction details are summarized in Table 2-2 and well construction logs are presented in Appendix G.

2.4.2 Monitoring Well Development

Development of each newly installed monitoring well was performed on November 7–8, 2012. The monitoring wells were developed using surging and pumping techniques. Due to the fine-grained nature of the subsurface materials, development was considered complete when the groundwater temperature, conductivity, and pH in the well stabilized within 10 percent and a turbidity of less than 50 nephelometric turbidity units was achieved, or until no further improvement was noted. Development water was discharged to the ground surface away from the well. Monitoring well development logs are included in Appendix H.

2.4.3 Groundwater Sampling

Groundwater sampling was completed to evaluate groundwater flow patterns across the site, assess groundwater quality, and to assess the potential impacts of soil/fill contamination to groundwater quality at various locations. Groundwater samples were collected from seven groundwater monitoring wells. The first event of groundwater sampling was conducted in November 2012, and the second event was conducted in April 2013. Prior to the start of the groundwater sampling event, a complete round of static water level measurements were taken from each monitoring well location to prepare a groundwater contour map and evaluate groundwater flow patterns. One additional gauging event was conducted in March 2013.

Methods

Groundwater samples were collected from seven monitoring wells on November 28–29, 2012 and on April 16, 2013. Groundwater samples were collected using low-flow sampling procedures. As part of the low-flow sampling procedures, each monitoring well was purged until groundwater parameters (pH, conductivity, oxygen reduction potential, temperature, dissolved oxygen, and turbidity) stabilized within 10 percent. During sampling, purge water was discharged to the ground surface away from the well.

Due to the fine-grained nature of formation and monitoring well construction, turbidity during the November 2012 sampling event did not drop below the goal of 50 nephelometric turbidity units at wells MW-04, MW-06, and MW-08. Therefore, groundwater samples from these locations collected during the November 2012 sampling event were requested to be filtered by the fixed laboratory. Monitoring well gauging, purging, and sampling forms are provided in Appendix I.

Non-dedicated equipment and tools used to collect groundwater samples for chemical analysis were decontaminated prior to and between each sample interval. Pumps were decontaminated with a non-phosphate detergent wash, potable water rinse, isopropanol rinse, potable water rinse, 10 percent nitric acid rinse, followed by deionized water rinse.

Laboratory Analysis

Following purging, groundwater samples were collected from each monitoring well. Groundwater samples were placed in appropriate sample containers, sealed, and submitted to Chemtech Consulting Group for analysis. The samples were labeled, handled, and packaged following the procedures described in Generic QAPP (EA 2011b) and site-specific QAPP Addendum (EA 2012). QA/QC samples were collected at the frequency detailed in the QAPP Addendum. Groundwater samples were analyzed in accordance with the NYSDEC ASP.

Groundwater samples collected from the monitoring well network were analyzed for TCL VOCs by EPA Method 8260B, TCL SVOCs by EPA Method 8270C, TAL metals and mercury by EPA Method 6010B/7470A/7471A, pesticides by EPA Method 8081A (November 2012 event only), TCL PCBs by EPA Method 8082 (November 2012 sampling event only), cyanide by EPA Method 9010B, as well as the following monitored natural attenuation parameters:

- TOC by Method SM5310
- Biological oxygen demand by Method SM5210B
- Chemical oxygen demand by Method 5220D
- Alkalinity by Method SM2320B
- Chloride, nitrate, nitrite, and sulfate by EPA Method 300
- Sulfide by Method SM4500.

As previously noted, due to the fine-grained nature of subsurface materials, turbidity did not drop below 50 nephelometric turbidity units at monitoring wells MW-04, MW-06, and MW-08 during the November 2012 groundwater sampling event. Therefore, additional volume of unpreserved groundwater samples from these wells were submitted to the analytical laboratory to be laboratory-filtered and analyzed for dissolved TAL metals and mercury by EPA Method 6010B/7471. Also, due to a shipping issue, six of the seven samples collected during the April 2013 sampling event for biological oxygen demand arrived at the laboratory outside of the holding time. Therefore, none of the samples were analyzed for biological oxygen demand.

2.5 SURFACE WATER/SEDIMENT SAMPLING PROGRAM

During the RI, a total of 5 surface water and 10 sediment samples were collected from Smokes Creek. Floodplain soil (identified by the "FP" at the end of the sample name) and stormwater samples were also collected during the RI, from outfalls that discharge at an elevation above the waterline of the creek, as described in Section 2.6.

2.5.1 Surface Water

During the Phase II investigation, five surface water samples (SW-05 through SW-09) were collected from Smokes Creek on April 18, 2013 (Figure 2-1 and Table 2-1D):

- One upstream background sample (SW-05) located near the RI Phase I sediment sampling transect location SD-05A/SD-05B
- One sample (SW-06) located immediately downstream from the RI Phase I stormwater outfall sampling location (SD/SW-03), near the RI Phase I sediment sampling transect location SD-06A/SD-06B
- One sample (SW-07) located immediately downstream from the RI Phase I stormwater outfall sampling location (SD/SW-04), near the RI Phase I sediment transect location SD-07A/SD-07B
- One sample (SW-08) located mid-stream between the RI Phase I stormwater outfall sampling locations (SD-03 and SD-04) and co-located with sediment sample SD-08
- One sample (SW-09) located downstream from the site (north of the Stadium Property) and co-located with sediment sample SD-09.

Methods

Surface water samples from each sampling location were collected using a dedicated sample container and each sample was transferred immediately upon collection to appropriate sample containers. Water quality parameters, including pH, conductivity, turbidity, dissolved oxygen, temperature, and oxidation-reduction potential were collected at each sampling location. Water quality parameters; and descriptions of sampling locations, methods, and observations of water (i.e., color, presence or absence of sheen, etc.) were recorded on surface water collection field forms. Surface water sampling field forms are presented in Appendix J.

Laboratory Analysis

Surface water samples were placed in appropriate sample containers, sealed, and submitted to Chemtech Consulting Group for analysis. The samples were labeled, handled, and packaged following the procedures described in Generic QAPP (EA 2011b) and site-specific QAPP Addendum (EA 2012). QA/QC samples were collected at the frequency detailed in the QAPP Addendum. Surface water samples were analyzed in accordance with the NYSDEC ASP.

Surface water samples collected during the Phase II activities were submitted for analysis of TAL metals and mercury by EPA Method 6010B/7470A/7471A, and cyanide by EPA Method 9010B in accordance with the NYSDEC ASP. In addition, surface water samples were analyzed for hardness by Method 2320, to allow calculation of hardness-specific standards.

2.5.2 Sediment

Sediment sampling conducted during the RI included the collection of sediment samples along three north-south transects during the Phase I activities, followed by the collection of two additional sediment samples during the Phase II activities, in conjunction with Smokes Creek surface water sampling.

RI Phase I (October 2012)

Six samples were collected during the initial investigation on October 18, 2012 from three transect sampling locations within Smokes Creek (SD-05A/B, SD-06A/B, and SD-07A/B) (Figure 2-1 and Table 2-1D).

RI Phase II (April 2013)

Two additional sediment samples were collected during the Phase II investigation on April 15-16, 2013 (Figure 2-1). Two sediment samples were collected from Smokes Creek, with one sample (SD-08) collected mid-stream between the Phase I investigation stormwater outfall sampling locations SD-03 and SD-04, and one sample (SD-09) collected downstream from the site (north of the Stadium Property).

Methods

Sediment sampling locations and field methodology were determined during the field sampling activities based on access limitations and field conditions. Sediment samples were collected using clean, dedicated acetate sleeves. A minimum of five core scoops were collected from each sampling location. Samples for VOCs were collected as grab samples; the remainder of the sediment was composited in a stainless steel bowl equipped with a clean, dedicated plastic liner using clean, dedicated plastic scoops. Sediment sampling field forms are presented in Appendix K.

Non-dedicated equipment and tools used to collect sediment samples for chemical analysis were decontaminated prior to and between each sample interval using a non-phosphate detergent wash, potable water rinse, isopropanol rinse, potable water rinse, 10 percent nitric acid rinse, followed by deionized water rinse.

Laboratory Analysis

Sediment samples were placed in appropriate sample containers, sealed, and submitted to Chemtech Consulting Group for laboratory analysis. The samples were labeled, handled, and packaged following the procedures described in the Generic QAPP (EA 2011b) and site-specific QAPP Addendum (EA 2012). QA/QC samples were collected at the frequency detailed in the Generic QAPP (EA 2011b) and QAPP Addendum (EA 2012).

During the Phase I investigation, each sediment sample was analyzed for TAL metals including mercury by EPA Method 6010B/7470A/7471A, TCL VOCs by EPA Method 8260B, TCL SVOCs by EPA Method 8270C, TCL pesticides by EPA Method 8081A, TCL PCBs by EPA Method 8082, and TOC by Lloyd Kahn Method in accordance with the NYSDEC ASP.

During the Phase II Investigation, sediment samples were analyzed for TAL metals including mercury by EPA Method 6010B/7470A/7471A, cyanide by EPA Method 9010B, and TOC by Lloyd Kahn Method in accordance with the NYSDEC ASP.

2.6 OUTFALL SAMPLING PROGRAM

During the RI, two water and three surface soil samples were collected from the stormwater outfall locations north of the site. The discharge point for the outfalls is onto the floodplain, at an elevation approximately 0.5–1.0 ft above the typical water level of the creek. The discharge from the outfalls is intermittent, typically following storm events.

2.6.1 Stormwater

RI Phase I (November 2012)

During the Phase I investigation, two water samples (SW-03 and SW-04) were collected from stormwater outfalls to the Smokes Creek floodplain on November 7, 2012 (Figure 2-1 and Table 2-1E). The SW-03 sample was collected from the storm sewer that runs from south to north along the western property boundary of the Baker Hall Property. The SW-04 sample was collected from an outfall located near the northwestern corner of the site. Following sample collection, a third outfall was discovered near the northeastern corner of the site. A soil/sediment sample was collected from this third outfall, as described in the following section; however, no water sample could be collected at that time due to a lack of flow.

Methods

Stormwater samples from each sampling location were collected using a dedicated sample container and each sample was transferred immediately upon collection to appropriate sample containers. Water quality parameters, including pH, conductivity, turbidity, dissolved oxygen, temperature, and oxidation-reduction potential were collected at each sampling location. Water quality parameters and descriptions of sampling locations, methods, and observations of water (i.e., color, presence or absence of sheen, etc.) from each outfall were recorded on surface water collection field forms. Surface water sampling field forms are presented in Appendix L.

Laboratory Analysis

Stormwater samples were placed in appropriate sample containers, sealed, and submitted to Chemtech Consulting Group for analysis. The samples were labeled, handled, and packaged following the procedures described in Generic QAPP (EA 2011b) and site-specific QAPP

Addendum (EA 2012). QA/QC samples were collected at the frequency detailed in the QAPP Addendum.

Stormwater samples collected during the Phase I RI were analyzed for TAL metals and mercury by EPA Method 6010B/7470A/7471A, TCL VOCs by EPA Method 8260B, TCL SVOCs by EPA Method 8270C, TCL pesticides by EPA Method 8081A, and TCL PCBs by EPA Method 8082 in accordance with the NYSDEC ASP.

2.6.2 Surface Soil

Two shallow (0–6 in. bgs) surface soil samples (SD-03A and SD-04) were collected on during the RI Phase I on October 18, 2012, from the area immediately downslope of the stormwater outfalls leading to Smokes Creek. Following this sampling event, an additional outfall was identified near the northeast corner of the site. The initially sampled SD-03 location was at the storm sewer running along the western boundary of the Baker Hall Property. This sample was renamed SD-03A and one additional soil sample (SD-03) was collected from the third outfall location near the northeast corner of the site on October 26, 2012.

Methods

Shallow surface soil (0–6 in. bgs) samples were collected using a decontaminated macrocore equipped with clean, dedicated acetate sleeve. Samples for VOC analyses were collected as grab samples; the remainder was composited in a stainless steel bowl equipped with a clean, dedicated plastic liner using clean, dedicated plastic scoops.

Non-dedicated equipment and tools used to collect soil/sediment samples for chemical analysis were decontaminated prior to and between each sample interval using a non-phosphate detergent wash, potable water rinse, isopropanol rinse, potable water rinse, 10 percent nitric acid rinse, followed by deionized water rinse.

Laboratory Analysis

The samples were placed in appropriate sample containers, sealed, and submitted to Chemtech Consulting Group for laboratory analysis. The samples were labeled, handled, and packaged following the procedures described in the Generic QAPP (EA 2011b) and site-specific QAPP Addendum (EA 2012). QA/QC samples were collected at the frequency detailed in the Generic QAPP (EA 2011b) and QAPP Addendum (EA 2012).

Each soil/unsubmerged sediment sample was analyzed for TAL metals, including mercury by EPA Method 6010B/7470A/7471A, TCL VOCs by EPA Method 8260B, TCL SVOCs by EPA Method 8270C, TCL pesticides by EPA Method 8081A, TCL PCBs by EPA Method 8082, and TOC by Lloyd Kahn Method in accordance with the NYSDEC ASP.

2.7 INDOOR AIR/VAPOR INTRUSION SAMPLING PROGRAM

A soil vapor intrusion (SVI) evaluation was conducted in the northern incinerator building on March 11–12, 2013 to coincide with the winter heating season. Two sub-slab soil vapor samples were collected from beneath the northern incinerator building. Corresponding indoor air samples were collected at two locations within the building. One ambient air sample was collected upwind of the northern incinerator building.

Methods

The New York State Department of Health (NYSDOH) Guidance for Evaluating SVI in the State of New York (NYSDOH 2006) and NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (2010) were followed during the planning and implementation of the SVI evaluations.

Prior to implementation of the SVI evaluation, a pre-sampling inspection was conducted to inspect and document the conditions at the northern incinerator building. This inspection included a record of product inventories for the basement floor of the building to identify and pre-screen potential indoor air sources of VOCs. In addition, weather conditions and indoor air temperature were documented. Following completion of the inspection, air/sub-slab vapor sampling locations were selected and ambient air screening was conducted using field equipment (i.e., parts per billion RAE Model PGM-7240 VOC Monitor [ppbRAE]). Product inventories, structure layout, field sampling forms, and photo logs for each structure sampled during the SVI evaluations/monitoring are provided in Appendix M.

A 6-L Summa® canister with a vacuum gauge and flow controller was used to collect each indoor, sub-slab vapor, and outdoor air sample. The canisters were individually certified clean in accordance with EPA Method TO-15 and under a vacuum pressure of no less than -25 in. of mercury. Flow controllers were regulated to collect at 3.8 milliliter per minute over a 24-hour collection period. Prior to initiating the sampling, the serial number of the canisters and associated regulators was recorded on the field sampling forms. In addition, sample identification, sample start date/time, vacuum gauge pressure, and required analysis (EPA Method TO-15) were recorded on the canister identification tag and field sampling form.

Sub-slab vapor samples were collected from locations near the indoor air canisters beneath the slab of the northern incinerator building out of the line of traffic, away from floor penetrations (i.e., cracks, floor drains, sumps, etc.), and a minimum of 5 ft from an exterior wall. Prior to installation of temporary sub-slab vapor points, a visual assessment of the condition of the ground-level floor was completed. Once the location was determined, a ⅜-in. diameter hole was drilled approximately 2 in. below the concrete floor slab using an electric hammer drill. A 1-in. diameter drill bit was then used to over drill the top 0.5 in. of the borehole to create an annular space for the surface seal. Concrete dust and flooring material were swept away from the drill hole and wiped with a dampened towel. Teflon-lined polyethylene tubing (0.25-in. outside diameter × ⅛-in. inside diameter, and approximately 3-ft long) was then inserted into the borehole drilled in the floor, extending no further than 2 in. below the bottom of the floor slab.

Melted beeswax was then poured around the tubing at the floor penetration and allowed to set tightly around the tubing.

Once sub-slab vapor points were installed and the beeswax hardened, dry leak tests were performed using helium tracer gas. A leak test bucket was used to infuse the area surrounding the sub-slab vapor point with helium; once helium detector concentrations indicated approximately 100 percent helium within the leak bucket, a GilAir 5 air pump was used to purge the sub-slab vapor point prior to sampling. The purge air was then drawn into ppbRAE and the total VOC reading was recorded on the sampling form.

The Summa® canister for each sub-slab vapor sample was connected to the sample tubing using a compression fitting and placed on the floor adjacent to the sampling point. For indoor air samples, the canister was placed in the breathing zone (i.e., 3–5 ft above the floor), attached to the flow regulator, and the valve was opened to begin sampling.

One outdoor ambient air sample was collected concurrent with the sub-slab vapor and indoor air samples to represent outdoor ambient air quality during the SVI evaluation sampling event. In accordance with the NYSDOH SVI Guidance (2010), outdoor ambient air samples were set up to collect a representative air sample from within the breathing zone (i.e., 3–5 ft aboveground surface) during a sample period corresponding with other sample types.

Following the 24-hour collection period, the canister valves were closed to terminate sample collection. If canister vacuum gauges reached -5 in. of mercury or less before the 24-hour collection period had concluded, the canister valves were closed to terminate sample collection. Due to the inherent error associated with flow regulator gauges, termination of sample collection prior to reaching -5 in. of mercury was implemented when access to the canister was limited. Flow regulator ending gauge pressures and sample end times were recorded on the canister identification tags and the field sampling forms. Once sample collection was completed, the canister and flow controllers were disconnected from the sample tubing. The temporary sub-slab vapor sampling point tubing and material was removed, and the surface was cleaned and sealed with hydraulic cement. Pertinent sample information was recorded on the associated chain-of-custody and the canister was repackaged into the originating box.

Laboratory Analysis

Each air/vapor sample canisters was labeled, handled, and packaged following the procedures described in Generic QAPP (EA 2011b) and site-specific QAPP Addendum (EA 2012). QA/QC samples were collected at the frequency detailed in the QAPP Addendum. Samples were sent to Spectrum Analytical for analysis of VOCs by EPA Method TO-15.

2.8 DECONTAMINATION METHODS

Non-dedicated equipment and tools used to collect samples for chemical analysis were decontaminated prior to and between each sample interval. Split-spoon and macrocore samplers were decontaminated using a non-phosphate detergent wash and potable water rinse. Other non-dedicated sampling equipment (e.g., stainless steel spoons, scoops, hand augers, etc.) was decontaminated with a non-phosphate detergent wash, potable water rinse, isopropanol rinse, potable water rinse, 10 percent nitric acid rinse, followed by deionized water rinse.

2.9 INVESTIGATIVE-DERIVED WASTE

EA was responsible for the storage, handling, and disposal of investigative-derived waste; including personal protective equipment, and solids and liquids generated during the on-site soil sampling program, monitoring well installation, and groundwater purging and sampling activities.

Soil cuttings from on-site drilling operations that did not exhibit visible staining, sheen, or discernable odors were spread onto the surrounding ground surface. Decontamination fluids and purge water that did not exhibit visible staining, sheen, or discernable odors, were discharged to the ground surface. Trash and debris were placed in plastic bags and placed in a trash dumpster for disposed by a local garbage hauler. Protective clothing (i.e., nitrile gloves) was packed in plastic bags and placed in a trash dumpster for disposal by a local garbage hauler.

2.10 SITE SURVEY

Following completion of RI activities, Popli Design Group returned to the site to complete the site survey and expand upon the initial base map and survey activities discussed in Section 2.1.4. Newly completed surface soil sample locations, soil boring locations, monitoring well locations, and surface water sampling locations were surveyed upon completion of each phase of RI field activities on November 7–8, 2012, April 28, 2013, July 8, 2013, August 18, 2013, and March 4, 2014.

Vertical control was established to the nearest +/-0.1 ft for all ground surface elevations. Monitoring well riser elevations were reported to the nearest +/-0.01 ft. Elevations were determined relative to the North American Vertical Datum of 1988, with reference made to an existing monument in the vicinity of the site. Horizontal control was established by traverse runs to establish location with respect to the New York State planar horizontal coordinate grid system and provided in New York State Plane (North American Datum of 1983). Horizontal traverses were tied into established permanent benchmarks. Horizontal traverse runs were tied back to initial control points as a check for closure and error of closure was recorded. Horizontal coordinates reported in the State Plane West Zone (feet), North American Datum of 1983, to an accuracy of +/-0.5 ft. As previously noted, a copy of the completed survey map is provided in Appendix D.

2.11 DATA VALIDATION

Analytical data packages (Appendix M) (also referred to as Sample Delivery Groups) were reviewed to ensure that required laboratory components are included, QA/QC requirements were performed, and data use restrictions were well defined. The analytical data were qualified and appropriately flagged by the data validator. Analytical data that were qualified were taken into account during the interpretation of the data.

2.11.1 Data Validation Procedures

A Data Usability Summary Report (DUSR) was prepared for each Sample Delivery Groups associated with this RI. The DUSRs were prepared according to the guidelines established by the NYSDEC DER QA Group and reviewed the following questions:

- Is the data package complete as defined under the requirements for the NYSDEC ASP Category B or EPA CLP deliverables?
- Have all holding times been met?
- Do all the QC data (blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data) fall within the protocol required limits and specifications?
- Have all of the data been generated using established and agreed upon analytical protocols?
- Does an evaluation of the raw data confirm the results provided in the data summary sheets and qualify control verification forms?
- Have the correct data qualifiers been used?

Upon receipt of the analytical laboratory reports, a preliminary review of the data was performed by EA to verify that all of the necessary paperwork, i.e., chain-of-custodies, traffic reports, analytical reports, and deliverable packages, were present. EA then sent the Sample Delivery Groups to Data Validation Services, Inc., which verified the qualitative and quantitative reliability of the data as the laboratory provided it and then performed a detailed QA review.

The following items/criteria were reviewed for organics:

- Case narrative and deliverables compliance
- Holding times both technical and procedural and sample preservation (including pH and temperature)
- System Monitoring Compound (Surrogate) recoveries and summaries
- Matrix spike/matrix spike duplicate results, recoveries and summaries
- Blank spike results, recoveries and summaries

- Method blank results and summaries
- Gas chromatography/mass spectroscopy tuning and performance
- Initial and continuing calibration summaries
- Internal standard areas, retention times and summaries
- Field and trip blank data when applicable
- Blind field duplicate sample results when applicable
- Gas chromatography/Electron Capture Detector Instrument Performance Check
- Pesticide cleanup checks
- Organic analysis data sheets (Form I)
- Gas chromatography/mass spectroscopy and gas chromatograms, mass spectra, and quantitation reports
- Quantitation/detection limits
- Qualitative and quantitative compound identification.

The following items/criteria were reviewed for the inorganics:

- Case narrative and deliverable requirements
- Holding times and sample preservation
- Detection limits
- Inorganic analysis data sheets (Form I)
- Initial and continuing calibration verifications
- Contract Required Detection Limit standard analysis
- Laboratory blank data
- Inductively-coupled plasma spectroscopy interference check sample analysis

- Matrix spike analysis
- Matrix duplicate analysis
- Laboratory control sample results
- Inductively coupled plasma serial dilution analysis
- Field blank results (rinsate blanks) when applicable
- Field duplicate results when applicable.

Based upon the results of the data review, Data Validation Services prepared detailed DUSR/data validation summary reports. The DUSRs/validation reports consist of a section that contains an assessment of the deliverables, followed by a section that describes, on an item-by-item basis, the analytical results and any qualifications that were considered when using the data. The qualifications were made by assessing the results submitted by the laboratory in terms of the technical requirements of the analytical methods (including QA/QC criteria) and data validation requirements. The DUSRs/reports highlight the data results that did not meet QC limits and, therefore, may have required data qualification. The reports also indicate the data qualification actions taken as a result of these criteria. DUSRs are provided in Appendix N.

2.11.2 Validation Results

Based upon the data evaluation process, the qualifications of data are made by the use of qualifier codes. These qualifiers serve as an indication of the qualitative and quantitative reliability of the data. The qualifier codes utilized for this project are as follows:

- ***No qualifier***—The analyte was positively identified at the associated numerical value, which is the concentration of the analyte in the sample.
- ***U***—Indicates analyte not detected at or above the Contract Required Detection Limit, or the compound is not detected due to qualification through the method or field blank.
- ***J***—The reported value is estimated due to variance from QC limits.
- ***UJ***—The element was analyzed for but not detected. The sample quantitation limit is an estimate due to variance from QC limits.
- ***E***—Reported value is estimated because of the presence of interference.
- ***R***—Reported value is unusable and rejected due to variance from QC limits.

The analytical results for samples collected as part of the investigation are valid and usable with qualifications as noted in each DUSR. Data qualifiers were taken into account during the interpretation of the analytical results. Analytical results were simplified for preparation of the analytical results summary tables that are presented in Chapter 4. Qualifier flags were limited to "U" for non-detects, "J" for estimated values based upon results of the validation, "UJ" for non-detect values that were estimated based on the validation and "R" for values that were deemed as unusable during the validation process based on quality control deficiencies.

Overall, there was no significant impact regarding the usability of the data set (Appendix N). The validator has determined that, after thorough review of the entire data set, each sample collected during the investigation is valid and should be considered usable.

2.12 QUALITATIVE EXPOSURE ASSESMENT

A Qualitative Human Health Exposure Assessment for the site was completed. The objectives of the Exposure Assessment were to:

- Identify potential exposure pathways for contaminants at the site
- Identify COPCs for each exposure pathway
- Qualitatively evaluate potential human health exposures for each pathway.

The exposure assessment was conducted in accordance with the protocols specified in the RI/FS Work Plan (EA 2012) and is presented in Chapter 6.

2.13 FISH AND WILDLIFE RESOURCES IMPACT ANALYSIS

A Fish and Wildlife Resources Impact Analysis was performed to identify actual or potential impacts to fish and wildlife resources from site contaminants of ecological concern, and to provide information necessary for the design of a remedial alternative. This analysis contained:

- Site descriptions and a characterization of plant and animal resources, and their value to humans and the environment

- Evaluation of potential exposure pathways to fish and wildlife from site-related contaminants of potential ecological concern (COPECs)

- Comparison of concentrations of COPECs to regulatory criteria or derived toxicological benchmarks for the protection of fish and wildlife

- Conclusions regarding the potential of exposure and possible risks to fish and wildlife on and in the vicinity of the site.

The Fish and Wildlife Resources Impact Analysis was conducted in accordance with the protocols specified in the RI/FS Work Plan (EA 2012) and is presented in Chapter 7.

3. ENVIRONMENTAL AND PHYSICAL SETTING

The following sections provide a detailed review of the physical characteristics of the RI Study Area, based on the findings of the RI. Physical characteristics are organized by topography, geology, hydrogeology, and hydrology.

3.1 TOPOGRAPHY

As part of the RI field activities, a topographic survey of the site and adjoining areas was completed. Based on the site topographic survey (Figure 3-1), site elevations range from approximately 594 to 615 ft amsl. The natural grade at the site, prior to ramp construction, was generally level, with elevations ranging from about 590 to 593 ft amsl, based on historical topographic maps. North of the site, the ground surface elevation along the paved walking path is generally level at 592 ft amsl and slopes down to Smokes Creek with a surface water elevation of approximately 580 ft amsl. A relatively narrow floodplain terrace (approximately 10-ft wide) is present from the water's edge to approximately 582 ft amsl.

3.2 GEOLOGY

As noted in Section 1.4.4, the overburden at the site consists of fill material underlain by Pleistocene glaciolacustrine deposits (Figure 3-2). Geological information of the subsurface at the site was gathered from the installation of soil borings and groundwater monitoring wells at approximately 60 locations throughout the RI Study Area (Figure 3-3).

Native material at the site is overlain by fill materials consisting of reworked silt and clay intermixed with varying amounts of slag and gravel, as well as trace amounts of glass, cinders, brick, and ash. A review of the geologic map of New York, Niagara Sheet published by the University of the State of New York, the State Education Department, dated 1970, identifies the native material underlying the site as glaciolacustrine deposits overlying shale and mudrock of the Levanna Shale Member of the Skaneateles Formation. The Levanna Shale Member overlies the Stafford Limestone Member and consists of a dark to medium-gray fossiliferous shale and mudrock. These deposits are associated with the Middle Devonian period. Bedrock was not encountered during this RI or previous investigations.

Fill Material

Fill material was observed at the majority of soil borings completed in the on-site area and in over half of the soil borings completed at off-site locations (i.e., 26 out of 46) to varying depths (Table 3-1). The observed fill material consisted of a mix of sand, gravel, silt, clay, glass, ash, cinders, slag, wood, brick, coal, and metal fragments. The fill material was typically dense and ranged from dry to moist. In some on-site and adjacent off-site areas, due to the operational history of the area (i.e., proximity to the incinerator buildings and ramp) and/or the presence of cinders or gravel-sized rounded glass (that appears to have been melted and subsequently hardened, indicating bottom ash), the fill material is likely to be associated with incinerator operations.

In on-site areas not including the ramp area, the observed fill material thickness ranged from 1 to 4.5 ft (Figures 3-4 and 3-5). In the ramp area, the observed fill material thickness ranged from approximately 14 ft (SB-11) to 23 ft (SB-13). Fill material thickness in the northern portion of the site (north of the northern incinerator) ranged from 4.5- to 6-ft thick.

Based upon the observations of fill material noted during the subsurface soil/fill material sampling conducted under the Site Investigation (Malcolm Pirnie, 2005) and during field investigation activities performed as part of this RI, a fill contour thickness map was prepared to illustrate the interpreted fill thickness, as based upon the known depths observed in soil and monitoring well boring locations throughout the RI Study Area (Figure 3-2).

Movement of surface water and precipitation infiltration through the fill material would be essentially unimpeded by confining or retarding geologic units allowing for high potential of contaminant leaching, particularly in areas of historical fill material. However, the underlying glaciolacustrine silt and clay serve as a confining unit and would prevent further downward leaching.

Glaciolacustrine Deposits

Glaciolacustrine deposits were encountered in soil and monitoring well borings completed during the RI. This geologic unit consisted primarily of reddish brown to gray laminated silt, clay, silty clay, and clayey silt of moderate to high plasticity. Consistency of the unit decreased from hard/stiff to softer with depth due to an increase in moisture content with depth. Horizontal and vertical laminations and fractures were observed in the glaciolacustrine deposits, and iron staining was observed along fractures in soil retrieved at MW-02A. Lenses containing varying amounts of fine to very fine sand were encountered in some borings (i.e., SB-06, SB-07, SB-10, SB-21, SB-22, and SB-25), but were not consistent throughout the site. Till consisting of clay and silt with some fine sand and gravel was encountered in monitoring well boring MW-08 at 25–27 ft bgs. Bedrock was not observed in any of the borings installed as part of this RI.

3.3 HYDROGEOLOGY

As part of this RI, seven monitoring wells were installed across the site to provide groundwater elevation information for evaluating groundwater flow direction at the site and to evaluate groundwater quality at the site. Groundwater level measurements were measured on November 7-8, 2012 prior to well development, on November 28–29, 2012 in conjunction with the first groundwater sampling event, on March 11, 2013, and in conjunction with the second groundwater sampling event on April 16, 2013. Groundwater level measurements collected are provided in Table 3-2 and groundwater elevation ranges were as follows:

- November 2012: 588.61 ft amsl at MW-03A to 583.08 ft amsl at MW-08
- March 2013: 589.54 ft amsl at MW-04 to 583.71 ft amsl at MW-08
- April 2013: 589.79 ft amsl at MW-04 to 583.55 ft amsl at MW-08.

The overall groundwater flow direction at the site is north, toward Smokes Creek (Figure 3-6). The elevation of Smokes Creek, as based on survey data from 28 April 2013, was 580.2 ft amsl.

Based on the April 2013 gauging event, the water table was located within glaciolacustrine deposits at a depth of approximately 3–8 ft below the overlying fill material (Figures 3-4 and 3-5). No monitoring wells were installed in the ramp area leading to the northern incinerator; however, saturated soil was encountered during installation of SB-11 at a depth of approximately 10 ft bgs, and in previously installed borings SB-03 and SB-04 at a depth of 4 ft bgs. The elevated saturated zones in these borings may be indicative of perched water in the ramp area.

3.4 HYDROLOGY

The site is located approximately 2.5 mi east of the eastern shore of Lake Erie. Smokes Creek flows generally west approximately 2.7 mi downstream to its discharge point at Lake Erie. The current configuration of the North Branch of Smokes Creek, located north of the site, is a result of channelization efforts conducted from 1948 to 1970 (Section 1.3.2.4). Prior to channelization, the creek meandered naturally.

Drainage from the elevated fill ramp flows radially to stormwater catch basins and drainage ditches, which likely conveys the water to Smokes Creek. Two stormwater catch basins were observed near the northern boundary of the site: one on the western and one on the eastern side of the northern incinerator building. The western catch basin appeared to be in good condition, while the eastern catch basin was nearly filled with sediment. Two outfall pipes, located north of the site, discharge stormwater to the floodplain of Smokes Creek. These outfall pipes are generally in poor condition (partially or mostly corroded) where they discharge to the flood plain. A third outfall was observed to the northeast of the site and is associated with a storm sewer running from south to north along the western property boundary of the adjacent Baker Hall Property. The storm sewer outfall is in good condition with a large concrete headwall at the discharge location.

Based on information obtained during the initial site visit, the northern incinerator building had a French drain that may be connected to the storm system. Historically, the incinerators were quenched with water after a batch-combustion took place. The associated wastewater reportedly ran into a drain system, potentially entering the storm sewer network and eventually Smokes Creek.

4. RESULTS OF THE REMEDIAL INVESTIGATION

RI analytical results are presented by media, for each area of concern, with comparison to the relevant SCGs. SCGs are promulgated requirements and non-promulgated guidance that govern activities that may affect the environment and are widely used at different stages of an investigation and remediation of a site. RI analytical data were evaluated using the following SCGs:

- 6 NYCRR Part 375 Environmental Remediation Programs – SCOs
- NYCRR Part 703.5 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended
- NYSDEC Screening and Assessment of Contaminated Sediment, Draft, January 24, 2013.

4.1 SOIL

Analytical results for surface and subsurface soil samples collected from the site were compared to the SCOs. RI soil delineation efforts were driven based on Unrestricted Use and/or current land use classifications, to assess the nature and extent of site-related contamination. The data comparisons to Unrestricted Use SCOs were used as a comparison to "pre-disposal" conditions. The data were also compared to SCOs that were selected to identify areas that may require remediation sufficient for the current and future anticipated use of the property, which may also require institutional controls (e.g., land use restrictions). The following table identifies the supplemental SCOs selected, based on land use, for each area of concern.

Area of Concern	Applicable SCO (Based on Current Land Use)
On-site Area	Commercial Use
Stadium Property	Restricted Residential Use
Baker Hall Property	Restricted Residential Use
Smokes Creek Corridor	Protection of Ecological Resources

4.1.1 On-site Area

4.1.1.1 Inorganic Constituents

Ten surface soil samples and 68 subsurface soil samples from 13 soil boring locations were collected from the On-site Area during the RI. Surface and subsurface soil results indicate that several inorganic constituents, primarily arsenic and lead, are present at concentrations that exceed Unrestricted Use, Restricted Residential, and Commercial SCOs in the soil/fill material at the site.

Surface Soil

Eight of 10 surface soil samples contained lead concentrations that exceeded the Unrestricted Use SCO (63 mg/kg), with concentrations ranging from 66.4 to 2,330 mg/kg (Table 4-1A and Figure 4-1). Lead concentrations also exceeded the Restricted Residential SCO (400 mg/kg) on the ramp leading to the northern incinerator (401 mg/kg) and the Commercial SCO (1,000 mg/kg) in the northeast corner of the site (2,330 mg/kg) (Table 4-1B). Cadmium and copper concentrations also exceeded Commercial SCOs in the northeast corner of the site. Barium, chromium, manganese, mercury, nickel, selenium, and zinc were also detected at concentrations that exceeded Unrestricted Use and/or Residential SCOs in at least one surface soil sample.

Subsurface Soil

Lead concentrations exceeded the Unrestricted Use SCO in at least one subsurface soil sampling interval from 11 of 12 soil borings advanced on-site, with concentrations ranging from 66.7 to 6,820 mg/kg (Table 4-2A). Subsurface soil lead concentrations also exceeded both Restricted Residential and Commercial SCOs in the soil borings located on the ramp leading to the northern incinerator, and in the two monitoring wells located along the northern and northeastern property boundary (Table 4-2B). The highest on-site lead concentrations (2,040–6,820 mg/kg) were detected in soil from the northeastern area of the ramp. The magnitude of subsurface soil lead impacts in the fill material is heterogeneous and varies with depth within the soil ramp (Figures 4-2A and 4-2B). By contrast, in the northern area of the site, lead impacts are present throughout the fill with concentrations decreasing with depth (Figure 3-2).

Arsenic, barium, cadmium, copper, and nickel concentrations also exceeded Commercial SCOs in subsurface soil samples collected from the ramp and northeastern area of the site. Chromium, total cyanide, manganese, mercury, silver, and zinc exceeded Unrestricted Use and/or Residential SCOs in at least one subsurface soil sample.

4.1.1.2 Organic Constituents

Several organic compounds were detected in the On-site Area soil at concentrations exceeding Unrestricted Use SCOs, including the VOCs acetone and methylene chloride, several SVOCs, and the pesticides dichlorodiphenyldichloroethylene (DDE), dichlorodiphenyldichloroethane (DDD), and dichlorodiphenyltrichloroethane (DDT) (Tables 4-3 and 4-4). Concentrations (ranging from 0.58 to 1.7 mg/kg) of four SVOCs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and indeno[1,2,3-cd]pyrene) exceeded the Unrestricted Use/Restricted Residential/Commercial SCOs. None of the soil samples collected from the On-site Area contained VOCs, pesticides, or PCBs at concentrations that exceeded Residential or Commercial SCOs.

Site-Related Contaminants of Potential Concern

During the initial phases of the RI, laboratory analysis included the following analytical suites: TCL VOCs, TCL SVOCs, TAL metals, TCL pesticides, TCL PCBs, and total cyanide.

However, during the off-site delineation phases (Phases II–V) that followed, the analytical list was primarily focused on site-related COPCs (i.e., TAL metals). The soil investigation continued until the limit of arsenic and lead impacts, below Restricted Residential SCOs, was delineated. Arsenic and lead were selected as indicator constituents based on the results of the On-site Area soil sampling. Of the constituents that exceeded Restricted Residential and/or Commercial SCOs in more than one sample in the On-site Area, arsenic has the lowest SCO[3], while lead had the highest frequency of detection and range of observed concentrations.

4.1.2 Stadium Property

Seven surface soil samples and 16 subsurface soil samples from five soil boring locations were collected from the Stadium Property during the RI.

4.1.2.1 Inorganic Constituents

None of the surface or subsurface soil samples collected from the Stadium Property contained arsenic or lead (identified, based on the On-site Area sampling, as the indicator metals) at concentrations that exceeded Restricted Residential SCOs (Table 4-5A and 4-6A, Figure 4-3). No concentrations of arsenic or lead exceeded Unrestricted Use SCOs in the western extent of soil sampling locations. Detected concentrations of chromium, lead, nickel, and zinc, in excess of Unrestricted Use SCOs, were of similar concentration to those identified in background samples (see Section 4.1.5).

4.1.2.2 Organic Constituents

No organic compounds were detected in surface or subsurface soil at concentrations exceeding Unrestricted Use SCOs (Table 4-5B and 4-6B).

4.1.3 Baker Hall Property

A total of 14 surface soil samples and 45 subsurface soil samples from 14 soil boring locations were collected from the Baker Hall Property during the RI. Surface and subsurface soil results indicate that several metals, primarily arsenic and lead, are present at concentrations that exceed Unrestricted Use, Restricted Residential, and Commercial SCOs in the soil/fill material at the Baker Hall Property area of concern.

4.1.3.1 Inorganic Constituents

Surface Soil

Nine of 14 surface soil samples contained lead concentrations that exceeded the Unrestricted Use SCO (63 mg/kg), with concentrations ranging from 90 to 2,420 mg/kg (Table 4-7A and Figure

[3] One vertical soil sampling interval had a mercury concentration (1.0 mg/kg) that slightly exceeded the Restricted Residential SCO (0.81 mg/kg).

4-4). Surface soil lead concentrations also exceeded the Restricted Residential SCO (400 mg/kg) at seven sampling locations and Commercial SCOs at five locations, primarily along the western (adjoining the On-site Area) and northern (adjoining the Smokes Creek Corridor) property boundaries. Arsenic was also detected above Unrestricted Use (13 mg/kg) and/or Restricted Residential/Commercial (16 mg/kg) SCOs in five surface soil samples.

Barium, cadmium, and copper concentrations also exceeded Commercial SCOs in the northeast corner of the site. Barium, cadmium, chromium, copper, mercury, nickel, selenium, silver, and zinc exceeded Unrestricted Use and/or Residential SCOs in at least one surface soil sample.

Subsurface Soil

Lead concentrations exceeded the Unrestricted Use SCO in at least one subsurface soil sampling interval from 8 of 14 soil borings advanced at the Barker Hall Property, with concentrations ranging from 195 to 2,030 mg/kg (Table 4-7B). Subsurface soil lead concentrations also exceeded both Restricted Residential and/or Commercial SCOs in soil borings primarily located in the northwestern corner of the parcel, where the layer of fill material was observed to be thickest (Figure 3-2). The presence of lead in subsurface soil was observed to directly correlate to the presence of fill.

Arsenic, barium, cadmium, copper, and mercury concentrations also exceeded Commercial SCOs in the northeast corner of the Baker Hall Property. Arsenic, barium, cadmium, chromium, copper, mercury, nickel, selenium, silver, and zinc were also detected above Unrestricted Use and/or Residential SCOs in at least one surface soil sample.

4.1.3.2 Organic Constituents

Several SVOCs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and indeno[1,2,3-cd]pyrene) were detected at four locations, at low concentrations (ranging from 0.5 to 8.5 mg/kg), which slightly exceed the Unrestricted Use, Restricted Residential, and/or Commercial SCOs (Tables 4-8A and 4-8B). In general, PAHs were observed in a subset of locations (in the northwest corner of the parcel) where lead concentrations also exceeded the Restricted Residential SCO. Two pesticides (p-p'-DDE at 0.004 mg/kg and p-p'-DDT at 0.01J to 0.04J mg/kg) were detected at concentrations greater than Unrestricted Use SCOs (0.0033 mg/kg) in two surface soil samples. No VOC or PCB concentrations in surface or subsurface soil were detected above Unrestricted Use SCOs.

4.1.4 Waste Characterization

Subsurface soil/fill material from the ramp, where elevated metals concentrations were detected via TAL metals analysis, did not exhibit hazardous waste characteristics, based on the TCLP metals results from four subsurface soil samples collected from the soil ramp (at SB-WC). During the supplemental delineation activities, a composited soil/fill material sample was obtained from several soil boring locations in the northwestern corner of the Baker Hall Property. This sample was analyzed for TCLP VOCs, TCLP SVOCs, TCLP pesticides, total

PCBs, ignitability, corrosivity, and reactivity, with the results not indicative of characteristic hazardous waste.

4.1.5 Smokes Creek Corridor

A total of 22 surface soil samples and 64 subsurface soil samples were collected from 26 soil boring locations (including shallow [from 0 to 6 in. bgs] floodplain soil).

4.1.5.1 Inorganic Constituents

Surface Soil

Nineteen of 22 surface soil samples contained lead concentrations exceeding the Unrestricted Use SCO (63 mg/kg), with concentrations ranging from 42 to 2,720 mg/kg (Table 4-9A and Figure 4-5). Lead concentrations exceeded the Restricted Residential SCO (400 mg/kg) (and the Commercial SCO [1,000 mg/kg]) in samples adjacent to the recreational path, extending from the On-site Area to approximately 50 ft beyond the eastern extent of the recreational path (Table 4-9B). Arsenic, barium, cadmium, copper, manganese, mercury, nickel, selenium, silver, and zinc concentrations also exceeded Restricted Residential SCOs in the same areas where elevated lead concentrations were detected. Arsenic, barium, cadmium, chromium, copper, manganese, mercury, nickel, selenium, silver, and zinc also exceeded Unrestricted Use and/or Protection of Ecological Resources SCOs in at least one surface soil sample.

Subsurface Soil

Lead concentrations exceeded Unrestricted Use SCO in at least one subsurface soil sampling interval from 19 of 26 soil borings advanced along the Smokes Creek Corridor, with concentrations ranging from 65.9 to 8,210 mg/kg (Table 4-10A). Lead concentrations did not exceed Unrestricted Use SCOs in the subsurface soil intervals in the three easternmost sampling locations.

The highest lead concentrations (976–8,210 mg/kg) in the Smokes Creek Corridor, which exceed the Restricted Residential SCO (400 mg/kg) and the Commercial SCO (1,000 mg/kg), were generally detected in subsurface soil along the recreational path, north of the Baker Hall Property and city park (Table 4-10B). Lead impacts are present throughout the fill, which average approximately 2 ft in thickness throughout this area; however, in contrast to the On-site Area, concentrations do not decrease with depth.

Arsenic, barium, cadmium, copper, total cyanide, mercury, nickel, selenium, silver, and zinc concentrations also exceeded Restricted Residential SCOs in the same areas where elevated lead concentrations were detected. Arsenic, barium, cadmium, chromium, copper, total cyanide, mercury, nickel, selenium, silver, and zinc also exceeded Unrestricted Use and/or Protection of Ecological Resources SCOs in at least one surface soil sample.

4.1.5.2 Organic Constituents

Concentrations of two pesticides (p,p'-DDE at 0.019 mg/kg and p-p'-DDT at 0.014 mg/kg) were detected in subsurface soil at concentrations exceeding the Unrestricted Use SCOs (0.0033 mg/kg) at the monitoring well boring location within the western portion of the Smokes Creek Corridor, northwest of the On-site Area (Table 4-11). No other organic compound detections exceeded the Unrestricted Use SCOs (Appendix O).

4.1.6 Background

Six background surface soil samples collected were analyzed for TAL metals, including mercury and TCL SVOCs. Three samples were collected west of the site, in the western portion of the Stadium Property and adjacent to a residential property southwest of the site. The remaining three samples were collected east of the site and the Baker Hall Property, in a city park, which adjoins the parcel to the east.

Lead concentrations, which ranged from 52.6 to 148 mg/kg, exceeded the Unrestricted Use SCO (63 mg/kg) at one of six background locations (Table 4-12, and Figures 4-3 and 4-4). Background arsenic concentrations (6.07 to 9.75 mg/kg) were below the Unrestricted Use SCO (13 mg/kg). Nickel and zinc concentrations were also detected above Unrestricted Use SCOs in at least one background surface soil sample. No SVOCs were detected at concentrations above the Unrestricted Use SCOs in the background soil samples (Table 4-13).

4.2 GROUNDWATER

Groundwater samples were collected from seven monitoring wells in November 2012 and April 2013 to determine if groundwater quality has been impacted by site-related activities. Analytical results for groundwater samples were compared to the NYSDEC Class GA groundwater standards and guidance values (6 NYCRR Part 703.5 Water Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended) (Table 4-14).

4.2.1 Inorganic Constituents

Concentrations of several inorganic constituents (antimony, arsenic, chromium, iron, lead, magnesium, manganese, nickel, and sodium) exceeded the Class GA standards and guidance values in groundwater samples collected from one or more monitoring wells, as summarized in the following table and Figure 4-6.

<table>
<tr><th>Constituent</th><th>Groundwater Standards and Guidance Values[(a)]</th><th>No. of Exceedances / No. of Samples</th><th>Range of Detections</th><th>Well Exhibiting Maximum Exceedance</th></tr>
<tr><td colspan="5">November 2012 Sampling Event</td></tr>
<tr><td>Antimony</td><td>3</td><td>6/7</td><td>4.56–6.08</td><td>MW-03A (west of ramp)</td></tr>
<tr><td>Chromium</td><td>50</td><td>1/7</td><td>293</td><td>MW-04 (upgradient)</td></tr>
<tr><td>Iron</td><td>300</td><td>6/7</td><td>728–15,000</td><td rowspan="2">MW-07 (downgradient)</td></tr>
<tr><td>Lead</td><td>25</td><td>1/7</td><td>30.5</td></tr>
<tr><td>Magnesium</td><td>35,000</td><td>6/7</td><td>35,100–53,200</td><td>MW-03A (west of ramp)</td></tr>
<tr><td>Manganese</td><td>300</td><td>3/7</td><td>338–364</td><td rowspan="2">MW-04 (upgradient)</td></tr>
<tr><td>Nickel</td><td>100</td><td>2/7</td><td>123–195</td></tr>
<tr><td>Sodium</td><td>20,000</td><td>7/7</td><td>27,400–214,000</td><td>MW-03A (west of ramp)</td></tr>
<tr><td colspan="5">April 2013 Sampling Event[(b)]</td></tr>
<tr><td>Arsenic</td><td>24</td><td>2/7</td><td>30.2–43.7</td><td>MW-07 (downgradient)</td></tr>
<tr><td>Iron</td><td>300</td><td>7/7</td><td>653–14,200</td><td rowspan="2">MW-08 (downgradient)</td></tr>
<tr><td>Magnesium</td><td>35,000</td><td>6/7</td><td>41,700–72,800</td></tr>
<tr><td>Sodium</td><td>20,000</td><td>7/7</td><td>33,400–254,000</td><td>MW-03A (west of ramp)[(c)]</td></tr>
<tr><td colspan="5">(a) 6 NYCRR Part 703.5 Water Quality Regulations (Class GA), as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended.
(b) Due to the elevated turbidity conditions observed during sampling at November 2012, the April 2013 results are considered more representative of natural groundwater conditions. However, it should be noted that antimony, magnesium, and sodium results from laboratory-filtered (unpreserved) samples from the November 2012 event were also above the criteria.
(c) The anomalously elevated sodium concentrations at MW-03A are likely due to its proximity to the DPW road salt storage area.
NOTE: Concentrations in µg/L.
Inorganic constituents analyzed by EPA Method 6000/7000 series.
Table includes only those TAL metals that exceeded the standard or guidance value in one or more samples.</td></tr>
</table>

Concentrations of lead (30.5 µg/L; November 2012) and arsenic (43.7 µg/L; April 2013) exceeded Class GA standards and guidance values in groundwater samples collected from monitoring well MW-07 located along the downgradient On-site Area boundary, north of the ramp. All other inorganic constituents that exceeded Class GA SCGs in On-site Area monitoring wells and in groundwater from the upgradient monitoring well, which suggests that those constituents are unlikely to be related to on-site contaminated soil.

4.2.2 Organic Constituents

During the November 2012 sampling event, concentrations of acetone slightly exceeded the Class GA criteria (50 µg/L) in groundwater samples collected from the upgradient well (63 µg/L) and one of the on-site wells (68 µg/L). During the April 2013 sampling event, acetone concentrations were below the Class GA criteria, with concentrations ranging from 5.2 to 21.8 µg/L. It should be noted that acetone is commonly indicative of laboratory contamination.

4.2.3 Geochemistry

As part of this RI, groundwater geochemical parameters were measured in the field (i.e., pH and oxidation-reduction potential) and analyzed in the laboratory to further assess groundwater conditions at the site, specifically, the mobility of heavy metals (e.g., cadmium, chromium, lead). The geochemical parameters analyzed to evaluate natural attenuation processes (including sorption and anion exchange capacity[4]) included TOC, alkalinity, major anions (chloride, nitrate/nitrite, and sulfate/sulfide), biological oxygen demand, and chemical oxygen demand. The groundwater geochemical parameter results from the November 2012 and April 2013 sampling events are summarized in Table 4-15.

The concentration of heavy metals in soil is influenced by several multi-phase reactions (e.g., inorganic and organic complexation, and oxidation-reduction, precipitation/dissolution, adsorption/desorption reactions). The potential mobility of heavy metals in groundwater is primarily controlled by specific sorption with organic matter and variable charge soil surfaces[5]. The solubility of metals in water is influenced by pH and oxidation-reduction conditions. In general, heavy metals are more soluble at lower oxidation-reduction conditions, where the reduced species predominates (e.g., Fe^{2+} is more soluble than Fe^{3+}). Oxidation-reduction reactions are also indicated by the reduction of anions, such as sulfate (SO_4^{2-}) to sulfide (S^{2-}), or nitrate (NO_3^-) to nitrite (NO_2^-). As shown in Table 4-15, the field parameter measurements indicated generally neutral to slightly basic pH conditions (7.06 to 7.97), and slightly reducing conditions (-98 to 62 millivolts). Under these conditions, minimal solubility of heavy metals in groundwater would be expected.

4.2.3.1 Anion Exchange Capacity

To further assess metal impacts to groundwater and the influence of anion exchange capacity on desorption of metals from soil/fill material to groundwater, major anions (chloride, sulfate/sulfide, and nitrate/nitrite) were analyzed during the November 2012 and April 2013 sampling events. A high anion exchange capacity indicates a likelihood of high metal concentrations within groundwater, resulting from desorption of positively charged metals from soil/fill particles as they bond with negatively charged anions in groundwater to form soluble compounds. Chloride and sulfate, two commonly detected anions in groundwater, are typically used to measure the dissolution processes occurring at a site.

Chloride

Chloride was detected in each groundwater sample for both sampling events. In November 2012 samples, chloride concentrations ranged from 8,300 µg/L at MW-05 to 410,000 µg/L at MW-03A, with the concentration at MW-03A exceeding the Class GA criteria of 250,000 µg/L. Concentrations observed in April 2013 were similar, and ranged from 7,550 µg/L at MW-05 to 430,000 µg/L at MW-03A.

[4] Anion exchange capacity is the amount of negatively charged ions that an absorbent can bind, multiplied by the ionic charges.
[5] Variable charge solids are solids that will sorb ions from solution without an equivalent ion exchange back into solution, resulting in a variable charge dependent on pH and the available ions.

Sulfate/Sulfide

During the November 2012 sampling event, concentrations of sulfate were detected in groundwater samples from each of the monitoring wells, with concentrations ranging from 18,000 µg/L at MW-02A to 120,000 µg/L at MW-04. Sulfate was reported from the April 2013 sampling event, at a concentration of 110,000 µg/L for groundwater from MW-08. Sulfide was detected at four out of seven wells at concentrations ranging from 1,120 µg/L to 1,440 µg/L during the November 2012 event, but was not detected in groundwater from any of the wells during the April 2013 sampling event.

Nitrate/Nitrite

In November 2012, nitrate was detected at wells MW-05, MW-06, and MW-07, with concentrations ranging from 228 to 353 µg/L. In general, nitrate concentrations were higher in the samples collected in April 2013, with detected concentrations ranging from 266 to 1,330 µg/L (maximum concentration was at upgradient well MW-04). Nitrite was not detected in any of the monitoring wells during either sampling event.

4.2.3.2 Alkalinity

In addition to the anions, groundwater samples were also submitted for analysis of alkalinity. The total alkalinity of a groundwater system is indicative of the system's capacity to neutralize acid. Alkalinity results from the presence of hydroxides, carbonates, and bicarbonates of elements such as calcium, magnesium, sodium, potassium, or ammonia. Alkalinity is important in maintaining groundwater pH because it buffers a groundwater system against acids.

Concentrations of alkalinity within the groundwater samples collected during November 2012 ranged from 380,000 µg/L to 460,000 µg/L. Similar concentrations were observed in April 2013 samples, with concentrations ranging from 304,000 µg/L to 435,000 µg/L. As shown in Table 4-14, the field measurements of pH conducted during groundwater sampling indicated neutral to slightly alkaline conditions, with pH ranging from 7.06 to 7.97 standard units. An elevated pH of 9.07 was observed at MW-03A (western part of site) during the April 2013 sampling event.

4.2.3.3 Biological Oxygen Demand/Chemical Oxygen Demand

Biological and chemical oxygen demand analyses are used as a general indicator of the amount of organic compound pollution present in a water sample. These parameters were not evaluated since there is no evidence of the site-related organic groundwater contamination.

4.3 SURFACE WATER, FLOODPLAIN SOIL, AND SEDIMENT

4.3.1 Surface Water

Surface water samples were collected from five locations in Smokes Creek during the RI Phase II in April 2013 and analyzed for inorganic constituents including TAL metals including mercury, cyanide, and hardness[6]. Analytical results for surface water samples were compared to the NYSDEC Class C, Type Aquatic (Chronic) (A[C]) surface water standards and guidance values (6 NYCRR Part 703.5 Water Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended).

Several inorganic constituents were detected in surface water samples collected from Smokes Creek; however, only aluminum was detected at concentrations ranging from 100 to 111 µg/L, which are slightly above the Class C, Type A(C) standard (100 µg/L) (Table 4-16 and Figure 4-7).

4.3.2 Floodplain Soil

One of four shallow subsurface soil samples collected within the Smokes Creek floodplain contained a lead concentration (97.1 mg/kg) that exceeded Unrestricted Use/Protection of Ecological Receptors SCOs (63 mg/kg) (Table 4-17 and Figure 4-8). Concentrations of nickel (36.5–45.7 mg/kg) and zinc (198–235 mg/kg) also exceeded SCOs (nickel at 30 mg/kg and zinc at 109 mg/kg). As discussed in the following section, neither lead nor zinc concentrations in sediment collected from Smokes Creek exceeded sediment guidance values. The detected concentration range of nickel was similar to the background samples, which also exceeded the Unrestricted Use SCO.

4.3.3 Sediment

A total of eight sediment samples were collected from Smokes Creek during the RI. Analytical results for sediment samples were screened against the sediment guidance values provided in the Draft NYSDEC Division of Fish, Wildlife and Marine Resources, Bureau of Habitat Screening and Assessment of Contaminated Sediments (2013).

4.3.3.1 Inorganic Constituents

In sediment samples, nickel and silver were the only inorganic constituents that exceeded Class A[7] sediment guidance values (Table 4-18 and Figure 4-8). Detected nickel concentrations, which ranged from 28.1 to 42.1 mg/kg, fall within the Class B[8] sediment range (23–49 mg/kg). One silver concentration (1.1 mg/kg) fell within the lowest level of the Class B sediment range (1–2.2 mg/kg).

Nickel concentrations were frequently detected in surface and subsurface soil samples at concentrations above the Unrestricted Use SCO (30 mg/kg) in the On-site Area; however, only one subsurface soil sample contained a nickel concentration (342 mg/kg) above Restricted Residential/Commercial SCOs (310 mg/kg). Therefore, nickel is not considered to be a primary site-related contaminant of concern. Additionally, nickel concentrations from two background

[6] These data are used to calculate location-specific, hardness-adjusted water quality standards.
[7] Class A sediments are considered to be of low risk to aquatic life.
[8] Class B sediments are considered to be slightly to moderately contaminated.

soil sample locations were above the Unrestricted Use SCO, which indicates that there might be other naturally-occurring sources of elevated nickel in sediment at Smokes Creek (Table 4-12).

4.3.3.2 Organic Constituents

No organic compounds were detected in sediment at concentrations exceeding NYSDEC sediment guidance values (Appendix O).

4.4 OUTFALL RESULTS

4.4.1 Stormwater

Stormwater samples were collected from two outfall pipes to Smokes Creek in November 2012, with two outfall sampling locations co-located with surface soil samples. Analytical results for stormwater samples were compared to the NYSDEC Class C surface water standards and guidance values (6 NYCRR Part 703.5 Water Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended).

4.4.1.1 Inorganic Constituents

The total cyanide concentration (32 µg/L) at the northwestern outfall exceeded the Class C, Type Aquatic (Acute) Standard of 22 µg/L (Table 4-18 and Figure 4-7). Both total cyanide (8.0 µg/L) and selenium (6.98 µg/L) concentrations exceeded Class C Aquatic (Chronic) Standards (5.2 µg/L for total cyanide and 4.6 µg/L for selenium) at the northeastern outfall location. Cyanide and selenium are likely to be related to On-site Area soil since both constituents were detected above Unrestricted Use and/or Restricted Residential SCOs in surface soil (selenium) or subsurface soil (cyanide).

4.4.1.2 Organic Constituents

No organic compounds were detected in stormwater outfall samples at concentrations exceeding Class C standards (Appendix O).

4.4.2 Surface Soil

Three surface soil samples were collected directly downslope from the outfall pipes, including two samples leading from the site to Smokes Creek and one sample from an outfall on the adjacent Baker Hall Property leading to Smokes Creek.

4.4.2.1 Inorganic Constituents

Two metals were detected in surface soil at concentrations exceeding the SCOs (Table 4-19 and Figure 4-8). The surface soil lead concentration (65.3 mg/kg) from the outfall located on the Baker Hall Property exceeded the Unrestricted Use/Protection of Ecological Resources SCO (63 mg/kg). At the northeast On-site Area outfall, the surface soil lead concentration (138 mg/kg) was approximately twice as high. At the northwestern outfall location, lead concentrations were below SCOs, but the zinc concentration (98 J mg/kg) was below the Unrestricted Use/Protection of Ecological Resources SCO (109 mg/kg). Both lead (primary) and zinc (secondary) were identified at concentrations that exceeded Unrestricted Use/Protection of Ecological Resources SCO in the On-site Area and Baker Hall Property soil. The elevated concentrations of these constituents in surface soil near the stormwater outfalls is likely related to soil contamination in these areas.

4.4.2.2 Organic Constituents

Several SVOCs (benzo[b]fluoranthene, chrysene, and indeno[1,2,3-cd]pyrene) were detected at concentrations that slightly exceeded the Unrestricted Use SCOs (0.5–1 mg/kg) (Table 4-19). No other organic compounds were detected in surface soil downgradient from the outfalls at concentrations exceeding Unrestricted Use SCOs (Appendix O).

4.5 SOIL VAPOR/INDOOR AIR

To evaluate the potential for vapor intrusion at the northern incinerator building, two co-located indoor air and sub-slab soil vapor samples were collected in March 2013, during the winter heating season. In addition, one outdoor ambient air sample was collected upwind of the northern incinerator building.

The indoor air and sub-slab soil vapor results were compared to the NYSDOH matrices, to evaluate whether action was required (Table 4-20). While several low-level detections of various VOCs were observed, a review of the matrices indicated that no action was required beyond taking steps to identify and reduce potential indoor air sources of the VOCs. These results are summarized in the following table.

NYSDOH Matrix [(a)]	Group 1 (Carbon Tetrachloride and Trichloroethene)	Group 2 (1,1,1-Trichloroethane and Tetrachloroethene)
Matrix 1	Take reasonable and practical actions to identify source(s) and reduce exposures.	Take reasonable and practical actions to identify source(s) and reduce exposures.
Matrix 2	No further action.	No further action.

(a) NYSDOH 2006.
NOTE: Analytical data results obtained by Spectrum Analytical, Inc. using EPA Method TO-15. All concentrations reported in micrograms per cubic meter (µg/m^3).

4.6 RESULTS SUMMARY

4.6.1 Soil

The soil investigation originally included the On-site Area, the adjoining Stadium Property to the west, the Smokes Creek Corridor to the north, and the Baker Hall Property to the east. However, in order to delineate the extent of site-related contamination (using arsenic and lead as indicator constituents), the investigation was expanded to encompass the northern portion of the Baker

Hall Property, and approximately 300 ft west of the site and more than 1,350 ft east of the site along the recreational path (located within the Smokes Creek Corridor). Based on the analytical results of the investigation, the lateral and vertical extent of soil contamination was delineated. The areal extent of soil contamination identified in excess of Restricted Residential and Commercial SCOs is illustrated on Figure 4-9.

The interpreted areal and vertical extent of fill was combined to estimate the volume of contaminated material derived from the incinerator site. These volumes are presented in the following table, by area of concern.

Area of Concern	Soil Cleanup Objective	Estimated Volume of Contaminated Material	
		Cubic Yards	Tons[(a)]
On-Site Area	Commercial	19,000 – 23,000	30,400 – 36,800
Baker Hall Property[(b)]	Restricted Residential	6,000	9,600
Smokes Creek Corridor	Restricted Residential	4,200-5,000	6,720-8,000
	Protection of Ecological Receptors	5,500-7,000	9,280-11,200

(a) Estimates assume that 1 yd^3 of material is approximately equal to 1.6 tons.
(b) Refined estimate based on the supplemental delineation activities conducted on the Baker Hall property.

4.6.1.1 On-site Area

Surface and subsurface soil results indicate that several inorganic constituents, primarily arsenic and lead, are present at concentrations that exceed Unrestricted Use, Restricted Residential, and Commercial SCOs in soil/fill material at the site. In general, the most elevated concentrations, above Commercial SCOs, were observed in the ramp area, where the ash/fill materials are also thickest, and in the area north of the northern incinerator building. However, it should be noted that the maximum On-site Area lead concentration (23,600 mg/kg) was reported in an ash sample collected from the basement of the southern incinerator building during the 2005 Site Investigation sampling (Malcolm Pirnie, 2005). Other constituents that exceeded SCOs (primarily arsenic, chromium, copper, nickel, and zinc) are typically associated with elevated lead concentrations.

One SVOC, a PAH, was detected at low concentrations slightly exceeding the Unrestricted Use/Restricted Residential SCOs. In general, PAH concentrations were observed in a subset of locations where lead concentrations also exceeded the SCO. None of the soil samples collected from the On-site Area contained VOCs, pesticides, or PCBs at concentrations greater than the Residential or Commercial SCOs.

4.6.1.2 Stadium Property

Surface and subsurface soil results indicate that none of the inorganic constituents (which were identified, based on the On-site Area sampling, as the indicator metals) were detected above Restricted Residential SCOs. Several inorganic constituents were detected in the eastern line of sampling locations, closest to the On-site Area property boundary, at concentrations above Unrestricted Use SCOs; however, the concentrations were similar to those detected in background samples. No organic compounds were detected in surface or subsurface soil at concentrations exceeding Unrestricted Use SCOs.

4.6.1.3 Baker Hall Property

Surface and subsurface soil results indicate that several inorganic constituents, primarily arsenic and lead, are present at elevated concentrations in the soil/fill material at the property. The site-related contamination at the Baker Hall Property is associated with soil/fill material, which is thickest in the northwestern corner of the property, located east of the northern incinerator building. The contaminated soil/fill thins to the south along the western property line, which is shared with the incinerator site, and along the northern property line, which is shared with the creek path.

Several SVOCs (primarily PAHs) were detected at low concentrations, slightly exceeding the Restricted Residential SCOs. In general, PAHs were observed in a subset of locations (along the northwestern Baker Hall Property boundary) where lead concentrations also exceeded the SCO. None of the soil samples collected from the Baker Hall Property contained VOCs, pesticides, or PCBs at concentrations greater than the Residential or Commercial SCOs.

4.6.1.4 Smokes Creek Corridor

Surface and subsurface soil results indicate that several inorganic constituents, primarily arsenic and lead, are present at concentrations greater than the Unrestricted Use, Restricted Residential, and Commercial SCOs in soil/fill material in Smokes Creek Corridor, primarily in surface soil adjacent to the recreational path. The site-related contamination in the Smokes Creek Corridor is associated with soil/fill material, in sample locations collected adjacent to the recreational path, which adjoins the northern boundary of the On-site Area and the Baker Hall Property. Soil contamination was identified throughout and beyond the recreational path which extends approximately 1,300 ft east of the eastern boundary of the On-site Area.

Concentrations of two pesticides slightly exceeded Unrestricted Use SCOs in subsurface soil from the monitoring well location near the recreational path. No other organic compound detections exceeded the Unrestricted Use SCOs.

4.6.2 Groundwater

Elevated concentrations of arsenic and lead were detected in the monitoring well located along the downgradient On-site Area boundary, north of the ramp. Each compound was only detected in one of two monitoring events; however, their presence may indicate that a limited amount of leaching of inorganic compounds is occurring from the On-site Area contaminated soil.

Several other inorganic constituents (antimony, chromium, iron, magnesium, manganese, nickel, and sodium) exceeded Class GA standards and guidance values in both On-site Area site monitoring wells and the background monitoring well, which suggests that those constituents are unlikely to be related to On-site Area contaminated soil. With the exception of acetone, a common laboratory contaminant, no organic compounds were detected in groundwater at concentrations exceeding the Class GA criteria.

4.6.3 Surface Water and Sediment

Surface water and sediment samples collected within the Smokes Creek channel do not appear to be impacted by site-specific contaminants.

Surface Water

Aluminum was the only constituent detected at concentrations exceeding the NYSDEC Class C, Type A(C) surface water standards and guidance values; however, the concentrations were relatively low and did not vary significantly from upstream to downstream sampling locations. Aluminum, which was not identified as a site-specific contaminant of concern, does not appear to be site related.

Sediment

Nickel was detected above the sediment guidance values; however, nickel was not identified as a site-specific contaminant of concern, based on the results of On-site Area soil sampling. The elevated concentrations, which are similar to background soil concentrations, indicate that there might be other naturally-occurring sources of nickel.

4.6.4 Outfalls

Stormwater

Two inorganic constituents (cyanide and selenium), which are likely related to the On-site Area soil contamination, were detected at concentrations that slightly exceeded Class C surface water standards in stormwater samples collected from the two outfalls located north of the incinerator site. These outfall pipes, which appear to be connected to the stormwater drainage system, discharge to the floodplain (i.e., above the normal creek stage). No organic compounds were detected in water samples collected from the stormwater outfalls.

Surface Soil

Concentrations of lead and zinc exceeded Unrestricted Use/Protection of Ecological Resources SCOs in the surface soil samples collected downslope of the stormwater outfall locations. Similar concentrations of lead and zinc were also observed at the outfall located on the Baker Hall Property just upstream of the site.

Several PAHs were also detected slightly above Unrestricted Use SCOs in surface soil samples. All of these constituents were identified in On-site Area and/or Baker Hall Property soil at elevated concentrations, which indicates that they could be derived from site-related soil contamination. With the exception of acetone, a common laboratory contaminant, no organic compounds were detected above Unrestricted Use SCOs in the surface soil samples.

4.6.5 Soil Vapor/Indoor Air

Several low-level detections of various VOCs were observed in the indoor air and/or sub-slab soil vapor samples; however, there were no sources of VOCs identified in the On-site Area soils. Based on the levels of VOCs detected, no action was required beyond taking steps to identify and reduce potential indoor air sources of VOCs.

5. FATE AND TRANSPORT

This chapter presents the environmental fate and transport mechanisms for the COPCs identified at the site during the RI. The COPCs are evaluated to determine the potential for continued on-site presence and potential off-site migration. The evaluation process assists in determining the current and future potential exposure pathways to human populations and the environment and in identifying potential technologies that may be appropriate for remediation of the site.

Three main factors are being evaluated when assessing a COPCs fate and transport in the environment:

- Physiochemical characteristics of individual COPCs
- Site environmental characteristics
- Biological interactions.

5.1 CONTAMINANTS OF POTENTIAL CONCERN

Historical site data and the findings of this RI have identified TAL metals, specifically lead, as the primary COPC at the site. Secondary COPCs include: arsenic, barium, cadmium, chromium, copper, manganese, nickel, and zinc. Total cyanide was also detected in stormwater.

Lead was detected in surface and subsurface soil samples from on-site locations at concentrations exceeding Unrestricted Use and Commercial SCOs, and in off-site locations at concentrations exceeding Unrestricted Use and/or Restricted-Residential SCOs. In addition, arsenic and lead were detected in sediment samples at concentrations exceeding the Class A criteria. Lead was also detected in groundwater at concentrations exceeding the Class GA criteria.

Table 5-1 summarizes the physiochemical characteristics of each of the primary and secondary COPCs identified above applicable SCGs at the Lackawanna Incinerator site; these characteristics influence the respective fate and transport of COPCs in the environment. Because lead has been identified as the primary COPC for the site, the specific chemical characteristics of lead are discussed in greater detail within the following sections.

5.2 PHYSIOCHEMICAL CHARACTERISTICS

Lead released to groundwater, surface water, and land is usually in the form of elemental lead, lead oxides and hydroxides, and lead metal oxyanion complexes (Smith et al. 1995; Evanko and Dzomback 1997).

Although lead will occur naturally in the environment, most high concentration levels found throughout the environment come from human activities, with the greatest increase occurring between the years of 1950 and 2000, reflecting increased worldwide use of leaded gasoline. Lead can enter the environment through releases from activities such as mining lead and other metals, and from factories that make or use lead, lead alloys, or lead compounds. Lead is typically released into the environment during burning of coal, oil, or waste. Once lead gets into the atmosphere, it may travel long distances if the lead particles are very small. Lead is commonly precipitated from the air by rain and by particles falling to land or into surface water. However, due to the historical operation of the site, lead concentrations observed in on-site surface soil are likely the result of incineration of waste and subsequent deposition of ash/fill material at the site.

Lead adheres strongly to soil particles and remains in the upper layer of soil. Lead may be transported when soil particles are moved by rainwater and surface runoff. Movement of lead from soil particles into groundwater is unlikely unless the rain falling on the soil is acidic or "soft." Movement of lead from soil will also depend on the type of lead compound, and on the physical and chemical characteristics of the soil.

Lead occurs most commonly with an oxidation state of 0 or +II. Lead (II) is the more common and reactive form of lead. This form produces mononuclear and polynuclear oxides and hydroxides (Evanko and Dzombak 1997). Under most conditions, lead (II) and lead-hydroxy complexes are the most stable forms of lead (Smith et al. 1995). Low solubility compounds are formed by complexation with inorganic (Cl-, CO_3^{2-}, SO_4^{2-}, PO_4^{3-}) and organic ligands (humic and fulvic acids, EDTA, amino acids) (Bodek et al. 1988). Complexation is the formation of a coordination entity, a compound which consists of a central metallic atom attached in a surrounding array to other atoms. Lead carbonate solids generally form within basic solutions with a pH above 6. Lead sulfide is the most stable solid when high sulfide concentrations are present under reducing conditions (Evanko and Dzomback 1997).

Most lead that is released to the environment is retained in the soil (Evans 1989). The primary processes influencing the fate of lead in soil include adsorption, ion exchange, precipitation, and complexation with sorbed organic matter. The mobility of metals in groundwater is affected by various chemical reactions, including dissolution-precipitation, oxidation-reduction, adsorption-desorption and complexation. These processes limit the amount of lead that can be transported into the surface water or groundwater. The relatively volatile organolead compound tetramethyl lead may form in anaerobic sediments as a result of alkyllation by microorganisms (Smith et al. 1995; Evanko and Dzomback 1997).

The amount of dissolved lead in surface water and groundwater depends on pH and the concentration of dissolved salts and the types of mineral surfaces present. In surface water and groundwater systems, a significant fraction of lead is undissolved and occurs as precipitates ($PbCO_3$, Pb_2O, $Pb(OH)_2$, $PbSO_4$), sorbed ions or surface coatings on minerals, or as suspended organic matter (Evanko and Dzomback 1997).

5.2.1 Water Solubility

Water solubility is the measure of a compound's ability to dissolve in water and is typically expressed in a unit of mass/volume (e.g., mg/L or µg/L). Aqueous solubility is one factor that can affect a compound's concentration and residence time in water. Compounds that exhibit high water solubility remain in solution while compounds with low solubility tend to go out of solution or affix to more hydrophobic surfaces.

Elemental lead is insoluble in water under normal conditions (20 degrees Celsius, and pressure = 1 bar). It may however occur dissolved in water as lead carbonate ($PbCO_3$ or $Pb(CO_3)_2^{2-}$). A well-known example of a water soluble lead compound is lead sugar (lead(II)acetate), which derived its name from its sweet nature. Lead frequently binds to sulphur in sulfide form (S^{2-}), or to phosphor in phosphate form (PO_4^{3-}). In these forms, lead is extremely insoluble, and is present as immobile compounds in the environment (Lenntech 1998-2009). Lead compounds are generally soluble in soft, slightly acidic water. Lead also has a tendency to form compounds of low solubility with the major anions found in natural water, including hydroxide, carbonate, sulfide, and, more rarely, sulfate acting as solubility controls in precipitating soluble lead from water (U.S. Department of Health and Human Services 1998). As a result, lead is generally much more prevalent in groundwater and surface water as a suspended solid in the form of a colloidal particle or an undissolved particle of a lead compound rather than in a dissolved form.

5.2.2 Volatilization

The process of volatilization involves the movement of a compound from the surface of a liquid or solid medium to the vapor phase. Typically, only the neutral or uncharged form of a compound can volatilize. Volatilization is calculated from the equilibrium vapor pressure which is essentially the solubility of the compound in air (measured as a partial pressure). When measuring a compound's fate in the environment, a more convenient index is the Henry's Law Constant, which defines the ratio of the compound's vapor pressure and water solubility, reported in units of atm-m^3/moles or atm-m^3/L. Generally, compounds with a Henry's Law Constant greater than 10^{-3} are readily volatized, compounds with constants of from 10^{-3} to 10^{-5} are somewhat volatized, and compounds with constants less than 10^{-5} have limited volatility.

When evaluating Table 5-1, it would be assumed that lead with a Henry's Law Constant of 0.00E+00 will not volatilize when in contact with air, although, as discussed previously, organolead compounds such as tetramethyl lead will volatilize from water.

5.2.3 Adsorption/Desorption

Adsorption/desorption defines the degree to which compounds are bound to be released from a solid matrix. Adsorption is defined as the accumulation of ions at the interface between a solid phase and an aqueous phase. A soil matrix will often include organic matter, clay minerals, iron and manganese oxides and hydroxides, and carbonates. Soil organic matter can consist of microbial communities, soluble biochemicals (i.e., amino acids, proteins, organic acids, ligins), and insoluable humic substances. These humic substances and biochemicals can provide sites for metal sorption. As metals interact with natural biochemicals they form water soluble complexes that increase the mobility of the metals. Metals binding to organic matter tend to affix to potentially reactive sites, ranging from weak forces of attraction to formation of strong chemical bonds. Soil organic matter is typically the main source of soil cation exchange capacity in surface mineral soils. Major metal cations include cadmium, copper, lead, mercury and zinc.

However, organic matter content in soil tends to decrease with depth, making subsurface mineral content of soil a more important surface for sorption. The cation exchange capacity is a measure of the negatively charged sites for cation adsorption and anion exchange capacity is a measure of the positively charged sites for anion adsorption. Anion capacity is relatively small in comparison with the cation adsorption capacity of soil.

Soil surfaces maintain either a net negative or positive charge depending on the nature of the surface and the soil pH. For pH dependent charged surfaces, whether organic or inorganic, as the pH decreases, typically the number of negatively charged sites diminishes. In a more acidic condition, the majority of pH dependent surfaces will be positively charged and under more alkaline conditions, the majority of sites will maintain a negative charge.

Several types of surface complexes can form between a metal and soil surface and are defined by the extent of bonding between the metal ion and the surface. Metals with a weak association or in an outer sphere complex are surrounded by water and are not directly bonded to the soil surface. These ions accumulate at the interface of charged surfaces in response to electrostatic forces. These reactions are rapid and reversible with only a weak dependence on the electron configuration of the surface group and the adsorbed ion. These two metal-surface interactions have also been termed exchange reactions because the introduction of other cations into the system, in sufficient concentration, causes the replacement or exchange of the original cations.

Metals associated with exchange sites may, depending on the environment, be relatively mobile. With inner sphere complexation, the metal is bound directly to the soil surface; no waters of hydration are involved. It is distinguished from the exchangeable state by having ionic and/or covalent character to the binding between the metal and the surface. A much higher bonding energy is involved than in exchange reactions, and the bonding depends on the electron configuration of both the surface group and the metal. This adsorption mechanism is often termed specific adsorption. The term specific implies that there are differences in the energy of adsorption among cations, such that other ions, including major cations, sodium, calcium, and magnesium, do not effectively compete for specific surface sites. Adsorbed metal cations are relatively immobile and unaffected by high concentrations of the major cations due to large differences in their energies of adsorption.

Partition coefficients are concentration ratios of the compound between two phases and include K_{ow}, $K_{d,}$ and K_{oc}; all have units of liters per kilogram. The K_{ow} is the octanol-water partition coefficient, which quantifies the concentration ratio of the compound in the octanol (organic) phase and aqueous phase. Octanol is used as a substitute for lipids; therefore, the K_{ow} is typically used to relate the compound partitioning from water to biota. The K_d is the concentration ratio of the compound between a solid and aqueous phase at steady-state. The K_d is constant for inorganic analytes (metals), but varies for organic analytes. The latter led to the usage of the K_{oc}, which is the organic carbon-water partition coefficient. The product of the compounds K_{oc} and the organic carbon content of the site soil or sediment is the site specific K_d for the compound. Higher values for K_{ow}, $K_{d,}$ and K_{oc} indicate a preference of the compound for the non-aqueous phase (low solubility in water). Metals, and specifically lead, maintain both low K_{ow} and K_{oc} values, as shown in Table 5-1.

5.2.4 Precipitation

Precipitation differs from adsorption in that the metal will form a new three dimensional solid state and not be associated with the surface of existing soil particles. Lead is retained in the soil or fill material, and transported during precipitation from the unsaturated zone into the groundwater table, with further potential migration to surface water and sediments.

As pH increases, aqueous metals species will tend to precipitate as hydroxide, oxyhydroxide, or hydroxysulfate minerals. In addition, as pH increases, dissolved metals may adsorb onto surfaces of these newly formed minerals and/or other surfaces present in the environment, such as organic matter due to decreasing competition with protons, decreased surface potential, and increased hydrolysis of metal ions at circum-neutral pH (EPA 2007). Because the removal of metals and metalloids present in the aqueous phase via mineral precipitation or surface adsorption processes are dependent upon pH, and metals tend to precipitate with increases in pH, the groundwater metal concentrations at monitoring well MW-03 would be expected to be lower than concentrations at monitoring well MW-04 due to groundwater conditions at monitoring well MW-03 that are more conducive to mineral precipitation (higher pH values at monitoring well MW-03). This relationship (lower metal concentrations in well MW-03) was documented during the RI.

5.3 BIOLOGICAL INTERACTIONS

The interactions between a COPC and biota present in the RI Study Area may also affect the COPCs fate and transport within the environment. These interactions are described in the following sections.

5.3.1 Bioconcentration

Bioconcentration is the accumulation of compounds by biota to greater concentrations than present in the aqueous phase. This is quantified using the bioconcentration factor which is the ratio of the compound concentration in the biota and in the water. As stated in Section 5.2.3, bioconcentration factors are typically expressed in units of L/kg and higher values of K_{ow}, $K_{d,}$ and $K_{oc,}$ indicate a preference of the compound for the non-aqueous phase (low solubility in water). With the exception of lead and other metals, the majority of the COPCs reported in the on-site soil/fill typically had lower values for K_{ow}, $K_{d,}$ and $K_{oc,}$ which means they would be less persistent in the on-site soil and biota, and tend to readily mobilize within groundwater.

5.3.2 Bioaccumulation

Bioaccumulation is the accumulation of compounds by biota from both aqueous phase and dietary phase exposure. The bioaccumulation factor, when related to aqueous phase concentrations, is larger than the actual bioconcentration factor. Lead and other metals have been known to bioaccumulate in fish, birds, mammals and plants. No biota samples were taken during this RI to confirm whether the site was serving as a source to compounds accumulating in biota.

5.4 CONTAMINANT MIGRATION

Based upon the physicochemical characteristics of lead, the geology and hydrogeology of the RI Study Area, and the nature and extent of impacted media in the RI Study Area, lead migration may have occurred via several pathways, including atmospheric migration via volatilization and particulate distribution (i.e., wind) from disturbed soils, aquatic migration via groundwater and migration via surface water runoff, leaching from soil into groundwater and soil erosion.

5.4.1 Migration through Anthropogenic Activities

Lead can migrate at the site through construction activities such as disturbing soil. Lead can be introduced into your body by inhalation (breathing) and ingestion (eating). Lead is not absorbed through your skin, unless it is present as an organolead compound, such as tetramethyl lead. When lead is scattered in the air as a dust, fume, or mist, it can be inhaled and absorbed through the lungs and upper respiratory tract. Inhalation is by far the most important exposure route in construction. Lead may be in the air if dust is created during excavation or other soil disturbance. Lead can be absorbed through the digestive system through inadvertent ingestion, leading to bioaccumulation in the blood, fatty tissues, bones, and teeth. Ingestion exposures can happen on the job, mostly by handling food, cigarettes, chewing tobacco, or make-up that can have lead dust on them; or handle food items with unwashed hands or dusty clothing contaminated with lead dust. Additionally, unabated lead dust created during construction activities may be deposited in other areas of the site or on vegetation where it can be easily transported by stormwater surface runoff to Smokes Creek.

5.4.2 Migration with Surface Runoff and Erosion

A likely migration pathway associated with runoff and erosion from the site includes surface water and surface soil/fill that is transported from on-site to Smokes Creek. This form of transport may have resulted from surface drainage including rain events, surface water runoff, snow melt, or from current site activities or historical operations. Lead's migration in this transport mechanism would likely be slow due to the low solubility, K_{ow} and K_{oc} properties of the metal. Surface runoff and erosion at the site would have likely brought lead downslope toward Smokes Creek.

5.4.3 Migration through Atmospheric Deposition

The primary COPC within the on-site soil/fill is lead, which requires high temperatures to volatilize. As such, the migration of lead and other metals in air would likely be from wind erosion of on-site surface soil/fill resulting in suspended particulates within air, rather than through volatilization. EPA studies have shown that lead is generally present in the atmosphere, likely due to wind erosion.

5.4.4 Leaching from Soil to Groundwater

The downward movement of lead from soil by leaching is very slow under most natural conditions. The conditions that induce leaching are the presence of lead in soil at concentrations that either approach or exceed the sorption capacity of a soil, the presence in the soil of materials that are capable of forming soluble chelates with lead, and a decrease in the pH of the leaching solution (e.g., acid rain) (NSF 1977). Partial favorable conditions for leaching may be present in some soils near lead- smelting and sites that contain elevated levels of lead in soil (U.S. Department of Health and Human Services 1998). Information obtained during the RI suggests that this migration mechanism is not significant at the site.

5.4.5 Migration within Groundwater

Lead and other metals have very low water solubility. In particular, lead has a tendency to form compounds of low solubility with the major anions found in natural water, including hydroxide, carbonate, sulfide, and, more rarely, sulfate acting as solubility controls in precipitating lead from water (U.S. Department of Health and Human Services 1998). As a result, lead is generally much more prevalent in groundwater as a suspended solid rather than in a dissolved form.

Based on the groundwater elevations determined during the RI, shallow groundwater flow is toward Smokes Creek. Thus groundwater flow represents a potential COPC migration pathway at the site. Metals, including antimony, chromium, iron, lead, magnesium, manganese, and sodium, were detected in groundwater samples at concentrations exceeding the NYSDEC Class GA criteria. However, although COPCs appear to be migrating from the site, this is not considered a primary migrations pathway, and site-related impacts were not indicated by analytical results for surface water and sediment samples collected adjacent to, and downstream of, the site.

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6. QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

This chapter identifies potential current and future human receptors and the associated exposure pathways to site related COPCs, and provides a qualitative assessment of the potential significance of the exposure pathways as determined by the RI.

The qualitative human health exposure assessment includes four key elements: (1) identifying potential exposure pathways for contaminated media, (2) identifying the COPCs for each of the identified pathways, (3) a qualitative evaluation of potential human health exposures for each exposure pathway based on the identified COPCs, and (4) the conclusions of the exposure assessment.

6.1 EXPOSURE SETTING

The site is bounded to the west by the Lackawanna Veterans' Stadium, to the south by Reddon Street and the City of Lackawanna DPW, to the east by the Baker Hall Property, and to the north by a paved walking path along the southern shore of Smokes Creek.

6.2 NATURE AND EXTENT OF CONTAMINANTS OF CONCERN

The Lackawanna Incinerator site consists of two multi-story, brick incinerator buildings, including the southern incinerator and the northern incinerator. The incinerators were primarily used to burn municipal trash. The southern incinerator was in operation from its construction in 1927 until around 1950, when it was decommissioned and the northern incinerator was put into operation. The northern incinerator was built into the face of a mound of fill that was used as a ramp for truck traffic to access the third floor of the incinerator. The ramp was initially constructed from a mix of soil and steel foundry slag, and was widened over time to the east and west through the addition of street sweepings and discarded refractory brick from the incinerator chimneys obtained from routine repair and maintenance activities. The northern incinerator began operating around 1950; operations ceased in 1980.

During the RI, EA evaluated four media which included: soil/fill material (surface soil/fill and subsurface soil/fill), groundwater, surface water, and sediment. Potential exposure pathways for each of these media are described in the sections below.

6.2.1 Surface and Subsurface Soil/Fill

The eastern portion of the site is dominated by the ramp leading to the northern incinerator building. Portions of the site are used by the City of Lackawanna DPW for stockpiling soil and fill materials, and for equipment storage. Vegetation, including grasses, shrubs, and small trees, was observed surrounding the incinerator buildings and along the sloped sides of the ramp. The property is bounded to the north by a walking path along the southern shore of Smokes Creek. The Baker Hall Property to the east of the site contains 12 acres of undeveloped land consisting of an overgrown vacant field and emergent woods.

Direct contact with surface soil by City of Lackawanna DPW workers and users of the northern incinerator building is a potentially complete exposure pathway via incidental ingestion and dermal absorption. In addition, if future redevelopment of the site were to occur, direct contact with surface and subsurface soil by construction workers could potentially take place (incidental ingestion and dermal absorption). There is also a potential for inhalation of contaminant-laden particulates by construction workers, and possibly, off-site receptors.

The presence of metals (particularly lead but also including arsenic, barium, cadmium, chromium, copper, cyanide, manganese, and nickel) and SVOCs (particularly PAHs) in on-site soil could result in incidental ingestion and dermal contact exposures to current site personnel (city workers), as well as site workers and visitors during any redevelopment activities. Additional exposure to contaminants would be possible via inhalation of particulates during site redevelopment. Metals and SVOCs in on-site surface and subsurface soil could also act as a source of groundwater contamination. Groundwater exposure pathways are discussed below.

6.2.2 Groundwater

Currently, there is no groundwater usage at or in the immediate vicinity of the site (e.g., potable or industrial wells), and no expected future use of groundwater, as connection to a public water supply is available. However, groundwater from the site flows northward and discharges to surface water in Smokes Creek. Metals, including antimony, chromium, iron, lead, magnesium, manganese, and sodium, were detected in groundwater samples at concentrations exceeding the NYSDEC Class GA criteria.

The primary source of water for the City of Lackawanna is Lake Erie and the Niagara River and thus is not expected to be impacted by site conditions. Site groundwater flows to the north and discharges to Smokes Creek which flows west approximately 2.7 mi to Lake Erie. Potential exposure pathways for surface water are discussed below.

6.2.3 Sediment

A potential direct exposure pathway for Smokes Creek sediment is via ingestion of fish, as the creek is known for its steelhead trout fishing. Smokes Creek flows west to Lake Erie, located approximately 2.7 mi downstream from the Lackawanna Incinerator site. Therefore, Smokes Creek could act as a contributing source of sediment contamination to Smokes Creek downstream from the site and to Lake Erie. Therefore, there is potential for exposure to contaminated fish further downstream along Smokes Creek.

Sediment criteria for each constituent were compared to detected concentrations of analytes in each of the sediment samples and exceedances were determined. Elevated concentrations of metals were observed, but the concentrations were similar to the range detected in background soil samples which indicates that they might be ubiquitous in the area and not a result of migration from on-site soil contamination.

6.2.4 Surface Water (Including Stormwater)

Smokes Creek is designated by the NYSDEC as Class C water. The best usage for Class C waters is fishing and non-contact activities. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival, and shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes (6 NYCRR 701.7). Inorganic constituents, including total cyanide and selenium, were detected in stormwater outfall samples, with concentrations exceeding the Class C Aquatic (Acute) and/or the Class C (Chronic) standards. The results of the surface water sampling of Smokes Creek indicated that while several inorganic constituents were detected, only aluminum was detected at concentrations slightly exceeding the Class C (Chronic) standard (100 µg/L).

Smokes Creek near the site is approximately 20-ft wide and no more than 4-ft deep, and the creek itself is known for steelhead trout fishing. Therefore, ingestion of fish from Smokes Creek is likely an exposure pathway. Based on a review of the land usage in the vicinity of the site and the nature of the creek, direct contact (incidental ingestion and dermal absorption [i.e., secondary contact]) with surface water could occur as a result of fishing or other recreational activities. Smokes Creek is vegetated, with a wide variety of grasses and shrubs observed along its banks. A walking path along the southern shore of Smokes Creek is open to the public providing access to the creek for fishing and other activities.

Ponded water has been observed in the emergent woods on the Baker Hall Property. Direct contact (incidental ingestion and dermal absorption [i.e., secondary contact]) with surface water on the Baker Hall Property could occur as a result of recreational activities or off-site maintenance or construction activities.

6.3 SELECTION OF CONTAMINANTS OF POTENTIAL CONCERN

COPCs for the site were selected following the practice established by the EPA in the Risk Assessment Guidance for Superfund Volume I, Part A (EPA 1989). The selection criteria were as follows:

- The frequency of detection for chemicals in soil and groundwater was utilized to determine COPCs. Chemicals with a frequency of detection of less than 5 percent in a data set of 20 or more samples were excluded from this assessment. Also, consideration was given as to whether the detected chemical is related to historical and current uses of the site.

- Chemicals not detected at least once above the limit of detection were automatically excluded from this assessment, regardless of the size of the data set.

- Chemicals selected as COPCs were identified in at least one sample location at a concentration above its respective SCG.

A summary list of COPCs by medium is provided in Table 6-1. Relevant and appropriate requirements (i.e., SCGs) for these COPCs are discussed in Chapter 4.

This human exposure assessment provides qualitative descriptions of potential exposure to site-related COPCs for human populations who may reasonably be expected to contact site media under present or future conditions. This qualitative assessment is comprised of two components for the On-site Area/Baker Hall Property and Smokes Creek Corridor exposure scenarios:

- Description of exposure setting and identification of potentially exposed populations
- Identification of exposure pathways.

These components are discussed in greater detail in the following sections.

6.4 IDENTIFICATION OF POTENTIALLY EXPOSED POPULATIONS

This section identifies potential receptors and exposure pathways. A complete exposure pathway is one that meets the following criteria (NYSDEC 2002a; EPA 1989):

- A COPC must be present.

- Release and transport mechanisms and media must be available to move the chemicals from the source medium to an exposure medium.

- A potential opportunity must exist for receptors to contact the affected media.

- A receptor population and a means for chemical uptake (e.g., ingestion, inhalation) must exist.

Under current and future site use conditions, the potentially exposed populations (i.e., potential receptors) are those that might come into contact with the COPCs. Table 6-2 presents the exposure pathway matrix, and depicts the various exposure routes for potential current and future on-site and off-site human populations. Inorganic constituents (primarily metals) were evaluated as the primary COPCs as their environmental persistence and detections in on-site fill material provide the most likely exposure scenarios and potentially complete pathways.

6.4.1 Current Exposure Scenarios

On-site/Baker Hall

The site is currently used by the Lackawanna DPW for materials staging and equipment and vehicle storage. The first floor of the northern incinerator is used by the City Animal Control Officer for the temporary caging of animals. A complete exposure pathway to subsurface soil (fill material) and on-site groundwater at the site is unlikely for current on-site users. The more possible exposure pathways under current exposure scenarios exist for on-site surface soil and surface water. It is possible for on-site workers to come in direct contact with site surface soil and surface water. The potential for surface soil and surface water ingestion is expected to be low, but moderate potential exists for dermal contacts and particulate inhalation to on-site workers (Figure 6-1).

Current off-site human populations considered in this qualitative exposure assessment include adult commercial and industrial workers, adult construction workers, adult and child visitors and residents, and recreationists. A complete exposure pathway to site surface soil/fill, subsurface soil (fill material), groundwater, and surface water is unlikely for all current off-site human populations.

Smokes Creek Corridor

Recreational exposure (i.e., dermal contact and ingestion while wading or swimming or boating) to surface water and sediment in Smokes Creek is possible. There is potential for exposure to site-related COPCs due to the use of Smokes Creek for fishing, and due to the presence of the walking path along the southern shore of the creek providing access to the creek (Figure 6-2). However, it is unlikely that Smokes Creek is used year round for fishing and/or recreational purposes.

6.4.2 Future Exposure Scenarios

Future human populations considered in this exposure assessment include on-site trespassers, on-site and off-site construction workers, nearby off-site utility workers, on-site commercial workers, on-site adult and child visitors to commercial/industrial establishments, and on-site and off-site adult and child residents.

On-site construction workers are considered since virtually any site redevelopment would involve construction activity in some form. Potentially complete on-site exposure media for construction workers would include surface and subsurface soil/fill. In addition, subsurface construction activities that contact the groundwater table would present another potentially complete exposure pathway. In addition, should repairs or replacement of drainage pipes at the site be required in the future, potential exposure to surface water and sediment would exist for on-site utility workers. Soil particulate and volatilization of chemicals from soil to ambient air during construction excavation activities may be complete exposure pathways for this population.

Off-site construction and subsurface utility work exposure to areas surrounding the site is considered in the event of future off-site redevelopment. Chemical exposure for off-site construction and nearby off-site utility workers could be expected because of the presence of subsurface utility lines in areas adjacent to the site. Potential off-site exposure media for construction workers and nearby off-site utility workers would include soil/fill, as analyzed during this RI, in addition to soil particulate and volatilization of chemicals from soil to ambient air during construction activities.

The possibility exists that the site may be used in the future for commercial purposes. Thus, exposure of adult on-site commercial workers and adult and child visitors to future on-site commercial establishment is possible. These individuals may be exposed to soil/fill (both surface and subsurface) and groundwater contamination. Potential on-site exposure media for future on-site residents would include surface and subsurface soil.

6.5 IDENTIFICATION OF EXPOSURE PATHWAYS

Long-term exposure to heavy metals (lead) can affect the nervous system in humans and animals. Some of the long-term symptoms are common to a variety of health problems and can be overlooked by exposed populations. Table 6-2 provides qualitative descriptions of the potentially complete exposure pathways for current and future on-site and off-site human populations, and anticipates level of exposure potential.

6.5.1 Current Use

Under current site use conditions, the on-site worker has a moderate to high potential for exposure to surface soil/fill via ingestion (oral), inhalation, or dermal contact. There is only minimal potential for exposure of current off-site populations to the soil/fill at the Lackawanna Incinerator site. Current off-site adult industrial workers and recreationalists have a moderate potential for exposure to contaminated surface water and sediment.

6.5.2 Future Use

Under future site use conditions, on-site construction workers have moderate potential for exposure to soil/fill and groundwater through ingestion and dermal contact, and soil particulate and volatized contaminants in ambient air through inhalation. On-site commercial workers and site visitors would face moderate potential for exposure to soil and groundwater via ingestion and dermal contact. Additionally, on-site utility workers would have moderate potential for exposure to surface water and sediment. There are no additional relevant exposure pathways for future off-site populations, with the exception of nearby off-site utility and construction workers, which would have minimal potential for exposure to subsurface soil and groundwater through ingestion and dermal contact, and soil particulate and volatized contaminants in ambient air through inhalation.

6.6 SUMMARY

There are several distinct human populations both on-site and in the vicinity of the site that could potentially be exposed to site-related COPCs. Current potential on-site populations which may be exposed include DPW workers and users of the northern incinerator building (i.e., City Animal Control Officer). Current off-site populations which may be exposed include commercial/industrial workers, adult and child visitors to commercial/industrial establishments, recreationists, and adult and child residents north of the site. Under future off-site use conditions, potential receptors at risk of exposure include construction and utility workers, and commercial/industrial workers. On-site, additional future receptors potentially at risk of exposure include construction workers, commercial/industrial workers, adult and child visitors to future on-site commercial establishments, and adult and child residents.

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7. FISH AND WILDLIFE RESOURCES IMPACT ANALYSIS

Following the Appendix 1C Decision Key in the NYSDEC's Fish and Wildlife Resources Impact Analysis guidance document, a Fish and Wildlife Resources Impact Analysis was deemed required (Table 7-1). Therefore, the following analysis identifies actual or potential risks to fish and wildlife residing on and in the vicinity of the site from contaminants potentially migrating from the site. The analysis focuses on risks associated with site-related chemicals detected in soil, surface water, sediment, and groundwater. This analysis contains:

- Site descriptions and a characterization of plant and animal resources and their value to humans and the environment
- Evaluation of potential exposure pathways to fish and wildlife from site-related COPECs
- Comparison of concentrations of COPECs to regulatory criteria or derived toxicological benchmarks for the protection of fish and wildlife
- Conclusions regarding the potential of exposure and possible risks to fish and wildlife on and in the vicinity of the site.

7.1 OBJECTIVES

The objectives of the Fish and Wildlife Resources Impact Analysis are to identify actual or potential impacts to fish and wildlife resources from site contaminants of ecological concern and to provide information necessary for the design of a remedial alternative. The Fish and Wildlife Resources Impact Analysis consists of the following steps:

- Identify all fish and wildlife resources based upon knowledge of the site and a search of NYSDEC records and/or other sources
- Describe the resources on the site and within 0.25 mi of the site
- Identify contaminant migration pathways and any fish and wildlife exposure pathways.
- Identify COPECs
- Based upon resources and pathways identified and the toxicity of the COPECs, draw conclusions regarding the actual or potential adverse impacts to fish and wildlife resources.

7.2 SITE DESCRIPTION

The site is located on South Park Avenue, in the City of Lackawanna, Erie County, New York. The property is rectangular in shape and has main access to the site on Reddon Street, off of South Park Avenue. The property is bounded to the west by the Lackawanna Veterans' Stadium, to the south by the City of Lackawanna DPW, to the east by the Baker Hall School property, and to the north by a paved walking path along the southern shore of Smokes Creek. Numerous single-family residential properties are located south and southwest of the site, while Holy Cross Cemetery is located to the north of the site north of Smokes Creek.

7.3 FISH AND WILDLIFE RESOURCES

Documented fish and wildlife resources exist within a 0.5-mi radius of the site, including Smokes Creek north of the site. Figure 7-1 presents the National Wetlands Inventory map for the site and a 0.5-mi radius, and downstream from the site along Smokes Creek. According to the National Wetlands Inventory Wetlands Mapper (2012), a 4.02-acre freshwater forested/shrub wetlands present approximately 0.12 mi east of the site and a 7.81-acre freshwater forested/shrub wetland is present approximately 0.20 mi northeast of the site. In addition, 14.86 acres of riverine wetlands are located along Smokes Creek approximately 0.81 mi downstream from the site. Because the NYSDEC does not regulate wetlands smaller than 12.4 acres in size, the National Wetlands Inventory map is also being presented for the New York State Freshwater Wetland map.

Rare plant or rare animal species are not mapped within the 0.5-mi radius of the site. Using the NYSDEC Environmental Resources Mapper, EA generated Figure 7-2, which depicts the classified water bodies, state-regulated freshwater wetlands, and check-zones. Smokes Creek was identified in the Environmental Resources Mapper as a Class C stream, which may be suitable for fishing, fish survival, and primary and secondary recreation.

The topography at the site is dominated by a ramp leading to the northern incinerator building and ranging in elevation from 593 to 618 ft amsl (Figure 1-4). Prior to construction of the ramp, the natural grade of the site would have been generally level, with elevations ranging from 585 to 593 ft amsl. The nearest surface water feature is Smokes Creek, which is channelized north of the site. Surface water flows radially from the elevated fill ramp to drainage ditches and two stormwater catch basins, which drain northward into Smokes Creek.

Regionally, groundwater flows northward across the site to Smokes Creek. Perched water within the fill ramp likely flows radially outward, and then northward to Smokes Creek. Depth to groundwater in the seven monitoring wells in November 2012 ranged from 7.23 to 13.84 ft below the top of casing, and from 6.43 to 12.54 ft below top of casing in April 2013. The interpreted groundwater contours (Figure 3-6) indicate that groundwater flows northward toward (and likely discharges to) Smokes Creek.

7.3.1 Ecological Resources

Based upon activities completed on-site and information obtained from the New York Natural Heritage Program Draft Ecological Communities within New York State (NYSDEC 2002b), the following distinct ecological habitat types were identified within a 0.5-mi radius of the site:

- ***Urban structure exterior—***This habitat type is characterized by the exterior surfaces of metal, wood, or concrete structures (e.g., commercial buildings, apartments, houses, or bridges), or any inorganic structural surface (glass, plastics, etc.), in an urban or densely populated suburban area. Vegetation, where present, is typically sparse, with lichens, mosses, terrestrial algae. Cracks and sheltered spaces may provide a place for vascular plants to take root or serve as nesting habitats for birds and insects, and roosting sites for bats. Typical species of birds include common nighthawk (*Chordeiles minor*) on rooftops, American robin (*Turdus migratorius*) on porches or under shelter, and exotic birds such as a house sparrow (*Passer domesticus*).

- ***Mowed lawn with trees—***This habitat type is characterized by residential, recreational, or commercial land that comprises lawn areas with clipped grasses and forbs, which are maintained by mowing. Trees typically cover at least 30 percent of the ground, and shrubs may cover less than 50 percent. Typical animal species include gray squirrel (*Sciurus carolinensis*), American robin (*Turdus migratorius*), mourning dove (*Zenaida macroura*), and mockingbird (*Mimus polyglottos*).

- ***Mowed lawn—***This habitat type is characterized by residential, recreational, or commercial land, or unpaved airport runways, which includes clipped grasses that are maintained by mowing. Trees may cover at least 30 percent of the ground, and shrubs may cover less than 50 percent. Typical birds include American robin (*Turdus migratorius*) and red winged blackbird (*Agelaius phoeniceus*).

- ***Paved road/path***—This limited habitat type consists of a paved road or path (e.g., asphalt, concrete, brick, stone, etc.). Sparse vegetation may be rooted in cracks in the pavement.

- ***Unpaved road/path***—This limited habitat type consists of an unpaved road or path (e.g., gravel, bare soil, or bedrock outcrop), which may be sparsely vegetated. The surface is maintained by regular trampling or scraping of the land surface. Characteristic species include the common dandelion (*Taraxacum officinale*) and the American robin (*Turdus migratorius*).

- ***Mowed roadside/path***—This limited habitat consists of a narrow strip of mowed vegetation along a roadside, through taller vegetation (e.g., meadows, old fields, woodlands, forests), or along utility corridors (e.g., power lines, telephone lines, gas pipelines). Typical vegetation in these areas may include grasses, sedges, and rushes; or forbs, vines, and low shrubs that can tolerate infrequent mowing.

- ***Brushy, cleared land*—**This habitat type includes land that has been clear-cut or cleared by brush-hog. As a result, there may be a lot of woody debris. Patchy vegetation may include herbs, shrubs, and tree saplings. The amount of vegetation present depends on soil fertility and how long it has been since the land was cleared.

- ***Successional old field*—**This habitat type comprises a meadow with forbs and grasses that develops where land was cleared and plowed (for farming or development), and later abandoned. Typical herbs include goldenrods (*Solidago altissima, S. nemoralis, S. rugosa, S. juncea, S. canadensis,* and *Euthamia graminifolia*), bluegrasses (*Poa pratensis, P. compressa*), timothy (*Phleum pratense*), quackgrass (*Agropyron repens*), smooth brome (*Bromus inermis*), sweet vernal grass (*Anthoxanthum odoratum*), orchard grass (*Dactylis glomerata*), common chickweed (*Cerastium arvense*), common evening primrose (*Oenothera biennis*), oldfield cinquefoil (*Potentilla simplex*), calico aster (*Aster lateriflorus*), New England aster (*Aster novae-angliae*), wild strawberry (*Fragaria virginiana*), Queen-Anne's lace (*Daucus corota*), ragweed (*Ambrosia artemisiifolia*), hawkweeds (*Hieracium* spp.), dandelion (*Taraxacum officinale*), and ox-tongue (*Picris hieracioides*). Shrubs may be present, but comprise less than 50 percent cover. Typical shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), silky dogwood (*Cornus amomum*), arrowwood (*Viburnum recognitum*), raspberries (*Rubus* spp.), sumac (*Rhus typhina, R. glabra*), and eastern red cedar (*Juniperus virginiana*). A characteristic bird is the field sparrow (*Spizella pusilla*). This transitional community is succeeded by a shrubland, woodland, or forest community.

- ***Flower/herb garden***—This habitat type is a residential, commercial, or horticultural land cultivated for the production of ornamental or culinary herbs and shrubs. Typical birds include the American robin (*Turdus migratorius*) and mourning dove (*Zenaida macroura*).

7.3.2 Observation of Stress

Limited signs of stress to vegetation and wildlife at or around the site were noted during the field activities undertaken during the RI at the site. No signs of stress to vegetation or wildlife resulting from impacts of site-related COPCs were observed during field activities.

The eastern portion of the site itself offers limited habitat, with minor wooded areas. The vacant land east of the site offers better quality habitat for small mammals and birds, with hardwood trees in the northern portion and grasses and emergent vegetation covering the remainder of the vacant land. The observations made during the RI field activities are generally consistent with the observations made during the 2005 Site Investigation (Malcolm Pirnie). Vegetative species observed were typical of disturbed areas and/or forest edge species, including tree of heaven (*Ailanthus altissima*), box elder (*Alnus negundo*), common reed (*Phragmites australis*), poison ivy (*Toxicodendron radicans*), smooth sumac (*Rhus glabra*), Japanese knotweed (*Polygonum cuspidatum*), garlic mustard (*Alliara officinalis*), purple loostrife (*Lythrum salicaria*), various grasses, thistle, ragweed (*Artemisia vulgaris*), and other low-growing forbs.

7.3.3 Value of Habitat to Associated Fauna

The residential, commercial, and industrial properties surrounding the site are of little value to wildlife. However, several wooded areas, creeks, fields and other isolated areas with vegetation exist within 0.5 mi of the site. These areas are of significant value to wildlife. An ecological habitat visual survey was conducted on May 24, 2005 as part of the previous investigation, and tracks of raccoon (*Procyon lotor*), Eastern wild turkey (*Meleagris gallopavo*), and whitetail deer (*Odoceoleus virginiana*) were observed in sediment along the water's edge. Due to the limited size of other habitat types in the vicinity of the site, larger mammalian and bird of prey species are not likely to occur at the site other than periodic transient movement across the site. The creek habitat and freshwater wetlands located north of the site are of great value to fish and other aquatic fauna that exist within Smokes Creek. The creek is known locally for steelhead trout fishing, and beaver were observed in the creek during 2012/2013 Phase I and II field activities.

7.3.4 Value of Resources to Humans

The site and surrounding area are of some value to humans for recreational use. Bird feeders may be in residential yards to the south and southwest of the site. A walking path open to the public is located along Smokes Creek. Smokes Creek is used recreationally for fishing and the walking path provides access to the creek for recreational purposes. Recreational use, including kayaking and boating in Smokes Creek is not likely due to the shallow depth of the creek.

7.4 CONTAMINANT EXPOSURE PATHWAYS

The Lackawanna Incinerator site was used from 1927 until 1980 to burn municipal trash for the most part, although some medical waste from Our Lady of Victory Hospital was intermittently burned. An elevated fill ramp leading to the northern incinerator building dominates the topography in the eastern portion of the site. The current primary use of the site is for materials staging, and equipment and vehicle storage area for the City of Lackawanna DPW. There are piles of waste road material, soil, and mulch located throughout the site, as well as excess piping, chain-link fencing, brick and cinder blocks, and scrap metal. The primary contaminants detected in surface and subsurface soil and groundwater at the site and sediment collected from Smokes Creek include metals (in particular lead). The primary contaminant detected in stormwater outfall samples draining to Smokes Creek was total cyanide.

There is documented surface and subsurface soil/fill, groundwater, surface water, and sediment contamination at the site, but habitat for endangered, threatened, or special concern species was not identified on the site or in the area immediately surrounding the site. Based upon the NYSDEC Environmental Resources Mapper, the site and Smokes Creek to the north are not listed as having an area suitable for rare animals and rare plants. There are no wetland areas on or adjacent to the site, although there are freshwater wetlands within 0.12 mi east and 0.20 mi northeast of the site, and 0.81 mi downstream from the site on Smokes Creek. The land area immediately surrounding the site would be characterized as developed, with scrub/shrub community types. Figure 7-3 illustrates the land cover types at the site and within the vicinity of the site.

Surface water flow from the site flows radially from the elevated fill ramp to drainage ditches and two stormwater catch basins, which drain northward into Smokes Creek. The northern incinerator also has a French drain that may be connected to this storm system. It is likely that contaminants are migrating from the site into Smokes Creek during precipitation events. Erosion of contaminated fill into Smokes Creek is another contaminant migration pathway. Smokes Creek flows westward and discharges to Lake Erie, located approximately 2.7 mi downstream from the site.

The soil/fill beneath the site is characterized by an unsaturated fill material zone underlain by native glaciolacustrine silt and clay. As the water table at the site occurs at approximately 7-10 ft bgs, any sizable amount of material released on the property could potentially reach the water table due to the porous nature of the fill material. Once these contaminants reach the water table, they can be transported via the groundwater flow mechanism. Groundwater at the site flows northward and discharges to Smokes Creek. Therefore, it is likely that contaminants are migrating from the site into Smokes Creek, potentially contaminating sediment and/or surface water. Because of this situation, groundwater is one of the potential pathways for contaminant migration at the site.

Although the potential for the migration of contaminants exists, environmental conditions and the physiochemical properties of the contaminants may limit the movement within the environment. Movement of contaminants through the unsaturated and saturated zones depends on several factors, including the sorptive capacity, retardation effects, and available organic material. These processes can serve to limit the migration of contaminants off-site. Figures 7-4 and 7-5 present conceptual site models for the On-site Area/Baker Hall Property and Smokes Creek Corridor ecological receptor exposure scenarios.

7.5 DESCRIPTION OF RESOURCES POTENTIALLY IMPACTED BY THE SITE

Because groundwater flows toward Smokes Creek, biological communities in the creek will be the focus of this Fish and Wildlife Resources Impact Analysis. Smokes Creek is located north of the site. It is classified as a Class C surface water body; fresh surface waters.

The U.S. Fish and Wildlife Services was contacted to request information concerning the specific occurrence of plants, wildlife and any endangered, threatened, proposed, or candidate species or their critical habitats on or in the vicinity of the site. The U.S. Fish and Wildlife Services reviewed their databases and found one record of a proposed endangered species: the northern long-eared Bat (*Myotis septenrionalis*) on or in the immediate vicinity of the site (Appendix P). The U.S. Fish and Wildlife Services did not identify any other rare or state-listed animals or plants, significant natural communities, or other significant or critical natural habitats.

7.6 IDENTIFICATION OF FISH AND WILDLIFE REGULATORY CRITERIA AND CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN

A criteria-specific analysis uses numerical criteria to assess potential ecological impacts associated with the contaminants. The numerical criteria are obtained from the New York State Department of Environmental Conservation Water Quality Regulations: Surface Water and Groundwater Classifications and Standards (6 NYCRR; Title 6, Chapter X Parts 700-706, Amendments through August 4, 1999) and the NYSDEC Technical Guidance for Screening Contaminated Sediments. If constituent concentrations are less than the numerical criteria, it is assumed that the constituent does not pose an unacceptable risk, and additional analysis is unnecessary. Where site-related constituent concentrations exceed the numerical criteria, an analysis of toxic effects may be required.

7.6.1 Screening of Analytical Results

As detailed in Chapter 4, the surface water results were compared to applicable SCGs found in the Division of Water Technical and Operational Guidance Series (1.1.1); Class C for protection of Fish and Wildlife Propagation and Survival.

The detected concentrations of constituents in groundwater were also used to evaluate the potential for site-related impacts to surface water. Groundwater concentrations were compared to Technical and Operational Guidance Series 1.1.1 Class GA SCGs. Sediment data results were compared to the SCGs calculated from the guidance provided in the NYSDEC Technical Guidance for Screening Contaminated Sediments. These SCGs were presented in Chapter 4.

7.6.1.1 Sediment Screening Results

Eight sediment samples were collected from Smokes Creek during the RI. Analytical results for sediment samples were screened against the sediment guidance values provided in the Draft NYSDEC Division of Fish, Wildlife and Marine Resources, Bureau of Habitat Screening and Assessment of Contaminated Sediments (2013). The screening of detected constituents of concern in sediment samples against guidance values is presented in Table 4-17.

In sediment samples, nickel and silver were the only inorganic constituents that exceeded Class A[9] sediment guidance values. Detected nickel concentrations, which ranged from 28.1 to 42.1 mg/kg, fall within the Class B[10] sediment range (23–49 mg/kg). One silver concentration (1.1 mg/kg) fell within the lowest level of the Class B sediment range (1–2.2 mg/kg).

Nickel concentrations were frequently detected in surface and subsurface soil samples at concentrations above the Unrestricted Use SCO (30 mg/kg) in the On-site Area; however, only one subsurface soil sample contained a nickel concentration (342 mg/kg) above Restricted Residential/Commercial SCOs (310 mg/kg). Therefore, nickel is not considered to be a primary

[9] Class A sediments are considered to be of low risk to aquatic life.
[10] Class B sediments are considered to be slightly to moderately contaminated.

site-related contaminant of concern. Additionally, nickel concentrations from two background soil sample locations were above the Unrestricted Use SCO, which indicates that there might be other naturally-occurring sources of elevated nickel in sediment at Smokes Creek

7.6.1.2 Surface Water Screening Results

Five surface water samples were collected from Smokes Creek and two stormwater samples were collected from outfalls leading from the site to Smokes Creek. Analytical results for these samples were compared to the NYSDEC Class C surface water standards and guidance values (6 NYCRR Part 703.5 Water Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended). The screening of detected constituents of concern in surface water/stormwater samples against standards and guidance values are presented on Tables 4-16 and 4-18, respectively.

Several inorganic constituents were detected in the surface samples from Smokes Creek; however, only aluminum was detected at concentrations slightly exceeding the Class C (Chronic) standard Total cyanide was detected in stormwater at concentrations exceeding both the Class C Aquatic (Acute) Standard and Class C Aquatic (Chronic) standard, and at SW-03 at concentrations exceeding the Aquatic (Chronic) standard. Selenium and iron were also detected above the Aquatic (Chronic) standard. No organic compounds were detected in the surface water or stormwater samples.

7.7 SUMMARY

In general, based on screening results reviewed under the Fish and Wildlife Resources Impact Analysis, both groundwater and surface water serve as potential exposure pathways to fish and wildlife near the site. However, the creek (surface water and sediment) does not appear to have been impacted by site-related contamination, based on the RI sampling results. Because the site-related impacts are primarily within the soil/fill above the native silt and clay materials, the potential exists for intermittent discharge of perched water via seeps. However, seeps have not been observed along the creek bank. Site-related impacts would more likely occur due to intermittent point source discharges from the stormwater outfalls, or from erosion and surface runoff along the southern creek bank.

8. SUMMARY AND CONCLUSIONS

8.1 SUMMARY

The RI was conducted using a phased approach to delineate the extent of site-related contamination in both on-site and off-site areas. The areas of concern and impacts associated with the environmental media are primarily based on laboratory analytical results and their comparison to the SCGs. The focus of the following summaries and conclusions are aimed at defining the nature and extent of COPC impacts within each media and area of concern (if applicable) to assess the available data for use in defining remedial action objectives, and screening remedial action alternatives for each area during the FS process. Tables 8-1A through 8-3B provide summaries by media/area for the COPCs including ranges of concentrations for each COPC and the frequency of exceedance of SCGs.

8.1.1 Site-Related COPCs

Although the ash stored in the southern incinerator building was not sampled during the RI due to structural instability, however, the results of the previous investigation indicated that the maximum detected concentrations in the ash samples exceeded the Commercial SCOs for barium (nearly twice the SCO of 400 mg/kg), copper (over 200 times the SCO of 270 mg/kg), lead (over 6 times the SCO of 1,000 mg/kg), and zinc (14.6 times the SCO of 10,000 mg/kg) (Malcolm Pirnie, 2005). The following table compares the maximum detected concentrations for those constituents with the highest level of exceedance (i.e., copper, lead, and zinc) in the ash samples, to those for soil samples in the areas of concern identified by this RI as well as during the previous investigation.

Constituent	Commercial Use SCO[a]	Ash, Southern Incinerator (2005)	On-site Soil (2005 and RI)	Baker Hall Property (RI)	Smokes Creek Corridor (RI)
Copper	270	**56,400**	**1,510**	**1,010**	**8,210**
Lead	1,000	**23,600**	**6,820**	**2,030**	**8,210**
Zinc	10,000	**146,000**	2,300	–	2,830

(a) 6 NYCRR Part 375 Environmental Remediation Programs

NOTE: – = Concentration did not exceed Commercial Use SCOs.
Concentrations in mg/kg. Concentration is the maximum detected.
Inorganic constituents analyzed by EPA Method 6000/7000 series.
Table includes the metals that were detected in ash samples, collected during the Site Investigation (Malcolm Pirnie 2005), at concentrations greater than twice the Commercial SCO.
Bolded values indicate exceedance of SCOs.

Although arsenic was not detected above the Commercial SCO in the ash samples collected from the southern incinerator building, elevated concentrations of arsenic were detected in the ramp and are considered site-related. In general, the most elevated inorganic concentrations were observed on-site in the ramp area, where the ash/fill materials are also thickest, and in the northern portion of the On-site Area.

8.1.2 Soil

Based on the results of the surface and subsurface soil investigation which included the On-site Area, the adjoining Stadium Property to the west, Smokes Creek Corridor to the north, and the Baker Hall Property to the east, the areal extent of soil contamination in excess of Restricted Residential SCOs was fully delineated. Soil contaminated with elevated concentrations of inorganic constituents extends from the primary On-site Area sources—the ramp and the fill material located north of the northern incinerator—to the east throughout the northern portion of the Baker Hall Property and, primarily, to the east along the recreational path within the Smokes Creek Corridor. There is no evidence of significant site-related contamination in the Stadium Property, located to the east of the incinerator site. Soil contamination is generally associated with ash/fill material that appears to have been reworked and/or transported via anthropogenic means. The native silts/clays underlying the fill material do not show evidence of contamination.

8.1.3 Groundwater

Elevated concentrations of arsenic and lead detected in the monitoring well located along the downgradient On-site Area boundary, north of the ramp may indicate that a limited amount of leaching of inorganic compounds is occurring from the On-site Area contaminated soil.

8.1.4 Surface Water and Sediment

Surface water and sediment samples collected within the Smokes Creek channel do not appear to be contaminated. No concentrations of site-related COPCs exceeded sediment guidance values.

8.1.5 Stormwater Outfalls

Two site-related constituents (cyanide and selenium) were detected at concentrations that slightly exceeded Class C surface water standards in stormwater samples collected from the two outfalls located north of the incinerator site. These outfall pipes, which appear to be connected to the stormwater drainage system, may provide a conduit for transport of impacted soil from the On-site Area to the floodplain above Smokes Creek.

8.1.6 Soil Vapor/Indoor Air

Low-level detections of various VOCs were observed in the indoor air and/or sub-slab soil vapor samples; however, based on the levels of VOCs detected, no action was required beyond taking steps to identify and reduce potential indoor air sources of VOCs.

8.2 CONCLUSIONS

The RI determined the extent of metals contamination in the areas of concern as a result of direct deposition (airborne as a result of waste incineration), as well as anthropogenic processes (i.e., on-site ash storage in the basement of the southern incinerator building, placement of ash in the ramp, off-site transport of ash to a landfill, and reworking of fill material containing ash or other incinerated material). The impacted areas of concern identified by the RI are listed in the following table.

Area of Concern	Soil Cleanup Objective	Estimated Volume of Contaminated Material	
		Cubic Yards	**Tons[a]**
On-Site Area	Commercial	19,000 – 23,000	30,400 – 36,800
Baker Hall Property[b]	Restricted Residential	6,000	9,600
Smokes Creek Corridor	Restricted Residential	4,200-5,000	6,720-8,000
	Protection of Ecological Receptors	5,500-7,000	9,280-11,200

(c) Estimates assume that 1 yd^3 of material is approximately equal to 1.6 tons.
(d) Refined estimate based on the supplemental delineation activities conducted on the Baker Hall property.

Based on the RI results, the Stadium Property is not considered an impacted area of concern.

8.3 CONCEPTUAL SITE MODEL

Contamination associated with the operation of the two municipal waste incinerators include the remaining incinerator buildings, on-site ash fill material, as well as ash fill material along the southern side of Smokes Creek and extending to the east onto the adjacent Baker Hall Property. The on-site soil contamination appears to be related to the integration of ash in the ramp and transport of ash from the incinerator buildings. Due to historical site use, runoff, and erosion, the ash has been reworked and distributed to off-site areas, resulting in site-related contamination to the north and east along the southern bank of Smokes Creek and the paved recreational path, and to the east in the northern portion of the Baker Hall Property.

The primary COPC is lead and the primary medium of concern is soil. Of secondary concern in soil are other site-related metals (i.e., arsenic, chromium, copper, nickel, and zinc), which occur in association with lead. The presence of contaminated soil/fill allows for ongoing distribution of contaminants through anthropogenic reworking and erosion of soil/fill, particularly in unpaved areas. Limited impacts to groundwater and surface water have also been identified, due to leaching of water through contaminated soil. Surface water quality of Smokes Creek could potentially be affected directly by runoff or stormwater discharge, and/or indirectly via groundwater discharge. No public water supply wells are present in the area. Municipal water is provided by the Erie County Water Authority, which is obtained from Lake Erie and the Niagara River.

Based on the qualitative human health exposure assessment, a complete exposure pathway exists for contaminated soil/fill in the On-site Area and at the Baker Hall Property, via dermal contact or incidental ingestion by on-site workers or trespassers. Based on the fish and wildlife resources impact analysis, a complete exposure pathway also exists for contaminated soil/fill or surface water at the on-site area and at the Baker Hall Property, via direct/dermal contact by ecological receptors.

8.4 DATA GAP EVALUATION

Potential data gaps to be considered for any future remedial site work that may be performed include:

- Delineating the extent of metals in exceedance of the Protection of Ecological Resources, in the Smokes Creek Corridor, specifically in floodplain soils/unsubmerged sediments

- Further assessing the on-site stormwater system and confirming the connection to the outfalls north of the site

- Further characterizing the ash stored in the southern incinerator building, and the area around this condemned structure following its demolition.

8.5 NEXT STEPS

Upon completion of an RI, it is appropriate to proceed with a FS for the site to evaluate potential remedial technologies and alternatives that would be effective at achieving the remedial action objectives that are to be pursued. The FS Report will include a:

- Summary of site background and RI results sufficient to justify the findings of the FS

- Detailed comparative analysis of remedial alternatives

- Recommendation of a preferred remedial alternative that is protective of public health and the environment

- Conceptual plan for implementing the preferred remedial alternative

- Conceptual design of the preferred remedial alternative, which includes a detailed engineer's cost estimate.

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FIGURES

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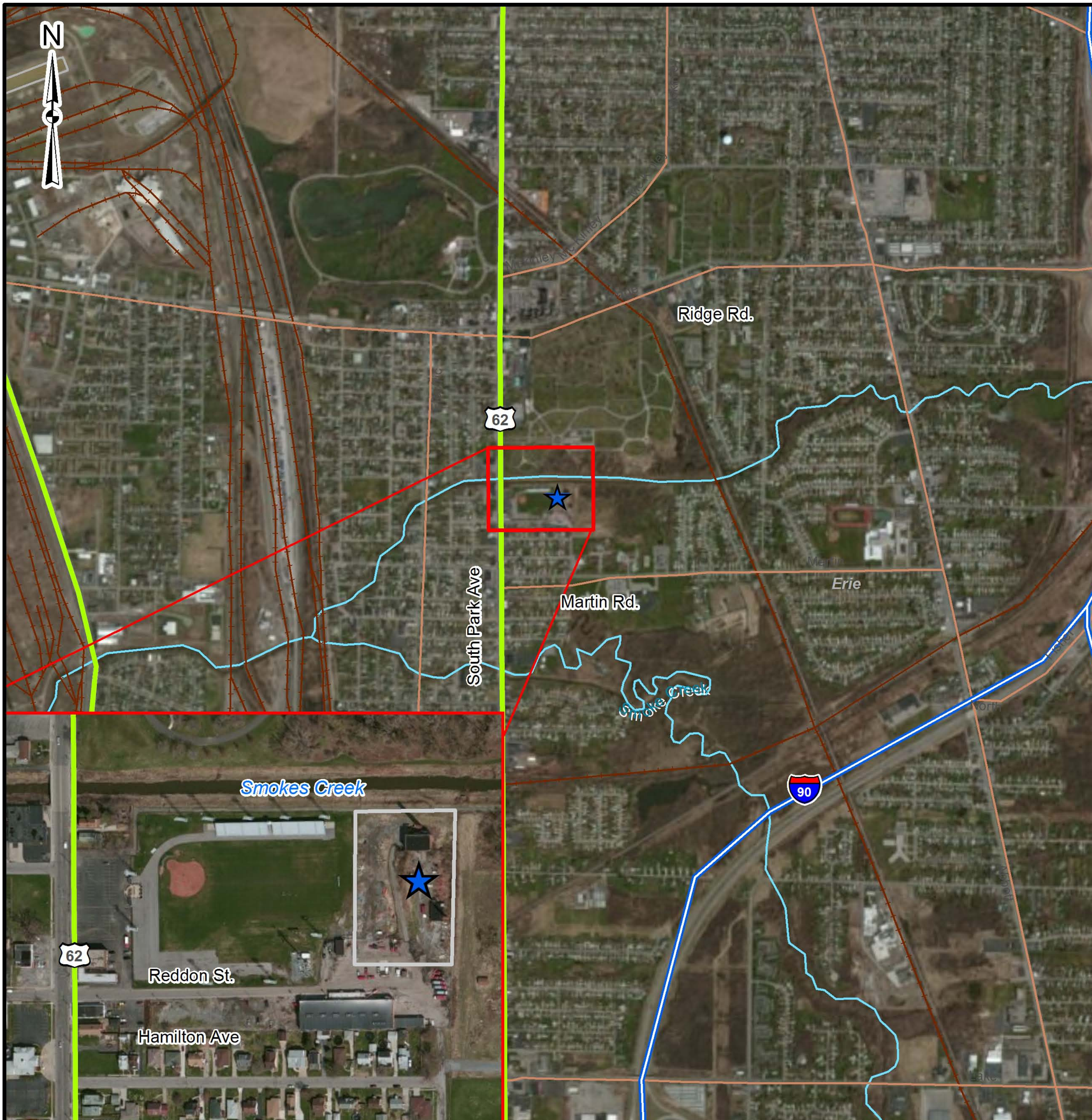

Legend

Lackawanna Incinerator sITE

On-Site Area

Miles
0 0.25 0.5 1
1 in = 0.5 miles

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 1-1
Site Location

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	CJS	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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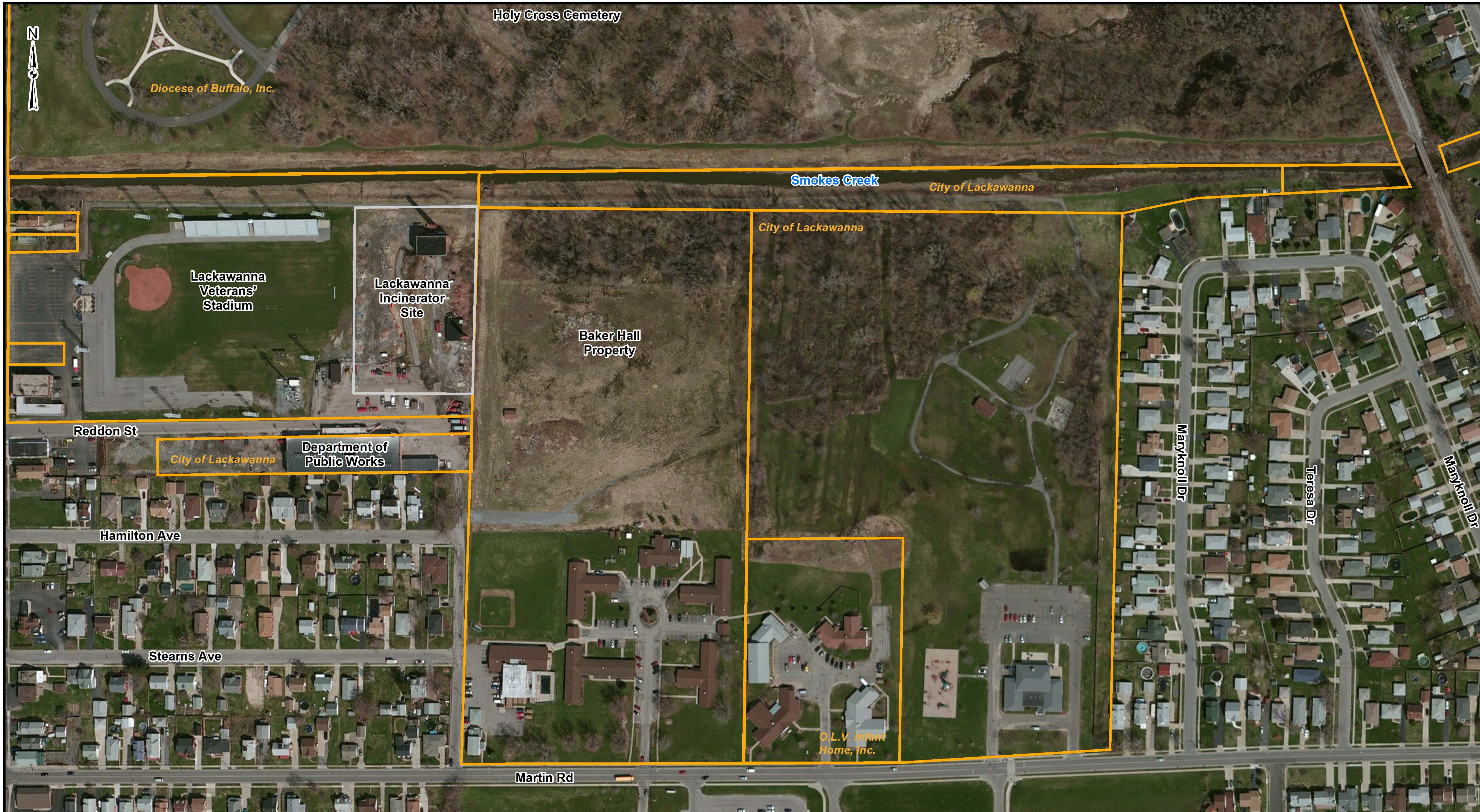

Legend

- Tax Parcels
- On-Site Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 1-2
Remedial Investigation
Study Area

Feet: 0, 100, 200, 400
1 inch = 200 feet

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	HAW	FD	AS SHOWN	OCTOBER 2014	14907.10	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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Legend

Tax Parcels
On-Site Area

2005 Site Investigation Locations

Historical Monitoring Well
Historical Soil Boring

Feet
0 50 100 200

1 in = 100 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 1-3
2005 Site Investigation Sampling Locations

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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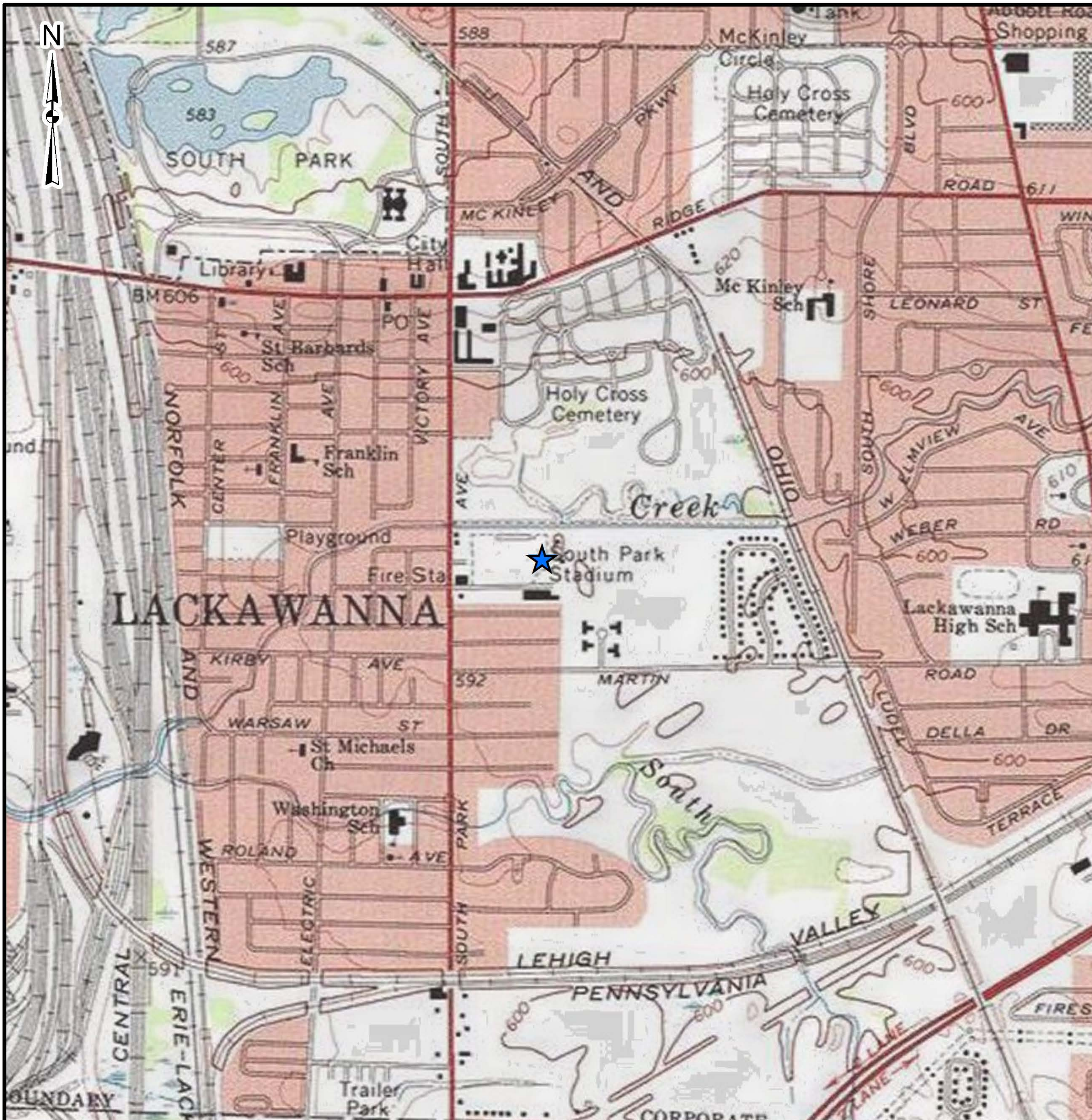

Legend

★ Lackawanna Incinerator Site

Feet

0 625 1,250 2,500

1 in = 1,250 ft

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Copyright:© 2013 Esri
Sources: Esri, USGS, NOAA

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 1-4
Topography

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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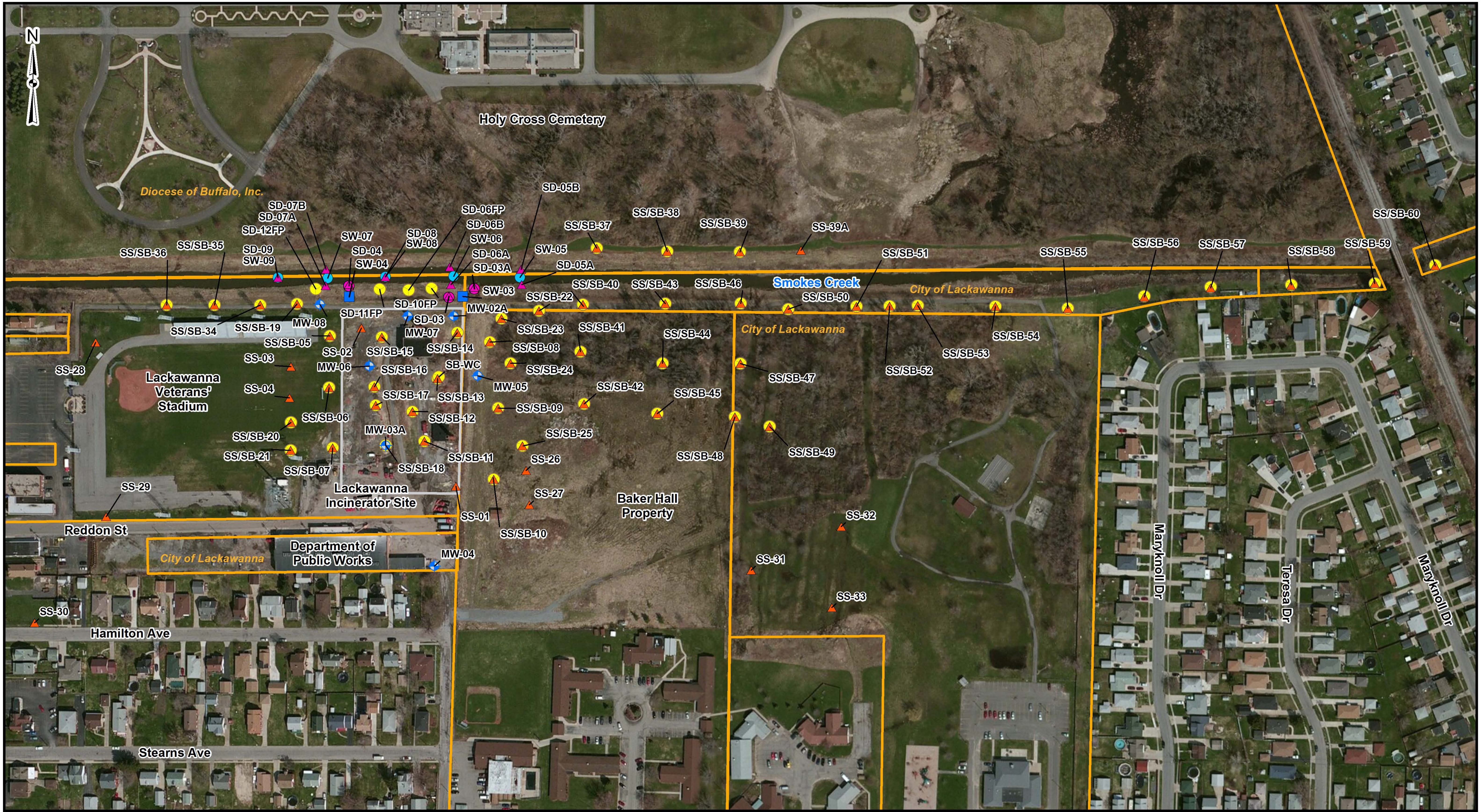

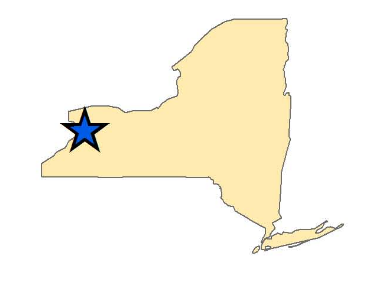

Legend

Storm Water	Surface Soil	Tax Parcels
Outfall Surface Soil	Surface Water	On-Site Area
Monitoring Well	Soil Boring	
Sediment		

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 2-1
Remedial Investigation
Sampling Locations

Feet
0 100 200 400
1 inch = 200 feet

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	HAW	FD	AS SHOWN	OCTOBER 2014	14907.10	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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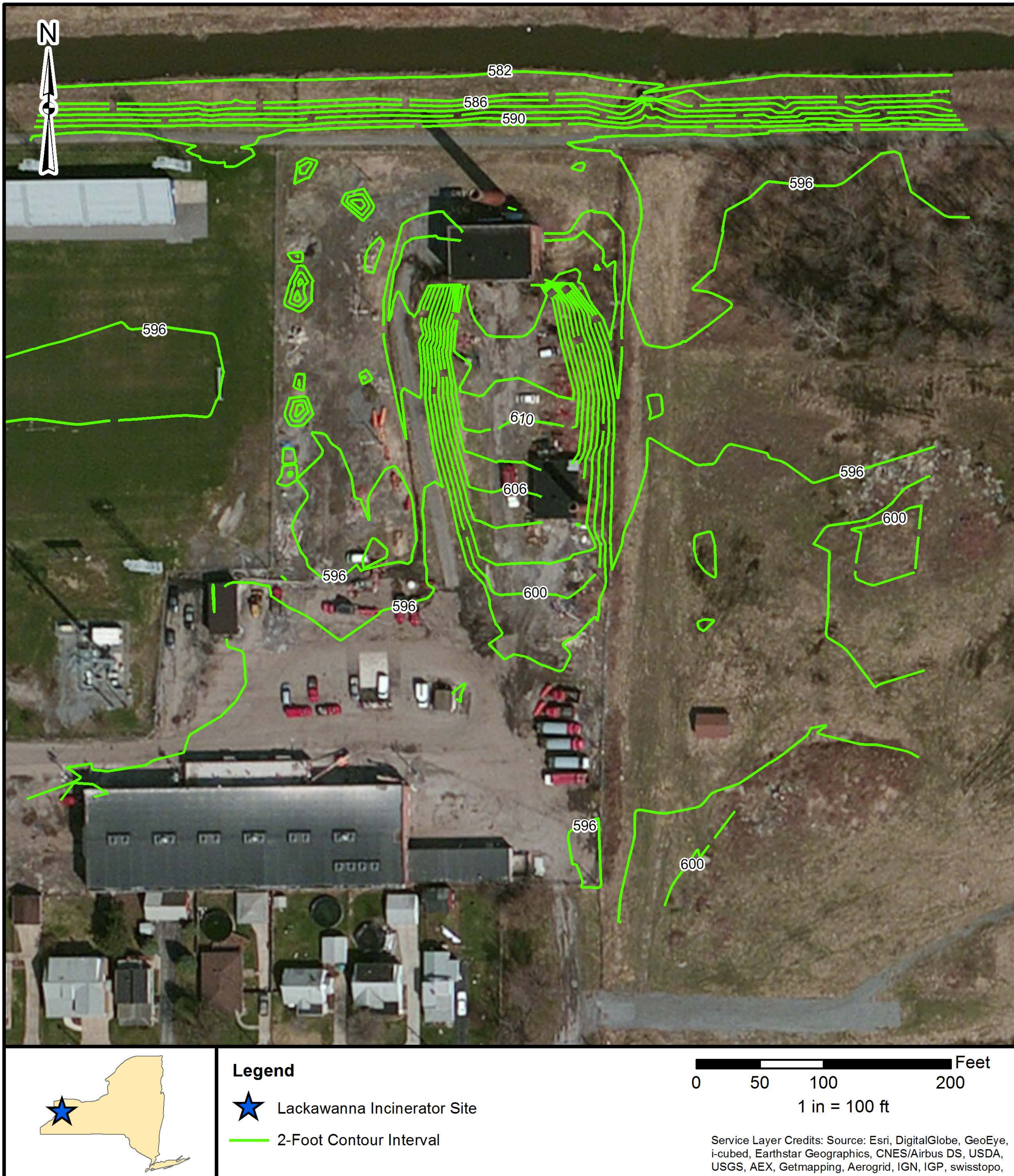
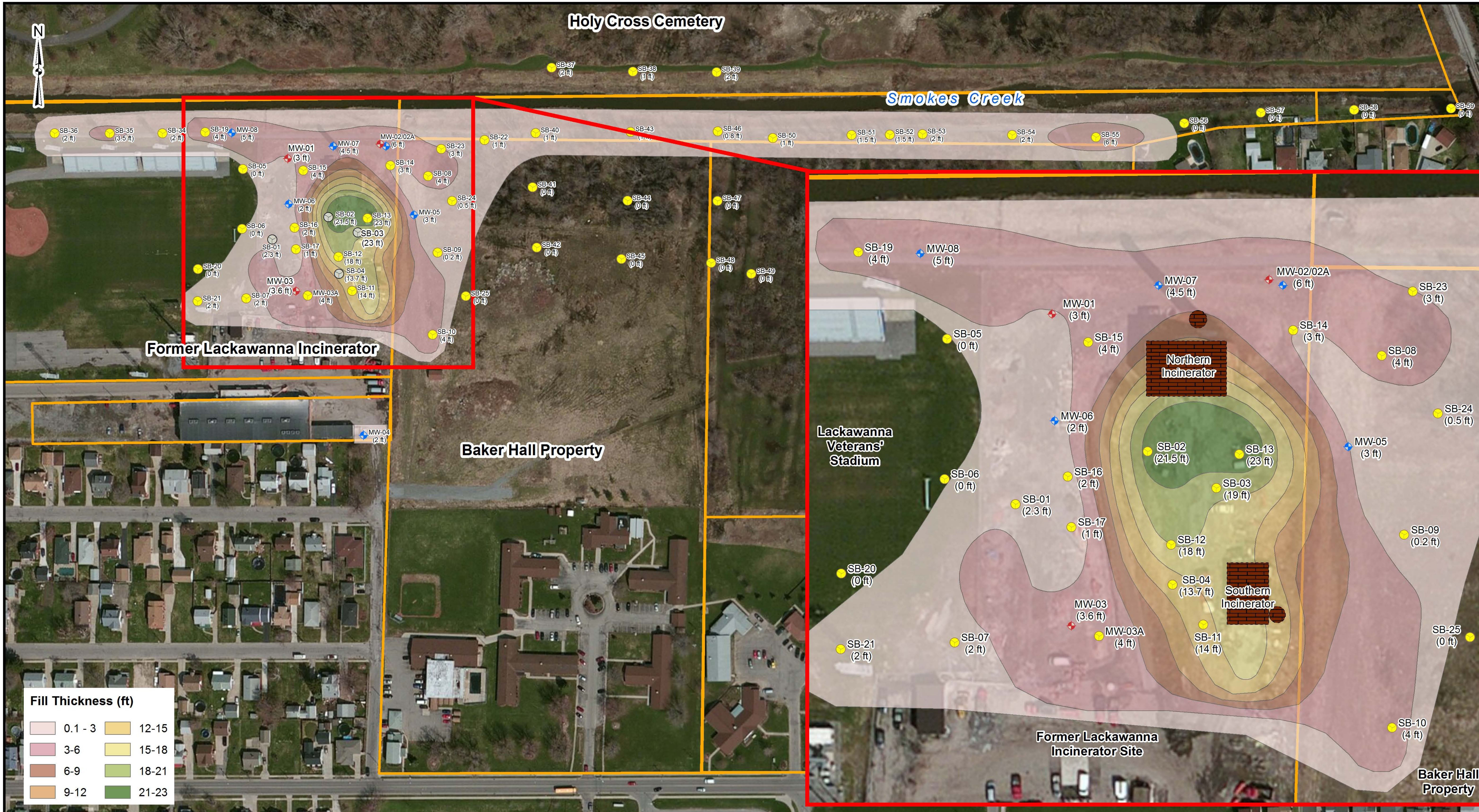


LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 3-1
Surveyed Site Topography

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI



Legend

- Tax Parcels
- Historical Monitoring Well (2005)
- Historical Soil Boring (2005)
- Monitoring Well
- Soil Borings

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 3-2
Interpreted Fill Thickness /
Depth to Native Soil

Feet
0 87.5 175 350
1 inch = 175 feet

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	HAW	FD	AS SHOWN	OCTOBER 2014	14907.10	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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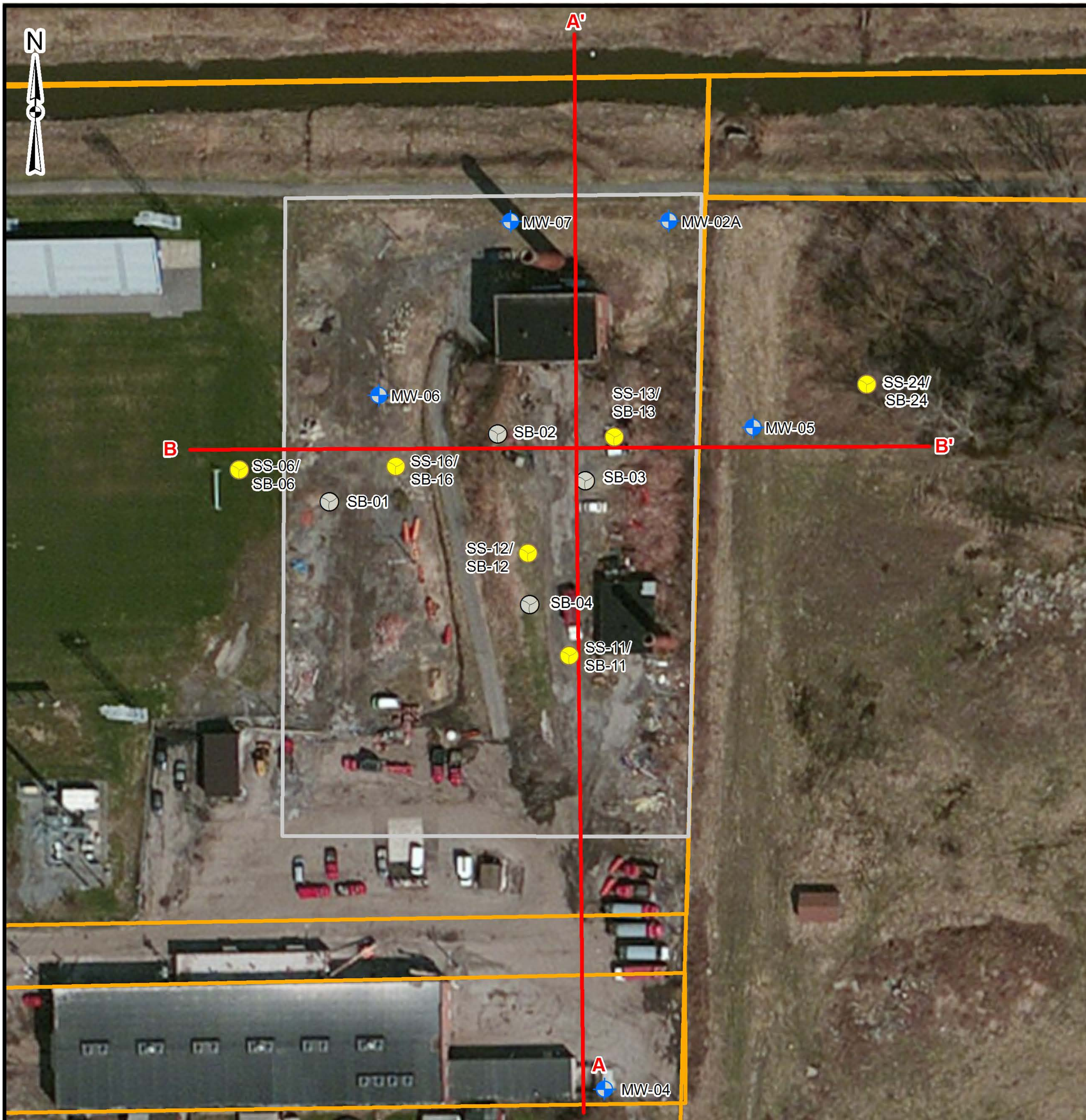

Legend

- Tax Parcels
- Historical Soil Boring (2005)
- Monitoring Well
- Surface Soil/Soil Boring
- On-Site Area

Note: Only the soil borings and well locations included in the cross sections are shown on this figure.

0 60 120 240 Feet

1 in = 120 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 3-3
Cross Section Locations

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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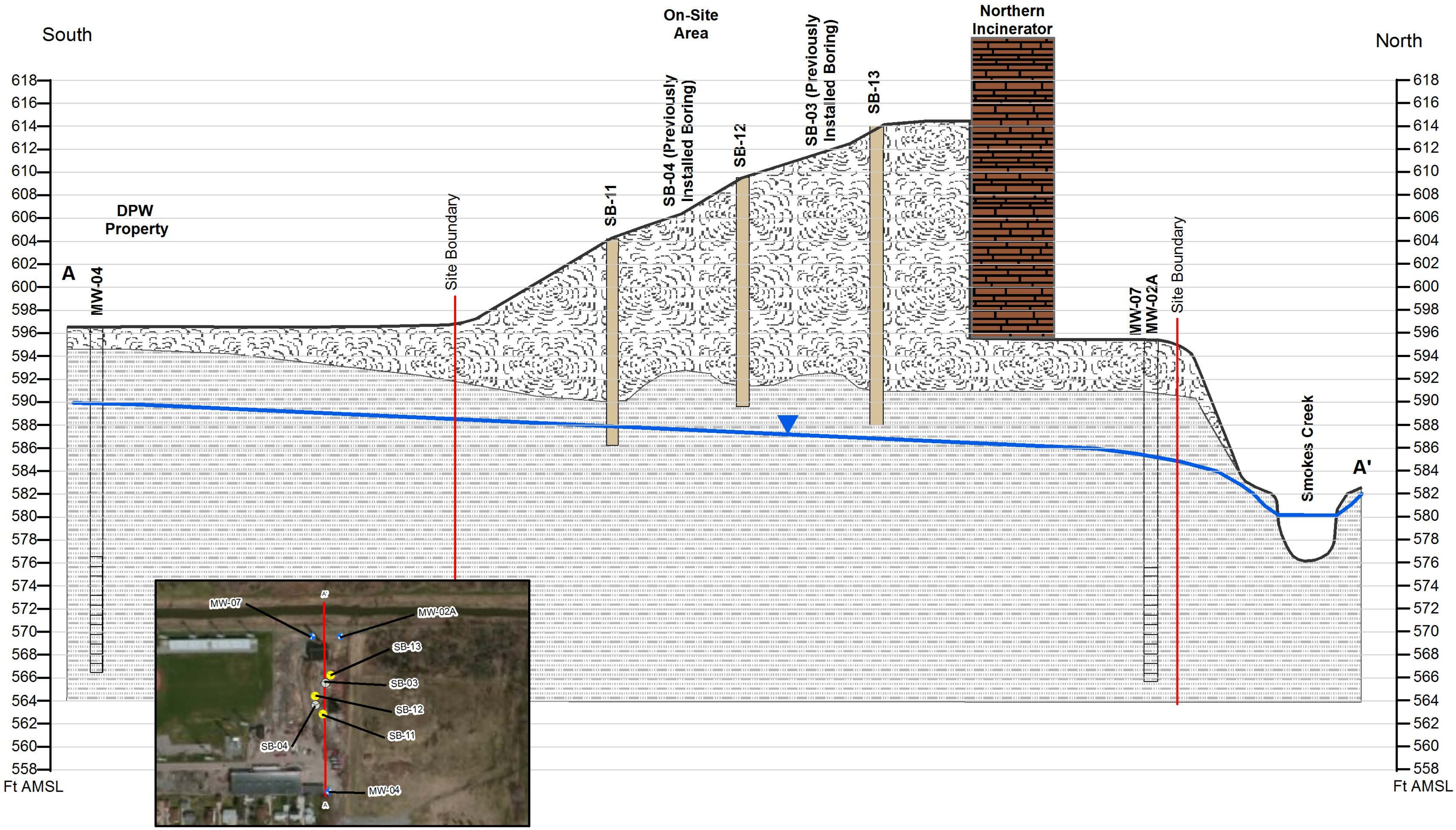

Legend

Boring	
Monitoring Well	
Well Screen	

Geology

- Fill
- Glaciolacustrine Silt and Clay

Hydrogeology

- Groundwater Elevation April 2013

Note: Scale bar represents scale for the cross section.

Feet: 0, 37.5, 75, 150

1 in = 75 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 3-4
Cross Section A-A'

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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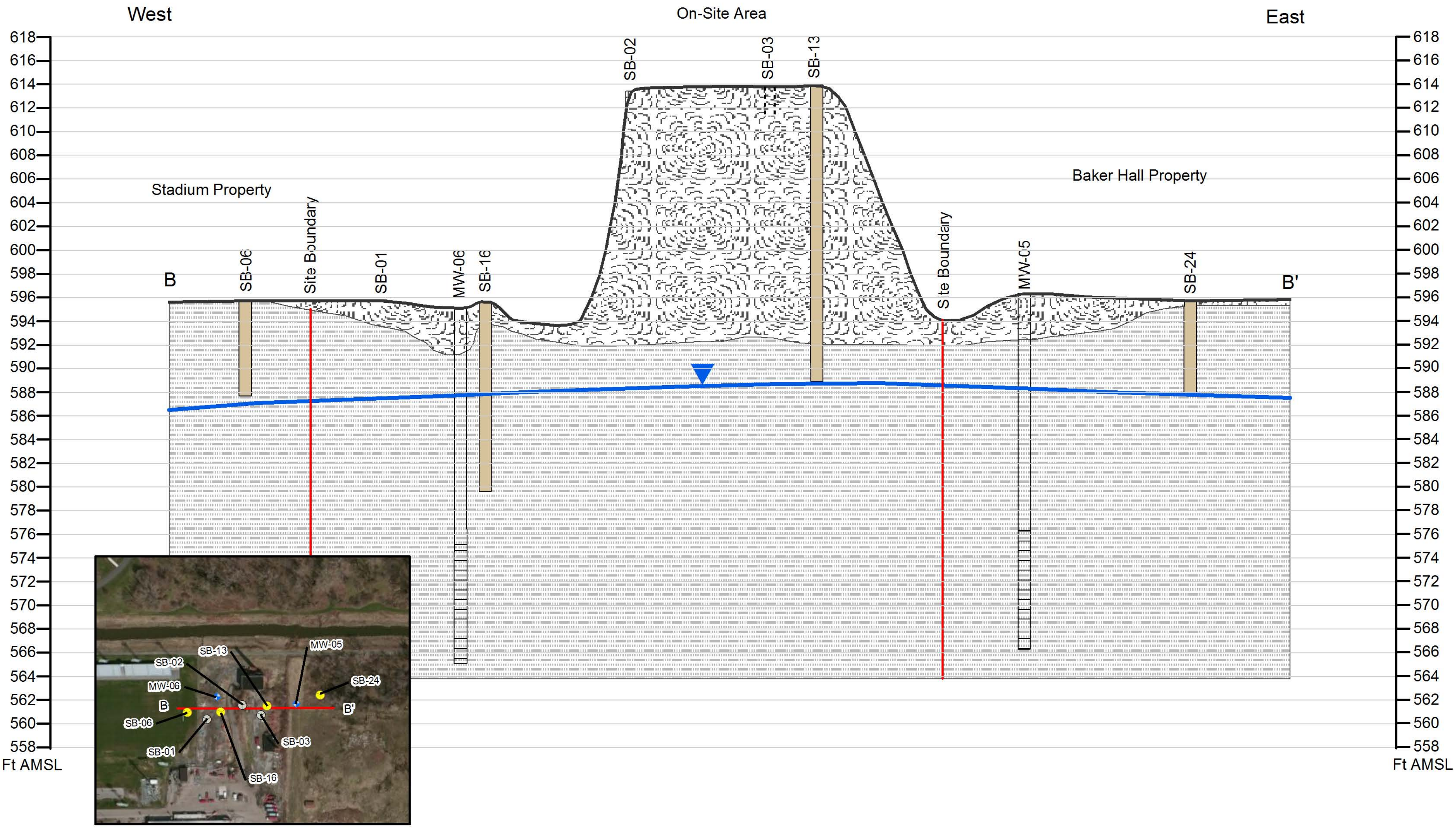


Legend

- Boring
- Well
- Screen

Geology

- Fill
- Glaciolacustrine Silt and Clay

Hydrogeology

- Groundwater Elevation April 2013

Note: Scale bar represents scale for the cross section.

Feet

0 30 60 120

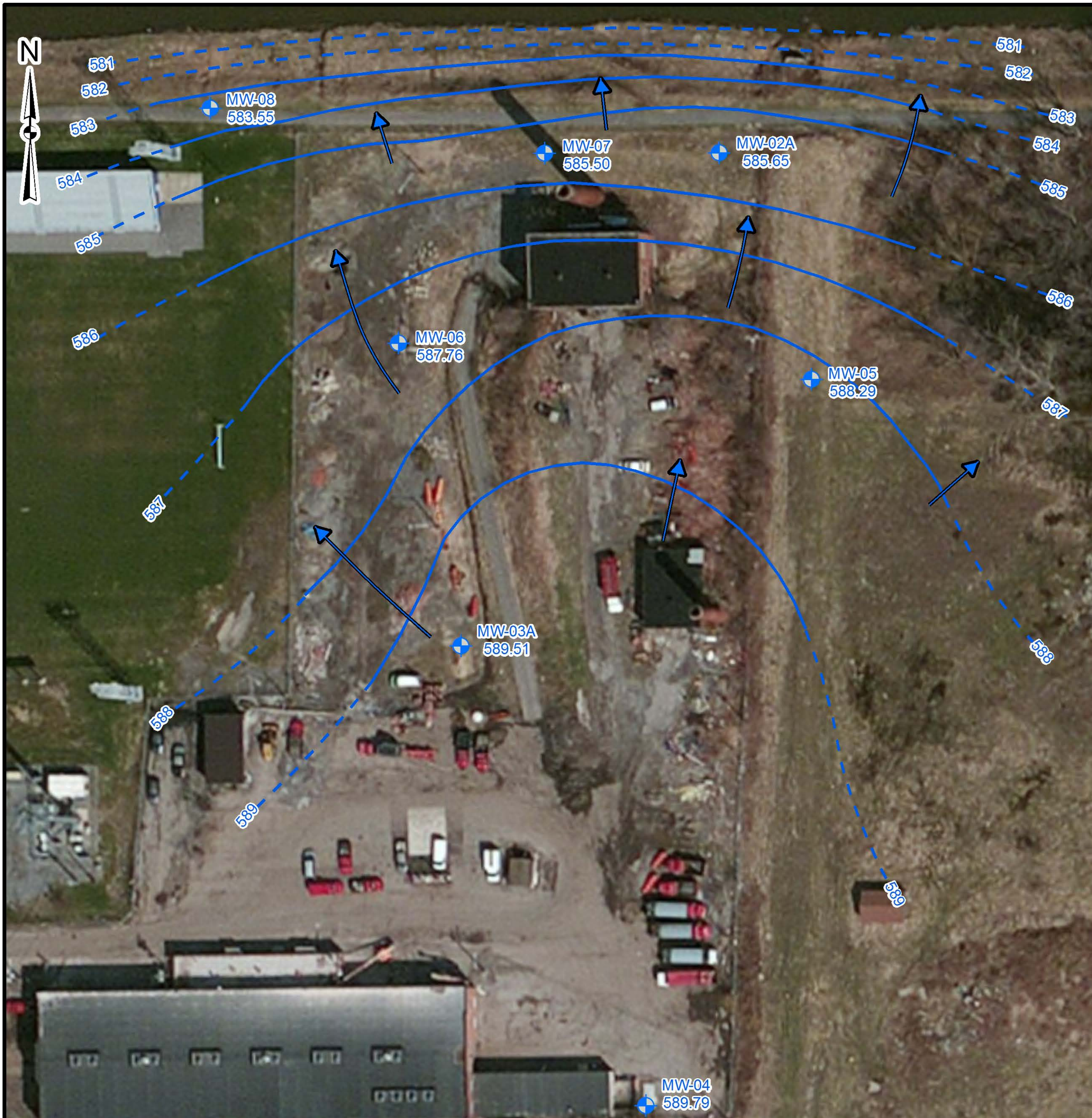
1 in = 60 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN,

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 3-5
Cross Section B-B'

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI



Legend

- Monitoring Well
- 1-Foot Groundwater Contour
- 1-Foot Inferred Groundwater Contour
- Groundwater Flow Direction

MW-03A 588.61 Groundwater Elevation in ft. AMSL (feet above mean sea level)

0 40 80 160 Feet

1 in = 80 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA,

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 3-6
Groundwater Contours
April 16, 2013

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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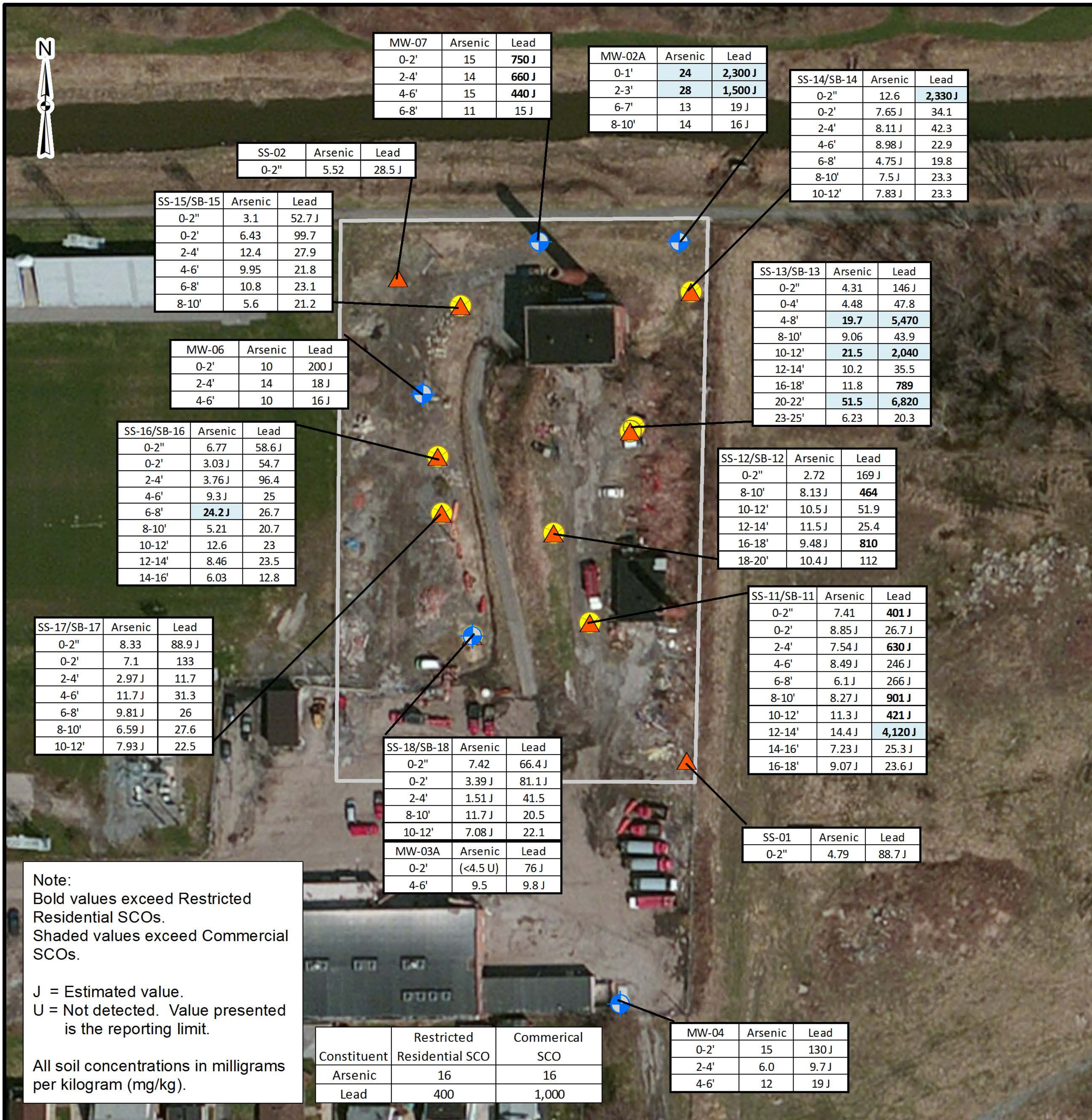

MW-07	Arsenic	Lead
0-2'	15	**750 J**
2-4'	14	**660 J**
4-6'	15	**440 J**
6-8'	11	15 J

MW-02A	Arsenic	Lead
0-1'	**24**	**2,300 J**
2-3'	**28**	**1,500 J**
6-7'	13	19 J
8-10'	14	16 J

SS-14/SB-14	Arsenic	Lead
0-2"	12.6	**2,330 J**
0-2'	7.65 J	34.1
2-4'	8.11 J	42.3
4-6'	8.98 J	22.9
6-8'	4.75 J	19.8
8-10'	7.5 J	23.3
10-12'	7.83 J	23.3

SS-02	Arsenic	Lead
0-2"	5.52	28.5 J

SS-15/SB-15	Arsenic	Lead
0-2"	3.1	52.7 J
0-2'	6.43	99.7
2-4'	12.4	27.9
4-6'	9.95	21.8
6-8'	10.8	23.1
8-10'	5.6	21.2

SS-13/SB-13	Arsenic	Lead
0-2"	4.31	146 J
0-4'	4.48	47.8
4-8'	**19.7**	**5,470**
8-10'	9.06	43.9
10-12'	**21.5**	**2,040**
12-14'	10.2	35.5
16-18'	11.8	**789**
20-22'	**51.5**	**6,820**
23-25'	6.23	20.3

MW-06	Arsenic	Lead
0-2'	10	200 J
2-4'	14	18 J
4-6'	10	16 J

SS-16/SB-16	Arsenic	Lead
0-2"	6.77	58.6 J
0-2'	3.03 J	54.7
2-4'	3.76 J	96.4
4-6'	9.3 J	25
6-8'	**24.2 J**	26.7
8-10'	5.21	20.7
10-12'	12.6	23
12-14'	8.46	23.5
14-16'	6.03	12.8

SS-12/SB-12	Arsenic	Lead
0-2"	2.72	169 J
8-10'	8.13 J	**464**
10-12'	10.5 J	51.9
12-14'	11.5 J	25.4
16-18'	9.48 J	**810**
18-20'	10.4 J	112

SS-17/SB-17	Arsenic	Lead
0-2"	8.33	88.9 J
0-2'	7.1	133
2-4'	2.97 J	11.7
4-6'	11.7 J	31.3
6-8'	9.81 J	26
8-10'	6.59 J	27.6
10-12'	7.93 J	22.5

SS-11/SB-11	Arsenic	Lead
0-2"	7.41	**401 J**
0-2'	8.85 J	26.7 J
2-4'	7.54 J	**630 J**
4-6'	8.49 J	246 J
6-8'	6.1 J	266 J
8-10'	8.27 J	**901 J**
10-12'	11.3 J	**421 J**
12-14'	14.4 J	**4,120 J**
14-16'	7.23 J	25.3 J
16-18'	9.07 J	23.6 J

SS-18/SB-18	Arsenic	Lead
0-2"	7.42	66.4 J
0-2'	3.39 J	81.1 J
2-4'	1.51 J	41.5
8-10'	11.7 J	20.5
10-12'	7.08 J	22.1

MW-03A	Arsenic	Lead
0-2'	(<4.5 U)	76 J
4-6'	9.5	9.8 J

SS-01	Arsenic	Lead
0-2"	4.79	88.7 J

MW-04	Arsenic	Lead
0-2'	15	130 J
2-4'	6.0	9.7 J
4-6'	12	19 J

Note:
Bold values exceed Restricted Residential SCOs.
Shaded values exceed Commercial SCOs.

J = Estimated value.
U = Not detected. Value presented is the reporting limit.

All soil concentrations in milligrams per kilogram (mg/kg).

Constituent	Restricted Residential SCO	Commerical SCO
Arsenic	16	16
Lead	400	1,000

Legend

- Monitoring Well
- On-Site Area
- Surface Soil
- Soil Boring

0 50 100 200 Feet
1 in = 100 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 4-1
Arsenic and Lead Soil Results
On-Site Area

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	HAW	HAW	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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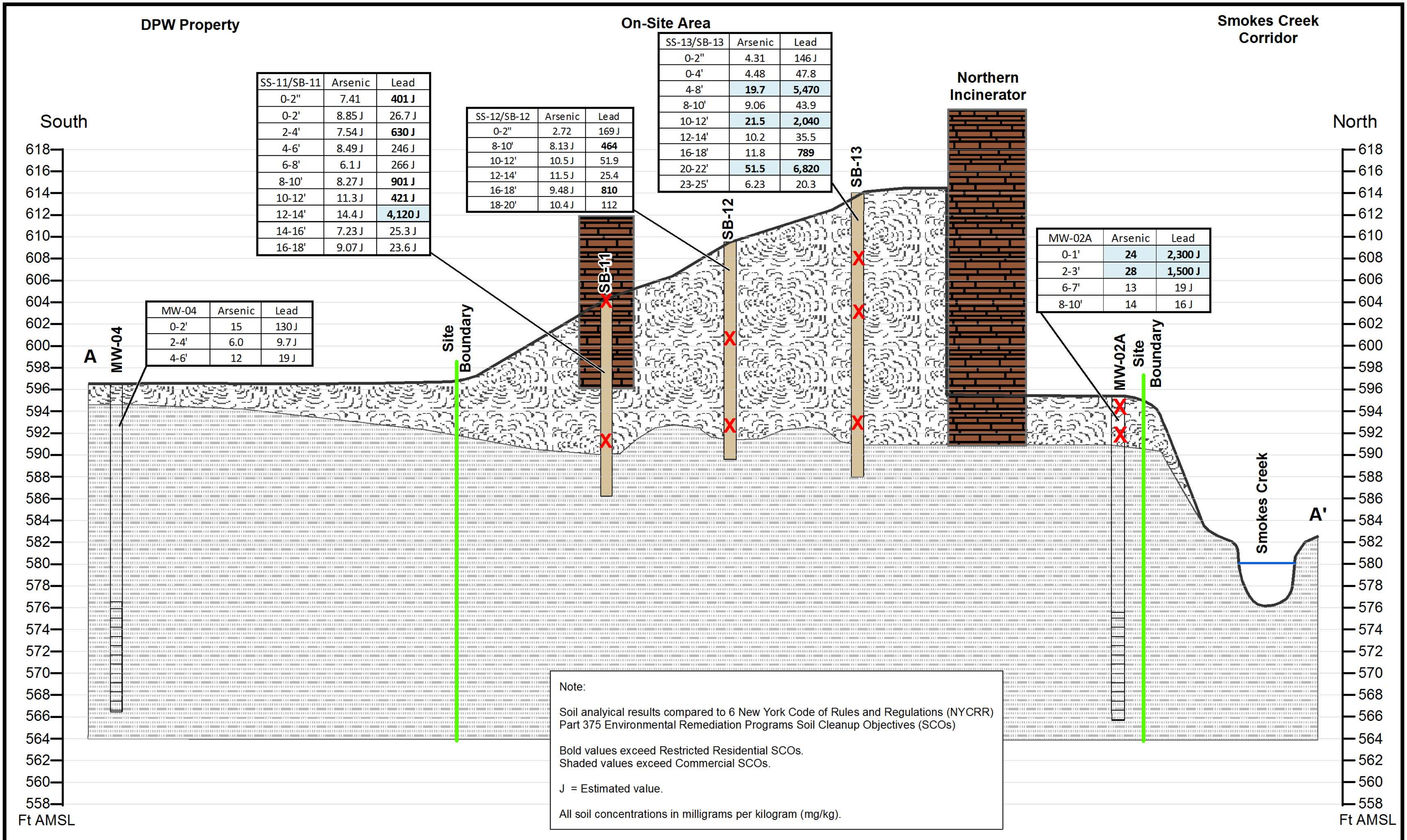

SS-11/SB-11	Arsenic	Lead
0-2"	7.41	**401 J**
0-2'	8.85 J	26.7 J
2-4'	7.54 J	**630 J**
4-6'	8.49 J	246 J
6-8'	6.1 J	266 J
8-10'	8.27 J	**901 J**
10-12'	11.3 J	**421 J**
12-14'	14.4 J	**4,120 J**
14-16'	7.23 J	25.3 J
16-18'	9.07 J	23.6 J

SS-12/SB-12	Arsenic	Lead
0-2"	2.72	169 J
8-10'	8.13 J	**464**
10-12'	10.5 J	51.9
12-14'	11.5 J	25.4
16-18'	9.48 J	**810**
18-20'	10.4 J	112

SS-13/SB-13	Arsenic	Lead
0-2"	4.31	146 J
0-4'	4.48	47.8
4-8'	**19.7**	**5,470**
8-10'	9.06	43.9
10-12'	**21.5**	**2,040**
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20-22'	**51.5**	**6,820**
23-25'	6.23	20.3

MW-04	Arsenic	Lead
0-2'	15	130 J
2-4'	6.0	9.7 J
4-6'	12	19 J

MW-02A	Arsenic	Lead
0-1'	**24**	**2,300 J**
2-3'	**28**	**1,500 J**
6-7'	13	19 J
8-10'	14	16 J

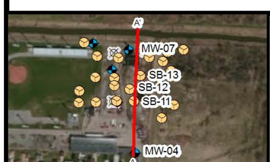
Note:

Soil analyical results compared to 6 New York Code of Rules and Regulations (NYCRR) Part 375 Environmental Remediation Programs Soil Cleanup Objectives (SCOs)

Bold values exceed Restricted Residential SCOs.
Shaded values exceed Commercial SCOs.

J = Estimated value.

All soil concentrations in milligrams per kilogram (mg/kg).



Borings

- Boring
- Monitoring Well
- Well Screen

Geology

- Fill
- Glaciolacustrine Silt and Clay

X Sample interval with criteria exceeding SCO

Constituent	Restricted Residential SCO	Commerical SCO
Arsenic	16	16
Lead	400	1,000

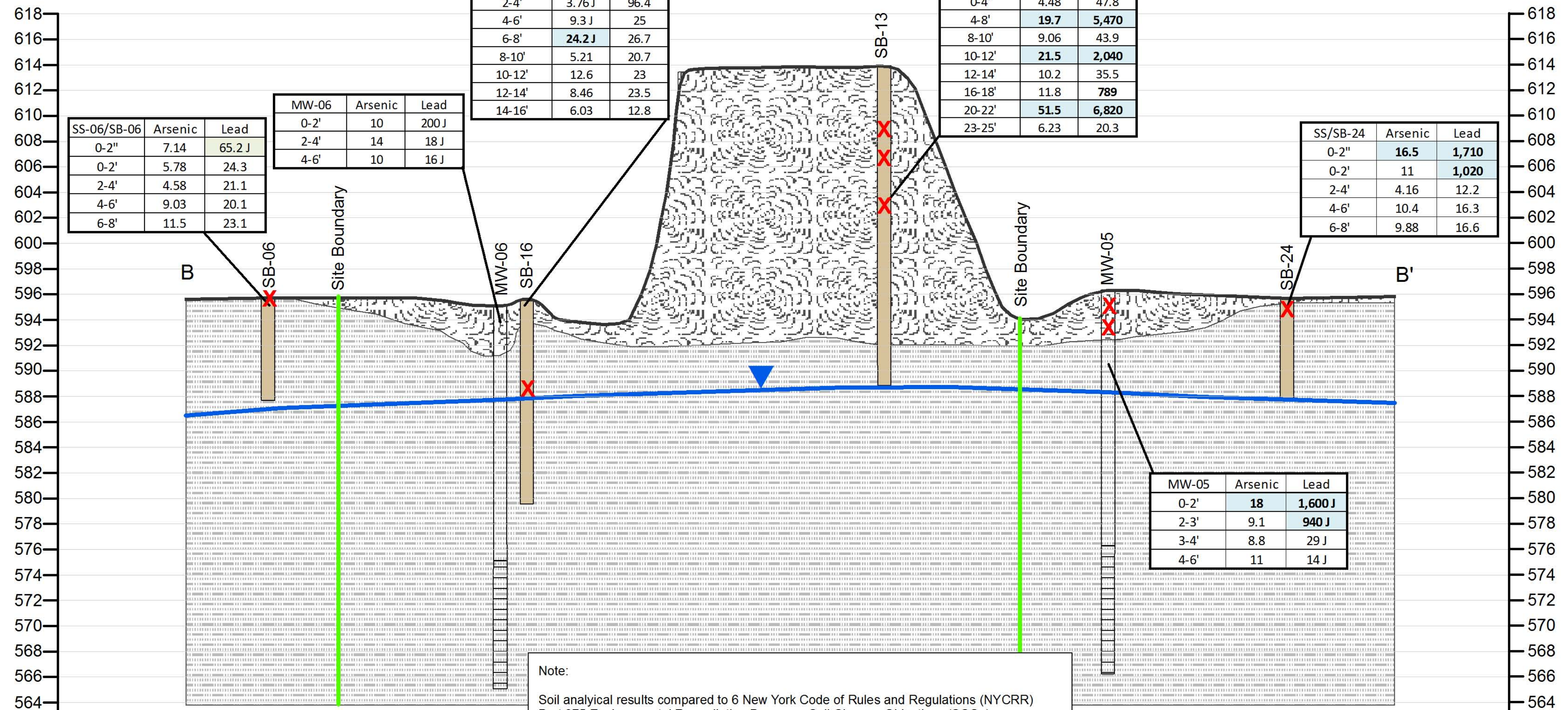
Location	Analyte
Sample Interval (ft. bgs)	Result (mg/kg)

Feet
0 37.5 75 150
1 inch = 75 feet

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 4-2A
Cross Section A-A'
Soil Results

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI



SS-06/SB-06	Arsenic	Lead
0-2"	7.14	65.2 J
0-2'	5.78	24.3
2-4'	4.58	21.1
4-6'	9.03	20.1
6-8'	11.5	23.1

MW-06	Arsenic	Lead
0-2'	10	200 J
2-4'	14	18 J
4-6'	10	16 J

SS-16/SB-16	Arsenic	Lead
0-2"	6.77	58.6 J
0-2'	3.03 J	54.7
2-4'	3.76 J	96.4
4-6'	9.3 J	25
6-8'	**24.2 J**	26.7
8-10'	5.21	20.7
10-12'	12.6	23
12-14'	8.46	23.5
14-16'	6.03	12.8

SS-13/SB-13	Arsenic	Lead
0-2"	4.31	146 J
0-4'	4.48	47.8
4-8'	**19.7**	**5,470**
8-10'	9.06	43.9
10-12'	**21.5**	**2,040**
12-14'	10.2	35.5
16-18'	11.8	**789**
20-22'	**51.5**	**6,820**
23-25'	6.23	20.3

SS/SB-24	Arsenic	Lead
0-2"	**16.5**	**1,710**
0-2'	11	**1,020**
2-4'	4.16	12.2
4-6'	10.4	16.3
6-8'	9.88	16.6

MW-05	Arsenic	Lead
0-2'	**18**	**1,600 J**
2-3'	9.1	**940 J**
3-4'	8.8	29 J
4-6'	11	14 J

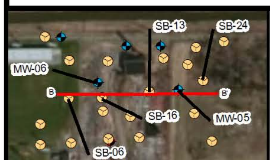
Note:

Soil analyical results compared to 6 New York Code of Rules and Regulations (NYCRR) Part 375 Environmental Remediation Programs Soil Cleanup Objectives (SCOs)

Bold values exceed Restricted Residential SCOs.
Values shaded in blue exceed Commercial SCOs (on-site)
Values shaded in green exceed Unrestricted Use SCOs (Stadium and Baker Hall properties).

J = Estimated value.

All soil concentrations in milligrams per kilogram (mg/kg).



Borings

Boring
Well
Screen

Geology

Fill
Glaciolacustrine Silt and Clay

Groundwater Elevation April 2013
X Sample interval with criteria exceeding SCO

Constituent	Restricted Residential SCO	Commerical SCO	Unrestricted Use SCO
Arsenic	16	16	13
Lead	400	1,000	63

Location	Analyte
Sample Interval (ft. bgs)	Result (mg/kg)

Feet
0 30 60 120
1 in = 60 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,

LACKAWANNA INCINERATOR SITE (NO. 915206)
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FIGURE 4-2B
Cross Section B-B'
Soil Results

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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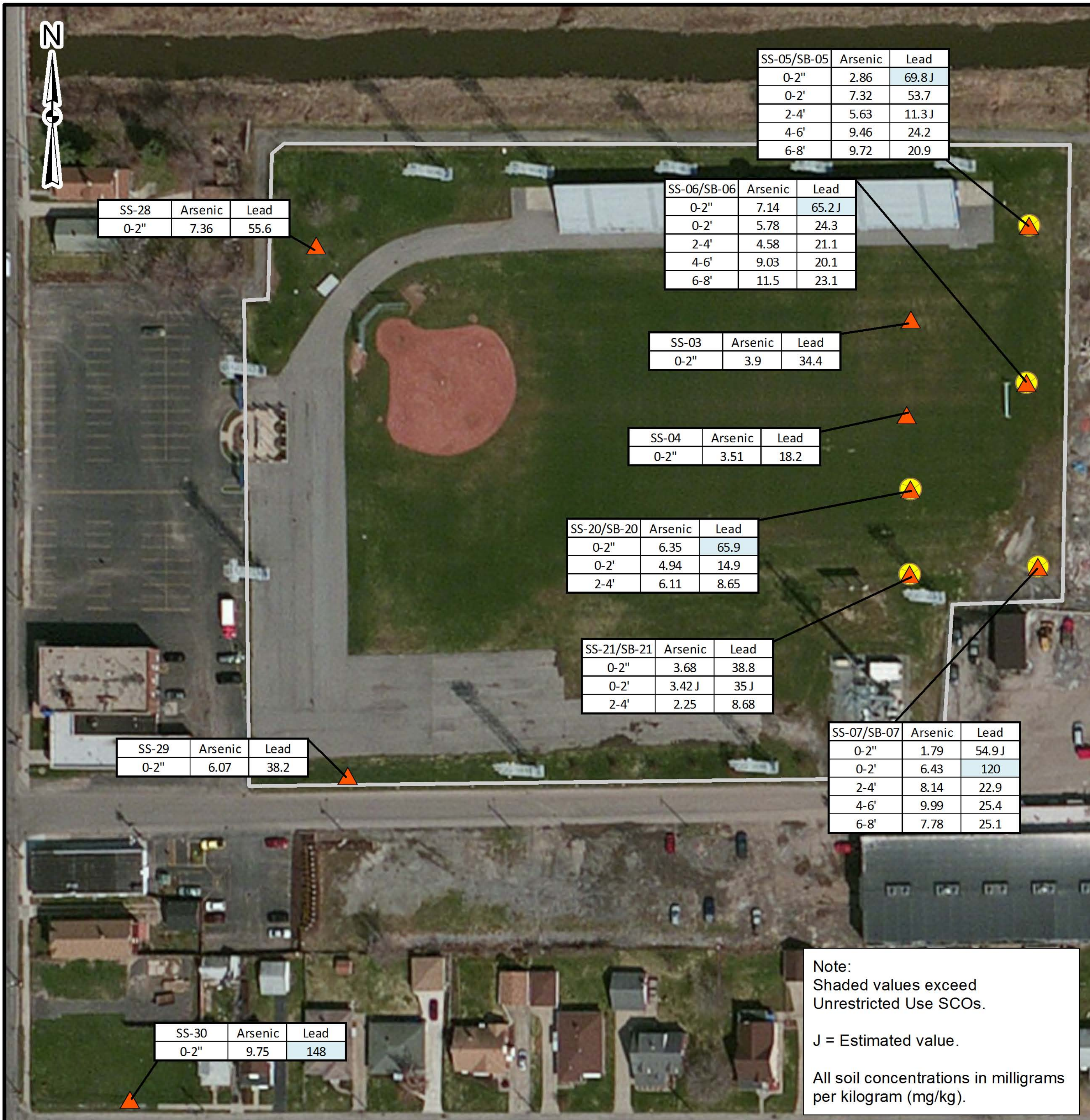

SS-05/SB-05	Arsenic	Lead
0-2"	2.86	69.8 J
0-2'	7.32	53.7
2-4'	5.63	11.3 J
4-6'	9.46	24.2
6-8'	9.72	20.9

SS-28	Arsenic	Lead
0-2"	7.36	55.6

SS-06/SB-06	Arsenic	Lead
0-2"	7.14	65.2 J
0-2'	5.78	24.3
2-4'	4.58	21.1
4-6'	9.03	20.1
6-8'	11.5	23.1

SS-03	Arsenic	Lead
0-2"	3.9	34.4

SS-04	Arsenic	Lead
0-2"	3.51	18.2

SS-20/SB-20	Arsenic	Lead
0-2"	6.35	65.9
0-2'	4.94	14.9
2-4'	6.11	8.65

SS-21/SB-21	Arsenic	Lead
0-2"	3.68	38.8
0-2'	3.42 J	35 J
2-4'	2.25	8.68

SS-29	Arsenic	Lead
0-2"	6.07	38.2

SS-07/SB-07	Arsenic	Lead
0-2"	1.79	54.9 J
0-2'	6.43	120
2-4'	8.14	22.9
4-6'	9.99	25.4
6-8'	7.78	25.1

SS-30	Arsenic	Lead
0-2"	9.75	148

Note:
Shaded values exceed Unrestricted Use SCOs.

J = Estimated value.

All soil concentrations in milligrams per kilogram (mg/kg).

Legend

- Surface Soil
- Soil Boring
- Stadium Area

Constituent	Restricted Residential SCO	Unrestricted Use SCO
Arsenic	16	13
Lead	400	63

Feet
0 50 100 200
1 in = 100 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 4-3
Arsenic and Lead Soil Results
Stadium Area

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	HAW	HAW	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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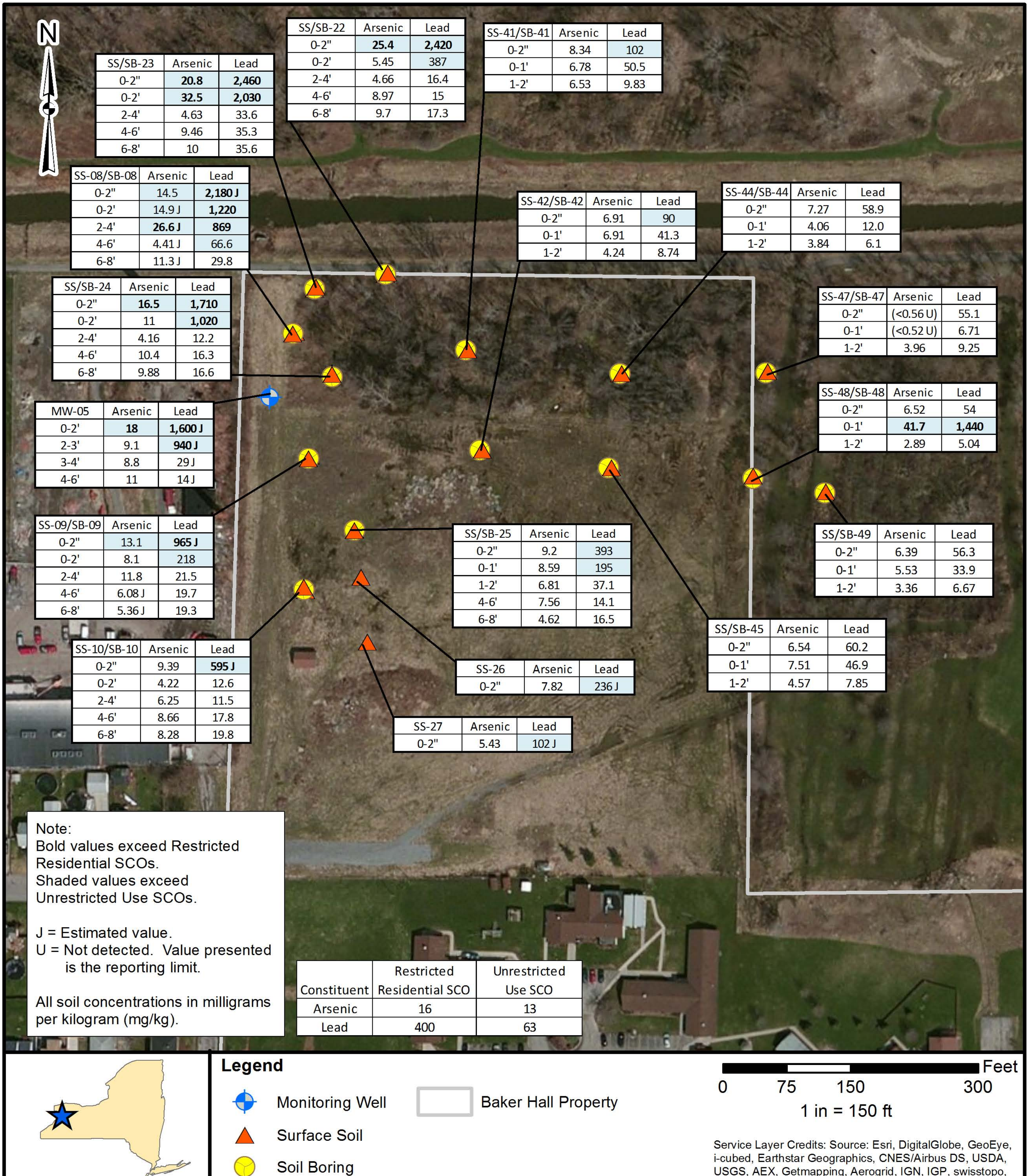


SS/SB-23	Arsenic	Lead
0-2"	**20.8**	**2,460**
0-2'	**32.5**	**2,030**
2-4'	4.63	33.6
4-6'	9.46	35.3
6-8'	10	35.6

SS/SB-22	Arsenic	Lead
0-2"	**25.4**	**2,420**
0-2'	5.45	387
2-4'	4.66	16.4
4-6'	8.97	15
6-8'	9.7	17.3

SS-41/SB-41	Arsenic	Lead
0-2"	8.34	102
0-1'	6.78	50.5
1-2'	6.53	9.83

SS-08/SB-08	Arsenic	Lead
0-2"	14.5	**2,180 J**
0-2'	14.9 J	**1,220**
2-4'	**26.6 J**	**869**
4-6'	4.41 J	66.6
6-8'	11.3 J	29.8

SS-42/SB-42	Arsenic	Lead
0-2"	6.91	90
0-1'	6.91	41.3
1-2'	4.24	8.74

SS-44/SB-44	Arsenic	Lead
0-2"	7.27	58.9
0-1'	4.06	12.0
1-2'	3.84	6.1

SS/SB-24	Arsenic	Lead
0-2"	**16.5**	**1,710**
0-2'	11	**1,020**
2-4'	4.16	12.2
4-6'	10.4	16.3
6-8'	9.88	16.6

SS-47/SB-47	Arsenic	Lead
0-2"	(<0.56 U)	55.1
0-1'	(<0.52 U)	6.71
1-2'	3.96	9.25

SS-48/SB-48	Arsenic	Lead
0-2"	6.52	54
0-1'	**41.7**	**1,440**
1-2'	2.89	5.04

MW-05	Arsenic	Lead
0-2'	**18**	**1,600 J**
2-3'	9.1	**940 J**
3-4'	8.8	29 J
4-6'	11	14 J

SS-09/SB-09	Arsenic	Lead
0-2"	13.1	**965 J**
0-2'	8.1	218
2-4'	11.8	21.5
4-6'	6.08 J	19.7
6-8'	5.36 J	19.3

SS/SB-25	Arsenic	Lead
0-2"	9.2	393
0-1'	8.59	195
1-2'	6.81	37.1
4-6'	7.56	14.1
6-8'	4.62	16.5

SS/SB-49	Arsenic	Lead
0-2"	6.39	56.3
0-1'	5.53	33.9
1-2'	3.36	6.67

SS/SB-45	Arsenic	Lead
0-2"	6.54	60.2
0-1'	7.51	46.9
1-2'	4.57	7.85

SS-10/SB-10	Arsenic	Lead
0-2"	9.39	**595 J**
0-2'	4.22	12.6
2-4'	6.25	11.5
4-6'	8.66	17.8
6-8'	8.28	19.8

SS-26	Arsenic	Lead
0-2"	7.82	236 J

SS-27	Arsenic	Lead
0-2"	5.43	102 J

Note:
Bold values exceed Restricted Residential SCOs.
Shaded values exceed Unrestricted Use SCOs.

J = Estimated value.
U = Not detected. Value presented is the reporting limit.

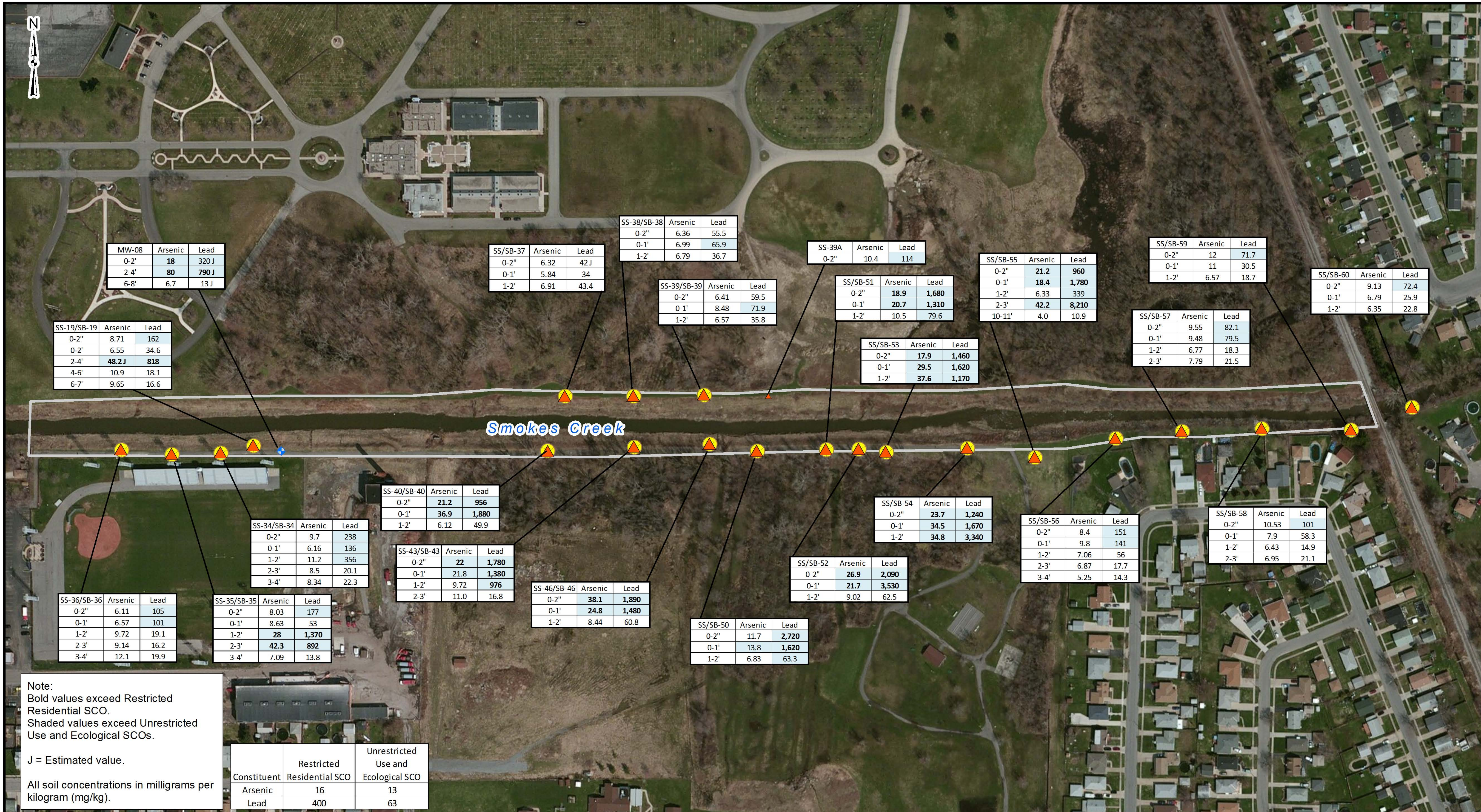
All soil concentrations in milligrams per kilogram (mg/kg).

Constituent	Restricted Residential SCO	Unrestricted Use SCO
Arsenic	16	13
Lead	400	63

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 4-4
Arsenic and Lead Soil Results
Baker Hall Property

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	HAW	HAW	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI



MW-08	Arsenic	Lead
0-2'	**18**	320 J
2-4'	**80**	**790 J**
6-8'	6.7	13 J

SS-19/SB-19	Arsenic	Lead
0-2"	8.71	162
0-2'	6.55	34.6
2-4'	**48.2 J**	**818**
4-6'	10.9	18.1
6-7'	9.65	16.6

SS/SB-37	Arsenic	Lead
0-2"	6.32	42 J
0-1'	5.84	34
1-2'	6.91	43.4

SS-38/SB-38	Arsenic	Lead
0-2"	6.36	55.5
0-1'	6.99	65.9
1-2'	6.79	36.7

SS-39/SB-39	Arsenic	Lead
0-2"	6.41	59.5
0-1'	8.48	71.9
1-2'	6.57	35.8

SS-39A	Arsenic	Lead
0-2"	10.4	114

SS/SB-51	Arsenic	Lead
0-2"	**18.9**	**1,680**
0-1'	**20.7**	**1,310**
1-2'	10.5	79.6

SS/SB-53	Arsenic	Lead
0-2"	**17.9**	**1,460**
0-1'	**29.5**	**1,620**
1-2'	**37.6**	**1,170**

SS/SB-55	Arsenic	Lead
0-2"	**21.2**	**960**
0-1'	**18.4**	**1,780**
1-2'	6.33	339
2-3'	**42.2**	**8,210**
10-11'	4.0	10.9

SS/SB-59	Arsenic	Lead
0-2"	12	71.7
0-1'	11	30.5
1-2'	6.57	18.7

SS/SB-57	Arsenic	Lead
0-2"	9.55	82.1
0-1'	9.48	79.5
1-2'	6.77	18.3
2-3'	7.79	21.5

SS/SB-60	Arsenic	Lead
0-2"	9.13	72.4
0-1'	6.79	25.9
1-2'	6.35	22.8

SS-40/SB-40	Arsenic	Lead
0-2"	**21.2**	**956**
0-1'	**36.9**	**1,880**
1-2'	6.12	49.9

SS-34/SB-34	Arsenic	Lead
0-2"	9.7	238
0-1'	6.16	136
1-2'	11.2	356
2-3'	8.5	20.1
3-4'	8.34	22.3

SS-43/SB-43	Arsenic	Lead
0-2"	**22**	**1,780**
0-1'	**21.8**	**1,380**
1-2'	9.72	**976**
2-3'	11.0	16.8

SS-46/SB-46	Arsenic	Lead
0-2"	**38.1**	**1,890**
0-1'	**24.8**	**1,480**
1-2'	8.44	60.8

SS/SB-50	Arsenic	Lead
0-2"	11.7	**2,720**
0-1'	13.8	**1,620**
1-2'	6.83	63.3

SS/SB-52	Arsenic	Lead
0-2"	**26.9**	**2,090**
0-1'	**21.7**	**3,530**
1-2'	9.02	62.5

SS/SB-54	Arsenic	Lead
0-2"	**23.7**	**1,240**
0-1'	**34.5**	**1,670**
1-2'	**34.8**	**3,340**

SS/SB-56	Arsenic	Lead
0-2"	8.4	151
0-1'	9.8	141
1-2'	7.06	56
2-3'	6.87	17.7
3-4'	5.25	14.3

SS/SB-58	Arsenic	Lead
0-2"	10.53	101
0-1'	7.9	58.3
1-2'	6.43	14.9
2-3'	6.95	21.1

SS-36/SB-36	Arsenic	Lead
0-2"	6.11	105
0-1'	6.57	101
1-2'	9.72	19.1
2-3'	9.14	16.2
3-4'	12.1	19.9

SS-35/SB-35	Arsenic	Lead
0-2"	8.03	177
0-1'	8.63	53
1-2'	**28**	**1,370**
2-3'	**42.3**	**892**
3-4'	7.09	13.8

Note:
Bold values exceed Restricted Residential SCO.
Shaded values exceed Unrestricted Use and Ecological SCOs.

J = Estimated value.

All soil concentrations in milligrams per kilogram (mg/kg).

Constituent	Restricted Residential SCO	Unrestricted Use and Ecological SCO
Arsenic	16	13
Lead	400	63

Legend

- Monitoring Well
- Smokes Creek Area
- Surface Soil
- Soil Boring

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 4-5
Arsenic and Lead Soil Results
Smokes Creek Corridor

Feet
0 100 200 400
1 inch = 200 feet

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	HAW	FD	AS SHOWN	OCTOBER 2014	14907.10	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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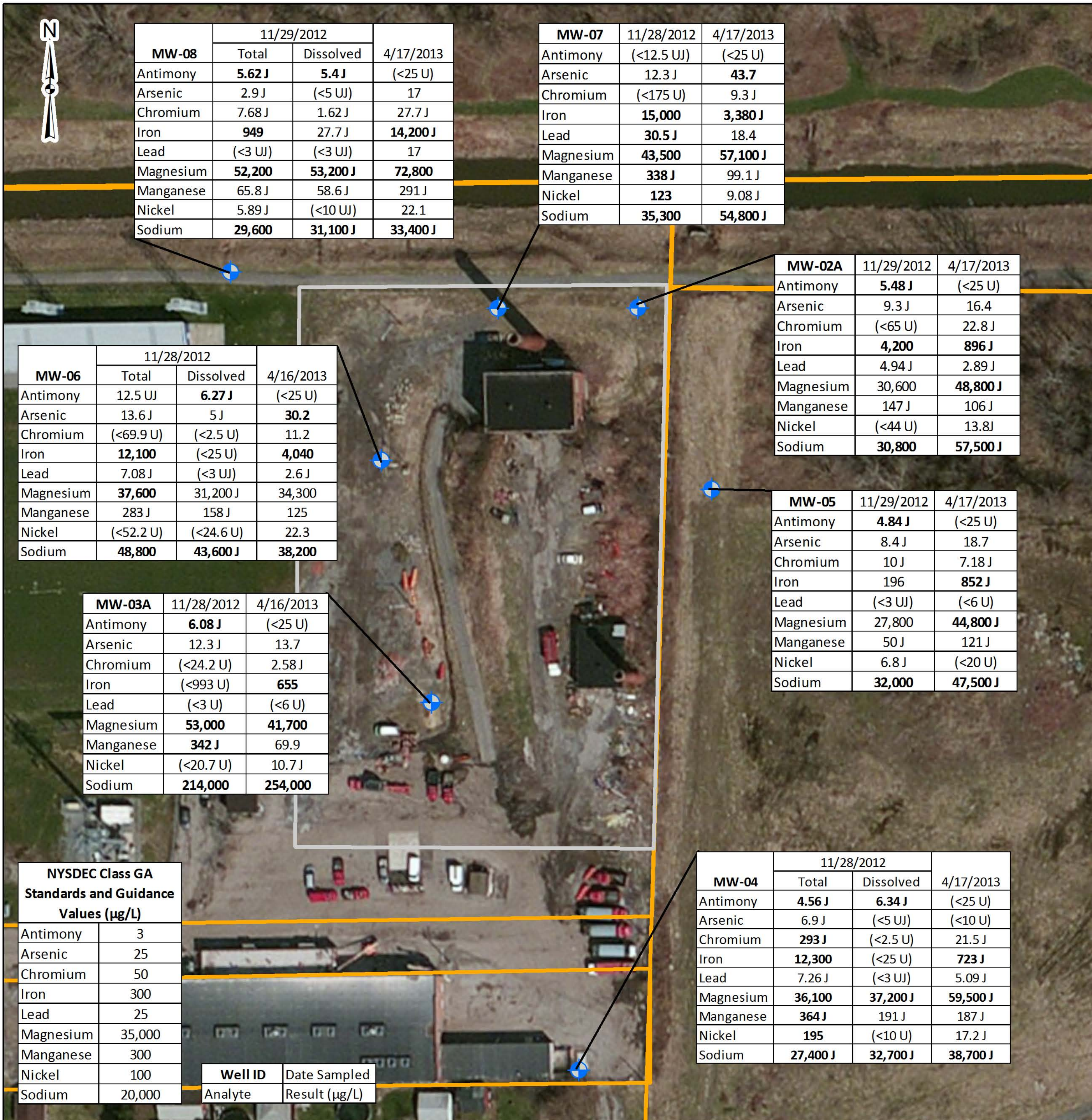

MW-08	11/29/2012 Total	11/29/2012 Dissolved	4/17/2013
Antimony	**5.62 J**	**5.4 J**	(<25 U)
Arsenic	2.9 J	(<5 UJ)	17
Chromium	7.68 J	1.62 J	27.7 J
Iron	**949**	27.7 J	**14,200 J**
Lead	(<3 UJ)	(<3 UJ)	17
Magnesium	**52,200**	**53,200 J**	**72,800**
Manganese	65.8 J	58.6 J	291 J
Nickel	5.89 J	(<10 UJ)	22.1
Sodium	**29,600**	**31,100 J**	**33,400 J**

MW-07	11/28/2012	4/17/2013
Antimony	(<12.5 UJ)	(<25 U)
Arsenic	12.3 J	**43.7**
Chromium	(<175 U)	9.3 J
Iron	**15,000**	**3,380 J**
Lead	**30.5 J**	18.4
Magnesium	**43,500**	**57,100 J**
Manganese	**338 J**	99.1 J
Nickel	**123**	9.08 J
Sodium	**35,300**	**54,800 J**

MW-02A	11/29/2012	4/17/2013
Antimony	**5.48 J**	(<25 U)
Arsenic	9.3 J	16.4
Chromium	(<65 U)	22.8 J
Iron	**4,200**	**896 J**
Lead	4.94 J	2.89 J
Magnesium	30,600	**48,800 J**
Manganese	147 J	106 J
Nickel	(<44 U)	13.8J
Sodium	**30,800**	**57,500 J**

MW-06	11/28/2012 Total	11/28/2012 Dissolved	4/16/2013
Antimony	12.5 UJ	**6.27 J**	(<25 U)
Arsenic	13.6 J	5 J	**30.2**
Chromium	(<69.9 U)	(<2.5 U)	11.2
Iron	**12,100**	(<25 U)	**4,040**
Lead	7.08 J	(<3 UJ)	2.6 J
Magnesium	**37,600**	31,200 J	34,300
Manganese	283 J	158 J	125
Nickel	(<52.2 U)	(<24.6 U)	22.3
Sodium	**48,800**	**43,600 J**	**38,200**

MW-05	11/29/2012	4/17/2013
Antimony	**4.84 J**	(<25 U)
Arsenic	8.4 J	18.7
Chromium	10 J	7.18 J
Iron	196	**852 J**
Lead	(<3 UJ)	(<6 U)
Magnesium	27,800	**44,800 J**
Manganese	50 J	121 J
Nickel	6.8 J	(<20 U)
Sodium	**32,000**	**47,500 J**

MW-03A	11/28/2012	4/16/2013
Antimony	**6.08 J**	(<25 U)
Arsenic	12.3 J	13.7
Chromium	(<24.2 U)	2.58 J
Iron	(<993 U)	**655**
Lead	(<3 U)	(<6 U)
Magnesium	**53,000**	**41,700**
Manganese	**342 J**	69.9
Nickel	(<20.7 U)	10.7 J
Sodium	**214,000**	**254,000**

MW-04	11/28/2012 Total	11/28/2012 Dissolved	4/17/2013
Antimony	**4.56 J**	**6.34 J**	(<25 U)
Arsenic	6.9 J	(<5 UJ)	(<10 U)
Chromium	**293 J**	(<2.5 U)	21.5 J
Iron	**12,300**	(<25 U)	**723 J**
Lead	7.26 J	(<3 UJ)	5.09 J
Magnesium	**36,100**	**37,200 J**	**59,500 J**
Manganese	**364 J**	191 J	187 J
Nickel	**195**	(<10 U)	17.2 J
Sodium	**27,400 J**	**32,700 J**	**38,700 J**

NYSDEC Class GA Standards and Guidance Values (µg/L)	
Antimony	3
Arsenic	25
Chromium	50
Iron	300
Lead	25
Magnesium	35,000
Manganese	300
Nickel	100
Sodium	20,000

Well ID	Date Sampled
Analyte	Result (µg/L)

Legend

- Monitoring Well
- On-Site Area
- Tax Parcels

Note: Bold indicates exceedance of NYSDEC Class GA Standards and Guidance Values for inorganics.
J = Estimated value
U = The constituent was not detected; the associated value is the reporting limit.
µg/L = micrograms per liter

0 50 100 200 Feet
1 in = 100 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

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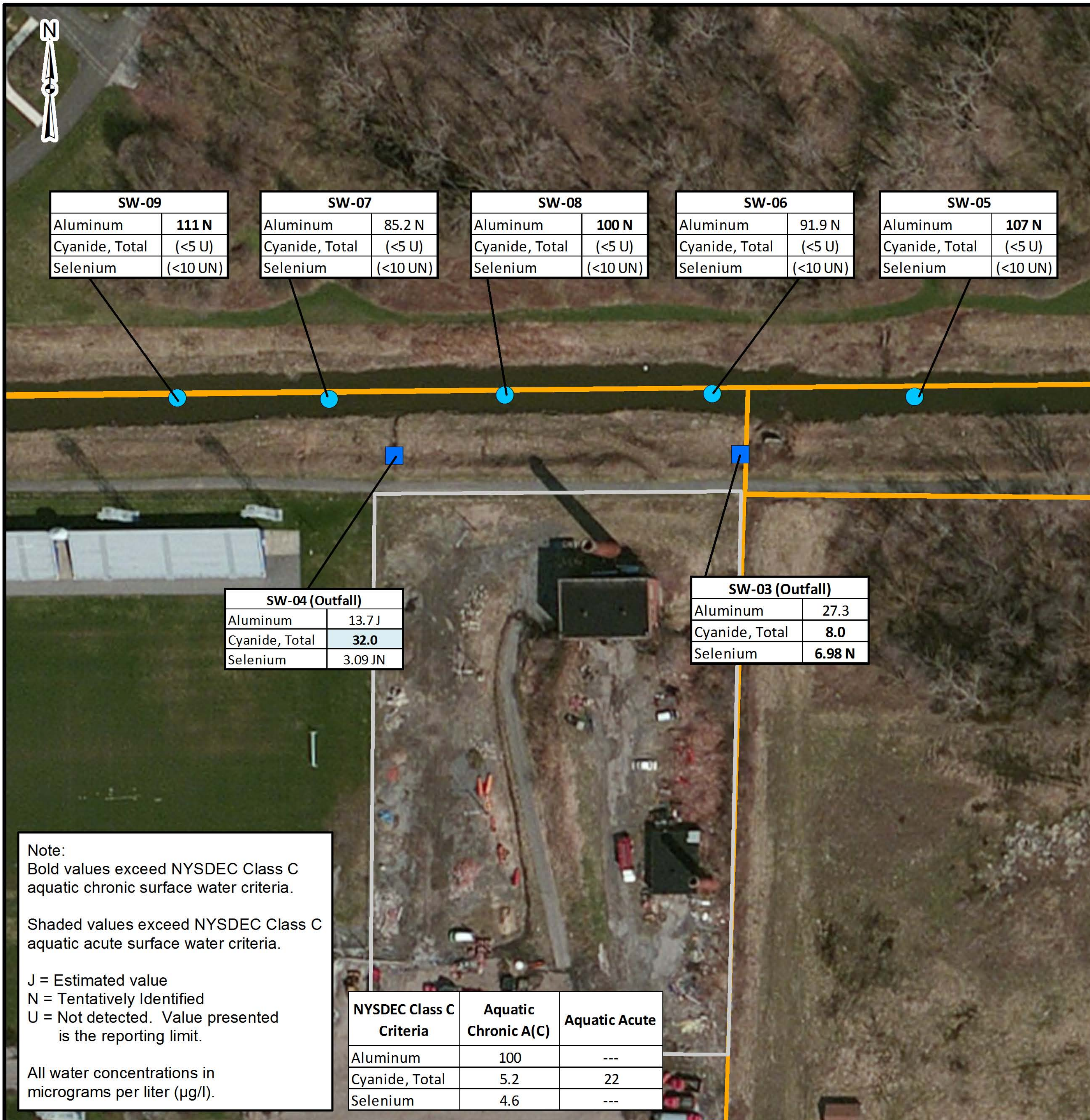
LACKAWANNA, NEW YORK

FIGURE 4-6
Groundwater Inorganic Results

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	HAW	HAW	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI



SW-09	
Aluminum	**111 N**
Cyanide, Total	(<5 U)
Selenium	(<10 UN)

SW-07	
Aluminum	85.2 N
Cyanide, Total	(<5 U)
Selenium	(<10 UN)

SW-08	
Aluminum	**100 N**
Cyanide, Total	(<5 U)
Selenium	(<10 UN)

SW-06	
Aluminum	91.9 N
Cyanide, Total	(<5 U)
Selenium	(<10 UN)

SW-05	
Aluminum	**107 N**
Cyanide, Total	(<5 U)
Selenium	(<10 UN)

SW-04 (Outfall)	
Aluminum	13.7 J
Cyanide, Total	**32.0**
Selenium	3.09 JN

SW-03 (Outfall)	
Aluminum	27.3
Cyanide, Total	**8.0**
Selenium	**6.98 N**

Note:
Bold values exceed NYSDEC Class C aquatic chronic surface water criteria.

Shaded values exceed NYSDEC Class C aquatic acute surface water criteria.

J = Estimated value
N = Tentatively Identified
U = Not detected. Value presented is the reporting limit.

All water concentrations in micrograms per liter (µg/l).

NYSDEC Class C Criteria	Aquatic Chronic A(C)	Aquatic Acute
Aluminum	100	---
Cyanide, Total	5.2	22
Selenium	4.6	---

Legend

Surface Water | On-Site Area
Storm Water | Tax Parcels

0 50 100 200 Feet
1 in = 100 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

LACKAWANNA INCINERATOR SITE (NO. 915206)
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FIGURE 4-7
Stormwater Outfall and Smokes Creek Surface Water Inorganic Results

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	HAW	HAW	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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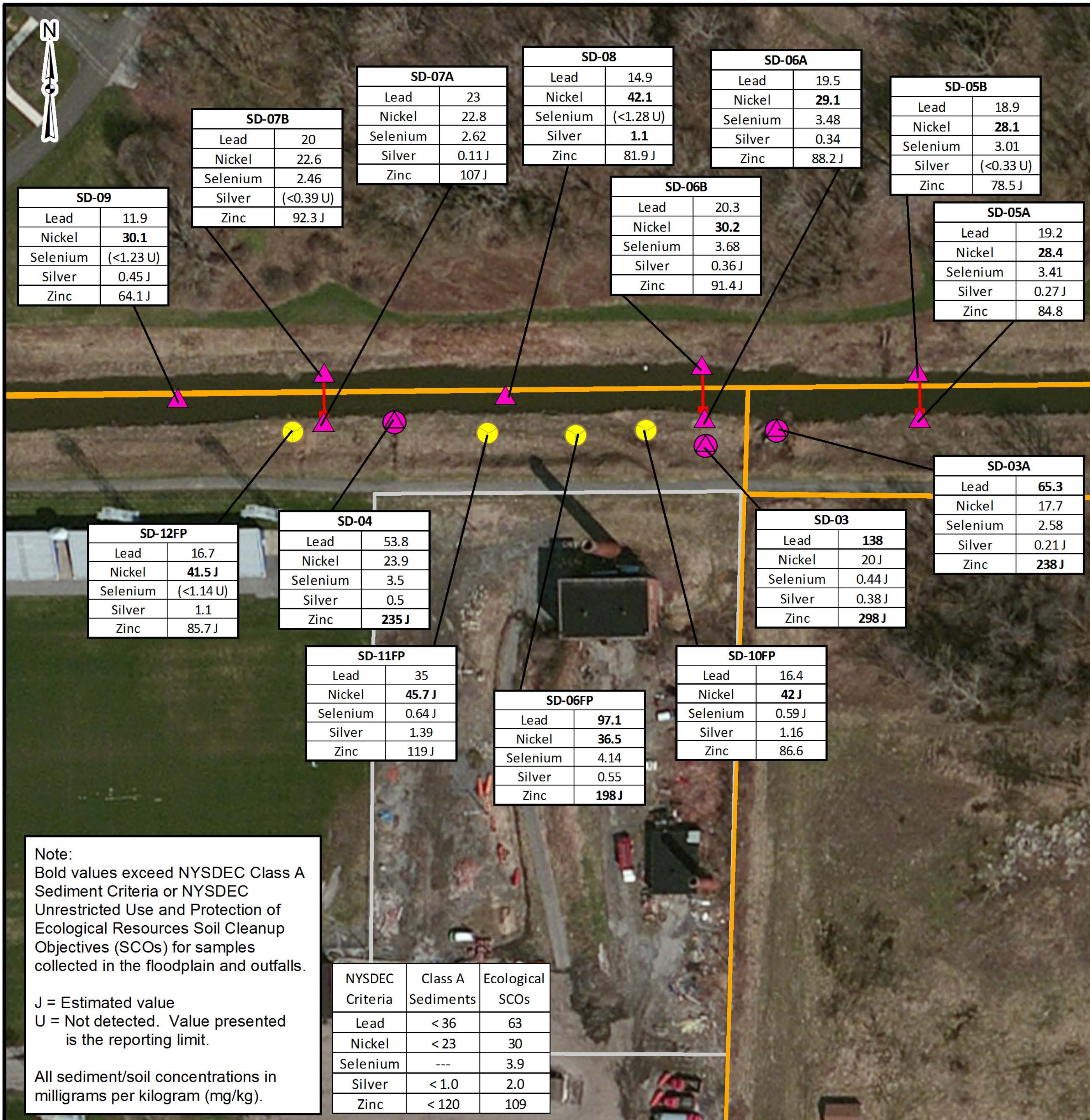

SD-09	
Lead	11.9
Nickel	**30.1**
Selenium	(<1.23 U)
Silver	0.45 J
Zinc	64.1 J

SD-07B	
Lead	20
Nickel	22.6
Selenium	2.46
Silver	(<0.39 U)
Zinc	92.3 J

SD-07A	
Lead	23
Nickel	22.8
Selenium	2.62
Silver	0.11 J
Zinc	107 J

SD-08	
Lead	14.9
Nickel	**42.1**
Selenium	(<1.28 U)
Silver	**1.1**
Zinc	81.9 J

SD-06A	
Lead	19.5
Nickel	**29.1**
Selenium	3.48
Silver	0.34
Zinc	88.2 J

SD-05B	
Lead	18.9
Nickel	**28.1**
Selenium	3.01
Silver	(<0.33 U)
Zinc	78.5 J

SD-06B	
Lead	20.3
Nickel	**30.2**
Selenium	3.68
Silver	0.36 J
Zinc	91.4 J

SD-05A	
Lead	19.2
Nickel	**28.4**
Selenium	3.41
Silver	0.27 J
Zinc	84.8

SD-03A	
Lead	**65.3**
Nickel	17.7
Selenium	2.58
Silver	0.21 J
Zinc	**238 J**

SD-12FP	
Lead	16.7
Nickel	**41.5 J**
Selenium	(<1.14 U)
Silver	1.1
Zinc	85.7 J

SD-04	
Lead	53.8
Nickel	23.9
Selenium	3.5
Silver	0.5
Zinc	**235 J**

SD-03	
Lead	**138**
Nickel	20 J
Selenium	0.44 J
Silver	0.38 J
Zinc	**298 J**

SD-11FP	
Lead	35
Nickel	**45.7 J**
Selenium	0.64 J
Silver	1.39
Zinc	119 J

SD-06FP	
Lead	**97.1**
Nickel	**36.5**
Selenium	4.14
Silver	0.55
Zinc	**198 J**

SD-10FP	
Lead	16.4
Nickel	**42 J**
Selenium	0.59 J
Silver	1.16
Zinc	86.6

Note:
Bold values exceed NYSDEC Class A Sediment Criteria or NYSDEC Unrestricted Use and Protection of Ecological Resources Soil Cleanup Objectives (SCOs) for samples collected in the floodplain and outfalls.

J = Estimated value
U = Not detected. Value presented is the reporting limit.

All sediment/soil concentrations in milligrams per kilogram (mg/kg).

NYSDEC Criteria	Class A Sediments	Ecological SCOs
Lead	< 36	63
Nickel	< 23	30
Selenium	---	3.9
Silver	< 1.0	2.0
Zinc	< 120	109

Legend

- Outfall Surface Soil
- Sediment
- Soil Boring
- Sediment Transect
- Tax Parcels
- On-Site Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo,

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FIGURE 4-8
Floodplain Soil and Sediment Inorganic Results

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	HAW	HAW	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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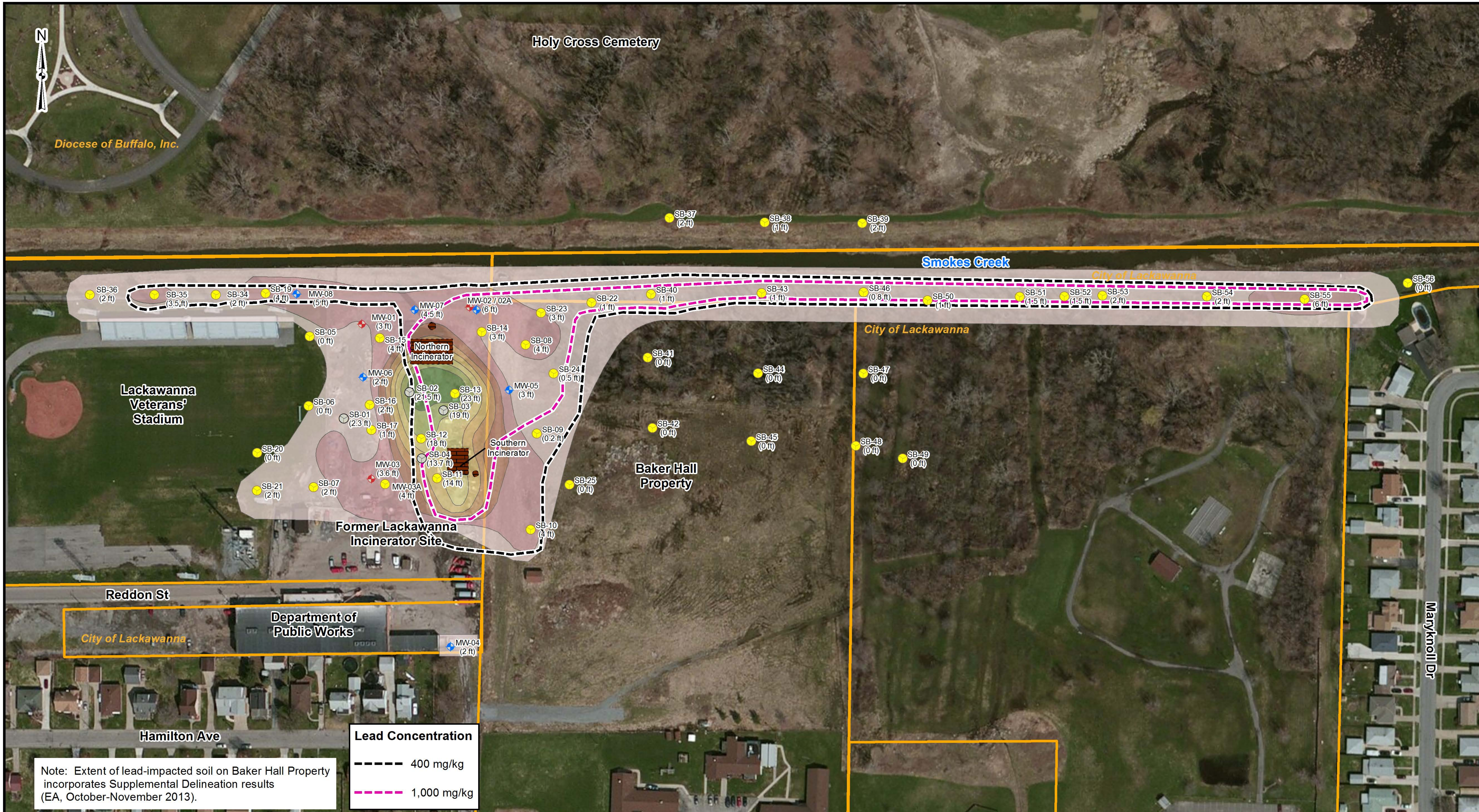

Legend

- Tax Parcels
- Historical Monitoring Well (2005)
- Historical Soil Boring (2005)
- Monitoring Well
- Soil Borings

Fill Thickness (feet)

0.1 - 3	12-15
3-6	15-18
6-9	18-21
9-12	21-23

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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FIGURE 4-9
Interpreted Extent of Lead
in Soil/Fill

1 inch = 150 feet

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	HAW	FD	AS SHOWN	OCTOBER 2014	14907.10	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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Legend

Lackawanna Incinerator Site

0.5-mile Radius

0 800 1,600 3,200 Feet

1 in = 1,600 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 7-1
Wetland Locations

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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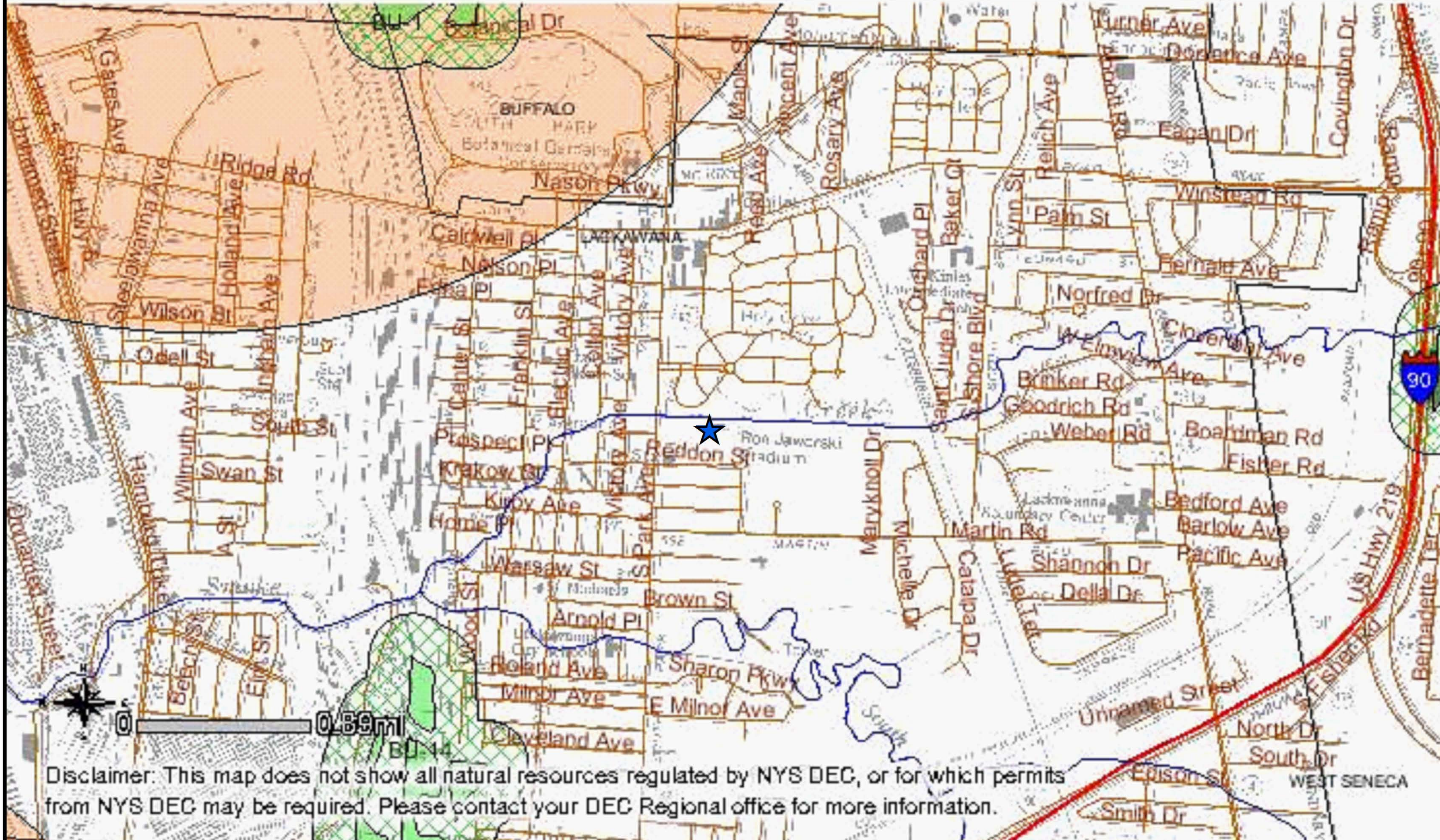

Legend

- ★ Lackawanna Incinerator Site
- Wetland Checkzone
- State-Regulated Freshwater Wetland
- Rare Plants and/or Rare Animals
- Classified Water Bodies

LACKAWANNA INCINERATOR SITE (NO. 915206) REMEDIAL INVESTIGATION REPORT LACKAWANNA, NEW YORK	FIGURE 7-2 NYSDEC Environmental Resources Mapper

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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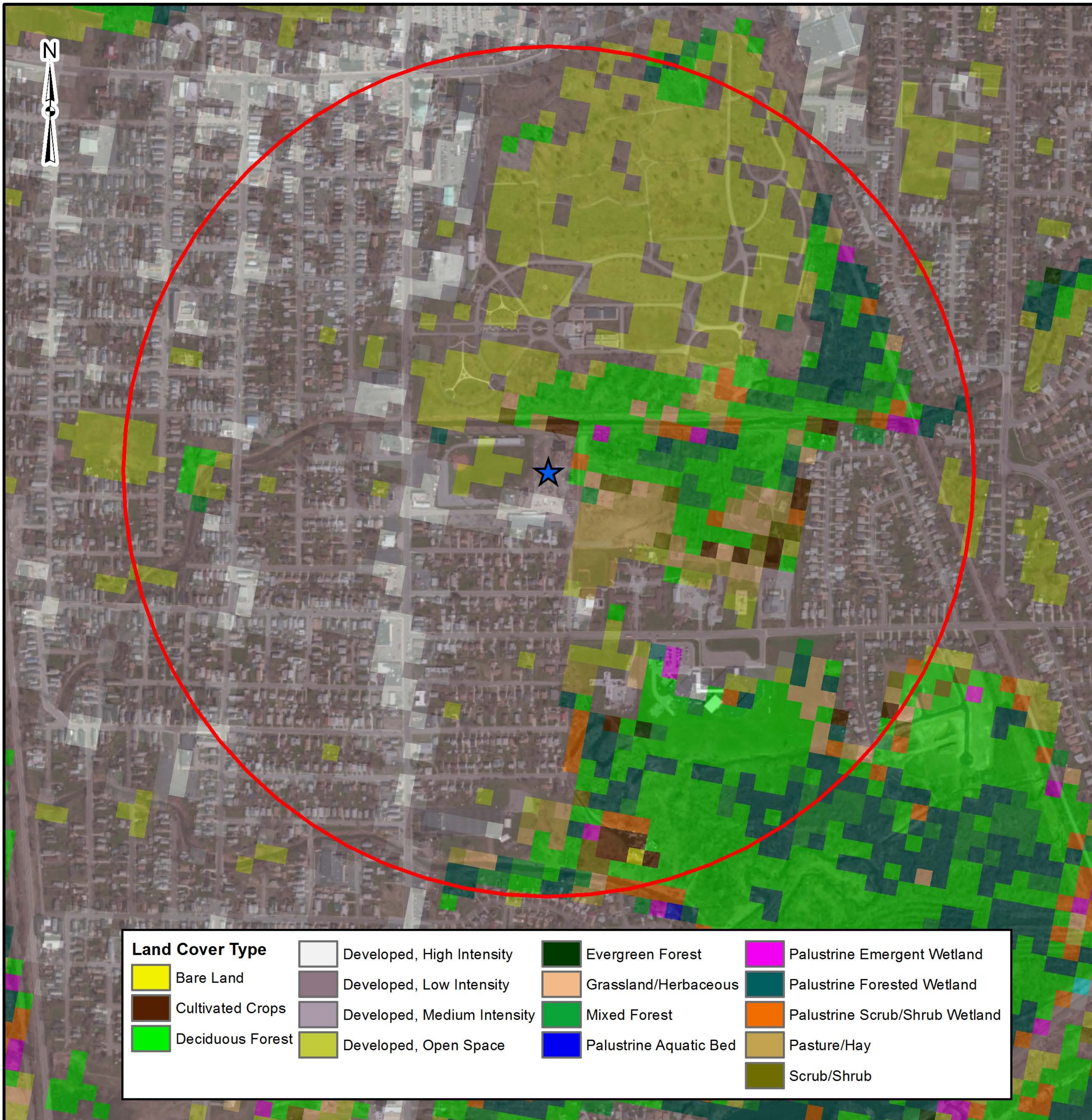

Legend

Lackawanna Incinerator Site

0.5-Mile Radius

Feet

0 425 850 1,700

1 in = 850 ft

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User

LACKAWANNA INCINERATOR SITE (NO. 915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 7-3
Land Cover Type

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JMB	ALK	ALK	FD	AS SHOWN	OCTOBER 2014	1490710	14907.10 - Lackawanna Incinerator/ GIS/MXD/RI

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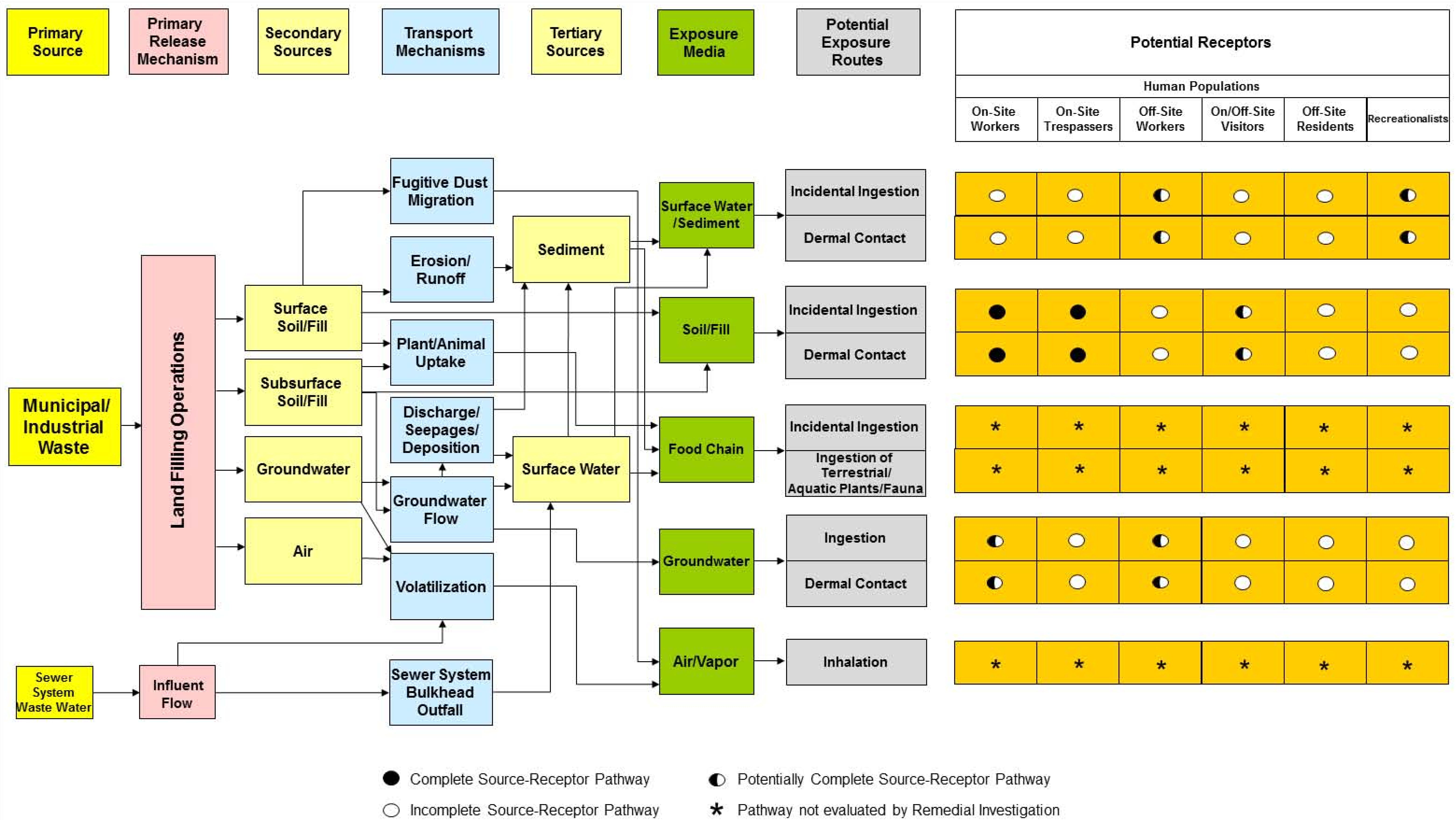

LACKAWANNA INCINERATOR (915206)
REMEDIAL INVESTIGATION REPORT
LACKAWANNA, NEW YORK

FIGURE 8-1
Conceptual Site Model

PROJECT MGR: JMB	DATE: OCTOBER 2014	EA PROJECT NO: 14907.10

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TABLES

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TABLE 2-1A SURFACE SOIL SAMPLES AND LABORATORY ANALYSES

Area	Sample Name	RI Phase	Date	VOCs	SVOCs	Pesticides	PCBs	Metals	Cyanide
Background	SS-28	II	4/16/2013	---	X	---	---	X	---
	SS-29	II	4/16/2013	---	X	---	---	X	---
	SS-30	II	4/16/2013	---	X	---	---	X	---
	SS-31	II	4/16/2013	---	X	---	---	X	---
	SS-32	II	4/16/2013	---	X	---	---	X	---
	SS-33	II	4/16/2013	---	X	---	---	X	---
On-Site	SS-01	I	10/24/2012	X	X	X	X	X	X
	SS-02/SS-02R	I	10/24/2012	X	X	X	X	X	X
	SS-11	I	10/24/2012	X	X	X	X	X	X
	SS-12	I	10/24/2012	X	X	X	X	X	X
	SS-12 (DUP)	I	10/24/2012	X	X	X	X	X	X
	SS-13	I	10/24/2012	X	X	X	X	X	X
	SS-14	I	10/24/2012	X	X	X	X	X	X
	SS-15	I	10/24/2012	X	X	X	X	X	X
	SS-16	I	10/24/2012	X	X	X	X	X	X
	SS-17	I	10/24/2012	X	X	X	X	X	X
	SS-18	I	10/24/2012	X	X	X	X	X	X
Stadium	SS-03	II	4/15/2013	---	---	---	---	X	---
	SS-04	II	4/15/2013	---	---	---	---	X	---
	SS-05	I	10/24/2012	X	X	X	X	X	X
	SS-06	I	10/24/2012	X	X	X	X	X	X
	SS-07	I	10/24/2012	X	X	X	X	X	X
	SS-19	II	4/15/2013	---	---	---	---	X	---
	SS-20	II	4/15/2013	---	---	---	---	X	---
	SS-21	II	4/15/2013	---	---	---	---	X	---

NOTE:
RI = Remedial investigation
VOC = Volatile organic compound
SVOC = Semivolatile organic compound
PCB = Polychlorinated biphenyl
--- = Analysis not requested
X = Analysis conducted
DUP = Duplicate field sample

Laboratory analyses completed by Chemtech Consulting Group for the indicated Target Compound List (TCL)/Target Analyte List (TAL) constituents. TCL SVOCs by U.S. Environmental Protection Agency (EPA) Method 8270C; TCL VOCs by EPA Method 8260B; TAL metals including mercury by EPA Method 6010B/7470A/7471A; TCL pesticides by EPA Method 8081A; TCL PCBs by EPA Method 8082; and Cyanide - a TAL inorganic constituent by EPA Method 9010B.

TABLE 2-1A SURFACE SOIL SAMPLES AND LABORATORY ANALYSES (CONTINUED)

Area	Sample Name	RI Phase	Date	VOCs	SVOCs	Pesticides	PCBs	Metals	Cyanide
Baker Hall	SS-08	I	10/24/2012	X	X	X	X	X	X
	SS-09	I	10/24/2012	X	X	X	X	X	X
	SS-10	I	10/24/2012	X	X	X	X	X	X
	SS-22	II	4/15/2013	---	X	---	---	X	---
	SS-23	II	4/15/2013	---	X	---	---	X	---
	SS-24	II	4/15/2013	---	X	---	---	X	---
	SS-25	II	4/15/2013	---	X	---	---	X	---
	SS-26	II	4/17/2013	---	X	---	---	X	---
	SS-26 (DUP)	II	4/17/2013	---	X	---	---	X	---
	SS-27	II	4/16/2013	---	X	---	---	X	---
	SS-44	III	7/2/2013	---	---	---	---	X	---
	SS-45	III	7/2/2013	---	---	---	---	X	---
	SS-47	III	7/2/2013	---	---	---	---	X	---
	SS-48	III	7/2/2013	---	---	---	---	X	---
	SS-49	IV	8/13/2013	---	---	---	---	X	---
Smokes Creek, West	SS-34	III	7/1/2013	---	---	---	---	X	X
	SS-35	III	7/1/2013	---	---	---	---	X	---
	SS-36	III	7/1/2013	---	---	---	---	X	---
Smokes Creek	SS-40	III	7/1/2013	---	---	---	---	X	---
	SS-41	III	7/1/2013	---	---	---	---	X	---
	SS-42	III	7/1/2013	---	---	---	---	X	---
	SS-43	III	7/2/2013	---	---	---	---	X	---
	SS-46	III	7/2/2013	---	---	---	---	X	---
Smokes Creek, Northeast	SS-37	III	7/1/2013	---	---	---	---	X	---
	SS-38	III	7/1/2013	---	---	---	---	X	---
	SS-39	III	7/1/2013	---	---	---	---	X	---
	SS-39A	III	7/2/2013	---	---	---	---	X	---
Smokes Creek, East	SS-50	IV	8/13/2013	---	---	---	---	X	---
	SS-51	IV	8/13/2013	---	---	---	---	X	---
	SS-52	IV	8/13/2013	---	---	---	---	X	---
	SS-53	IV	8/13/2013	---	---	---	---	X	---
	SS-54	IV	8/13/2013	---	---	---	---	X	---
	SS-55	V	2/21/2014	---	---	---	---	X	---
	SS-55 (DUP)	V	2/24/2014	---	---	---	---	X	---
	SS-56	V	2/21/2014	---	---	---	---	X	---
	SS-57	V	2/21/2014	---	---	---	---	X	---
	SS-58	V	2/21/2014	---	---	---	---	X	---
	SS-59	V	2/21/2014	---	---	---	---	X	---
	SS-60	V	2/21/2014	---	---	---	---	X	---

TABLE 2-1B SUBSURFACE SOIL SAMPLES AND LABORATORY ANALYSES

Area	Sample Name	RI Phase	Date	VOCs	SVOCs	Pesticides	PCBs	TOC	Metals	Cyanide
On-Site	MW-02A(0-1')	I	10/29/2012	---	X	---	---	---	X	X
	MW-02A(2-3')	I	10/29/2012	X	X	X	X	---	X	X
	MW-02A(6-7')	I	10/29/2012	---	X	---	---	---	X	X
	MW-02A(8-10')	I	10/29/2012	---	X	---	---	---	X	X
	MW-03A(0-2')	I	10/31/2012	---	X	---	---	---	X	X
	MW-03A(4-6')	I	10/31/2012	---	X	---	---	---	X	X
	MW-04(0-2')	I	11/2/2012	---	X	---	---	---	X	X
	MW-04(2-4')	I	11/2/2012	---	X	X	X	---	X	X
	MW-04(4-6')	I	11/2/2012	---	X	---	---	---	X	X
	MW-06(0-2')	I	10/31/2012	X	X	X	X	---	X	X
	MW-06(0-2') (DUP)	I	10/31/2012	X	X	X	X	---	X	X
	MW-06(2-4')	I	10/31/2012	---	X	---	---	---	X	X
	MW-06(4-6')	I	10/31/2012	---	X	---	---	---	X	X
	MW-07(0-2')	I	11/5/2012	---	X	---	---	---	X	X
	MW-07(2-4')	I	11/5/2012	X	X	X	X	---	X	X
	MW-07(2-4') (DUP)	I	11/5/2012	X	X	X	X	---	X	X
	MW-07(4-6')	I	11/5/2012	---	X	---	---	---	X	X
	MW-07(6-8')	I	11/5/2012	---	X	---	---	---	X	X
	MW-08(0-2')	I	11/6/2012	X	X	X	X	---	X	X
	MW-08(0-2') (DUP)	I	11/6/2012	X	X	X	X	---	X	X
	MW-08(2-4')	I	11/6/2012	---	X	---	---	---	X	X
	MW-08(6-8')	I	11/6/2012	---	X	---	---	---	X	X
	SB-11(0-2')	I	11/6/2012	---	X	---	---	---	X	---
	SB-11(2-4')	I	11/6/2012	---	X	---	---	---	X	---
	SB-11(4-6')	I	11/6/2012	X	X	X	X	---	X	X
	SB-11(4-6') (DUP)	I	11/6/2012	X	X	---	---	---	X	X
	SB-11(6-8')	I	11/6/2012	---	X	---	---	---	X	---
	SB-11(8-10')	I	11/6/2012	---	X	---	---	---	X	---
	SB-11(10-12')	I	11/6/2012	---	X	---	---	---	X	---
	SB-11(12-14')	I	11/6/2012	---	X	---	---	---	X	---
	SB-11(14-16')	I	11/6/2012	---	X	---	---	---	X	---
	SB-11(16-18')	I	11/6/2012	---	X	---	---	---	X	---
	SB-12A(0-2')	I	10/26/2012	X	X	X	X	---	X	X
	SB-12A(0-2') (DUP)	I	10/26/2012	X	X	X	X	---	X	X
	SB-12(8-10')	I	10/25/2012	---	X	---	---	---	X	---
	SB-12(12-14')	I	10/25/2012	---	X	---	---	---	X	---
	SB-12(14-16')	I	10/25/2012	---	X	---	---	---	X	---
	SB-12(16-18')	I	10/25/2012	---	X	---	---	---	X	---
	SB-12(18-20')	I	10/25/2012	---	X	---	---	---	X	---
	SB-13(0-4')	I	10/25/2012	X	X	X	X	---	X	X
	SB-13(4-8')	I	10/25/2012	---	---	---	---	---	X	---
	SB-13(8-10')	I	10/25/2012	X	X	X	X	---	X	X
	SB-13(10-12')	I	10/25/2012	---	X	---	---	---	X	---
	SB-13(12-14')	I	10/25/2012	---	X	---	---	---	X	---

NOTE:

NOTE:	RI	= Remedial investigation
	VOC	= Volatile organic compound
	SVOC	= Semivolatile organic compound
	PCB	= Polychlorinated biphenyl
	TOC	= Total organic carbon
	---	= Analysis not requested
	X	= Analysis conducted
	DUP	= Duplicate field sample

Laboratory analyses completed by Chemtech Consulting Group for the indicated Target Compound List (TCL)/Target Analyte List (TAL) constituents. TCL SVOCs by U.S. Environmental Protection Agency (EPA) Method 8270C; TCL VOCs by EPA Method 8260B; TAL metals including mercury by EPA Method 6010B/7470A/7471A; TCL pesticides by EPA Method 8081A; TCL PCBs by EPA Method 8082; and Cyanide - a TAL inorganic constituent by EPA Method 9010B.

TABLE 2-1B SUBSURFACE SOIL SAMPLES AND LABORATORY ANALYSES (CONTINUED)

Area	Sample Name	RI Phase	Date	VOCs	SVOCs	Pesticides	PCBs	TOC	Metals	Cyanide
On-Site	SB-13(16-18')	I	10/25/2012	---	X	---	---	---	X	---
	SB-13(20-22')	I	10/25/2012	X	X	X	X	---	X	X
	SB-13(23-25')	I	10/25/2012	---	X	---	---	---	X	---
	SB-14(0-2')	I	10/25/2012	X	X	X	X	---	X	X
	SB-14(0-2') (DUP)	I	10/25/2012	X	X	X	X	---	X	X
	SB-14(2-4')	I	10/25/2012	---	X	---	---	---	X	---
	SB-14(4-6')	I	10/25/2012	---	X	---	---	---	X	---
	SB-14(6-8')	I	10/25/2012	---	X	---	---	---	X	---
	SB-14(8-10')	I	10/25/2012	---	X	---	---	---	X	---
	SB-14(10-12')	I	10/25/2012	---	X	---	---	---	X	---
	SB-15(0-2')	I	10/25/2012	X	X	X	X	---	X	X
	SB-15(2-4')	I	10/25/2012	---	X	---	---	---	X	---
	SB-15(4-6')	I	10/25/2012	---	X	---	---	---	X	---
	SB-15(6-8')	I	10/25/2012	---	X	---	---	---	X	---
	SB-15(8-10')	I	10/25/2012	---	X	---	---	---	X	---
	SB-16(0-2')	I	10/25/2012	---	X	---	---	---	X	---
	SB-16(2-4')	I	10/25/2012	---	X	---	---	---	X	---
	SB-16(4-6')	I	10/25/2012	---	X	---	---	---	X	---
	SB-16(6-8')	I	10/25/2012	---	X	---	---	---	X	---
	SB-16(8-10')	I	10/25/2012	---	X	---	---	---	X	---
	SB-16(10-12')	I	10/25/2012	---	X	---	---	---	X	---
	SB-16(12-14')	I	10/25/2012	---	X	---	---	---	X	---
	SB-16(14-16')	I	10/25/2012	---	X	---	---	---	X	---
	SB-17(0-2')	I	10/25/2012	---	X	---	---	---	X	---
	SB-17(2-4')	I	10/25/2012	X	X	X	X	---	X	X
	SB-17(4-6')	I	10/25/2012	---	X	---	---	---	X	---
	SB-17(6-8')	I	10/25/2012	---	X	---	---	---	X	---
	SB-17(8-10')	I	10/25/2012	---	X	---	---	---	X	---
	SB-17(10-12')	I	10/25/2012	---	X	---	---	---	X	---
	SB-18(0-2')	I	10/26/2012	X	X	X	X	---	X	X
	SB-18(0-2') (DUP)	I	10/26/2012	X	X	X	X	---	X	X
	SB-18(2-4')	I	10/26/2012	---	X	---	---	---	X	---
	SB-18(8-10')	I	10/26/2012	---	X	---	---	---	X	---
	SB-18(10-12')	I	10/26/2012	---	X	---	---	---	X	---
Stadium	SB-05(0-2')	I	10/26/2012	---	X	---	---	---	X	---
	SB-05(2-4')	I	10/26/2012	X	X	X	X	---	X	X
	SB-05(2-4') (DUP)	I	10/26/2012	X	X	X	X	---	X	---
	SB-05(4-6')	I	10/26/2012	---	X	---	---	---	X	---
	SB-05(6-8')	I	10/26/2012	---	X	---	---	---	X	---
	SB-06(0-2')	I	10/26/2012	---	X	---	---	---	X	---
	SB-06(2-4')	I	10/26/2012	X	X	X	X	---	X	X
	SB-06(4-6')	I	10/26/2012	---	X	---	---	---	X	---
	SB-06(6-8')	I	10/26/2012	---	X	---	---	---	X	---
	SB-07(0-2')	I	10/26/2012	---	X	---	---	---	X	---
	SB-07(2-4')	I	10/26/2012	---	X	---	---	---	X	---
	SB-07(4-6')	I	10/26/2012	---	X	---	---	---	X	---
	SB-07(6-8')	I	10/26/2012	---	X	---	---	---	X	---
	SB-20(0-2')	II	4/16/2013	---	---	---	---	---	X	---
	SB-20(2-4')	II	4/16/2013	---	---	---	---	---	X	---
	SB-21(0-2')	II	4/16/2013	---	---	---	---	---	X	---
	SB-21(0-2') (DUP)	II	4/16/2013	---	---	---	---	---	X	---
	SB-21(2-4')	II	4/16/2013	---	---	---	---	---	X	---

TABLE 2-1B SUBSURFACE SOIL SAMPLES AND LABORATORY ANALYSES (CONTINUED)

Area	Sample Name	RI Phase	Date	VOCs	SVOCs	Pesticides	PCBs	TOC	Metals	Cyanide
Baker Hall	MW-05(0-2')	I	11/1/2012	---	X	---	---	---	X	X
	MW-05(2-3')	I	11/1/2012	---	X	---	---	---	X	X
	MW-05(3-4')	I	11/1/2012	---	X	---	---	---	X	X
	MW-05(4-6')	I	11/1/2012	---	X	---	---	---	X	X
	SB-08(0-2')	I	10/26/2012	---	X	---	---	---	X	---
	SB-08(2-4')	I	10/26/2012	X	X	X	X	---	X	X
	SB-08(4-6')	I	10/26/2012	---	X	---	---	---	X	---
	SB-08(6-8')	I	10/26/2012	---	X	---	---	---	X	---
	SB-09(0-2')	I	10/26/2012	X	X	X	X	---	X	---
	SB-09(2-4')	I	10/26/2012	X	X	X	X	---	X	---
	SB-09(4-6')	I	10/26/2012	---	X	---	---	---	X	---
	SB-09(6-8')	I	10/26/2012	---	X	---	---	---	X	---
	SB-10(0-2')	I	10/26/2012	X	X	X	X	---	X	---
	SB-10(2-4')	I	10/26/2012	---	X	---	---	---	X	---
	SB-10(4-6')	I	10/26/2012	---	X	---	---	---	X	---
	SB-10(6-8')	I	10/26/2012	---	X	---	---	---	X	---
	SB-22(0-2')	II	4/15/2013	---	X	---	---	---	X	---
	SB-22(2-4')	II	4/15/2013	---	X	---	---	---	X	---
	SB-22(4-6')	II	4/15/2013	---	X	---	---	---	X	---
	SB-22(6-7')	II	4/15/2013	---	X	---	---	---	X	---
	SB-23(0-2')	II	4/15/2013	---	X	---	---	---	X	---
	SB-23(2-4')	II	4/15/2013	---	X	---	---	---	X	---
	SB-23(4-6')	II	4/15/2013	---	X	---	---	---	X	---
	SB-23(6-8')	II	4/15/2013	---	X	---	---	---	X	---
	SB-24(0-2')	II	4/15/2013	---	X	---	---	---	X	---
	SB-24(2-4')	II	4/15/2013	---	X	---	---	---	X	---
	SB-24(4-6')	II	4/15/2013	---	X	---	---	---	X	---
	SB-24(6-8')	II	4/15/2013	---	X	---	---	---	X	---
	SB-25(0-1')	II	4/15/2013	---	X	---	---	---	X	---
	SB-25(1-2')	II	4/15/2013	---	X	---	---	---	X	---
	SB-25(4-6')	II	4/15/2013	---	X	---	---	---	X	---
	SB-25(6-8')	II	4/15/2013	---	X	---	---	---	X	---
	SB-44(0-1')	III	7/2/2013	---	---	---	---	---	X	---
	SB-44(1-2')	III	7/2/2013	---	---	---	---	---	X	---
	SB-45(0-1')	III	7/2/2013	---	---	---	---	---	X	---
	SB-45(1-2')	III	7/2/2013	---	---	---	---	---	X	---
	SB-47(0-1')	III	7/2/2013	---	---	---	---	---	X	---
	SB-47(1-2')	III	7/2/2013	---	---	---	---	---	X	---
	SB-48(0-1')	III	7/2/2013	---	---	---	---	---	X	---
	SB-48(1-2')	III	7/2/2013	---	---	---	---	---	X	---
	SB-49(0-1')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-49(1-2')	IV	8/13/2013	---	---	---	---	---	X	---
Smokes Creek, West	SB-19(0-2')	II	4/15/2013	---	---	---	---	---	X	---
	SB-19(2-4')	II	4/15/2013	---	---	---	---	---	X	---
	SB-19(2-4') (DUP)	II	4/15/2013	---	---	---	---	---	X	---
	SB-19(4-6')	II	4/15/2013	---	---	---	---	---	X	---
	SB-19(6-7')	II	4/15/2013	---	---	---	---	---	X	---
	SB-34(0-1')	III	7/1/2013	---	---	---	---	---	X	---
	SB-34(1-2')	III	7/1/2013	---	---	---	---	---	X	---
	SB-34(2-3')	III	7/1/2013	---	---	---	---	---	X	---
	SB-34(2-3') (DUP)	III	7/1/2013	---	---	---	---	---	X	---
	SB-34(3-4')	III	7/1/2013	---	---	---	---	---	X	---
	SB-35(0-1')	III	7/1/2013	---	---	---	---	---	X	---
	SB-35(1-2')	III	7/1/2013	---	---	---	---	---	X	---
	SB-35(2-3')	III	7/1/2013	---	---	---	---	---	X	---
	SB-35(3-4')	III	7/1/2013	---	---	---	---	---	X	---
	SB-36(0-1')	III	7/1/2013	---	---	---	---	---	X	---
	SB-36(1-2')	III	7/1/2013	---	---	---	---	---	X	---
	SB-36(2-3')	III	7/1/2013	---	---	---	---	---	X	---
	SB-36(3-4')	III	7/1/2013	---	---	---	---	---	X	---

TABLE 2-1B SUBSURFACE SOIL SAMPLES AND LABORATORY ANALYSES (CONTINUED)

Area	Sample Name	RI Phase	Date	VOCs	SVOCs	Pesticides	PCBs	TOC	Metals	Cyanide
Smokes Creek	SD-06FP	I	10/18/2012	X	X	X	X	X	X	X
	SD-10FP	II	4/15/2013	---	---	---	---	X	X	X
	SD-11FP	II	4/15/2013	---	---	---	---	X	X	X
	SD-12FP	II	4/15/2013	---	---	---	---	X	X	X
	SB-40(0-1')	III	7/1/2013	---	---	---	---	---	X	---
	SB-40(1-2')	III	7/1/2013	---	---	---	---	---	X	---
	SB-41(0-1')	III	7/1/2013	---	---	---	---	---	X	---
	SB-41(1-2')	III	7/1/2013	---	---	---	---	---	X	---
	SB-42(0-1')	III	7/1/2013	---	---	---	---	---	X	---
	SB-42(1-2')	III	7/1/2013	---	---	---	---	---	X	---
	SB-43(0-1')	III	7/2/2013	---	---	---	---	---	X	---
	SB-43(1-2')	III	7/2/2013	---	---	---	---	---	X	---
	SB-43(2-3')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-46(0-1')	III	7/2/2013	---	---	---	---	---	X	---
	SB-46(0-1') (DUP)	III	7/2/2013	---	---	---	---	---	X	---
	SB-46(1-2')	III	7/2/2013	---	---	---	---	---	X	---
Smokes Creek, Northeast	SB-37(0-1')	III	7/1/2013	---	---	---	---	---	X	---
	SB-37(0-1') (DUP)	III	7/1/2013	---	---	---	---	---	X	---
	SB-37(1-2')	III	7/1/2013	---	---	---	---	---	X	---
	SB-38(0-1')	III	7/1/2013	---	---	---	---	---	X	---
	SB-38(1-2')	III	7/1/2013	---	---	---	---	---	X	---
	SB-39(0-1')	III	7/1/2013	---	---	---	---	---	X	---
	SB-39(1-2')	III	7/1/2013	---	---	---	---	---	X	---
Smokes Creek, East	SB-50(0-1')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-50(0-1') (DUP)	IV	8/13/2013	---	---	---	---	---	X	---
	SB-50(1-2')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-51(0-1')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-51(1-2')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-52(0-1')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-52(1-2')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-53(0-1')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-53(1-2')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-54(0-1')	IV	8/13/2013	---	---	---	---	---	X	---
Smokes Creek, East	SB-54(1-2')	IV	8/13/2013	---	---	---	---	---	X	---
	SB-55(0-1')	V	2/21/2014	---	---	---	---	---	X	---
	SB-55(1-2')	V	2/21/2014	---	---	---	---	---	X	---
	SB-55(2-3')	V	2/21/2014	---	---	---	---	---	X	---
	SB-55(10-11')	V	2/21/2014	---	---	---	---	---	X	---
	SB-56(0-1')	V	2/21/2014	---	---	---	---	---	X	---
	SB-56(1-2')	V	2/21/2014	---	---	---	---	---	X	---
	SB-56(2-3')	V	2/21/2014	---	---	---	---	---	X	---
	SB-56(3-4')	V	2/21/2014	---	---	---	---	---	X	---
	SB-57(0-1')	V	2/21/2014	---	---	---	---	---	X	---
	SB-57(1-2')	V	2/21/2014	---	---	---	---	---	X	---
	SB-57(2-3')	V	2/21/2014	---	---	---	---	---	X	---
	SB-58(0-1')	V	2/21/2014	---	---	---	---	---	X	---
	SB-58(1-2')	V	2/21/2014	---	---	---	---	---	X	---
	SB-58(2-3')	V	2/21/2014	---	---	---	---	---	X	---
	SB-58(2-3') (DUP)	V	2/24/2014	---	---	---	---	---	X	---
	SB-59(0-1')	V	2/21/2014	---	---	---	---	---	X	---
	SB-59(1-2')	V	2/21/2014	---	---	---	---	---	X	---
	SB-60(0-1')	V	2/21/2014	---	---	---	---	---	X	---
	SB-60(1-2')	V	2/21/2014	---	---	---	---	---	X	---

TABLE 2-1C GROUNDWATER SAMPLES AND LABORATORY ANALYSES

Area	Sample Name	RI Phase	Date	VOCs	SVOCs	Pesticides	PCBs	Metals	Cyanide	Geochemistry
On-Site	MW-02A	I	11/29/2012	X	X	X	X	X	X	X
	MW-02A	II	4/17/2013	X	X	---	---	X	X	X (a)
	MW-03A	I	11/28/2012	X	X	X	X	X	X	X
	MW-03A	II	4/16/2013	X	X	---	---	X	X	X
	MW-06	I	11/28/2012	X	X	X	X	X (b)	X	X
	MW-06	II	4/16/2013	X	X	---	---	X	X	X
	MW-07	I	11/28/2012	X	X	X	X	X	X	X
	MW-07	II	4/17/2013	X	X	---	---	X	X	X (a)
On-Site/DPW	MW-04	I	11/28/2012	X	X	X	X	X (b)	X	X
	MW-04	II	4/17/2013	X	X	---	---	X	X	X (a)
Baker Hall	MW-05	I	11/29/2012	X	X	X	X	X	X	X
	MW-05	II	4/17/2013	X	X	---	---	X	X	X (a)
	MW-05 (DUP)	II	4/17/2013	X	X	---	---	X	X	X (a)
Smokes Creek Corridor	MW-08	I	11/29/2012	X	X	X	X	X (b)	X	X
	MW-08 (DUP)	I	11/29/2012	X	X	X	X	X	X	X
	MW-08	II	4/17/2013	X	X	---	---	X	X	X (a)

NOTE:

RI	= Remedial investigation
VOC	= Volatile organic compound
SVOC	= Semivolatile organic compound
PCB	= Polychlorinated biphenyl
X	= Analysis conducted
---	= Analysis not requested
X (a)	= Biological oxygen demand sample was outside of holding time due to a shipping issue and was not analyzed.
X (b)	= An unpreserved sample was filtered in the laboratory and analyzed for metals due to elevated turbidity.
DPW	= Department of Public Works
DUP	= Duplicate field sample

Laboratory analyses completed by Chemtech Consulting Group for the indicated Target Compound List (TCL)/Target Analyte List (TAL) constituents. TCL SVOCs by U.S. Environmental Protection Agency (EPA) Method 8270C; TCL VOCs by EPA Method 8260B; TAL metals including mercury by EPA Method 6010B/7470A/7471A; TCL pesticides by EPA Method 8081A; TCL PCBs by EPA Method 8082; Cyanide - a TAL inorganic constituent by EPA Method 9010B; and geochemistry parameters (Total organic carbon by Method SM5310; Biological oxygen demand by Method SM5210B; Chemical oxygen demand by Method 5220D; Alkalinity by Method SM2320B; Chloride, nitrate, nitrite, and sulfate by EPA Method 300; Sulfide by Method SM4500.

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TABLE 2-1D SMOKES CREEK SURFACE WATER/SEDIMENT SAMPLES AND LABORATORY ANALYSES

Area	Sample Name	RI Phase	Date	VOCs	SVOCs	Pesticides	PCBs	Hardness	TOC	Metals	Cyanide
Smokes Creek	SW-05	II	4/18/2013	---	---	---	---	X	---	X	X
	SW-06	II	4/18/2013	---	---	---	---	X	---	X	X
	SW-06 (DUP)	II	4/18/2013	---	---	---	---	X	---	X	X
	SW-07	II	4/18/2013	---	---	---	---	X	---	X	X
	SW-08	II	4/18/2013	---	---	---	---	X	---	X	X
	SW-09	II	4/18/2013	---	---	---	---	X	---	X	X
	SD-05A (0-6")	I	10/18/2012	X	X	X	X	---	X	X	X
	SD-05B (0-4")	I	10/18/2012	X	X	X	X	---	X	X	X
	SD-06A (0-4")	I	10/18/2012	X	X	X	X	---	X	X	X
	SD-06B (0-4")	I	10/18/2012	X	X	X	X	---	X	X	X
	SD-07A (0-6")	I	10/18/2012	X	X	X	X	---	X	X	X
	SD-07B (0-6")	I	10/18/2012	X	X	X	X	---	X	X	X
	SD-07B (DUP)	I	10/18/2012	X	X	X	X	---	X	X	X
	SD-08	II	4/16/2013	---	---	---	---	---	X	X	X
	SD-08B (DUP)	II	4/16/2013	---	---	---	---	---	X	X	X
	SD-09	II	4/16/2013	---	---	---	---	---	X	X	X

NOTE:
RI = Remedial investigation
VOC = Volatile organic compound
SVOC = Semivolatile organic compound
PCB = Polychlorinated biphenyl
TOC = Total organic carbon
--- = Analysis not requested
X = Analysis conducted
DUP = Duplicate field sample

Laboratory analyses completed by Chemtech Consulting Group for the indicated Target Compound List (TCL)/Target Analyte List (TAL) constituents. TCL SVOCs by U.S. Environmental Protection Agency (EPA) Method 8270C; TCL VOCs by EPA Method 8260B; TAL metals including mercury by EPA Method 6010B/7470A/7471A; TCL pesticides by EPA Method 8081A; TCL PCBs by EPA Method 8082; Cyanide - a TAL inorganic constituent by EPA Method 9010B; and TOC by Lloyd Kahn for sediment, or hardness by SM 2320 for surface water.

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TABLE 2-1E OUTFALL STORMWATER AND SURFACE SOIL SAMPLES AND LABORATORY ANALYSES

Area	Sample Name	RI Phase	Date	VOCs	SVOCs	Pesticides	PCBs	Hardness	TOC	Metals	Cyanide
Outfall, northeast of site	SW-03	I	11/7/2012	X	X	X	X	X	---	X	X
	SD-03 (0-6")	I	10/26/2012	X	X	X	X	---	X	X	X
Outfall, northwest of site	SW-04	I	11/7/2012	X	X	X	X	X	---	X	X
	SW-04 (DUP)	I	11/7/2012	---	X	---	---	X	---	X	X
	SD-04 (0-6")	I	10/18/2012	X	X	X	X	---	X	X	X
Outfall, stormsewer	SD-03A (0-6")	I	10/18/2012	X	X	X	X	---	X	X	X

NOTE:
RI = Remedial investigation
VOC = Volatile organic compound
SVOC = Semivolatile organic compound
PCB = Polychlorinated biphenyl
TOC = Total organic carbon
X = Analysis conducted
--- = Analysis not requested
DUP = Duplicate field sample

Laboratory analyses completed by Chemtech Consulting Group for the indicated Target Compound List (TCL)/Target Analyte List (TAL) constituents. TCL SVOCs by U.S. Environmental Protection Agency (EPA) Method 8270C; TCL VOCs by EPA Method 8260B; TAL metals including mercury by EPA Method 6010B/7470A/7471A; TCL pesticides by EPA Method 8081A; TCL PCBs by EPA Method 8082; Cyanide - a TAL inorganic constituent by EPA Method 9010B; TOC by Lloyd Kahn, or hardness by SM 2320.

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TABLE 2-2 MONITORING WELL CONSTRUCTION DETAILS

Well ID	Well Type[a]	Installation Date	Easting	Northing	Well Completion	Ground Surface Elevation (ft amsl)	Elevation Top of casing (ft amsl)	Well Diameter (in.)	Total Depth (ft bgs)	Screen Midpoint (ft bgs)	Screened Interval (ft bgs)
MW-01	Destroyed	4/7/2005	---	---	Flush	595.48	597.53	2	22.00	17.00	11.0 - 21.0
MW-02	Decommissioned	4/7/2005	---	---	Stick-up	595.70	598.03	2	25.00	20.00	14.0 - 24.0
MW-02A	Overburden - PVC	10/29/2012	1084753.7	1027450.4	Stick-up	595.70	598.19	2	29.60	24.60	19.60 - 29.60
MW-03	Destroyed	4/7/2005	---	---	Flush	596.35	596.03	2	31.00	26.00	20.0 - 30.0
MW-03A	Overburden - PVC	10/31/2012	1084602.8	1027162.3	Flush	596.40	596.14	2	29.92	24.92	19.92 - 29.92
MW-04	Overburden - PVC	11/5/2012	1084710.8	1026893.5	Flush	596.45	596.22	2	29.64	24.64	19.64 - 29.64
MW-05	Overburden - PVC	11/2/2012	1084807.6	1027317.9	Flush	596.33	596.03	2	30.02	25.02	20.02 - 30.02
MW-06	Overburden - PVC	11/1/2012	1084566.4	1027339.1	Flush	595.07	594.80	2	29.45	24.45	19.45 - 29.45
MW-07	Overburden - PVC	11/5/2012	1084651.7	1027450.3	Flush	595.41	595.15	2	27.14	22.14	17.14 - 27.14
MW-08	Overburden - PVC	11/6/2012	1084456.2	1027476.6	Flush	593.56	593.42	2	23.06	18.06	13.06 - 23.06

(a) Previously installed monitoring wells MW-01 and MW-03 could not be located and are assumed to be destroyed.

NOTE:
ID = Identification
ft = Feet
amsl = Above mean sea level
in. = Inches
bgs = below ground surface
--- = Unknown
PVC = Polyvinyl chloride

Northing and Easting coordinates are in New York State Plane Coordinate System, Western Zone, NAD 83 (CORS 96) Datum

Vertical values are referenced to the North American Vertical Datum of 1988 (NAVD 88)

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TABLE 3-1 FILL THICKNESS OBSERVED AT SOIL BORING LOCATIONS

RI Area of Concern	General Area	Location Name	Ground Surface Elevation (ft amsl)	Date Completed	Total Depth of Boring (ft)	Fill Thickness (ft)	Elevation of Native Material (ft amsl)
On-Site	Ramp	SB-11	604.2	11/8/2012	18.0	14.0	590.2
		SB-12	609.5	11/8/2012	21.0	12.0	597.5
		SB-13	614.0	11/8/2012	25.0	23.0	591.0
	Northern	MW-02A	595.7	11/8/2012	29.6	6.0	589.7
		MW-07	595.4	11/8/2012	27.1	4.5	590.9
		SB-14	594.2	11/8/2012	12.0	3.0	591.2
		SB-15	595.0	11/8/2012	12.0	4.0	591.0
	Southern/DPW	MW-04	596.5	11/8/2012	29.6	2.0	594.5
	Western	MW-03A	596.4	11/8/2012	29.9	4.0	592.4
		MW-06	595.1	11/8/2012	29.5	2.0	593.1
		SB-16	595.5	11/8/2012	16.0	2.0	593.5
		SB-17	595.5	11/8/2012	12.0	1.0	594.5
		SB-18	596.4	11/8/2012	28.0	4.5	591.9
Stadium Property	Western	SB-05	595.0	11/8/2012	8.0	0.0	595.0
		SB-06	595.6	11/8/2012	8.0	0.0	595.6
		SB-07	595.7	11/8/2012	12.0	2.0	593.7
		SB-20	595.4	5/7/2013	8.0	0.0	595.4
		SB-21	595.1	5/7/2013	8.0	2.0	593.1
Baker Hall Property	Adjoining to East	SB-49	595.6	8/15/2013	2.0	0.0	595.6
	Northern	SB-41	594.6	7/8/2013	2.0	0.0	594.6
		SB-42	594.9	7/8/2013	2.0	0.0	594.9
		SB-22	596.4	5/7/2013	7.0	1.0	595.4
		SB-23	596.3	5/7/2013	8.0	3.0	593.3
		SB-24	595.7	5/7/2013	8.0	0.5	595.2
	Northeastern	SB-44	594.4	7/8/2013	2.0	0.0	594.4
		SB-45	596.1	7/8/2013	2.0	0.0	596.1
		SB-47	594.5	7/8/2013	2.0	0.0	594.5
		SB-48	595.3	7/8/2013	2.0	0.0	595.3
	Northwestern	MW-05	596.3	11/8/2012	30.0	3.0	593.3
		SB-08	597.1	11/8/2012	8.0	4.0	593.1
		SB-09	595.6	11/8/2012	8.0	0.2	595.4
	Western boundary	SB-10	595.7	11/8/2012	8.0	4.0	591.7
		SB-25	597.2	5/7/2013	8.0	0.0	597.2
Smokes Creek Corridor	Cemetery/North of Creek	SB-37	596.6	7/8/2013	2.0	2.0	594.6
		SB-38	596.3	7/8/2013	2.0	1.0	595.3
		SB-39	596.3	7/8/2013	2.0	2.0	594.3

NOTE:
RI = Remedial Investigation
ft = Feet
amsl = Above mean sea level
DPW = Department of Public Works

TABLE 3-1 FILL THICKNESS OBSERVED AT SOIL BORING LOCATIONS (CONTINUED)

RI Area of Concern	General Area	Location Name	Ground Surface Elevation (ft amsl)	Date Completed	Total Depth of Boring (ft)	Fill Thickness (ft)	Elevation of Native Material (ft amsl)
Smokes Creek Corridor	Eastern	SB-50	595.8	8/15/2013	2.0	1.0	594.8
		SB-51	597.0	8/15/2013	2.0	1.5	595.5
		SB-52	597.6	8/15/2013	2.0	1.5	596.1
		SB-53	596.5	8/15/2013	2.0	2.0	594.5
		SB-54	600.1	8/15/2013	2.0	2.0	598.1
		SB-55	599.2	3/3/2014	12.0	6.0	593.2
		SB-56	596.3	3/3/2014	4.0	0.0	596.3
		SB-57	596.8	3/3/2014	4.0	0.0	596.8
		SB-58	597.0	3/3/2014	4.0	0.0	597.0
		SB-59	598.5	3/3/2014	4.0	0.0	598.5
		SB-60	597.6	3/3/2014	2.0	0.0	597.6
Smokes Creek Corridor	North of Site	SD-06FP	583.0	11/8/2012	4.0	0.0	583.0
		SD-10FP	582.9	5/7/2013	4.0	0.0	582.9
		SD-11FP	582.8	5/7/2013	4.0	0.0	582.8
		SD-12FP	582.8	5/7/2013	4.0	0.0	582.8
	North of Baker Hall	SB-40	596.3	7/8/2013	2.0	1.0	595.3
		SB-43	595.3	7/8/2013	2.0	1.0	594.3
		SB-46	595.5	7/8/2013	2.0	0.8	594.7
Smokes Creek Corridor	Western	MW-08	593.6	11/8/2012	23.1	5.0	588.6
		SB-19	593.5	5/7/2013	7.0	4.0	589.5
		SB-34	593.6	7/8/2013	4.0	2.0	591.6
		SB-35	592.8	7/8/2013	4.0	3.5	589.3
		SB-36	593.3	7/8/2013	4.0	2.0	591.3

TABLE 3-2 GROUNDWATER ELEVATIONS

Well ID	Elevation TIC (ft amsl)	Groundwater Elevation (ft amsl)			
		11/7-8/2012[(a)]	11/28-29/2012[(b)]	3/11/2013[(c)]	4/16/2013
MW-02A	598.19	583.75	584.35	585.57	585.65
MW-03A	596.14	589.93	588.61	586.78	589.51
MW-04	596.22	571.56	587.77	589.54	589.79
MW-05	596.03	584.98	585.69	588.21	588.29
MW-06	594.80	587.41	587.57	587.76	587.76
MW-07	595.15	583.93	584.47	585.74	585.50
MW-08	593.42	582.50	583.08	583.71	583.55

(a) November 7-8, 2012 measurements made prior to development.
(b) November 28-29, 2012 measurements made prior to groundwater sampling.
(c) March 11, 2013 measurements made during air sampling event.
(d) April 16, 2013 measurements were made prior to groundwater sampling.

NOTE:
ID = Identification
TIC = Top of inner well casing
ft = Feet
amsl = Above mean sea level

TABLE 4-1A COMPARISON OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - ON-SITE AREA

Area	**NYSDEC**	**South On-Site**	**North On-Site**	**Ramp**				**North On-Site**	**West On-Site**			
Sample Name	**Unrestricted Use**	**SS-01**	**SS-02**	**SS-11**	**SS-12**	**SS-12 (DUP)**	**SS-13**	**SS-14**	**SS-15**	**SS-16**	**SS-17**	**SS-18**
Sample Date	**SCOs[(a)] (mg/kg)**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**10/24/2012**
Barium	350	138 J	24.4 J	201 J	158 J	100 J	146 J	**399 J**	54.5 J	80.6 J	72.4 J	56.4 J
Cadmium	2.5	1.53 J	0.400 J	**2.78 J**	**4.73 J**	**6.15 J**	**2.83 J**	**22 J**	0.920 J	0.690 J	0.960 J	0.650 J
Chromium	30	26.9 J	8.32 J	26.1 J	**513 J**	**506 J**	**49.6 J**	**60.5 J**	10.4 J	10.2 J	12.4 J	10.8 J
Copper	50	25.2 J	13.2 J	**80.4 J**	**63 J**	35.5 J	**51 J**	**406 J**	15.3 J	20.3 J	27.5 J	20 J
Cyanide, Total	27	0.151 J	0.298 U	0.658	0.060 J	0.139 J	0.099 J	0.091 J	0.064 J	0.305 U	0.067 J	0.043 J
Lead	63	**88.7 J**	28.5 J	**401 J**	**169 J**	**168 J**	**146 J**	**2,330 J**	52.7 J	58.6 J	**88.9 J**	**66.4 J**
Manganese	1,600	**1,610 J**	163 J	993 J	**4,190 J**	**3,080 J**	1,430 J	1,180 J	628 J	538 J	625 J	355 J
Mercury	0.18	0.046 J	0.075 J	**0.326 J**	0.041 J	0.031 J	0.048 J	**0.261 J**	0.030 J	0.078 J	0.036 J	0.070 J
Nickel	30	17.2 J	14.6 J	28.3 J	**40.8 J**	**40.3 J**	**42.3 J**	**80.6 J**	11.8 J	21.2 J	15.4 J	23.7 J
Selenium	3.9	**5.25**	2.21	**6.38**	**13.3**	**15.2**	**6.93**	**14.8**	2.21	3.42	2.81	3.04
Zinc	109	**312**	67.9	**711**	**188**	**210**	**368**	**1,840**	93	**117**	**149**	107

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use Soil Cleanup Objectives. December.

NOTE:
- NYSDEC = New York State Department of Environmental Conservation
- SCO = Soil Cleanup Objective
- mg/kg = Milligrams per kilogram
- DUP = Duplicate field sample.
- J = Estimated concentration.
- U = Not detected; the associated value is the detection limit.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000.
Data Validation completed by Data Validation Services.
Table includes only those contituents that exceed the indicated SCO in one or more samples.
Bolded concentrations exceed the indicated SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

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TABLE 4-1B COMPARISON OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA

Area	NYSDEC Restricted Residential SCOs[a] (mg/kg)	NYSDEC Commercial SCOs[a] (mg/kg)	South On-Site	North On-Site	Ramp			
Sample Name			SS-01	SS-02	SS-11	SS-12	SS-12 (DUP)	SS-13
Sample Date			10/24/2012	10/24/2012	10/24/2012	10/24/2012	10/24/2012	10/24/2012
Cadmium	4.3	9.3	1.53 J	0.400 J	2.78 J	**4.73 J**	**6.15 J**	2.83 J
Chromium	180	1,500	26.9 J	8.32 J	26.1 J	**513 J**	**506 J**	49.6 J
Copper	270	270	25.2 J	13.2 J	80.4 J	63 J	35.5 J	51 J
Lead	400	1,000	88.7 J	28.5 J	**401 J**	169 J	168 J	146 J
Manganese	2,000	10,000	1,610 J	163 J	993 J	**4,190 J**	**3,080 J**	1,430 J

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Restricted Residential and Commercial Use Soil Cleanup Objectives. December.

NOTE:
- NYSDEC = New York State Department of Environmental Conservation
- SCO = Soil Cleanup Objective
- mg/kg = Milligrams per kilogram
- DUP = Duplicate field sample.
- J = Estimated concentration.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000.
Data Validation completed by Data Validation Services.
Table includes only those constituents that exceed the indicated SCO in one or more samples.
Bolded concentrations exceed the Restricted Residential SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-1B COMPARISON OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	NYSDEC Restricted Residential SCOs[a] (mg/kg)	NYSDEC Commercial SCOs[a] (mg/kg)	North On-Site	West On-Site			
Sample Name			SS-14	SS-15	SS-16	SS-17	SS-18
Sample Date			10/24/2012	10/24/2012	10/24/2012	10/24/2012	10/24/2012
Cadmium	4.3	9.3	**22 J**	0.920 J	0.690 J	0.960 J	0.650 J
Chromium	180	1,500	60.5 J	10.4 J	10.2 J	12.4 J	10.8 J
Copper	270	270	**406 J**	15.3 J	20.3 J	27.5 J	20 J
Lead	400	1,000	**2,330 J**	52.7 J	58.6 J	88.9 J	66.4 J
Manganese	2,000	10,000	1,180 J	628 J	538 J	625 J	355 J
NOTE:	Shaded concentrations exceed the Commercial SCOs.						

TABLE 4-2A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - ON-SITE AREA

Area	**NYSDEC Unrestricted Use SCOs[(a)] (mg/kg)**	**North On-Site**				**West On-Site**		**Upgradient**			**West On-Site**
Sample Name		**MW-02A(0-1')**	**MW-02A(2-3')**	**MW-02A(6-7')**	**MW-02A(8-10')**	**MW-03A(0-2')**	**MW-03A(4-6')**	**MW-04(0-2')**	**MW-04(2-4')**	**MW-04(4-6')**	**MW-06(0-2')**
Sample Date		**10/29/2012**	**10/29/2012**	**10/29/2012**	**10/29/2012**	**10/31/2012**	**10/31/2012**	**11/2/2012**	**11/2/2012**	**11/2/2012**	**10/31/2012**
Arsenic	13	**24**	**28**	**13**	**14**	4.5 U	9.5	**15**	6.0	12	10
Barium	350	**430**	**900**	99	76	70	50	92	68	83	87
Cadmium	2.5	**6.5**	**6.6**	0.720 U	0.710 U	0.720	0.800 U	1.1	0.780 U	0.740 U	1.4
Chromium	30	**67**	**130**	19	18	**52**	12	9.7 J	12 J	19 J	20
Copper	50	**360**	**650**	33	30	45	26	28 J	21 J	33 J	37
Cyanide, Total	27	NA	**66**	NA	NA	NA	NA	NA	0.310 UJ	NA	**150 J**
Lead	63	**2,300 J**	**1,500 J**	19 J	16 J	**76 J**	9.8 J	**130 J**	9.7 J	19 J	**200 J**
Manganese	1,600	1,300 J	**1,600 J**	700 J	450 J	1,000 J	470 J	140 J	270 J	860 J	680 J
Mercury	0.18	**0.27**	**1.0**	0.100 U	0.099 U	0.095 U	0.110 U	0.120 U	0.110 U	0.100 U	0.100 U
Nickel	30	**85**	**130**	**37**	**32**	11	21	11 J	17 J	**37 J**	25
Silver	2	**26**	1.8 U	1.8 U	1.8 U	3.4 U	2 U	**5.1 J**	**3.1 J**	**4.6 J**	1.8 U
Zinc	109	**1,900 J**	**2,900 J**	82 J	77 J	**170 J**	62 J	**170**	54	78	**220 J**

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use SCOs. December.

NOTE:

NOTE:	NYSDEC	= New York State Department of Environmental Conservation
	SCO	= Soil Cleanup Objective
	mg/kg	= Milligrams per kilogram
	U	= Not detected; the associated value is the detection limit.
	J	= Estimated concentration.
	NA	= Not analyzed.
	D	= Result obtained from a diluted sample analysis.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000.
Data Validation completed by Data Validation Services.
Table includes only those contituents that exceed the indicated SCO in one or more samples.
Bolded concentrations exceed the indicated SCO.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-2A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	**NYSDEC**	**West On-Site**			**North On-Site**					**Ramp**
Sample Name	**Unrestricted Use**	**MW-06(0-2') (DUP)**	**MW-06(2-4')**	**MW-06(4-6')**	**MW-07(0-2')**	**MW-07(2-4')**	**MW-07(2-4') (DUP)**	**MW-07(4-6')**	**MW-07(6-8')**	**SB-11(0-2')**
Sample Date	**SCOs[(a)] (mg/kg)**	**10/31/2012**	**10/31/2012**	**10/31/2012**	**11/5/2012**	**11/5/2012**	**11/5/2012**	**11/5/2012**	**11/5/2012**	**11/6/2012**
Arsenic	13	6.1	**14**	10	**15**	**14**	12	**15**	11	8.85 J
Barium	350	78	110	110	**480**	**1,200 J**	**390 J**	320	93	96.4
Cadmium	2.5	0.830	0.740 U	0.740 U	**8.5**	**3.1 J**	1.4 J	1.5	0.720 U	0.780
Chromium	30	15	22	22	**53 J**	**46 J**	**73 J**	28 J	18 J	17.9 J
Copper	50	25	31	32	**240 J**	**190 J**	**250 J**	**110 J**	30 J	16.9 J
Cyanide, Total	27	8.5 J	NA	NA	NA	**170 J**	**90 J**	NA	NA	NA
Lead	63	**86 J**	18 J	16 J	**750 J**	**660 J**	**820 J**	**440 J**	15 J	26.7 J
Manganese	1,600	510 J	580 J	700 J	950 J	360 J	430 J	360 J	470 J	313 J
Mercury	0.18	0.099 U	0.100 U	0.100 U	**0.24**	**0.31**	**0.23**	**0.27**	0.100 U	0.041
Nickel	30	14	**37**	**39**	**65 J**	**32 J**	**40 J**	**32 J**	**31 J**	**38.4 J**
Silver	2	1.8 U	1.9 U	1.9 U	**6.8 J**	**6.3 J**	1.8 UJ	1.9 U	1.8 U	1.47 J
Zinc	109	**150 J**	88 J	87 J	**1,300**	**1,300 J**	**760 J**	**530**	74.0	74.7
NOTE: DUP	= Duplicate field sample.									

TABLE 4-2A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	NYSDEC	Ramp									
Sample Name	**Unrestricted Use**	**SB-11(2-4')**	**SB-11(4-6')**	**SB-11(4-6') (DUP)**	**SB-11(6-8')**	**SB-11(8-10')**	**SB-11(10-12')**	**SB-11(12-14')**	**SB-11(14-16')**	**SB-11(16-18')**	**SB-12A(0-2')**
Sample Date	**SCOs[(a)] (mg/kg)**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**10/26/2012**
Arsenic	13	7.54 J	8.49 J	5.23 J	6.1 J	8.27 J	11.3 J	**14.4 J**	7.23 J	9.07 J	6.57 J
Barium	350	333	109	120	195	120	288	**588**	74.6	72.6	73.5 J
Cadmium	2.5	**2.57**	0.760	0.650	1.97	1.13	1.55	**3.73**	0.470	0.680	0.660 J
Chromium	30	18 J	17.8 J	15 J	**63.2 J**	18.5 J	26 J	**36.1 J**	16.8 J	18.1 J	**49.1 J**
Copper	50	**58.3 J**	**64 J**	20.1 J	38.4 J	24.7 J	**107 J**	**139 J**	23.6 J	21.7 J	20.7 J
Cyanide, Total	27	NA	0.152 J	0.096 J	NA	NA	NA	NA	NA	NA	0.342
Lead	63	**630 J**	**246 J**	**70.8 J**	**266 J**	**901 J**	**421 J**	**4,120 J**	25.3 J	23.6 J	**66.7 J**
Manganese	1,600	462 J	529 J	352 J	1,440 J	393 J	425 J	561 J	412 J	236 J	1,020 J
Mercury	0.18	0.142	0.067 J	0.034 J	0.102	0.098	0.144	0.031	0.018	0.018	0.130
Nickel	30	**38.2 J**	**30.7 J**	**31.1 J**	**34.6 J**	**41.1 J**	**38.6 J**	**41.3 J**	**47.8 J**	**39 J**	22.3 J
Silver	2	**2.41 J**	1.55 J	1.12 J	**2.37 J**	1.7 J	1.96 J	**3.35 J**	1.37 J	1.41 J	0.870 J
Zinc	109	**666**	**137**	**126**	**371**	**153**	**465**	**4,040 D**	79.7	81.2	**111 J**

NOTE: D = Result obtained from a diluted sample analysis.

TABLE 4-2A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	NYSDEC	Ramp									
Sample Name	Unrestricted Use	SB-12A(0-2') (DUP)	SB-12(8-10')	SB-12(12-14')	SB-12(14-16')	SB-12(16-18')	SB-12(18-20')	SB-13(0-4')	SB-13(4-8')	SB-13(8-10')	SB-13(10-12')
Sample Date	SCOs[a] (mg/kg)	10/26/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012
Arsenic	13	5.36 J	8.13 J	10.5 J	11.5 J	9.48 J	10.4 J	4.48	**19.7**	9.06	**21.5**
Barium	350	81.9 J	173 J	101 J	73 J	145 J	113 J	53.3 J	**584 J**	106 J	**397 J**
Cadmium	2.5	**2.9 J**	1.95	1.68	1.45	**4.42**	1.73	0.820	**42.7**	1.33	**17.1**
Chromium	30	**148 J**	17 J	16.9 J	15.2 J	**134 J**	16.7 J	8.58 J	**89.9 J**	13.1 J	**50.4 J**
Copper	50	48.8 J	**63.5 J**	30.2 J	23.8 J	**67.2 J**	27.8 J	13.8 J	**309 J**	32.2 J	**684 J**
Cyanide, Total	27	0.471	NA	NA	NA	NA	NA	0.285 J	NA	0.197 J	NA
Lead	63	**191 J**	**464**	51.9	25.4	**810**	**112**	47.8	**5,470**	43.9	**2,040**
Manganese	1,600	**2,080 J**	419 J	418 J	359 J	1,380 J	534 J	482 J	1,170 J	334 J	776 J
Mercury	0.18	0.112	0.124	0.016	0.151	0.131	0.023	0.066	0.096	0.027	0.032
Nickel	30	27.3 J	**35.8**	**44.2**	**43.9**	**36.3**	**43.4**	16.4	**147**	**41.8**	**342**
Silver	2	0.740 J	1.65	1.59	1.75	**2.39**	1.63	0.540	0.240 U	**2.09**	1.58
Zinc	109	**293 J**	**364**	**112**	81.8	**583**	**132**	**139**	**1,760**	**149**	**1,990**

TABLE 4-2A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	NYSDEC	Ramp				North On-Site					
Sample Name	**Unrestricted Use**	**SB-13(12-14')**	**SB-13(16-18')**	**SB-13(20-22')**	**SB-13(23-25')**	**SB-14(0-2')**	**SB-14(0-2') (DUP)**	**SB-14(2-4')**	**SB-14(4-6')**	**SB-14(6-8')**	**SB-14(8-10')**
Sample Date	**SCOs[(a)] (mg/kg)**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**
Arsenic	13	10.2	11.8	**51.5**	6.23	7.65 J	11.2	8.11 J	8.98 J	4.75 J	7.5 J
Barium	350	88.3 J	281 J	**1,500 J**	76.3 J	50.7 J	91.7 J	29.7 J	72.3 J	50.9 J	80.5 J
Cadmium	2.5	1.62	**3.98**	**19.5**	0.970	0.740 J	1.43 J	0.840	1.29	1.03	1.20
Chromium	30	13.6 J	19.7 J	**67.1 J**	13.8 J	9.1 J	17.5 J	7.97 J	15.4 J	15.9 J	16.2 J
Copper	50	28.6 J	**178 J**	**1,510 J**	21 J	25.2 J	25.8 J	20.7 J	22.4 J	27.1 J	23 J
Cyanide, Total	27	NA	NA	0.711	NA	0.292 U	0.307 U	NA	NA	NA	NA
Lead	63	35.5	**789**	**6,820**	20.3	34.1	31.3	42.3	22.9	19.8	23.3
Manganese	1,600	403 J	381 J	643 J	323 J	390 J	471 J	213 J	199 J	232 J	385 J
Mercury	0.18	0.021	**0.607 D**	0.090	0.011 J	0.026	0.034	0.013	0.013	0.015	0.014
Nickel	30	**50.2**	**50.7**	**59.0**	**38.3**	**33.7**	**52.2**	24.8	**40.9**	**41.9**	**44.8**
Silver	2	1.65	**2.47**	**6.21**	1.47	1.64	**2.06**	1.05	1.47	1.48	1.70
Zinc	109	**142**	**794**	**4,910 D**	77.9	**601 J**	91.4 J	**255**	85.3	84.3	97.2

TABLE 4-2A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	NYSDEC	North On-Site						West On-Site			
Sample Name	Unrestricted Use	SB-14(10-12')	SB-15(0-2')	SB-15(2-4')	SB-15(4-6')	SB-15(6-8')	SB-15(8-10')	SB-16(0-2')	SB-16(2-4')	SB-16(4-6')	SB-16(6-8')
Sample Date	SCOs[(a)] (mg/kg)	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012
Arsenic	13	7.83 J	6.43	12.4	9.95	10.8	5.60	3.03 J	3.76 J	9.3 J	**24.2 J**
Barium	350	73 J	91.2 J	99.8 J	76.5 J	72.9 J	50.2 J	66.1 J	262 J	92.1 J	94.6 J
Cadmium	2.5	1.34	2.16	1.32	1.27	1.45	0.970	0.900	2.39	1.14	1.78
Chromium	30	15.9 J	15.7 J	15.8 J	14.5 J	13.4 J	13.1 J	5.87 J	8.39 J	16.6 J	15.6 J
Copper	50	23.2 J	26.6 J	24.4 J	22.7 J	21.1 J	21 J	9.22 J	6.59 J	23.3 J	25.2 J
Cyanide, Total	27	NA	0.545	NA	NA	NA	NA	NA	NA	NA	NA
Lead	63	23.3	**99.7**	27.9	21.8	23.1	21.2	54.7	**96.4**	25.0	26.7
Manganese	1,600	381 J	268 J	639 J	421 J	355 J	229 J	569 J	1,490 J	370 J	821 J
Mercury	0.18	0.013	**0.704 D**	0.016	0.013	0.014	0.017	0.061	0.012	0.019	0.013
Nickel	30	**44.3**	**30.3**	**48.2**	**44.6**	**45.2**	**35.8**	9.84	13.3	**42.8**	**73.5**
Silver	2	1.42	1.50	**2.03**	1.51	1.58	1.35	0.430	1.18	1.72	1.79
Zinc	109	92.1	**467**	86.3	82.7	77.8	70.9	96.9	**263**	84.7	95.9

TABLE 4-2A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	**NYSDEC**	**West On-Site**									
Sample Name	**Unrestricted Use**	**SB-16(8-10')**	**SB-16(10-12')**	**SB-16(12-14')**	**SB-16(14-16')**	**SB-17(0-2')**	**SB-17(2-4')**	**SB-17(4-6')**	**SB-17(6-8')**	**SB-17(8-10')**	**SB-17(10-12')**
Sample Date	**SCOs[(a)] (mg/kg)**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**
Arsenic	13	5.21	12.6	8.46	6.03	7.10	2.97 J	11.7 J	9.81 J	6.59 J	7.93 J
Barium	350	66.4 J	56.2 J	72.7 J	21.3 J	71.7 J	52.6 J	98.7 J	87.8 J	87.3 J	56.8 J
Cadmium	2.5	1.00	1.14	1.37	0.690	2.25	0.170	1.65	1.63	0.790	1.28
Chromium	30	14.3 J	12.2 J	15.2 J	6.98 J	18.7 J	6.85 J	16.9 J	14.8 J	15.3 J	13.8 J
Copper	50	24 J	19.6 J	23.2 J	16.5 J	25.6 J	4.47 J	26.7 J	23.7 J	21.1 J	22.4 J
Cyanide, Total	27	NA	NA	NA	NA	NA	0.136 J	NA	NA	NA	NA
Lead	63	20.7	23	23.5	12.8	**133**	11.7	31.3	26	27.6	22.5
Manganese	1,600	207 J	236 J	379 J	278 J	561 J	69.8 J	455 J	665 J	240 J	212 J
Mercury	0.18	0.014	0.014	0.014	0.013	0.025	0.052	0.015	0.014	0.014	0.015
Nickel	30	**35.5**	**38.6**	**45.6**	22.6	**31.8**	5.17	**55**	**53.7**	**50**	**39.4**
Silver	2	1.37	1.63	1.68	0.720	1.48	0.300	**2.06**	1.50	1.02	1.29
Zinc	109	74.8	72.7	85.7	45.7	**245**	20.8	89.8	80.0	83.6	74.8

TABLE 4-2A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	NYSDEC	West On-Site				
Sample Name	**Unrestricted Use**	**SB-18(0-2')**	**SB-18(0-2') (DUP)**	**SB-18(2-4')**	**SB-18(8-10')**	**SB-18(10-12')**
Sample Date	**SCOs[(a)] (mg/kg)**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**
Arsenic	13	3.39 J	**41.1 J**	1.51 J	11.7 J	7.08 J
Barium	350	65.9 J	50.4 J	98.5 J	68 J	65.5 J
Cadmium	2.5	1.33 J	2.17 J	0.930 J	0.970 J	1.24 J
Chromium	30	16.9 J	21.6 J	6.23 J	13.9 J	13.3 J
Copper	50	23.1 J	45 J	11 J	25.8 J	26.8 J
Cyanide, Total	27	0.273 J	0.175 J	NA	NA	NA
Lead	63	**81.1 J**	**84.2**	41.5	20.5	22.1
Manganese	1,600	615 J	417 J	854 J	233 J	361 J
Mercury	0.18	0.079 J	**0.223 J**	0.011 J	0.017	0.016
Nickel	30	11.9 J	12.7 J	5.59 J	**34.5 J**	**38.7 J**
Silver	2	0.880 J	0.290 J	0.320 J	0.870 J	0.760 J
Zinc	109	**183 J**	**118 J**	**223 J**	71.6 J	67 J

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA

Area	NYSDEC Restricted Residential SCOs[a] (mg/kg)	NYSDEC Commercial SCOs[a] (mg/kg)	North On-Site				West On-Site		Upgradient
Sample Name			**MW-02A(0-1')**	**MW-02A(2-3')**	**MW-02A(6-7')**	**MW-02A(8-10')**	**MW-03A(0-2')**	**MW-03A(4-6')**	**MW-04(0-2')**
Sample Date			**10/29/2012**	**10/29/2012**	**10/29/2012**	**10/29/2012**	**10/31/2012**	**10/31/2012**	**11/2/2012**
Arsenic	16	16	**24**	**28**	13	14	4.5 U	9.5	15
Barium	400	400	**430**	**900**	99	76	70	50	92
Cadmium	4.3	9.3	**6.5**	**6.6**	0.720 U	0.710 U	0.720	0.800 U	1.1
Copper	270	270	**360**	**650**	33	30	45	26	28 J
Cyanide, Total	27	27	NA	**66**	NA	NA	NA	NA	NA
Lead	400	1,000	**2,300 J**	**1,500 J**	19 J	16 J	76 J	9.8 J	130 J
Manganese	2,000	10,000	1,300 J	1,600 J	700 J	450 J	1,000 J	470 J	140 J
Mercury	0.81	2.8	0.270	**1.00**	0.100 U	0.099 U	0.095 U	0.110 U	0.120 U
Nickel	310	310	85	130	37	32	11	21	11 J

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Restricted Residential and Commercial Use Soil Cleanup Objectives. December.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
U = Not detected; the associated value is the detection limit.
J = Estimated concentration.
NA = Not analyzed.
Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000.
Data Validation completed by Data Validation Services.
Table includes only those constituents that exceed the indicated SCO in one or more samples.
Bolded concentrations exceed the Restricted Residential SCOs.
Shaded concentrations exceed the Commercial SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	**NYSDEC Restricted Residential SCOs[a] (mg/kg)**	**NYSDEC Commercial SCOs[a] (mg/kg)**	**Upgradient**		**West On-Site**				**North On-Site**
Sample Name			**MW-04(2-4')**	**MW-04(4-6')**	**MW-06(0-2')**	**MW-06(0-2') (DUP)**	**MW-06(2-4')**	**MW-06(4-6')**	**MW-07(0-2')**
Sample Date			**11/2/2012**	**11/2/2012**	**10/31/2012**	**10/31/2012**	**10/31/2012**	**10/31/2012**	**11/5/2012**
Arsenic	16	16	6.0	12	10	6.1	14	10	15
Barium	400	400	68	83	87	78	110	110	**480**
Cadmium	4.3	9.3	0.780 U	0.740 U	1.4	0.830	0.740 U	0.740 U	**8.5**
Copper	270	270	21 J	33 J	37	25	31	32	240 J
Cyanide, Total	27	27	0.310 UJ	NA	**150 J**	8.5 J	NA	NA	NA
Lead	400	1,000	9.7 J	19 J	200 J	86 J	18 J	16 J	**750 J**
Manganese	2,000	10,000	270 J	860 J	680 J	510 J	580 J	700 J	950 J
Mercury	0.81	2.8	0.110 U	0.100 U	0.100 U	0.099 U	0.100 U	0.100 U	0.240
Nickel	310	310	17 J	37 J	25	14	37	39	65 J

NOTE: DUP = Duplicate field sample.

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	**NYSDEC Restricted Residential SCOs[(a)] (mg/kg)**	**NYSDEC Commercial SCOs[(a)] (mg/kg)**	**North On-Site**				**Ramp**		
Sample Name			**MW-07(2-4')**	**MW-07(2-4') (DUP)**	**MW-07(4-6')**	**MW-07(6-8')**	**SB-11(0-2')**	**SB-11(2-4')**	**SB-11(4-6')**
Sample Date			**11/5/2012**	**11/5/2012**	**11/5/2012**	**11/5/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**
Arsenic	16	16	14	12	15	11	8.85 J	7.54 J	8.49 J
Barium	400	400	**1,200 J**	390 J	320	93	96.4	333	109
Cadmium	4.3	9.3	3.1 J	1.4 J	1.5	0.720 U	0.780	2.57	0.760
Copper	270	270	190 J	250 J	110 J	30 J	16.9 J	58.3 J	64 J
Cyanide, Total	27	27	**170 J**	**90 J**	NA	NA	NA	NA	0.152 J
Lead	400	1,000	**660 J**	**820 J**	**440 J**	15 J	26.7 J	**630 J**	246 J
Manganese	2,000	10,000	360 J	430 J	360 J	470 J	313 J	462 J	529 J
Mercury	0.81	2.8	0.310	0.230	0.270	0.100 U	0.041	0.142	0.067 J
Nickel	310	310	32 J	40 J	32 J	31 J	38.4 J	38.2 J	30.7 J

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	**NYSDEC Restricted Residential SCOs(a) (mg/kg)**	**NYSDEC Commercial SCOs(a) (mg/kg)**	**Ramp**						
Sample Name			**SB-11(4-6') (DUP)**	**SB-11(6-8')**	**SB-11(8-10')**	**SB-11(10-12')**	**SB-11(12-14')**	**SB-11(14-16')**	**SB-11(16-18')**
Sample Date			**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**
Arsenic	16	16	5.23 J	6.1 J	8.27 J	11.3 J	14.4 J	7.23 J	9.07 J
Barium	400	400	120	195	120	288	**588**	74.6	72.6
Cadmium	4.3	9.3	0.650	1.97	1.13	1.55	3.73	0.470	0.680
Copper	270	270	20.1 J	38.4 J	24.7 J	107 J	139 J	23.6 J	21.7 J
Cyanide, Total	27	27	0.096 J	NA	NA	NA	NA	NA	NA
Lead	400	1,000	70.8 J	266 J	**901 J**	**421 J**	**4,120 J**	25.3 J	23.6 J
Manganese	2,000	10,000	352 J	1,440 J	393 J	425 J	561 J	412 J	236 J
Mercury	0.81	2.8	0.034 J	0.102	0.098	0.144	0.031	0.018	0.018
Nickel	310	310	31.1 J	34.6 J	41.1 J	38.6 J	41.3 J	47.8 J	39 J

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	**NYSDEC Restricted Residential SCOs[a] (mg/kg)**	**NYSDEC Commercial SCOs[a] (mg/kg)**	**Ramp**						
Sample Name			**SB-12A(0-2')**	**SB-12A(0-2') (DUP)**	**SB-12(8-10')**	**SB-12(12-14')**	**SB-12(14-16')**	**SB-12(16-18')**	**SB-12(18-20')**
Sample Date			**10/26/2012**	**10/26/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**
Arsenic	16	16	6.57 J	5.36 J	8.13 J	10.5 J	11.5 J	9.48 J	10.4 J
Barium	400	400	73.5 J	81.9 J	173 J	101 J	73 J	145 J	113 J
Cadmium	4.3	9.3	0.660 J	2.9 J	1.95	1.68	1.45	**4.42**	1.73
Copper	270	270	20.7 J	48.8 J	63.5 J	30.2 J	23.8 J	67.2 J	27.8 J
Cyanide, Total	27	27	0.342	0.471	NA	NA	NA	NA	NA
Lead	400	1,000	66.7 J	191 J	**464**	51.9	25.4	**810**	112
Manganese	2,000	10,000	1,020 J	**2,080 J**	419 J	418 J	359 J	1,380 J	534 J
Mercury	0.81	2.8	0.130	0.112	0.124	0.016	0.151	0.131	0.023
Nickel	310	310	22.3 J	27.3 J	35.8	44.2	43.9	36.3	43.4

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	**NYSDEC Restricted Residential SCOs[(a)] (mg/kg)**	**NYSDEC Commercial SCOs[(a)] (mg/kg)**	**Ramp**						
Sample Name			**SB-13(0-4')**	**SB-13(4-8')**	**SB-13(8-10')**	**SB-13(10-12')**	**SB-13(12-14')**	**SB-13(16-18')**	**SB-13(20-22')**
Sample Date			**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**
Arsenic	16	16	4.48	**19.7**	9.06	**21.5**	10.2	11.8	**51.5**
Barium	400	400	53.3 J	**584 J**	106 J	397 J	88.3 J	281 J	**1,500 J**
Cadmium	4.3	9.3	0.820	**42.7**	1.33	**17.1**	1.62	3.98	**19.5**
Copper	270	270	13.8 J	**309 J**	32.2 J	**684 J**	28.6 J	178 J	**1,510 J**
Cyanide, Total	27	27	0.285 J	NA	0.197 J	NA	NA	NA	0.711
Lead	400	1,000	47.8	**5,470**	43.9	**2,040**	35.5	**789**	**6,820**
Manganese	2,000	10,000	482 J	1,170 J	334 J	776 J	403 J	381 J	643 J
Mercury	0.81	2.8	0.066	0.096	0.027	0.032	0.021	0.607 D	0.090
Nickel	310	310	16.4	147	41.8	**342**	50.2	50.7	59.0
NOTE: D = Result obtained from a diluted sample analysis.									

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	NYSDEC Restricted Residential SCOs[(a)] (mg/kg)	NYSDEC Commercial SCOs[(a)] (mg/kg)	Ramp	North On-Site					
Sample Name			**SB-13(23-25')**	**SB-14(0-2')**	**SB-14(0-2') (DUP)**	**SB-14(2-4')**	**SB-14(4-6')**	**SB-14(6-8')**	**SB-14(8-10')**
Sample Date			**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**
Arsenic	16	16	6.23	7.65 J	11.2	8.11 J	8.98 J	4.75 J	7.5 J
Barium	400	400	76.3 J	50.7 J	91.7 J	29.7 J	72.3 J	50.9 J	80.5 J
Cadmium	4.3	9.3	0.970	0.740 J	1.43 J	0.840	1.29	1.03	1.2
Copper	270	270	21 J	25.2 J	25.8 J	20.7 J	22.4 J	27.1 J	23 J
Cyanide, Total	27	27	NA	0.292 U	0.307 U	NA	NA	NA	NA
Lead	400	1,000	20.3	34.1	31.3	42.3	22.9	19.8	23.3
Manganese	2,000	10,000	323 J	390 J	471 J	213 J	199 J	232 J	385 J
Mercury	0.81	2.8	0.011 J	0.026	0.034	0.013	0.013	0.015	0.014
Nickel	310	310	38.3	33.7	52.2	24.8	40.9	41.9	44.8

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	NYSDEC Restricted Residential SCOs[(a)] (mg/kg)	NYSDEC Commercial SCOs[(a)] (mg/kg)	North On-Site						West On-Site
Sample Name			SB-14(10-12')	SB-15(0-2')	SB-15(2-4')	SB-15(4-6')	SB-15(6-8')	SB-15(8-10')	SB-16(0-2')
Sample Date			10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012
Arsenic	16	16	7.83 J	6.43	12.4	9.95	10.8	5.6	3.03 J
Barium	400	400	73 J	91.2 J	99.8 J	76.5 J	72.9 J	50.2 J	66.1 J
Cadmium	4.3	9.3	1.34	2.16	1.32	1.27	1.45	0.970	0.900
Copper	270	270	23.2 J	26.6 J	24.4 J	22.7 J	21.1 J	21 J	9.22 J
Cyanide, Total	27	27	NA	0.545	NA	NA	NA	NA	NA
Lead	400	1,000	23.3	99.7	27.9	21.8	23.1	21.2	54.7
Manganese	2,000	10,000	381 J	268 J	639 J	421 J	355 J	229 J	569 J
Mercury	0.81	2.8	0.013	0.704 D	0.016	0.013	0.014	0.017	0.061
Nickel	310	310	44.3	30.3	48.2	44.6	45.2	35.8	9.84

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	**NYSDEC Restricted Residential SCOs[(a)] (mg/kg)**	**NYSDEC Commercial SCOs[(a)] (mg/kg)**	**West On-Site**						
Sample Name			**SB-16(2-4')**	**SB-16(4-6')**	**SB-16(6-8')**	**SB-16(8-10')**	**SB-16(10-12')**	**SB-16(12-14')**	**SB-16(14-16')**
Sample Date			**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**
Arsenic	16	16	3.76 J	9.3 J	**24.2 J**	5.21	12.6	8.46	6.03
Barium	400	400	262 J	92.1 J	94.6 J	66.4 J	56.2 J	72.7 J	21.3 J
Cadmium	4.3	9.3	2.39	1.14	1.78	1	1.14	1.37	0.690
Copper	270	270	6.59 J	23.3 J	25.2 J	24 J	19.6 J	23.2 J	16.5 J
Cyanide, Total	27	27	NA	NA	NA	NA	NA	NA	NA
Lead	400	1,000	96.4	25	26.7	20.7	23	23.5	12.8
Manganese	2,000	10,000	1,490 J	370 J	821 J	207 J	236 J	379 J	278 J
Mercury	0.81	2.8	0.012	0.019	0.013	0.014	0.014	0.014	0.013
Nickel	310	310	13.3	42.8	73.5	35.5	38.6	45.6	22.6

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	NYSDEC Restricted Residential SCOs[a] (mg/kg)	NYSDEC Commercial SCOs[a] (mg/kg)	West On-Site						
Sample Name			SB-17(0-2')	SB-17(2-4')	SB-17(4-6')	SB-17(6-8')	SB-17(8-10')	SB-17(10-12')	SB-18(0-2')
Sample Date			10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/26/2012
Arsenic	16	16	7.1	2.97 J	11.7 J	9.81 J	6.59 J	7.93 J	3.39 J
Barium	400	400	71.7 J	52.6 J	98.7 J	87.8 J	87.3 J	56.8 J	65.9 J
Cadmium	4.3	9.3	2.25	0.170	1.65	1.63	0.790	1.28	1.33 J
Copper	270	270	25.6 J	4.47 J	26.7 J	23.7 J	21.1 J	22.4 J	23.1 J
Cyanide, Total	27	27	NA	0.136 J	NA	NA	NA	NA	0.273 J
Lead	400	1,000	133	11.7	31.3	26	27.6	22.5	81.1 J
Manganese	2,000	10,000	561 J	69.8 J	455 J	665 J	240 J	212 J	615 J
Mercury	0.81	2.8	0.025	0.052	0.015	0.014	0.014	0.015	0.079 J
Nickel	310	310	31.8	5.17	55	53.7	50	39.4	11.9 J

TABLE 4-2B COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO RESTRICTED RESIDENTIAL AND COMMERCIAL SOIL CLEANUP OBJECTIVES - ON-SITE AREA (CONTINUED)

Area	**NYSDEC Restricted Residential SCOs[(a)] (mg/kg)**	**NYSDEC Commercial SCOs[(a)] (mg/kg)**	**West On-Site**			
Sample Name			**SB-18(0-2') (DUP)**	**SB-18(2-4')**	**SB-18(8-10')**	**SB-18(10-12')**
Sample Date			**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**
Arsenic	16	16	**41.1 J**	1.51 J	11.7 J	7.08 J
Barium	400	400	50.4 J	98.5 J	68 J	65.5 J
Cadmium	4.3	9.3	2.17 J	0.930 J	0.970 J	1.24 J
Copper	270	270	45 J	11 J	25.8 J	26.8 J
Cyanide, Total	27	27	0.175 J	NA	NA	NA
Lead	400	1,000	84.2	41.5	20.5	22.1
Manganese	2,000	10,000	417 J	854 J	233 J	361 J
Mercury	0.81	2.8	0.223 J	0.011 J	0.017	0.016
Nickel	310	310	12.7 J	5.59 J	34.5 J	38.7 J

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TABLE 4-3 SUMMARY OF SURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA

Area	NYSDEC SCOs[a] (mg/kg)			South On-Site	North On-Site	Ramp				North On-Site
Sample Name	Unrestricted Use	Restricted Residential	Commercial	SS-01	SS-02/R	SS-11	SS-12	SS-12 (DUP)	SS-13	SS-14
Sample Date				10/24/2012	10/24/2012	10/24/2012	10/24/2012	10/24/2012	10/24/2012	10/24/2012
VOLATILE ORGANIC COMPOUNDS										
Acetone	0.05	100	500	0.030 U	0.030 U	0.032 U	0.029 U	0.029 U	0.030 U	0.032 U
SEMIVOLATILE ORGANIC COMPOUNDS										
Benzo(a)anthracene	1	1	5.6	4 U	0.390 U	4.2 U	3.8 U	3.8 U	3.9 U	0.190 J
Benzo(a)pyrene	1	1	1	4 U	0.390 U	4.2 U	3.8 U	3.8 U	3.9 U	0.220 J
Benzo(b)fluoranthene	1	1	5.6	4 U	0.390 U	4.2 U	3.8 U	3.8 U	3.9 U	0.300 J
Benzo(g,h,i)perylene	100	100	500	4 U	0.170 J	4.2 U	3.8 U	3.8 U	3.9 U	0.430 U
Chrysene	1	3.9	56	4 U	0.390 U	4.2 U	3.8 U	3.8 U	3.9 U	0.240 J
Fluoranthene	100	100	500	4 U	0.390 U	4.2 U	3.8 U	3.8 U	3.9 U	0.540
Phenanthrene	100	100	500	4 U	0.390 U	4.2 U	3.8 U	3.8 U	3.9 U	0.260 J
Pyrene	100	100	500	4 U	0.390 U	4.2 U	3.8 U	3.8 U	3.9 U	0.400 J
PESTICIDES										
Chlordane, alpha-	0.094	4.2	24	0.005	0.011	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
DDE, p,p'-	0.0033	8.9	62	0.002 U	0.002 U	0.002	0.002 U	0.002 U	0.002 U	0.002 U
DDT, p,p'-	0.0033	7.9	47	0.002 U	0.002 U	**0.004 J**	0.002 U	0.002 U	0.002 U	0.002 U

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use, Restricted Residential, and Commercial SCOs. December.

NOTE:
- NYSDEC = New York State Department of Environmental Conservation
- SCO = Soil Cleanup Objective
- mg/kg = Milligrams per kilogram
- DUP = Duplicate field sample.
- U = Not detected; the associated value is the detection limit.
- J = Estimated concentration.
- DDE = Dichlorodiphenyldichloroethylene
- DDT = Dichlorodiphenyltrichloroethane

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 8260, 8270, and 8081.
Data Validation completed by Data Validation Services.
Table includes only those contituents that were detected in one or more samples and for which SCOs have been established.
Bolded concentrations exceed the Unrestricted Use SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-3 SUMMARY OF SURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	NYSDEC SCOs [a] (mg/kg)			West On-Site			
Sample Name	Unrestricted	Restricted		SS-15	SS-16	SS-17	SS-18
Sample Date	Use	Residential	Commercial	10/24/2012	10/24/2012	10/24/2012	10/24/2012
VOLATILE ORGANIC COMPOUNDS							
Acetone	0.05	100	500	0.029 U	0.030 U	0.030 U	0.024 J
SEMIVOLATILE ORGANIC COMPOUNDS							
Benzo(a)anthracene	1	1	5.6	19 U	2 U	7.9 U	0.410 U
Benzo(a)pyrene	1	1	1	19 U	2 U	7.9 U	0.410 U
Benzo(b)fluoranthene	1	1	5.6	19 U	2 U	7.9 U	0.410 U
Benzo(g,h,i)perylene	100	100	500	19 U	2 U	7.9 U	0.410 U
Chrysene	1	3.9	56	19 U	2 U	7.9 U	0.410 U
Fluoranthene	100	100	500	19 U	2 U	7.9 U	0.410 U
Phenanthrene	100	100	500	19 U	2 U	7.9 U	0.410 U
Pyrene	100	100	500	19 U	2 U	7.9 U	0.410 U
PESTICIDES							
Chlordane, alpha-	0.094	4.2	24	0.002 U	0.002 U	0.002 U	0.002 U
DDE, p,p'-	0.0033	8.9	62	0.002 U	0.002 U	0.002 U	0.002 U
DDT, p,p'-	0.0033	7.9	47	0.002 U	0.002 U	0.002 U	0.002 U

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA

Area	NYSDEC SCOs[a] (mg/kg)			North On-Site				West On-Site		Upgradient
Sample Name	Unrestricted Use	Restricted Residential	Commercial	MW-02A(0-1')	MW-02A(2-3')	MW-02A(6-7')	MW-02A(8-10')	MW-03A(0-2')	MW-03A(4-6')	MW-04(0-2')
Sample Date				10/29/2012	10/29/2012	10/29/2012	10/29/2012	10/31/2012	10/31/2012	11/2/2012
VOLATILE ORGANIC COMPOUNDS										
Acetone	0.05	100	500	NA	0.012 U	NA	NA	NA	NA	NA
Benzene	0.06	4.8	44	NA	0.001 U	NA	NA	NA	NA	NA
Butanone, 2-	0.12	100	500	NA	0.002 U	NA	NA	NA	NA	NA
Ethylbenzene	1	41	390	NA	0.001 U	NA	NA	NA	NA	NA
Methylene chloride	0.05	100	500	NA	0.003	NA	NA	NA	NA	NA
Tetrachloroethene	1.3	19	150	NA	0.002 U	NA	NA	NA	NA	NA
Toluene	0.7	100	500	NA	0.001 U	NA	NA	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS										
Anthracene	100	100	500	0.039 U	0.160 U	0.040 U	0.040 U	0.380 U	0.044 U	0.049 U
Benzo(a)anthracene	1	1	5.6	0.039 U	0.210	0.040 U	0.040 U	**1.0**	0.044 U	0.160
Benzo(a)pyrene	1	1	1	0.039 U	0.230	0.040 U	0.040 U	**1.1**	0.044 U	0.130
Benzo(b)fluoranthene	1	1	5.6	0.039 U	0.290	0.040 U	0.040 U	**1.7**	0.044 U	0.210
Benzo(g,h,i)perylene	100	100	500	0.039 U	0.310	0.040 U	0.040 U	1.1	0.044 U	0.150
Benzo(k)fluoranthene	0.8	3.9	56	0.039 U	0.160 U	0.040 U	0.040 U	0.600	0.044 U	0.079
Chrysene	1	3.9	56	0.039 U	0.230	0.040 U	0.040 U	**1.1**	0.044 U	0.180
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.039 U	0.160 U	0.040 U	0.040 U	0.380 U	0.044 U	0.049 U
Dibenzofuran	7	59	350	0.010 U	0.041 U	0.010 U	0.010 U	0.095 U	0.011 U	0.036 NJ
Fluoranthene	100	100	500	0.039 U	0.230	0.040 U	0.040 U	1.7	0.044 U	0.230
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.039 U	0.190	0.040 U	0.040 U	**0.80**	0.044 U	0.110
Methylphenol, 2-	0.33	100	500	0.010 U	0.041 U	0.010 U	0.010 U	0.095 U	0.011 U	0.012 U
Naphthalene	12	100	500	0.010 U	0.041 U	0.010 U	0.010 U	0.095 U	0.011 U	0.074
Phenanthrene	100	100	500	0.039 U	0.170	0.040 U	0.040 U	0.820	0.044 U	0.180
Phenol	0.33	100	500	0.039 U	0.160 U	0.040 U	0.040 U	0.380 U	0.044 U	0.049 U
Pyrene	100	100	500	0.039 U	0.290	0.040 U	0.040 U	1.7	0.044 U	0.240
PESTICIDES/POLYCHLORINATED BIPHENYLS										
Chlordane, alpha-	0.094	4.2	24	NA	NA	NA	NA	NA	NA	NA
DDD, p,p'-	0.0033	8.9	62	NA	0.008 U	NA	NA	NA	NA	NA
DDE, p,p'-	0.0033	7.9	47	NA	**0.007**	NA	NA	NA	NA	NA
Aroclor (Total)	0.1	1	1	NA	0.079 J	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	NA	0.030 U	NA	NA	NA	NA	NA

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use, Restricted Residential, and Commercial SCOs. December.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
NA = Not analyzed.
U = Not detected; the associated value is the detection limit.
N = Constituent is tentatively identified.
J = Estimated concentration.
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 8260, 8270, 8081, and 8082.
Data Validation completed by Data Validation Services.
Table includes only those contituents that were detected in one or more samples and for which SCOs have been established.
Bolded concentrations exceed the Unrestricted Use SCOs.
Shaded concentrations exceed the Restricted Residential SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	NYSDEC SCOs[a] (mg/kg)			Upgradient		West On-Site			
Sample Name	Unrestricted	Restricted		MW-04(2-4')	MW-04(4-6')	MW-06(0-2')	MW-06(0-2') (DUP)	MW-06(2-4')	MW-06(4-6')
Sample Date	Use	Residential	Commercial	11/2/2012	11/2/2012	10/31/2012	10/31/2012	10/31/2012	10/31/2012
VOLATILE ORGANIC COMPOUNDS									
Acetone	0.05	100	500	NA	NA	**0.30**	**0.19**	NA	NA
Benzene	0.06	4.8	44	NA	NA	0.001 U	0.001 U	NA	NA
Butanone, 2-	0.12	100	500	NA	NA	0.033 J	0.002 UJ	NA	NA
Ethylbenzene	1	41	390	NA	NA	0.001 U	0.001 U	NA	NA
Methylene chloride	0.05	100	500	NA	NA	0.044	0.050	NA	NA
Tetrachloroethene	1.3	19	150	NA	NA	0.002 U	0.002 U	NA	NA
Toluene	0.7	100	500	NA	NA	0.001 U	0.001 U	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS									
Anthracene	100	100	500	0.043 U	0.041 U	0.120 U	0.240 U	0.041 U	0.250 U
Benzo(a)anthracene	1	1	5.6	0.043 U	0.041 U	0.250	0.360	0.041 U	0.310
Benzo(a)pyrene	1	1	1	0.043 U	0.041 U	0.230	0.350	0.041 U	0.300
Benzo(b)fluoranthene	1	1	5.6	0.043 U	0.041 U	0.370	0.510	0.041 U	0.460
Benzo(g,h,i)perylene	100	100	500	0.043 U	0.041 U	0.190	0.340	0.041 U	0.320
Benzo(k)fluoranthene	0.8	3.9	56	0.043 U	0.041 U	0.120 U	0.240 U	0.041 U	0.250 U
Chrysene	1	3.9	56	0.043 U	0.041 U	0.280	0.400	0.041 U	0.330
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.043 U	0.041 U	0.120 U	0.240 U	0.041 U	0.250 U
Dibenzofuran	7	59	350	0.011 U	0.010 U	0.030 U	0.060 U	0.010 U	0.062 U
Fluoranthene	100	100	500	0.043 U	0.041 U	0.430	0.600	0.041 U	0.520
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.043 U	0.041 U	0.170	0.240	0.041 U	0.290
Methylphenol, 2-	0.33	100	500	0.011 U	0.010 U	0.030 U	0.060 U	0.010 U	0.062 U
Naphthalene	12	100	500	0.011 U	0.010 U	0.030 U	0.060 U	0.010 U	0.062 U
Phenanthrene	100	100	500	0.043 U	0.041 U	0.220	0.420	0.041 U	0.250 U
Phenol	0.33	100	500	0.043 U	0.041 U	0.120 U	0.240 U	0.041 U	0.250 U
Pyrene	100	100	500	0.043 U	0.041 U	0.420	0.620	0.041 U	0.530
PESTICIDES/POLYCHLORINATED BIPHENYLS									
Chlordane, alpha-	0.094	4.2	24	NA	NA	NA	NA	NA	NA
DDD, p,p'-	0.0033	8.9	62	0.003 U	NA	0.003 U	0.006 U	NA	NA
DDE, p,p'-	0.0033	7.9	47	0.003 U	NA	0.003 U	0.006 U	NA	NA
Aroclor (Total)	0.1	1	1	0.032 UJ	NA	0.030 U	0.056 J	NA	NA
Aroclor-1248	0.1	1	1	0.032 U	NA	0.030 U	0.056 J	NA	NA
NOTE:	DUP	= Duplicate field sample.							

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	NYSDEC SCOs[(a)] (mg/kg)			North On-Site					Ramp
Sample Name	Unrestricted	Restricted		MW-07(0-2')	MW-07(2-4')	MW-07(2-4') (DUP)	MW-07(4-6')	MW-07(6-8')	SB-11(0-2')
Sample Date	Use	Residential	Commercial	11/5/2012	11/5/2012	11/5/2012	11/5/2012	11/5/2012	11/6/2012
VOLATILE ORGANIC COMPOUNDS									
Acetone	0.05	100	500	NA	0.014 UJ	0.012 U	NA	NA	NA
Benzene	0.06	4.8	44	NA	0.001 UJ	0.001 U	NA	NA	NA
Butanone, 2-	0.12	100	500	NA	0.003 UJ	0.002 U	NA	NA	NA
Ethylbenzene	1	41	390	NA	0.001 U	0.001 U	NA	NA	NA
Methylene chloride	0.05	100	500	NA	0.003 UJ	0.002 U	NA	NA	NA
Tetrachloroethene	1.3	19	150	NA	0.003 U	0.002 U	NA	NA	NA
Toluene	0.7	100	500	NA	0.001 U	0.001 U	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS									
Anthracene	100	100	500	0.130	0.046 U	0.041 U	0.043 U	0.040 U	0.380 U
Benzo(a)anthracene	1	1	5.6	0.480	0.046 U	0.048	0.050	0.040 U	0.380 U
Benzo(a)pyrene	1	1	1	0.350	0.046 U	0.042	0.043 U	0.040 U	0.380 U
Benzo(b)fluoranthene	1	1	5.6	0.490	0.060	0.059	0.054	0.040 U	0.230 J
Benzo(g,h,i)perylene	100	100	500	0.250	0.047	0.049	0.046	0.040 U	0.380 U
Benzo(k)fluoranthene	0.8	3.9	56	0.180	0.046 U	0.041 U	0.043 U	0.040 U	0.380 U
Chrysene	1	3.9	56	0.420	0.046 U	0.049	0.047	0.040 U	0.380 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.120 U	0.046 U	0.041 U	0.043 U	0.040 U	0.380 U
Dibenzofuran	7	59	350	0.030 U	0.012 U	0.010 U	0.011 U	0.010 U	0.380 U
Fluoranthene	100	100	500	0.770	0.053	0.060	0.098	0.040 U	0.170 J
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.220	0.046 U	0.046	0.043 U	0.040 U	0.380 U
Methylphenol, 2-	0.33	100	500	0.030 U	0.012 U	0.010 U	0.011 U	0.010 U	0.380 U
Naphthalene	12	100	500	0.030 U	0.012 U	0.010 U	0.011 U	0.010 U	0.380 U
Phenanthrene	100	100	500	0.610	0.046 U	0.046	0.081	0.040 U	0.380 U
Phenol	0.33	100	500	0.120 U	0.046 U	0.041 U	0.043 U	0.040 U	0.380 U
Pyrene	100	100	500	0.820	0.066	0.077	0.096	0.040 U	0.380 U
PESTICIDES/POLYCHLORINATED BIPHENYLS									
Chlordane, alpha-	0.094	4.2	24	NA	NA	NA	NA	NA	NA
DDD, p,p'-	0.0033	8.9	62	NA	**0.006**	**0.010**	NA	NA	NA
DDE, p,p'-	0.0033	7.9	47	NA	0.004 U	0.003 U	NA	NA	NA
Aroclor (Total)	0.1	1	1	NA	0.035 U	0.030 U	NA	NA	NA
Aroclor-1248	0.1	1	1	NA	0.035 U	0.030 U	NA	NA	NA

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	**NYSDEC SCOs[a] (mg/kg)**			**Ramp**					
Sample Name	**Unrestricted**	**Restricted**		**SB-11(2-4')**	**SB-11(4-6')**	**SB-11(4-6') (DUP)**	**SB-11(6-8')**	**SB-11(8-10')**	**SB-11(10-12')**
Sample Date	**Use**	**Residential**	**Commercial**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**
VOLATILE ORGANIC COMPOUNDS									
Acetone	0.05	100	500	NA	**0.11**	**0.12**	NA	NA	NA
Benzene	0.06	4.8	44	NA	0.006 U	0.006 U	NA	NA	NA
Butanone, 2-	0.12	100	500	NA	0.020 J	0.025 J	NA	NA	NA
Ethylbenzene	1	41	390	NA	0.006 U	0.006 U	NA	NA	NA
Methylene chloride	0.05	100	500	NA	0.006 U	0.006 U	NA	NA	NA
Tetrachloroethene	1.3	19	150	NA	0.006 U	0.006 U	NA	NA	NA
Toluene	0.7	100	500	NA	0.006 U	0.006 U	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS									
Anthracene	100	100	500	0.390 U	0.420 U	0.380 U	0.390 U	0.400 U	0.400 U
Benzo(a)anthracene	1	1	5.6	0.390 U	0.420 U	0.380 U	0.230 J	0.400 U	0.400 U
Benzo(a)pyrene	1	1	1	0.390 U	0.420 U	0.380 U	0.230 J	0.400 U	0.400 U
Benzo(b)fluoranthene	1	1	5.6	0.200 J	0.420 U	0.380 U	0.310 J	0.400 U	0.400 U
Benzo(g,h,i)perylene	100	100	500	0.390 U	0.420 U	0.380 U	0.390 U	0.400 U	0.400 U
Benzo(k)fluoranthene	0.8	3.9	56	0.390 U	0.420 U	0.380 U	0.390 U	0.400 U	0.400 U
Chrysene	1	3.9	56	0.180 J	0.420 U	0.380 U	0.270 J	0.400 U	0.400 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.390 U	0.420 U	0.380 U	0.390 U	0.400 U	0.400 U
Dibenzofuran	7	59	350	0.390 U	0.420 U	0.380 U	0.390 U	0.400 U	0.400 U
Fluoranthene	100	100	500	0.350 J	0.420 U	0.380 U	0.430	0.400 U	0.170 J
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.390 U	0.420 U	0.380 U	0.390 U	0.400 U	0.400 U
Methylphenol, 2-	0.33	100	500	0.390 U	0.420 U	0.380 U	0.390 U	0.400 U	0.400 U
Naphthalene	12	100	500	0.390 U	0.420 U	0.380 U	0.390 U	0.400 U	0.400 U
Phenanthrene	100	100	500	0.210 J	0.420 U	0.380 U	0.280 J	0.400 U	0.400 U
Phenol	0.33	100	500	0.390 U	0.420 U	0.380 U	0.390 U	0.400 U	0.400 U
Pyrene	100	100	500	0.300 J	0.420 U	0.380 U	0.340 J	0.400 U	0.400 U
PESTICIDES/POLYCHLORINATED BIPHENYLS									
Chlordane, alpha-	0.094	4.2	24	NA	0.002 UJ	NA	NA	NA	NA
DDD, p,p'-	0.0033	8.9	62	NA	0.002 UJ	NA	NA	NA	NA
DDE, p,p'-	0.0033	7.9	47	NA	0.002 UJ	NA	NA	NA	NA
Aroclor (Total)	0.1	1	1	NA	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	NA	0.021 UJ	NA	NA	NA	NA

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	NYSDEC SCOs(a) (mg/kg)			Ramp					
Sample Name	Unrestricted	Restricted		SB-11(12-14')	SB-11(14-16')	SB-11(16-18')	SB-12A(0-2')	SB-12A(0-2') (DUP)	SB-12(8-10')
Sample Date	Use	Residential	Commercial	11/6/2012	11/6/2012	11/6/2012	10/26/2012	10/26/2012	10/25/2012
VOLATILE ORGANIC COMPOUNDS									
Acetone	0.05	100	500	NA	NA	NA	0.028 U	0.030 U	NA
Benzene	0.06	4.8	44	NA	NA	NA	0.006 U	0.006 U	NA
Butanone, 2-	0.12	100	500	NA	NA	NA	0.028 U	0.030 U	NA
Ethylbenzene	1	41	390	NA	NA	NA	0.006 U	0.006 U	NA
Methylene chloride	0.05	100	500	NA	NA	NA	0.012 U	0.028 U	NA
Tetrachloroethene	1.3	19	150	NA	NA	NA	0.006 U	0.006 U	NA
Toluene	0.7	100	500	NA	NA	NA	0.006 U	0.006 U	NA
SEMIVOLATILE ORGANIC COMPOUNDS									
Anthracene	100	100	500	0.440 U	0.400 U	0.390 U	0.370 U	0.400 U	0.400 U
Benzo(a)anthracene	1	1	5.6	0.440 U	0.400 U	0.390 U	0.330 J	0.240 J	0.400 U
Benzo(a)pyrene	1	1	1	0.440 U	0.400 U	0.390 U	0.330 J	0.250 J	0.400 U
Benzo(b)fluoranthene	1	1	5.6	0.440 U	0.400 U	0.390 U	0.470	0.330 J	0.400 U
Benzo(g,h,i)perylene	100	100	500	0.440 U	0.400 U	0.390 U	0.250 J	0.200 J	0.400 U
Benzo(k)fluoranthene	0.8	3.9	56	0.440 U	0.400 U	0.390 U	0.160 J	0.400 U	0.400 U
Chrysene	1	3.9	56	0.440 U	0.400 U	0.390 U	0.360 J	0.250 J	0.400 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.440 U	0.400 U	0.390 U	0.370 U	0.400 U	0.400 U
Dibenzofuran	7	59	350	0.440 U	0.400 U	0.390 U	0.370 U	0.400 U	0.400 U
Fluoranthene	100	100	500	0.440 U	0.400 U	0.390 U	0.610	0.510	0.400 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.440 U	0.400 U	0.390 U	0.240 J	0.180 J	0.400 U
Methylphenol, 2-	0.33	100	500	0.440 U	0.400 U	0.390 U	0.370 U	0.400 U	0.400 U
Naphthalene	12	100	500	0.440 U	0.400 U	0.390 U	0.370 U	0.400 U	0.400 U
Phenanthrene	100	100	500	0.440 U	0.400 U	0.390 U	0.340 J	0.300 J	0.400 U
Phenol	0.33	100	500	0.440 U	0.400 U	0.390 U	0.370 U	0.400 U	0.400 U
Pyrene	100	100	500	0.440 U	0.400 U	0.390 U	0.470	0.390 J	0.400 U
PESTICIDES/POLYCHLORINATED BIPHENYLS									
Chlordane, alpha-	0.094	4.2	24	NA	NA	NA	0.002 U	0.002 U	NA
DDD, p,p'-	0.0033	8.9	62	NA	NA	NA	0.002 U	0.002 U	NA
DDE, p,p'-	0.0033	7.9	47	NA	NA	NA	0.002 U	0.002 U	NA
Aroclor (Total)	0.1	1	1	NA	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	NA	NA	NA	0.019 U	0.020 U	NA

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	NYSDEC SCOs[(a)] (mg/kg)			Ramp						
Sample Name	Unrestricted	Restricted		SB-12(12-14')	SB-12(14-16')	SB-12(16-18')	SB-12(18-20')	SB-13(0-4')	SB-13(8-10')	SB-13(10-12')
Sample Date	Use	Residential	Commercial	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012
VOLATILE ORGANIC COMPOUNDS										
Acetone	0.05	100	500	NA	NA	NA	NA	0.029 U	0.029 U	NA
Benzene	0.06	4.8	44	NA	NA	NA	NA	0.006 U	0.006 U	NA
Butanone, 2-	0.12	100	500	NA	NA	NA	NA	0.029 U	0.029 U	NA
Ethylbenzene	1	41	390	NA	NA	NA	NA	0.006 U	0.006 U	NA
Methylene chloride	0.05	100	500	NA	NA	NA	NA	0.010 U	0.006 U	NA
Tetrachloroethene	1.3	19	150	NA	NA	NA	NA	0.001 J	0.007	NA
Toluene	0.7	100	500	NA	NA	NA	NA	0.006 U	0.006 U	NA
SEMIVOLATILE ORGANIC COMPOUNDS										
Anthracene	100	100	500	0.410 U	0.400 U	0.410 U	0.410 U	0.380 U	0.380 U	0.360 U
Benzo(a)anthracene	1	1	5.6	0.410 U	0.400 U	0.510	0.410 U	0.190 J	0.380 U	0.360 U
Benzo(a)pyrene	1	1	1	0.410 U	0.400 U	0.490 J	0.410 U	0.220 J	0.380 U	0.360 U
Benzo(b)fluoranthene	1	1	5.6	0.410 U	0.190 J	0.660 J	0.410 U	0.250 J	0.380 U	0.360 U
Benzo(g,h,i)perylene	100	100	500	0.410 U	0.400 U	0.340 J	0.410 U	0.380 U	0.380 U	0.360 U
Benzo(k)fluoranthene	0.8	3.9	56	0.410 U	0.400 U	0.250 J	0.410 U	0.380 U	0.380 U	0.360 U
Chrysene	1	3.9	56	0.410 U	0.400 U	0.560	0.410 U	0.200 J	0.380 U	0.360 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.410 U	0.400 U	0.410 U	0.410 U	0.380 U	0.380 U	0.360 U
Dibenzofuran	7	59	350	0.410 U	0.400 U	0.410 U	0.410 U	0.380 U	0.380 U	0.360 U
Fluoranthene	100	100	500	0.410 U	0.210 J	1 J	0.410 U	0.290 J	0.380 U	0.210 J
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.410 U	0.400 U	0.320 J	0.410 U	0.380 U	0.380 U	0.360 U
Methylphenol, 2-	0.33	100	500	0.410 U	0.400 U	0.410 U	0.410 U	0.380 U	0.380 U	0.360 U
Naphthalene	12	100	500	0.410 U	0.400 U	0.410 U	0.410 U	0.380 U	0.380 U	0.360 U
Phenanthrene	100	100	500	0.410 U	0.400 U	0.550	0.410 U	0.380 U	0.380 U	0.150 J
Phenol	0.33	100	500	0.410 U	0.400 U	0.410 U	0.410 U	0.380 U	0.380 U	0.360 U
Pyrene	100	100	500	0.410 U	0.170 J	0.840	0.410 U	0.250 J	0.380 U	0.150 J
PESTICIDES/POLYCHLORINATED BIPHENYLS										
Chlordane, alpha-	0.094	4.2	24	NA	NA	NA	NA	0.002 U	0.002 U	NA
DDD, p,p'-	0.0033	8.9	62	NA	NA	NA	NA	0.002 U	0.002 U	NA
DDE, p,p'-	0.0033	7.9	47	NA	NA	NA	NA	0.002 U	0.002 U	NA
Aroclor (Total)	0.1	1	1	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	NA	NA	NA	NA	0.020 U	0.020 U	NA

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	**NYSDEC SCOs[a] (mg/kg)**			**Ramp**				**North On-Site**	
Sample Name	**Unrestricted**	**Restricted**		**SB-13(12-14')**	**SB-13(16-18')**	**SB-13(20-22')**	**SB-13(23-25')**	**SB-14(0-2')**	**SB-14(0-2') (DUP)**
Sample Date	**Use**	**Residential**	**Commercial**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**	**10/25/2012**
VOLATILE ORGANIC COMPOUNDS									
Acetone	0.05	100	500	NA	NA	0.032 U	NA	0.029 U	0.031 U
Benzene	0.06	4.8	44	NA	NA	0.002 J	NA	0.006 U	0.006 U
Butanone, 2-	0.12	100	500	NA	NA	0.032 U	NA	0.029 U	0.031 U
Ethylbenzene	1	41	390	NA	NA	0.006 UJ	NA	0.006 U	0.006 U
Methylene chloride	0.05	100	500	NA	NA	0.009 U	NA	0.006 U	0.006 U
Tetrachloroethene	1.3	19	150	NA	NA	0.006 UJ	NA	0.006 U	0.006 U
Toluene	0.7	100	500	NA	NA	0.002 J	NA	0.006 U	0.006 U
SEMIVOLATILE ORGANIC COMPOUNDS									
Anthracene	100	100	500	0.400 U	0.400 U	0.460 J	0.390 U	0.380 U	0.410 U
Benzo(a)anthracene	1	1	5.6	0.400 U	0.400 U	**1 J**	0.390 U	0.380 U	0.410 U
Benzo(a)pyrene	1	1	1	0.400 U	0.400 U	**1.1 J**	0.390 U	0.380 U	0.410 U
Benzo(b)fluoranthene	1	1	5.6	0.400 U	0.400 U	**1.3 J**	0.390 U	0.380 U	0.410 U
Benzo(g,h,i)perylene	100	100	500	0.400 U	0.400 U	0.660 J	0.390 U	0.380 U	0.410 U
Benzo(k)fluoranthene	0.8	3.9	56	0.400 U	0.400 U	0.500 J	0.390 U	0.380 U	0.410 U
Chrysene	1	3.9	56	0.400 U	0.400 U	0.990 J	0.390 U	0.380 U	0.410 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.400 U	0.400 U	0.240 J	0.390 U	0.380 U	0.410 U
Dibenzofuran	7	59	350	0.400 U	0.400 U	0.420 U	0.390 U	0.380 U	0.410 U
Fluoranthene	100	100	500	0.400 U	0.400 U	2.0	0.390 U	0.380 U	0.410 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.400 U	0.400 U	**0.58**	0.390 U	0.380 U	0.410 U
Methylphenol, 2-	0.33	100	500	0.400 U	0.400 U	**1.2 J**	0.390 U	0.380 U	0.410 U
Naphthalene	12	100	500	0.400 U	0.400 U	0.420 U	0.390 U	0.380 U	0.410 U
Phenanthrene	100	100	500	0.400 U	0.400 U	1.3	0.390 U	0.380 U	0.410 U
Phenol	0.33	100	500	0.400 U	0.400 U	**7 D**	0.390 U	0.380 U	0.410 U
Pyrene	100	100	500	0.400 U	0.400 U	1.4	0.390 U	0.380 U	0.410 U
PESTICIDES/POLYCHLORINATED BIPHENYLS									
Chlordane, alpha-	0.094	4.2	24	NA	NA	0.002 U	NA	0.002 U	0.002 U
DDD, p,p'-	0.0033	8.9	62	NA	NA	0.002 U	NA	0.002 U	0.002 U
DDE, p,p'-	0.0033	7.9	47	NA	NA	0.002 U	NA	0.002 U	0.002 U
Aroclor (Total)	0.1	1	1	NA	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	NA	NA	0.022 U	NA	0.020 U	0.021 U

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	NYSDEC SCOs[a] (mg/kg)			North On-Site						
Sample Name	Unrestricted	Restricted		SB-14(2-4')	SB-14(4-6')	SB-14(6-8')	SB-14(8-10')	SB-14(10-12')	SB-15(0-2')	SB-15(2-4')
Sample Date	Use	Residential	Commercial	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012
VOLATILE ORGANIC COMPOUNDS										
Acetone	0.05	100	500	NA	NA	NA	NA	NA	0.032 U	NA
Benzene	0.06	4.8	44	NA	NA	NA	NA	NA	0.006 U	NA
Butanone, 2-	0.12	100	500	NA	NA	NA	NA	NA	0.032 U	NA
Ethylbenzene	1	41	390	NA	NA	NA	NA	NA	0.006 U	NA
Methylene chloride	0.05	100	500	NA	NA	NA	NA	NA	0.006 U	NA
Tetrachloroethene	1.3	19	150	NA	NA	NA	NA	NA	0.006 U	NA
Toluene	0.7	100	500	NA	NA	NA	NA	NA	0.006 U	NA
SEMIVOLATILE ORGANIC COMPOUNDS										
Anthracene	100	100	500	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Benzo(a)anthracene	1	1	5.6	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Benzo(a)pyrene	1	1	1	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Benzo(b)fluoranthene	1	1	5.6	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.210 J	0.400 U
Benzo(g,h,i)perylene	100	100	500	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Benzo(k)fluoranthene	0.8	3.9	56	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Chrysene	1	3.9	56	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.190 J	0.400 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Dibenzofuran	7	59	350	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Fluoranthene	100	100	500	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.380 J	0.400 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Methylphenol, 2-	0.33	100	500	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Naphthalene	12	100	500	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Phenanthrene	100	100	500	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.200 J	0.400 U
Phenol	0.33	100	500	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.420 U	0.400 U
Pyrene	100	100	500	0.400 U	0.400 U	0.400 U	0.410 U	0.420 U	0.260 J	0.400 U
PESTICIDES/POLYCHLORINATED BIPHENYLS										
Chlordane, alpha-	0.094	4.2	24	NA	NA	NA	NA	NA	0.002 U	NA
DDD, p,p'-	0.0033	8.9	62	NA	NA	NA	NA	NA	0.002 U	NA
DDE, p,p'-	0.0033	7.9	47	NA	NA	NA	NA	NA	0.002 U	NA
Aroclor (Total)	0.1	1	1	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	NA	NA	NA	NA	NA	0.022 U	NA

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	NYSDEC SCOs[a] (mg/kg)			North On-Site			West On-Site		
Sample Name	Unrestricted	Restricted		SB-15(4-6')	SB-15(6-8')	SB-15(8-10')	SB-16(0-2')	SB-16(2-4')	SB-16(4-6')
Sample Date	Use	Residential	Commercial	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012
VOLATILE ORGANIC COMPOUNDS									
Acetone	0.05	100	500	NA	NA	NA	NA	NA	NA
Benzene	0.06	4.8	44	NA	NA	NA	NA	NA	NA
Butanone, 2-	0.12	100	500	NA	NA	NA	NA	NA	NA
Ethylbenzene	1	41	390	NA	NA	NA	NA	NA	NA
Methylene chloride	0.05	100	500	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1.3	19	150	NA	NA	NA	NA	NA	NA
Toluene	0.7	100	500	NA	NA	NA	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS									
Anthracene	100	100	500	0.400 U	0.390 U	0.390 U	0.370 U	0.380 U	0.420 U
Benzo(a)anthracene	1	1	5.6	0.400 U	0.390 U	0.390 U	0.450	0.380 U	0.420 U
Benzo(a)pyrene	1	1	1	0.400 U	0.390 U	0.390 U	0.460 J	0.380 U	0.420 U
Benzo(b)fluoranthene	1	1	5.6	0.400 U	0.390 U	0.390 U	0.590 J	0.380 U	0.420 U
Benzo(g,h,i)perylene	100	100	500	0.400 U	0.390 U	0.390 U	0.300 J	0.380 U	0.420 U
Benzo(k)fluoranthene	0.8	3.9	56	0.400 U	0.390 U	0.390 U	0.200 J	0.380 U	0.420 U
Chrysene	1	3.9	56	0.400 U	0.390 U	0.390 U	0.510	0.380 U	0.420 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.400 U	0.390 U	0.390 U	0.370 U	0.380 U	0.420 U
Dibenzofuran	7	59	350	0.400 U	0.390 U	0.390 U	0.370 U	0.380 U	0.420 U
Fluoranthene	100	100	500	0.400 U	0.390 U	0.390 U	1 J	0.380 U	0.420 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.400 U	0.390 U	0.390 U	0.260 J	0.380 U	0.420 U
Methylphenol, 2-	0.33	100	500	0.400 U	0.390 U	0.390 U	0.370 U	0.380 U	0.420 U
Naphthalene	12	100	500	0.400 U	0.390 U	0.390 U	0.370 U	0.380 U	0.420 U
Phenanthrene	100	100	500	0.400 U	0.390 U	0.390 U	0.760	0.380 U	0.420 U
Phenol	0.33	100	500	0.400 U	0.390 U	0.390 U	0.370 U	0.380 U	0.420 U
Pyrene	100	100	500	0.400 U	0.390 U	0.390 U	0.920	0.380 U	0.420 U
PESTICIDES/POLYCHLORINATED BIPHENYLS									
Chlordane, alpha-	0.094	4.2	24	NA	NA	NA	NA	NA	NA
DDD, p,p'-	0.0033	8.9	62	NA	NA	NA	NA	NA	NA
DDE, p,p'-	0.0033	7.9	47	NA	NA	NA	NA	NA	NA
Aroclor (Total)	0.1	1	1	NA	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	NA	NA	NA	NA	NA	NA

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	NYSDEC SCOs[(a)] (mg/kg)			West On-Site					
Sample Name	Unrestricted	Restricted		SB-16(6-8')	SB-16(8-10')	SB-16(10-12')	SB-16(12-14')	SB-16(14-16')	SB-17(0-2')
Sample Date	Use	Residential	Commercial	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012
VOLATILE ORGANIC COMPOUNDS									
Acetone	0.05	100	500	NA	NA	NA	NA	NA	NA
Benzene	0.06	4.8	44	NA	NA	NA	NA	NA	NA
Butanone, 2-	0.12	100	500	NA	NA	NA	NA	NA	NA
Ethylbenzene	1	41	390	NA	NA	NA	NA	NA	NA
Methylene chloride	0.05	100	500	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1.3	19	150	NA	NA	NA	NA	NA	NA
Toluene	0.7	100	500	NA	NA	NA	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS									
Anthracene	100	100	500	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Benzo(a)anthracene	1	1	5.6	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Benzo(a)pyrene	1	1	1	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Benzo(b)fluoranthene	1	1	5.6	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Benzo(g,h,i)perylene	100	100	500	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Benzo(k)fluoranthene	0.8	3.9	56	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Chrysene	1	3.9	56	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Dibenzofuran	7	59	350	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Fluoranthene	100	100	500	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Methylphenol, 2-	0.33	100	500	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Naphthalene	12	100	500	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Phenanthrene	100	100	500	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Phenol	0.33	100	500	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
Pyrene	100	100	500	0.390 U	0.420 U	0.390 U	0.390 U	0.390 U	0.370 U
PESTICIDES/POLYCHLORINATED BIPHENYLS									
Chlordane, alpha-	0.094	4.2	24	NA	NA	NA	NA	NA	NA
DDD, p,p'-	0.0033	8.9	62	NA	NA	NA	NA	NA	NA
DDE, p,p'-	0.0033	7.9	47	NA	NA	NA	NA	NA	NA
Aroclor (Total)	0.1	1	1	NA	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	NA	NA	NA	NA	NA	NA

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	NYSDEC SCOs[a] (mg/kg)			West On-Site				
Sample Name	Unrestricted	Restricted		SB-17(2-4')	SB-17(4-6')	SB-17(6-8')	SB-17(8-10')	SB-17(10-12')
Sample Date	Use	Residential	Commercial	10/25/2012	10/25/2012	10/25/2012	10/25/2012	10/25/2012
VOLATILE ORGANIC COMPOUNDS								
Acetone	0.05	100	500	0.031 U	NA	NA	NA	NA
Benzene	0.06	4.8	44	0.006 U	NA	NA	NA	NA
Butanone, 2-	0.12	100	500	0.031 U	NA	NA	NA	NA
Ethylbenzene	1	41	390	0.006 U	NA	NA	NA	NA
Methylene chloride	0.05	100	500	0.006 U	NA	NA	NA	NA
Tetrachloroethene	1.3	19	150	0.006 U	NA	NA	NA	NA
Toluene	0.7	100	500	0.006 U	NA	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS								
Anthracene	100	100	500	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Benzo(a)anthracene	1	1	5.6	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Benzo(a)pyrene	1	1	1	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Benzo(b)fluoranthene	1	1	5.6	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Benzo(g,h,i)perylene	100	100	500	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Benzo(k)fluoranthene	0.8	3.9	56	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Chrysene	1	3.9	56	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Dibenzofuran	7	59	350	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Fluoranthene	100	100	500	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Methylphenol, 2-	0.33	100	500	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Naphthalene	12	100	500	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Phenanthrene	100	100	500	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Phenol	0.33	100	500	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
Pyrene	100	100	500	0.410 U	0.410 U	0.400 U	0.400 U	0.390 U
PESTICIDES/POLYCHLORINATED BIPHENYLS								
Chlordane, alpha-	0.094	4.2	24	0.002 U	NA	NA	NA	NA
DDD, p,p'-	0.0033	8.9	62	0.002 U	NA	NA	NA	NA
DDE, p,p'-	0.0033	7.9	47	0.002 U	NA	NA	NA	NA
Aroclor (Total)	0.1	1	1	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	0.021 U	NA	NA	NA	NA

TABLE 4-4 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - ON-SITE AREA (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**			**West On-Site**				
Sample Name	**Unrestricted**	**Restricted**		**SB-18(0-2')**	**SB-18(0-2') (DUP)**	**SB-18(2-4')**	**SB-18(8-10')**	**SB-18(10-12')**
Sample Date	**Use**	**Residential**	**Commercial**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**
VOLATILE ORGANIC COMPOUNDS								
Acetone	0.05	100	500	0.030 U	0.030 NJ	NA	NA	NA
Benzene	0.06	4.8	44	0.006 U	0.007 U	NA	NA	NA
Butanone, 2-	0.12	100	500	0.030 U	0.036 U	NA	NA	NA
Ethylbenzene	1	41	390	0.006 U	0.002 J	NA	NA	NA
Methylene chloride	0.05	100	500	0.007 U	0.066 U	NA	NA	NA
Tetrachloroethene	1.3	19	150	0.006 U	0.007 U	NA	NA	NA
Toluene	0.7	100	500	0.006 U	0.002 J	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS								
Anthracene	100	100	500	4 U	0.470 U	2 U	0.390 U	0.390 U
Benzo(a)anthracene	1	1	5.6	4 U	0.470 U	**1.2 J**	0.390 U	0.390 U
Benzo(a)pyrene	1	1	1	4 U	0.470 U	**1.2 J**	0.390 U	0.390 U
Benzo(b)fluoranthene	1	1	5.6	**1.6 J**	0.470 UJ	**1.6 J**	0.390 U	0.390 U
Benzo(g,h,i)perylene	100	100	500	4 U	0.470 U	2 U	0.390 U	0.390 U
Benzo(k)fluoranthene	0.8	3.9	56	4 U	0.470 U	2 U	0.390 U	0.390 U
Chrysene	1	3.9	56	4 U	0.470 U	**1.2 J**	0.390 U	0.390 U
Dibenzo(a,h)anthracene	0.33	0.33	0.56	4 U	0.470 U	2 U	0.390 U	0.390 U
Dibenzofuran	7	59	350	4 U	0.470 U	2 U	0.390 U	0.390 U
Fluoranthene	100	100	500	2.3 J	0.470 UJ	2.5	0.390 U	0.390 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	5.6	4 U	0.470 U	**0.820 J**	0.390 U	0.390 U
Methylphenol, 2-	0.33	100	500	4 U	0.470 U	2 U	0.390 U	0.390 U
Naphthalene	12	100	500	4 U	0.470 U	2 U	0.390 U	0.390 U
Phenanthrene	100	100	500	4 U	0.470 U	1.2 J	0.390 U	0.390 U
Phenol	0.33	100	500	4 U	0.470 U	2 U	0.390 U	0.390 U
Pyrene	100	100	500	1.7 J	0.470 UJ	1.7 J	0.390 U	0.390 U
PESTICIDES/POLYCHLORINATED BIPHENYLS								
Chlordane, alpha-	0.094	4.2	24	0.002 U	0.002 U	NA	NA	NA
DDD, p,p'-	0.0033	8.9	62	0.002 U	0.002 U	NA	NA	NA
DDE, p,p'-	0.0033	7.9	47	0.002 U	0.002 U	NA	NA	NA
Aroclor (Total)	0.1	1	1	NA	NA	NA	NA	NA
Aroclor-1248	0.1	1	1	0.020 U	0.024 U	NA	NA	NA

TABLE 4-5A SUMMARY OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS - STADIUM PROPERTY

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**Field**						
Sample Name	**Unrestricted**	**Restricted**	**SS-03**	**SS-04**	**SS-05**	**SS-06**	**SS-07**	**SS-20**	**SS-21**
Sample Date	**Use**	**Residential**	**4/15/2013**	**4/15/2013**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**4/15/2013**	**4/15/2013**
Chromium	30	180	10.4 J	7.05 J	5.67 J	23.9 J	**40.5 J**	18.6 J	13 J
Lead	63	400	34.4	18.2	**69.8 J**	**65.2 J**	54.9 J	**65.9**	38.8
Zinc	109	10,000	90.4 J	77.8 J	97.5	**135**	68.9	**168 J**	92.6 J

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
J = Estimated concentration.
Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000 series.
Data Validation completed by Data Validation Services.
Table includes only those constituents that exceeded SCOs in one or more samples.
Bolded concentrations exceed the Unrestricted Use SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

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TABLE 4-5B SUMMARY OF SURFACE SOIL ORGANIC COMPOUND RESULTS - STADIUM PROPERTY

Area	NYSDEC SCOs[a] (mg/kg)		Field		
Sample Name	Unrestricted	Restricted	SS-05	SS-06	SS-07
Sample Date	Use	Residential	10/24/2012	10/24/2012	10/24/2012
SEMIVOLATILE ORGANIC COMPOUNDS					
Benzo(a)anthracene	1	1	7.7 U	0.190 J	7.8 U
Benzo(b)fluoranthene	1	1	7.7 U	0.230 J	7.8 U
Chrysene	1	3.9	7.7 U	0.200 J	7.8 U
Fluoranthene	100	100	7.7 U	0.400 J	7.8 U
Phenanthrene	100	100	7.7 U	0.250 J	7.8 U
Pyrene	100	100	7.7 U	0.310 J	7.8 U

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use and Restricted Residential SCOs. December.

NOTE:

NYSDEC	= New York State Department of Environmental Conservation
SCO	= Soil Cleanup Objective
mg/kg	= Milligrams per kilogram
U	= Not detected; the associated value is the detection limit.
J	= Estimated concentration.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Method 8270.
Data Validation completed by Data Validation Services.
Table includes only those contituents that were detected in one or more samples and
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-6A SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - STADIUM PROPERTY

Area	NYSDEC SCOs[(a)] (mg/kg)		Field					
Sample Name	Unrestricted Use	Restricted Residential	SB-05(0-2')	SB-05(2-4')	SB-05(2-4') (DUP)	SB-05(4-6')	SB-05(6-8')	SB-06(0-2')
Sample Date			10/26/2012	10/26/2012	10/26/2012	10/26/2012	10/26/2012	10/26/2012
Lead	63	400	53.7	11.3 J	22.0	24.2	20.9	24.3
Mercury	0.18	0.81	0.017	0.040	0.024	0.018	0.016	0.046
Nickel	30	310	18.6	16.3 J	**46.3**	**44.4**	**40.8**	**30.8**
Zinc	109	10,000	78.1	29.1 J	86.0	76.3	80.1	78.0

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use SCOs. December.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
DUP = Duplicate field sample.
J = Estimated concentration.
Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000 series.
Data Validation completed by Data Validation Services.
Table includes only those constituents that exceeded SCOs in one or more samples.
Bolded concentrations exceed the Unrestricted Use SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-6A SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - STADIUM PROPERTY (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**Field**					
Sample Name	**Unrestricted**	**Restricted**	**SB-06(2-4')**	**SB-06(4-6')**	**SB-06(6-8')**	**SB-07(0-2')**	**SB-07(2-4')**	**SB-07(4-6')**
Sample Date	**Use**	**Residential**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**
Lead	63	400	21.1	20.1	23.1	**120**	22.9	25.4
Mercury	0.18	0.81	0.040	0.017	0.016	**0.196**	0.050	0.008 J
Nickel	30	310	14.8	**38.7**	**40.0**	20.8	13.4	**51.8**
Zinc	109	10,000	42.0	65.4	78.1	**141**	51.2	76.3

TABLE 4-6A SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - STADIUM PROPERTY (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**Field**					
Sample Name	**Unrestricted**	**Restricted**	**SB-07(6-8')**	**SB-20(0-2')**	**SB-20(2-4')**	**SB-21(0-2')**	**SB-21(0-2') (DUP)**	**SB-21(2-4')**
Sample Date	**Use**	**Residential**	**10/26/2012**	**4/16/2013**	**4/16/2013**	**4/16/2013**	**4/16/2013**	**4/16/2013**
Lead	63	400	25.1	14.9	8.65	35 J	**125 J**	8.68
Mercury	0.18	0.81	0.023	0.059	0.021	0.063	0.065	0.019
Nickel	30	310	**50.8**	**40.9**	19.8	5.72 J	17.1 J	21.1
Zinc	109	10,000	80.5	97.1 J	48.1 J	51 J	**183 J**	50.6 J

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TABLE 4-6B SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - STADIUM PROPERTY

Area	NYSDEC SCOs[a] (mg/kg)		Field						
Sample Name	Unrestricted	Restricted	SB-05(0-2')	SB-05(2-4')	SB-05(2-4') (DUP)	SB-05(4-6')	SB-05(6-8')	SB-06(0-2')	SB-06(2-4')
Sample Date	Use	Residential	10/26/2012	10/26/2012	10/26/2012	10/26/2012	10/26/2012	10/26/2012	10/26/2012
VOLATILE ORGANINC COMPOUNDS									
Ethylbenzene	1	41	NA	0.006 U	0.002 J	NA	NA	NA	0.006 U
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo(a)anthracene	1	1	8.2 U	0.390 U	0.400 U	0.400 U	0.400 U	0.420 U	0.380 U
Benzo(a)pyrene	1	1	8.2 U	0.390 U	0.400 U	0.400 U	0.400 U	0.420 U	0.380 U
Benzo(b)fluoranthene	1	1	8.2 U	0.390 U	0.400 U	0.400 U	0.400 U	0.420 U	0.380 U
Chrysene	1	3.9	8.2 U	0.390 U	0.400 U	0.400 U	0.400 U	0.420 U	0.380 U
Fluoranthene	100	100	8.2 U	0.390 U	0.400 U	0.400 U	0.400 U	0.420 U	0.380 U
Phenanthrene	100	100	8.2 U	0.390 U	0.400 U	0.400 U	0.400 U	0.420 U	0.380 U
Pyrene	100	100	8.2 U	0.390 U	0.400 U	0.400 U	0.400 U	0.420 U	0.380 U

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use and Restricted Residential SCOs. December.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
DUP = Duplicate field sample.
NA = Not analyzed.
U = Not detected; the associated value is the detection limit.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 8260 and 8270.
Data Validation completed by Data Validation Services.
Table includes only those contituents that were detected in one or more samples and for which SCOs have been established.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-6B SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - STADIUM PROPERTY (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**Field**					
Sample Name	**Unrestricted**	**Restricted**	**SB-06(4-6')**	**SB-06(6-8')**	**SB-07(0-2')**	**SB-07(2-4')**	**SB-07(4-6')**	**SB-07(6-8')**
Sample Date	**Use**	**Residential**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**
VOLATILE ORGANINC COMPOUNDS								
Ethylbenzene	1	41	NA	NA	NA	NA	NA	NA
SEMIVOLATILE ORGANIC COMPOUNDS								
Benzo(a)anthracene	1	1	0.400 U	0.400 U	0.170 J	0.410 U	0.410 U	0.400 U
Benzo(a)pyrene	1	1	0.400 U	0.400 U	0.160 J	0.410 U	0.410 U	0.400 U
Benzo(b)fluoranthene	1	1	0.400 U	0.400 U	0.250 J	0.410 U	0.410 U	0.400 U
Chrysene	1	3.9	0.400 U	0.400 U	0.190 J	0.410 U	0.410 U	0.400 U
Fluoranthene	100	100	0.400 U	0.400 U	0.300 J	0.410 U	0.410 U	0.400 U
Phenanthrene	100	100	0.400 U	0.400 U	0.400 U	0.410 U	0.410 U	0.400 U
Pyrene	100	100	0.400 U	0.400 U	0.240 J	0.410 U	0.410 U	0.400 U
NOTE:	J	= Estimated concentration.						

TABLE 4-7A SUMMARY OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS - BAKER HALL PROPERTY

Area	**NYSDEC SCOs[a] (mg/kg)**		**Northwest Corner**		**West Boundary**	**North Boundary**		
Sample Name	**Unrestricted**	**Restricted**	**SS-08**	**SS-09**	**SS-10**	**SS-22**	**SS-23**	**SS-24**
Sample Date	**Use**	**Residential**	**10/24/2012**	**10/24/2012**	**10/24/2012**	**4/15/2013**	**4/15/2013**	**4/15/2013**
Arsenic	13	16	**14.5**	**13.1**	9.39	**25.4**	**20.8**	**16.5**
Barium	350	400	217 J	**398 J**	214 J	**721**	**706 J**	**806 J**
Cadmium	2.5	4.3	**6.27 J**	**6.87 J**	**3.1 J**	**11.1 J**	**8.99**	**9.03**
Chromium	30	180	**32.9 J**	**35.7 J**	18.8 J	**75.3 J**	**81.5 J**	**58.7 J**
Copper	50	270	**166 J**	**115 J**	**91.9 J**	**553 J**	**433 J**	**197 J**
Cyanide, Total	27	27	0.153 J	0.803	0.078 J	NA	NA	NA
Lead	63	400	**2,180 J**	**965 J**	**595 J**	**2,420**	**2,460**	**1,710**
Manganese	1,600	2,000	552 J	786 J	456 J	1,030 J	1,100 J	845 J
Mercury	0.18	0.81	**0.228 J**	**0.695 J**	**0.263 J**	**0.374**	**0.370**	**0.563**
Nickel	30	310	**56.5 J**	**63.4 J**	20.4 J	**141 J**	**98.1**	**62.4**
Selenium	3.9	180	**7.59**	**8.55**	**4.00**	1.19 U	1.74 U	0.840 J
Silver	2	180	0.660 J	0.560 J	0.290 UJ	**5.35**	**3.67**	**3.26**
Zinc	109	10,000	**886**	**1,090**	**541**	**2,030 J**	**2,170 J**	**1,890 J**

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use and Restricted Residential Soil Cleanup Objectives. December.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
J = Estimated concentration.
NA = Not analyzed.
U = Not detected; the associated value is the detection limit.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000 series and total cyanide by 9010.
Data Validation completed by Data Validation Services.
Table includes only those contituents that exceed SCOs in one or more samples.
Bolded concentrations exceed the Unrestricted Use SCOs.
Shaded concentrations exceed the Restricted Residential SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-7A SUMMARY OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	**NYSDEC SCOs(a) (mg/kg)**		**West Boundary**	**Northeast Corner**		**North**	
Sample Name	**Unrestricted**	**Restricted**	**SS-25**	**SS-26 (DUP)**	**SS-27**	**SS-41**	**SS-42**
Sample Date	**Use**	**Residential**	**4/15/2013**	**4/17/2013**	**4/16/2013**	**7/1/2013**	**7/1/2013**
Arsenic	13	16	9.20	7.86	5.43	8.34	6.91
Barium	350	400	125 J	187	67.0	109 J	90.9 J
Cadmium	2.5	4.3	0.720	2.35	1.00	2.31	2.00
Chromium	30	180	23 J	19 J	13.8 J	16.3 J	14.4 J
Copper	50	270	32.3 J	**52.0**	18.8	18.6	24.1
Cyanide, Total	27	27	NA	NA	NA	NA	NA
Lead	63	400	**393**	**260 J**	**102 J**	**102**	**90.0**
Manganese	1,600	2,000	518 J	779	156	584 J	495 J
Mercury	0.18	0.81	0.132	0.103 J	0.080	0.077	0.087
Nickel	30	310	22.0	27.6 J	12.8 J	23.5	16.5
Selenium	3.9	180	0.730 J	1.27 U	1.19 U	**4.06**	3.73
Silver	2	180	0.740	0.633 U	0.596 U	0.317 UJ	0.358 UJ
Zinc	109	10,000	**413 J**	**280**	**137**	**155 J**	**158 J**
NOTE:	DUP	= Duplicate field sample.					

TABLE 4-7A SUMMARY OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	NYSDEC SCOs[a] (mg/kg)		Northeast Corner				East of Baker
Sample Name	**Unrestricted Use**	**Restricted Residential**	**SS-44**	**SS-45**	**SS-47**	**SS-48**	**SS-49**
Sample Date			**7/2/2013**	**7/2/2013**	**7/2/2013**	**7/2/2013**	**8/13/2013**
Arsenic	13	16	7.27	6.54	0.556 U	6.52	6.39
Barium	350	400	94.2	55.8	94.1	60.8	62.5
Cadmium	2.5	4.3	1.80	1.27	1.85	1.20	1.14
Chromium	30	180	16 J	12.5 J	14 J	11.3 J	**135**
Copper	50	270	13.8	14.7	13.6	11.6	11.7
Cyanide, Total	27	27	NA	NA	NA	NA	NA
Lead	63	400	58.9	60.2	55.1	54.0	56.3
Manganese	1,600	2,000	322 J	228 J	566 J	174 J	223
Mercury	0.18	0.81	0.073	0.061	0.124	0.072	0.072
Nickel	30	310	19.0	11.4	18.7	9.99	**49.5**
Selenium	3.9	180	2 J	1.63 J	**11.3 J**	1.98 J	0.770
Silver	2	180	0.182 J	0.181 J	0.102 J	0.149 J	1.63
Zinc	109	10,000	**128**	**120**	**219**	108	**132**

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TABLE 4-7B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - BAKER HALL PROPERTY

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**Northwest Corner**						
Sample Name	**Unrestricted Use**	**Restricted Residential**	**MW-05(0-2')**	**MW-05(2-3')**	**MW-05(3-4')**	**MW-05(4-6')**	**SB-08(0-2')**	**SB-08(2-4')**	**SB-08(4-6')**
Sample Date			**11/1/2012**	**11/1/2012**	**11/1/2012**	**11/1/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**
Arsenic	13	16	**18.0**	9.10	8.80	11.0	**14.9 J**	**26.6 J**	4.41 J
Barium	350	400	**800**	150	66.0	93.0	**462 J**	**443 J**	99.5 J
Cadmium	2.5	4.3	**7.60**	1.60	0.710 U	0.710 U	**11.2 J**	**5.7 J**	1.07 J
Chromium	30	180	**55.0**	18.0	13.0	20.0	**40.1 J**	29.4 J	12.3 J
Copper	50	270	**460**	37.0	25.0	33.0	**170 J**	**213 J**	19.9 J
Lead	63	400	**1,600 J**	**940 J**	29 J	14 J	**1,220**	**869**	**66.6**
Mercury	0.18	0.81	**0.86**	0.120	0.098 U	0.099 U	**0.198**	0.021	0.048
Nickel	30	310	**110**	16.0	20.0	**39.0**	**59.4 J**	**46.8 J**	20.8 J
Selenium	3.9	180	2.3 U	2.3 U	2.1 U	2.1 U	0.600 J	0.250 J	0.500 J
Silver	2	180	**4.00**	1.9 U	1.8 U	1.8 U	**2.5 J**	**3.0 J**	0.580 J
Zinc	109	10,000	**1,700 J**	**290 J**	69 J	80 J	**1,340 J**	**922 J**	103 J

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use and Restricted Residential Soil Cleanup Objectives. December.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
J = Estimated concentration.
U = Not detected; the associated value is the detection limit.
Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000 series.
Data Validation completed by Data Validation Services.
Table includes constituents that exceed SCOs in one or more samples.
Bolded concentrations exceed the indicated SCOs.
Shaded concentrations exceed the Restricted Residential SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-7B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	**NYSDEC SCOs[a] (mg/kg)**		**Northwest Corner**					**West Boundary**		
Sample Name	**Unrestricted Use**	**Restricted Residential**	**SB-08(6-8')**	**SB-09(0-2')**	**SB-09(2-4')**	**SB-09(4-6')**	**SB-09(6-8')**	**SB-10(0-2')**	**SB-10(2-4')**	**SB-10(4-6')**
Sample Date			**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**
Arsenic	13	16	11.3 J	8.10	11.8	6.08 J	5.36 J	4.22	6.25	8.66
Barium	350	400	111 J	110	57.2	75.8 J	65.7 J	64.0	29.7	68.6
Cadmium	2.5	4.3	1.81 J	1.94	0.780	0.970 J	0.920 J	0.380	0.410	0.600
Chromium	30	180	15.7 J	11.4	10.2	15.5 J	14.9 J	9.05	5.63	11.9
Copper	50	270	30.7 J	18.3 J	26.9 J	23.8 J	24.9 J	13.9 J	21.5 J	24.8 J
Lead	63	400	29.8	**218**	21.5	19.7	19.3	12.6	11.5	17.8
Mercury	0.18	0.81	0.042	**0.442**	0.104	0.019	0.016	0.021	0.015	0.022
Nickel	30	310	**54.6 J**	19.1	29.2	**38.1 J**	**34.9 J**	20.6	22.8	**33.2**
Selenium	3.9	180	1.02 J	0.600	0.390 J	0.220 J	0.500 UJ	0.270 J	0.520 U	0.520 U
Silver	2	180	1.44 J	0.570	0.750	0.940 J	0.640 J	0.620	0.230 J	0.710
Zinc	109	10,000	76 J	**187**	57.7	76.1 J	70.1 J	48.2	47.4	73.0

TABLE 4-7B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	NYSDEC SCOs[a] (mg/kg)		West Boundary	North Boundary						
Sample Name	Unrestricted Use	Restricted Residential	SB-10(6-8')	SB-22(0-2')	SB-22(2-4')	SB-22(4-6')	SB-22(6-7')	SB-23(0-2')	SB-23(2-4')	SB-23(4-6')
Sample Date			10/26/2012	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013
Arsenic	13	16	8.28	5.45	4.66	8.97	9.70	**32.5**	4.63	9.46
Barium	350	400	45.1	226	57.8	70.1	66.4	**960 J**	86.2 J	73 J
Cadmium	2.5	4.3	0.830	1.5 J	0.310 UJ	0.310 UJ	0.300 UJ	**6.36**	0.330 U	0.310 U
Chromium	30	180	13.0	17.4 J	10.1 J	15.1 J	14.9 J	**69 J**	13 J	16.9 J
Copper	50	270	26.1 J	**67.2 J**	6.5 J	18.4 J	18.9 J	**1,010 J**	10.9 J	27.8 J
Lead	63	400	19.8	**387**	16.4	15.0	17.3	**2,030**	33.6	35.3
Mercury	0.18	0.81	0.017	**0.306**	0.047	0.010 J	0.013	0.062	0.052	0.014
Nickel	30	310	**40.4**	26.1 J	16.5 J	**40 J**	**47.1 J**	**121**	20.2	**45.9**
Selenium	3.9	180	0.510 U	1.32	0.440 J	1.03 U	0.500 J	1.03 U	0.460 J	1.04 U
Silver	2	180	0.690	1.87	0.560	1.13	1.25	**4.13**	0.550 J	1.23
Zinc	109	10,000	72.4	**407 J**	47.1 J	80.7 J	83.4 J	**4,180 J**	82.4 J	**170 J**

TABLE 4-7B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	NYSDEC SCOs[a] (mg/kg)		North Boundary					West Boundary		
Sample Name	Unrestricted Use	Restricted Residential	SB-23(6-8')	SB-24(0-2')	SB-24(2-4')	SB-24(4-6')	SB-24(6-8')	SB-25(0-1')	SB-25(1-2')	SB-25(4-6')
Sample Date			4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013
Arsenic	13	16	10.0	11.0	4.16	10.4	9.88	8.59	6.81	7.56
Barium	350	400	96.6 J	**403 J**	70.6 J	62.4 J	74.6 J	104 J	45.7 J	43.6 J
Cadmium	2.5	4.3	0.320 U	1.93	0.330 U	0.310 U	0.310 U	0.210 J	0.310 U	0.370 U
Chromium	30	180	18.4 J	26.8 J	12.1 J	16 J	16.4 J	16.5 J	11.7 J	12.8 J
Copper	50	270	26.7 J	**51.9 J**	6.17 J	20.3 J	20.2 J	36.7 J	9.81 J	19.8 J
Lead	63	400	35.6	**1,020**	12.2	16.3	16.6	**195**	37.1	14.1
Mercury	0.18	0.81	0.015	0.130	0.043	0.011 J	0.013	0.113	0.018	0.006 J
Nickel	30	310	**57.4**	**32.3**	17.4	**37.9**	**40.6**	19.7	14.9	26.4
Selenium	3.9	180	0.540 J	1.07 J	1.1 U	1.03 U	1.04 U	0.580 J	1.04 U	1.24 U
Silver	2	180	1.38	1.91	0.870	1.14	1.21	0.770	0.380 J	0.770
Zinc	109	10,000	**171 J**	**820 J**	56.5 J	89.3 J	85.7 J	**250 J**	60.1 J	76.1 J

TABLE 4-7B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**West Boundary**	**North**				**Northeast Corner**		
Sample Name	**Unrestricted Use**	**Restricted Residential**	**SB-25(6-8')**	**SB-41(0-1')**	**SB-41(1-2')**	**SB-42(0-1')**	**SB-42(1-2')**	**SB-44(0-1')**	**SB-44(1-2')**	**SB-45(0-1')**
Sample Date			**4/15/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/2/2013**	**7/2/2013**	**7/2/2013**
Arsenic	13	16	4.62	6.78	6.53	6.91	4.24	4.06	3.84	7.51
Barium	350	400	58.5 J	113 J	63.2 J	94.1 J	53.9 J	93.2	40.8	58.5
Cadmium	2.5	4.3	0.300 U	1.90	1.44	1.77	1.01	1.03	0.468	1.24
Chromium	30	180	16.3 J	12.8 J	10.7 J	13.7 J	8.33 J	13.1 J	9.26 J	11.6 J
Copper	50	270	20.9 J	13.3	4.75	12.0	11.2	7.90	5.86	11
Lead	63	400	16.5	50.5	9.83	41.3	8.74	12.0	6.10	46.9
Mercury	0.18	0.81	0.011 J	0.063	0.046	0.093	0.04	0.064	0.029	0.046
Nickel	30	310	**41.5**	20.5	12.4	20.3	16.3	14.4	11.5	10.8
Selenium	3.9	180	0.980 U	3.59	3.80	3.69	2.01	1.91 J	1.13 J	1.81 J
Silver	2	180	1.00	0.322 UJ	0.268 UJ	0.307 UJ	0.264 UJ	0.298 U	0.283 U	0.163 J
Zinc	109	10,000	86.7 J	92.9 J	28.8 J	85.4 J	32.5 J	43.0	28.5	94.3

TABLE 4-7B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**Northeast Corner**					**East of Baker**	
Sample Name	**Unrestricted Use**	**Restricted Residential**	**SB-45(1-2')**	**SB-47(0-1')**	**SB-47(1-2')**	**SB-48(0-1')**	**SB-48(1-2')**	**SB-49(0-1')**	**SB-49(1-2')**
Sample Date			**7/2/2013**	**7/2/2013**	**7/2/2013**	**7/2/2013**	**7/2/2013**	**8/13/2013**	**8/13/2013**
Arsenic	13	16	4.57	0.522 U	3.96	**41.7**	2.89	5.53	3.36
Barium	350	400	58.5	44.4	47.7	**830**	32.8	63.8	41.1
Cadmium	2.5	4.3	0.686	0.751	0.839	**13.6**	0.466	0.810	0.290
Chromium	30	180	10.2 J	8.23 J	9.47 J	**87.4 J**	9.95 J	10.2	7.48
Copper	50	270	5.51	7.16	19.5	**553**	11.5	7.61	3.06
Lead	63	400	7.85	6.71	9.25	**1,440**	5.04	33.9	6.67
Mercury	0.18	0.81	0.015	0.032	0.032	**0.285**	0.020	0.066	0.029
Nickel	30	310	12.6	11.2	19.8	**100**	11.3	9.85	9.59
Selenium	3.9	180	1.13 J	**11 J**	0.933 J	0.529 UJ	0.997 J	0.590	0.370 J
Silver	2	180	0.272 U	0.261 U	0.241 U	0.265 U	0.273 U	1.42	0.910
Zinc	109	10,000	33.7	37.8	37.7	**2,470**	30.6	85.4	32.3

TABLE 4-8A SUMMARY OF SURFACE SOIL ORGANIC COMPOUND RESULTS - BAKER HALL PROPERTY

Area	NYSDEC SCOs[(a)] (mg/kg)		Northwest Corner		West Boundary	North Boundary	
Sample Name	Unrestricted	Restricted	SS-08	SS-09	SS-10	SS-22	SS-23
Sample Date	Use	Residential	10/24/2012	10/24/2012	10/24/2012	4/15/2013	4/15/2013
SEMIVOLATILE ORGANIC COMPOUNDS							
Benzo(a)anthracene	1	1	0.510	**1.90**	0.730	0.470 U	0.660 U
Benzo(a)pyrene	1	1	0.600 J	**1.9 J**	0.640 J	0.470 U	0.660 U
Benzo(b)fluoranthene	1	1	0.810 J	**2.7 J**	0.810 J	0.240 J	0.660 U
Benzo(k)fluoranthene	0.8	3.9	0.340 J	**1.1 J**	0.340 J	0.470 U	0.660 U
Chrysene	1	3.9	0.550	**2.00**	0.740	0.200 J	0.660 U
Dibenzo(a,h)anthracene	0.33	0.33	**0.380 J**	0.240 J	0.460 U	0.470 U	0.660 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	**0.580**	**0.760**	0.340 J	0.470 U	0.660 U
PESTICIDES							
DDE, p,p'-	0.0033	8.9	**0.004**	**0.004**	0.002 U	NA	NA
DDT, p,p'-	0.0033	7.9	**0.010 J**	**0.040 J**	0.002 U	NA	NA

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use, Restricted Residential, and Commercial Soil Cleanup Objectives. December.

NOTE:
- NYSDEC = New York State Department of Environmental Conservation
- SCO = Soil Cleanup Objective
- mg/kg = Milligrams per kilogram
- U = Not detected; the associated value is the detection limit.
- J = Estimated concentration.
- DDE = Dichlorodiphenyldichloroethylene
- DDT = Dichlorodiphenyltrichloroethane
- NA = Not analyzed.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 8270 and 8081.
Data Validation completed by Data Validation Services.
Table includes only those contituents detected in one or more samples and for which SCOs have been established.
Bolded concentrations exceed the Unrestricted Use SCOs.
Shaded concentrations exceed the Restricted Residential SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-8A SUMMARY OF SURFACE SOIL ORGANIC COMPOUND RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	NYSDEC SCOs[(a)] (mg/kg)		North Boundary	West Boundary	Northeast Corner		
Sample Name	**Unrestricted Use**	**Restricted Residential**	**SS-24**	**SS-25**	**SS-26**	**SS-26 (DUP)**	**SS-27**
Sample Date			**4/15/2013**	**4/15/2013**	**4/17/2013**	**4/17/2013**	**4/16/2013**
SEMIVOLATILE ORGANIC COMPOUNDS							
Benzo(a)anthracene	1	1	0.510 J	**4.8 D**	0.790	0.450 J	0.460 U
Benzo(a)pyrene	1	1	0.540	**4.4 D**	0.710	0.370 J	0.460 U
Benzo(b)fluoranthene	1	1	0.620	**5.8 D**	0.960	0.500	0.460 U
Benzo(k)fluoranthene	0.8	3.9	0.530 U	**2.20**	0.390 J	0.500 U	0.460 U
Chrysene	1	3.9	0.550	**5.0 D**	0.920	0.490 J	0.460 U
Dibenzo(a,h)anthracene	0.33	0.33	0.530 U	**0.670**	0.490 U	0.500 U	0.460 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.390 J	**2.70**	0.400 J	0.500 U	0.460 U
PESTICIDES							
DDE, p,p'-	0.0033	8.9	NA	NA	NA	NA	NA
DDT, p,p'-	0.0033	7.9	NA	NA	NA	NA	NA

NOTE: DUP = Duplicate field sample.
D = Results obtained from a diluted sample analysis.

TABLE 4-8B SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - BAKER HALL PROPERTY

Area	NYSDEC SCOs[a] (mg/kg)		Northwest Corner						
Sample Name	Unrestricted	Restricted	MW-05(0-2')	MW-05(2-3')	MW-05(3-4')	MW-05(4-6')	SB-08(0-2')	SB-08(2-4')	SB-08(4-6')
Sample Date	Use	Residential	11/1/2012	11/1/2012	11/1/2012	11/1/2012	10/26/2012	10/26/2012	10/26/2012
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo(a)anthracene	1	1	**1.0**	0.094	0.039 U	0.040 U	2.1 U	0.390 U	0.400 U
Benzo(a)pyrene	1	1	**1.1**	0.086	0.039 U	0.040 U	2.1 U	0.390 U	0.400 U
Benzo(b)fluoranthene	1	1	**1.6**	0.140	0.039 U	0.040 U	2.1 U	0.390 U	0.400 U
Benzo(k)fluoranthene	0.8	3.9	0.460	0.053	0.039 U	0.040 U	2.1 U	0.390 U	0.400 U
Chrysene	1	3.9	**1.1**	0.110	0.039 U	0.040 U	2.1 U	0.390 U	0.400 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	**0.800**	0.081	0.039 U	0.040 U	2.1 U	0.390 U	0.400 U

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use and Restricted Residential SCOs. December.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
U = Not detected; the associated value is the detection limit.
Analytical data results obtained by Chemtech Consulting Group using SW-846 Method 8270.
Data Validation completed by Data Validation Services.
Table includes only those contituents exceeding one or more SCOs.
Bolded concentrations exceed the Unrestricted Use SCOs.
Shaded concentrations exceed the Restricted Residential SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-8B SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**Northwest Corner**					**West Boundary**	
Sample Name	**Unrestricted**	**Restricted**	**SB-08(6-8')**	**SB-09(0-2')**	**SB-09(2-4')**	**SB-09(4-6')**	**SB-09(6-8')**	**SB-10(0-2')**	**SB-10(2-4')**
Sample Date	**Use**	**Residential**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**	**10/26/2012**
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo(a)anthracene	1	1	0.410 U	**7.0**	0.390 U	0.390 U	0.390 U	0.400 U	0.380 U
Benzo(a)pyrene	1	1	0.410 U	**7.3 J**	0.390 U	0.390 U	0.390 U	0.400 U	0.380 U
Benzo(b)fluoranthene	1	1	0.410 U	**8.5 J**	0.390 U	0.390 U	0.390 U	0.400 U	0.380 U
Benzo(k)fluoranthene	0.8	3.9	0.410 U	**3.2 J**	0.390 U	0.390 U	0.390 U	0.400 U	0.380 U
Chrysene	1	3.9	0.410 U	**7.1**	0.390 U	0.390 U	0.390 U	0.400 U	0.380 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.410 U	**4.3**	0.390 U	0.390 U	0.390 U	0.400 U	0.380 U
NOTE:	J	= Estimated concentration.							

TABLE 4-8B SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	NYSDEC SCOs[a] (mg/kg)		West Boundary		North Boundary				
Sample Name	Unrestricted	Restricted	SB-10(4-6')	SB-10(6-8')	SB-22(0-2')	SB-22(2-4')	SB-22(4-6')	SB-22(6-7')	SB-23(0-2')
Sample Date	Use	Residential	10/26/2012	10/26/2012	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo(a)anthracene	1	1	0.410 U	0.400 U	4.2 U	0.400 U	0.400 U	0.400 U	0.390 U
Benzo(a)pyrene	1	1	0.410 U	0.400 U	4.2 U	0.400 U	0.400 U	0.400 U	0.390 U
Benzo(b)fluoranthene	1	1	0.410 U	0.400 U	4.2 U	0.400 U	0.400 U	0.400 U	0.390 U
Benzo(k)fluoranthene	0.8	3.9	0.410 U	0.400 U	4.2 U	0.400 U	0.400 U	0.400 U	0.390 U
Chrysene	1	3.9	0.410 U	0.400 U	4.2 U	0.400 U	0.400 U	0.400 U	0.390 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.410 U	0.400 U	4.2 U	0.400 U	0.400 U	0.400 U	0.390 U

TABLE 4-8B SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - BAKER HALL PROPERTY (CONTINUED)

Area	NYSDEC SCOs[a] (mg/kg)		North Boundary						
Sample Name	Unrestricted	Restricted	SB-23(2-4')	SB-23(4-6')	SB-23(6-8')	SB-24(0-2')	SB-24(2-4')	SB-24(4-6')	SB-24(6-8')
Sample Date	Use	Residential	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013	4/15/2013
SEMIVOLATILE ORGANIC COMPOUNDS									
Benzo(a)anthracene	1	1	0.430 U	0.400 U	0.400 U	0.430 U	0.400 U	0.400 U	0.400 U
Benzo(a)pyrene	1	1	0.430 U	0.400 U	0.400 U	0.430 U	0.400 U	0.400 U	0.400 U
Benzo(b)fluoranthene	1	1	0.430 U	0.400 U	0.400 U	0.430 U	0.400 U	0.400 U	0.400 U
Benzo(k)fluoranthene	0.8	3.9	0.430 U	0.400 U	0.400 U	0.430 U	0.400 U	0.400 U	0.400 U
Chrysene	1	3.9	0.430 U	0.400 U	0.400 U	0.430 U	0.400 U	0.400 U	0.400 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.430 U	0.400 U	0.400 U	0.430 U	0.400 U	0.400 U	0.400 U

TABLE 4-8B SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - BAKER HALL PROPERTY
(CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**West Boundary**			
Sample Name	**Unrestricted**	**Restricted**	**SB-25(0-1')**	**SB-25(1-2')**	**SB-25(4-6')**	**SB-25(6-8')**
Sample Date	**Use**	**Residential**	**4/15/2013**	**4/15/2013**	**4/15/2013**	**4/15/2013**
SEMIVOLATILE ORGANIC COMPOUNDS						
Benzo(a)anthracene	1	1	0.610	0.400 U	0.460 U	0.390 U
Benzo(a)pyrene	1	1	0.620	0.400 U	0.460 U	0.390 U
Benzo(b)fluoranthene	1	1	0.830	0.400 U	0.460 U	0.390 U
Benzo(k)fluoranthene	0.8	3.9	0.340 J	0.400 U	0.460 U	0.390 U
Chrysene	1	3.9	0.710	0.400 U	0.460 U	0.390 U
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.320 J	0.400 U	0.460 U	0.390 U

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TABLE 4-9A COMPARISON OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR

Area	NYSDEC	West				Cemetery			
Sample Name	**Unrestricted Use**	**SS-19**	**SS-34**	**SS-35**	**SS-36**	**SS-37**	**SS-38**	**SS-39**	**SS-39A**
Sample Date	**SCOs[(a)] (mg/kg)**	**4/15/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/2/2013**
Arsenic	13	8.71	9.70	8.03	6.11	6.32	6.36	6.41	10.4 JD
Barium	350	95.8	133 J	105 J	67.9 J	67.4 J	81.3 J	82.1 J	97.6 D
Cadmium	2.5	0.400 UJ	**3.02 J**	2.49 J	1.89 J	1.63	1.81	2.00	4.89 UD
Chromium	30	20.9 J	**36.5 J**	19.7 J	14.1 J	12.8 J	14.8 J	15.8 J	23.2 J
Copper	50	37 J	**54.2 J**	46.8 J	25 J	20.8	28.8	29.6	**53.8 D**
Lead	63	**162**	**238**	**177**	**105**	42 J	55.5	59.5	**114 D**
Mercury	0.18	0.107	**0.263**	**0.264**	0.073	0.046	0.074	0.044	0.052
Nickel	30	**35.8 J**	**31.5 J**	29.2 J	19.1 J	24.7	**31.7**	**33.7**	**32.4 JND**
Selenium	3.9	0.730 J	**4.02 J**	3.77 J	2.83 J	2.60	3.76	3.31	16.3 UJ
Silver	2	1.18	0.224 J	R	R	0.290 UJ	0.309 UJ	0.280 UJ	8.14 UND
Zinc	109	**267 J**	**600 J**	**264 J**	**185 J**	88.8 J	**127 J**	**132 J**	**228 D**

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use Soil Cleanup Objectives. December.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
J = Estimated concentration.
D = Result obtained from a diluted sample analysis.
U = Not detected; the associated value is the detection limit.
N = The constituent is tentatively identified.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000 series.
Data Validation completed by Data Validation Services.
Table includes constituents that exceed the indicated SCOs in one or more samples.
Bolded concentrations exceed the indicated SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-9A COMPARISON OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC**	**North of Baker**			**East**				
Sample Name	**Unrestricted Use**	**SS-40**	**SS-43**	**SS-46**	**SS-50**	**SS-51**	**SS-52**	**SS-53**	**SS-54**
Sample Date	**SCOs[(a)] (mg/kg)**	**7/1/2013**	**7/2/2013**	**7/2/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**
Arsenic	13	**21.2**	**22 D**	**38.1 D**	11.7	**18.9**	**26.9**	**17.9**	**23.7**
Barium	350	**411 J**	**561 D**	**542 D**	**1,200**	**636**	**1,020**	**362**	**458**
Cadmium	2.5	**9.20**	**6.6 D**	**4.44 D**	**6.92**	**10.1**	**18.4**	**10.2**	**18.1**
Chromium	30	**37.4 J**	**66.2 J**	**63.6 J**	**42.9**	**51.1**	**65.4**	**75**	**85.6**
Copper	50	**1,680**	**804 D**	**712 D**	**81.3**	**110**	**371**	**239**	**8,180 D**
Lead	63	**956**	**1,780 D**	**1,890 D**	**2,720**	**1,680**	**2,090**	**1,460**	**1,240**
Mercury	0.18	**0.319**	**0.851 D**	0.098	**0.326**	**0.416**	**0.333**	0.159	0.144
Nickel	30	**58.3**	**91.6 ND**	**90.1 ND**	**36.4**	**37.4**	**58.4**	**53.1**	**143**
Selenium	3.9	**9.00**	16.6 UJ	14.3 UJ	0.870	0.770	0.390 J	0.620 U	0.560 U
Silver	2	0.135 J	8.32 UND	7.15 UND	**4.22**	**5.58**	**11.7**	**8.68**	**12.0**
Zinc	109	**1,070 J**	**2,040 D**	**2,730 D**	**1,160**	**1,570**	**1,990**	**1,180**	**1,620**

TABLE 4-9A COMPARISON OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC**	**East**						
Sample Name	**Unrestricted Use**	**SS-55**	**SS-55 (DUP)**	**SS-56**	**SS-57**	**SS-58**	**SS-59**	**SS-60**
Sample Date	**SCOs[(a)] (mg/kg)**	**2/21/2014**	**2/24/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**
Arsenic	13	**21.2**	**21.3**	8.40	9.55	10.53	12.0	9.13
Barium	350	348	**389**	103	90.4	98.2	79.0	108
Cadmium	2.5	**7.34**	**10.65**	1.53	0.957	1.33	1.38	1.29
Chromium	30	**41.9**	**70.5**	19.9	18.8	21.7	20.2	23.9
Copper	50	**240**	**328**	49.5	38.5	43.8	38.8	41.9
Lead	63	**960**	**1,360**	**151**	**82.1**	**101**	**71.7**	**72.4**
Mercury	0.18	0.133	0.145	0.070	0.047	0.064	0.063	0.058
Nickel	30	**61.9**	**86.2**	**39.9**	**36.7**	**40.7**	**38.4**	**43.8**
Selenium	3.9	1.89	2.34	1.09 JN	1.13 JN	0.967 JN	1.22 JN	1.59 JN
Silver	2	1.67	1.94	0.428 J	U	U	0.344 J	0.325 J
Zinc	109	U	U	**279**	**198**	**260**	**245**	**265**
NOTE:	DUP	= Duplicate field sample.						

TABLE 4-9B SUMMARY OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR

Area	NYSDEC SCOs[(a)] (mg/kg)		West				Cemetery			
Sample Name	Protection of	Restricted	SS-19	SS-34	SS-35	SS-36	SS-37	SS-38	SS-39	SS-39A
Sample Date	Ecological Resources	Residential	4/15/2013	7/1/2013	7/1/2013	7/1/2013	7/1/2013	7/1/2013	7/1/2013	7/2/2013
Arsenic	13	16	8.71	9.70	8.03	6.11	6.32	6.36	6.41	10.4 JD
Barium	433	400	95.8	133 J	105 J	67.9 J	67.4 J	81.3 J	82.1 J	97.6 D
Cadmium	4	4.3	0.400 UJ	3.02 J	2.49 J	1.89 J	1.63	1.81	2.00	4.89 UD
Chromium	41	180	20.9 J	**36.5 J**	19.7 J	14.1 J	12.8 J	14.8 J	15.8 J	23.2 J
Copper	50	270	37 J	**54.2 J**	46.8 J	25 J	20.8	28.8	29.6	**53.8 D**
Lead	63	400	**162**	**238**	**177**	**105**	42 J	55.5	59.5	**114 D**
Manganese	1,600	2,000	426 J	845 J	487 J	403 J	389 J	429 J	398 J	556 J
Mercury	0.18	0.81	0.107	**0.263**	**0.264**	0.073	0.046	0.074	0.044	0.052
Nickel	30	310	**35.8 J**	**31.5 J**	29.2 J	19.1 J	24.7	**31.7**	**33.7**	**32.4 JND**
Selenium	3.9	180	0.730 J	**4.02 J**	3.77 J	2.83 J	2.60	3.76	3.31	16.3 UJ
Silver	2	180	1.18	0.224 J	R	R	0.290 UJ	0.309 UJ	0.280 UJ	8.14 UND
Zinc	109	10,000	**267 J**	**600 J**	**264 J**	**185 J**	88.8 J	**127 J**	**132 J**	**228 D**

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Protection of Ecological Resources and Restricted Residential SCOs. December.

NOTE:
- NYSDEC = New York State Department of Environmental Conservation
- SCO = Soil Cleanup Objective
- mg/kg = Milligrams per kilogram
- J = Estimated concentration.
- D = Result obtained from a diluted sample analysis.
- U = Not detected; the associated value is the detection limit.
- N = The constituent is tentatively identified.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000 series.
Data Validation completed by Data Validation Services.
Table includes constituents that exceed SCOs in one or more samples.
Bolded concentrations exceed the Protection of Ecological Resources SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-9B SUMMARY OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**North of Baker**			**East**				
Sample Name	**Protection of**	**Restricted**	**SS-40**	**SS-43**	**SS-46**	**SS-50**	**SS-51**	**SS-52**	**SS-53**	**SS-54**
Sample Date	**Ecological Resources**	**Residential**	**7/1/2013**	**7/2/2013**	**7/2/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**
Arsenic	13	16	**21.2**	**22 D**	**38.1 D**	11.7	**18.9**	**26.9**	**17.9**	**23.7**
Barium	433	400	411 J	**561 D**	**542 D**	**1,200**	**636**	**1,020**	362	**458**
Cadmium	4	4.3	**9.20**	**6.6 D**	**4.44 D**	**6.92**	**10.1**	**18.4**	**10.2**	**18.1**
Chromium	41	180	**37.4 J**	**66.2 J**	**63.6 J**	**42.9**	**51.1**	**65.4**	**75.0**	**85.6**
Copper	50	270	**1,680**	**804 D**	**712 D**	**81.3**	**110**	**371**	**239**	**8,180 D**
Lead	63	400	**956**	**1,780 D**	**1,890 D**	**2,720**	**1,680**	**2,090**	**1,460**	**1,240**
Manganese	1,600	2,000	865 J	1,180 J	1,120 J	1,180	1,110	938	**2,490**	842
Mercury	0.18	0.81	**0.319**	**0.851 D**	0.098	**0.326**	**0.416**	**0.333**	0.159	0.144
Nickel	30	310	**58.3**	**91.6 ND**	**90.1 ND**	**36.4**	**37.4**	**58.4**	**53.1**	**143**
Selenium	3.9	180	**9.00**	16.6 UJ	14.3 UJ	0.870	0.770	0.390 J	0.620 U	0.560 U
Silver	2	180	0.135 J	8.32 UND	7.15 UND	**4.22**	**5.58**	**11.7**	**8.68**	**12.0**
Zinc	109	10,000	**1,070 J**	**2,040 D**	**2,730 D**	**1,160**	**1,570**	**1,990**	**1,180**	**1,620**
NOTE:	Shaded concentrations exceed the Restricted Residential SCOs.									

TABLE 4-9B SUMMARY OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[a] (mg/kg)**		**East**						
Sample Name	**Protection of**	**Restricted**	**SS-55**	**SS-55 (DUP)**	**SS-56**	**SS-57**	**SS-58**	**SS-59**	**SS-60**
Sample Date	**Ecological Resources**	**Residential**	**2/21/2014**	**2/24/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**
Arsenic	13	16	**21.2**	**21.3**	8.40	9.55	10.53	12.0	9.13
Barium	433	400	348	389	103	90.4	98.2	79.0	108
Cadmium	4	4.3	**7.34**	**10.65**	1.53	0.957	1.33	1.38	1.29
Chromium	41	180	**41.9**	**70.5**	19.9	18.8	21.7	20.2	23.9
Copper	50	270	**240**	**328**	49.5	38.5	43.8	38.8	41.9
Lead	63	400	**960**	**1,360**	**151**	**82.1**	**101**	**71.7**	**72.4**
Manganese	1,600	2,000	835	959	499	474	571	551	583
Mercury	0.18	0.81	0.133	0.145	0.070	0.047	0.064	0.063	0.058
Nickel	30	310	**61.9**	**86.2**	**39.9**	**36.7**	**40.7**	**38.4**	**43.8**
Selenium	3.9	180	1.89	2.34	1.09 JN	1.13 JN	0.967 JN	1.22 JN	1.59 JN
Silver	2	180	1.67	1.94	0.428 J	U	U	0.344 J	0.325 J
Zinc	109	10,000	U	U	**279**	**198**	**260**	**245**	**265**
NOTE:	DUP	= Duplicate field sample.							

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TABLE 4-10A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR

Area	NYSDEC	Northwest				West			
Sample Name	Unrestricted Use	MW-08(0-2')	MW-08(0-2') (DUP)	MW-08(2-4')	MW-08(6-8')	SB-19(0-2')	SB-19(2-4')	SB-19(2-4') (DUP)	SB-19(4-6')
Sample Date	SCOs[a] (mg/kg)	11/6/2012	11/6/2012	11/6/2012	11/6/2012	4/15/2013	4/15/2013	4/15/2013	4/15/2013
Arsenic	13	**18.0**	11.0	**80.0**	6.70	6.55	**48.2 J**	10.6 J	10.9
Barium	350	250	210	**8,800**	71.0	83.5	**461**	**422**	59.7
Cadmium	2.5	1.90	1.50	**5.50**	0.720 U	0.310 UJ	**5.88 J**	**6.18 J**	0.320 UJ
Chromium	30	26 J	24 J	**74 J**	18 J	16.2 J	**46.8 J**	**50.6 J**	16.4 J
Copper	50	**130 J**	**770 J**	**410 J**	29 J	19.3 J	**854 J**	**324 J**	19.7 J
Cyanide, Total	27	**100 J**	**110 J**	NA	NA	NA	NA	NA	NA
Lead	63	**320 J**	**290 J**	**790 J**	13 J	34.6	**818**	**793**	18.1
Mercury	0.18	0.180	0.160	**0.390**	0.100 U	0.035	**1.3 D**	**2.09 D**	0.015
Nickel	30	**36 J**	**35 J**	**92 J**	28 J	**38.1 J**	**70.3 J**	**90.2 J**	**46.5 J**
Selenium	3.9	2.2 U	2.2 U	2.2 U	2.2 U	0.470 J	0.990 U	0.960 U	0.500 J
Silver	2	**3.2 J**	1.8 U	1.9 U	1.8 U	1.10	0.150 J	**2.41 J**	1.39
Zinc	109	**440**	**450**	**2,700**	73.0	101 J	**1,350 J**	**757 J**	95 J

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use SCOs. December.

NOTE:
- NYSDEC = New York State Department of Environmental Conservation
- SCO = Soil Cleanup Objective
- mg/kg = Milligrams per kilogram
- DUP = Duplicate field sample.
- J = Estimated concentration.
- U = Not detected; the associated value is the detection limit.
- NA = Not analyzed.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000 series and total cyanide by 9010.
Data Validation completed by Data Validation Services.
Table includes constituents that exceeded SCOs.
Bolded concentrations exceed the indicated SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-10A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC**	**West**							
Sample Name	**Unrestricted Use**	**SB-19(6-7')**	**SB-34(0-1')**	**SB-34(1-2')**	**SB-34(2-3')**	**SB-34(2-3') (DUP)**	**SB-34(3-4')**	**SB-35(0-1')**	**SB-35(1-2')**
Sample Date	**SCOs[(a)] (mg/kg)**	**4/15/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**
Arsenic	13	9.65	6.16	11.2	8.50	6.41	8.34	8.63	**28.0**
Barium	350	66.0	102 J	249 J	81.1 J	128 J	66.5 J	90.3 J	**468 J**
Cadmium	2.5	0.290 UJ	2.14 J	**3.75 J**	1.57 J	2.05 J	2.32 J	2.33 J	**15.4 J**
Chromium	30	16.6 J	15 J	22.5 J	15.9 J	19.3 J	15.6 J	18.4 J	**46.5 J**
Copper	50	19.3 J	38.4 J	**103 J**	27.7 J	27.3 J	27.8 J	30.5 J	**447 J**
Cyanide, Total	27	NA	0.297 U	0.709	0.307 U	0.302 U	0.303 U	0.298 U	1.42
Lead	63	16.6	**136**	**356**	20.1	16.4	22.3	53.0	**1,370**
Mercury	0.18	0.015	**0.275**	**0.826 D**	0.010 J	0.022	0.010 J	**0.681 D**	**1.48 D**
Nickel	30	**48.6 J**	28.9 J	**35.6 J**	**33.5 J**	**45.3 J**	**31.6 J**	**36.5 J**	**50 J**
Selenium	3.9	0.540 J	3.46 J	**5.21 J**	3.52 J	3.7 J	3.51 J	3.69 J	**9.72 J**
Silver	2	1.48	R	0.804 J	R	R	R	R	R
Zinc	109	94.7 J	**175 J**	**462 J**	76 J	71.9 J	70 J	**130 J**	**1,320 J**
NOTE:	D	= Result obtained from a diluted sample analysis.							

TABLE 4-10A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC**	**West**						**Cemetery**	
Sample Name	**Unrestricted Use**	**SB-35(2-3')**	**SB-35(3-4')**	**SB-36(0-1')**	**SB-36(1-2')**	**SB-36(2-3')**	**SB-36(3-4')**	**SB-37(0-1')**	**SB-37(0-1') (DUP)**
Sample Date	**SCOs[(a)] (mg/kg)**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**
Arsenic	13	**42.3**	7.09	6.57	9.72	9.14	12.1	5.84	7.70
Barium	350	**1,050 J**	58.5 J	72.8 J	74.9 J	80.9 J	70.5 J	73.6 J	92.8 J
Cadmium	2.5	**11.9 J**	1.47 J	2.09 J	2.11 J	2.05 J	2.09 J	1.58	2.22
Chromium	30	**60.3 J**	14.6 J	14.7 J	13.9 J	18.1 J	16.6 J	12.3 J	16.6 J
Copper	50	**1,030 J**	23.9 J	22.9 J	21.7 J	27.8 J	30.6 J	25.9	27.6
Cyanide, Total	27	4.72	0.067 J	0.306 U	0.310 U	0.300 U	0.303 U	NA	NA
Lead	63	**892**	13.8	**101**	19.1	16.2	19.9	34.0	**472 J**
Mercury	0.18	**1.5 D**	0.015	0.036	0.034	0.012	0.008 J	0.030	0.054
Nickel	30	**64.2 J**	**31.1 J**	19.9 J	28.7 J	**36.8 J**	**35.4 J**	27.6	**31.8**
Selenium	3.9	**13 J**	3.18 J	3.12 J	3.87 J	3.48 J	3.68 J	2.66	3.44
Silver	2	R	R	R	R	R	R	0.243 UJ	0.285 UJ
Zinc	109	**1,960 J**	67.6 J	**166 J**	54.7 J	77 J	75.2 J	84.5 J	**139 J**

TABLE 4-10A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC**	**Cemetery**					**North of Baker**		
Sample Name	**Unrestricted Use**	**SB-37(1-2')**	**SB-38(0-1')**	**SB-38(1-2')**	**SB-39(0-1')**	**SB-39(1-2')**	**SB-40(0-1')**	**SB-40(1-2')**	**SB-43(0-1')**
Sample Date	**SCOs[(a)] (mg/kg)**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/2/2013**
Arsenic	13	6.91	6.99	6.79	8.48	6.57	**36.9**	6.12	**21.8 D**
Barium	350	87.7 J	86.5 J	86.6 J	91.9 J	75.7 J	**598 J**	115 J	**1,010 D**
Cadmium	2.5	1.92	1.94	2.03	2.34	1.71	**12.3**	1.94	**4.55 JD**
Chromium	30	14.4 J	16.4 J	15.1 J	16.2 J	14.3 J	**43.9 J**	14.5 J	**61.4 J**
Copper	50	28.8	29.8	28.3	36.6	26.6	**1,820**	17.2	**513 D**
Cyanide, Total	27	NA	NA	NA	NA	NA	NA	NA	NA
Lead	63	43.4	**65.9**	36.7	**71.9**	35.8	**1,880**	49.9	**1,380 D**
Mercury	0.18	0.071	0.057	0.026	0.038	0.030	0.053	0.050	**1.58 D**
Nickel	30	**33.8**	**33.4**	**33.3**	**36.5**	**30.9**	**76.7**	22.6	**58 ND**
Selenium	3.9	3.17	3.55	3.72	3.80	3.14	**6.18**	3.57	15.4 UJ
Silver	2	0.249 UJ	0.295 UJ	0.282 UJ	0.273 UJ	0.282 UJ	0.258 UJ	0.270 UJ	7.72 UND
Zinc	109	106 J	**166 J**	**205 J**	**136 J**	89.1 J	**1,230 J**	91.1 J	**2,310 D**
NOTE:	N	= The constituent is tentatively identified.							

TABLE 4-10A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC**	**North of Baker**					**East**		
Sample Name	**Unrestricted Use**	**SB-43(1-2')**	**SB-43(2-3')**	**SB-46(0-1')**	**SB-46(0-1') (DUP)**	**SB-46(1-2')**	**SB-50(0-1')**	**SB-50(0-1') (DUP)**	**SB-50(1-2')**
Sample Date	**SCOs[(a)] (mg/kg)**	**7/2/2013**	**8/13/2013**	**7/2/2013**	**7/2/2013**	**7/2/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**
Arsenic	13	9.72 JD	11.0	**24.8 D**	**17 D**	8.44 JD	**13.8**	**13.3**	6.83
Barium	350	**509 D**	73.5	**857 D**	**892 D**	173 D	**600**	**475**	116
Cadmium	2.5	2.14 JD	1.46	**7.02 D**	**7.25 D**	4.84 UD	**5.61**	**5.88**	1.85
Chromium	30	**38.8 J**	16.9	**92.3 D**	**76.8 J**	27.3 J	**42.6**	**35.7**	19.9
Copper	50	**173 D**	18.5	**480 D**	**765 D**	26.6 D	**54.8**	**63.7**	10.2
Cyanide, Total	27	NA	NA	NA	NA	NA	NA	NA	NA
Lead	63	**976 D**	16.8	**1,480 D**	**1,880 D**	60.8 D	**1,620**	**1,290**	**63.3**
Mercury	0.18	0.107	0.017	**0.239**	**0.229**	0.073	**0.269**	**0.318**	0.057
Nickel	30	**40.1 ND**	**38.3**	**92.5 J**	**65.7 ND**	**39.2 ND**	**44.5**	**39.7**	**36.2**
Selenium	3.9	13.7 UJ	0.700	15.8 UJ	13.9 UJ	16.1 UJ	1.45	0.830	0.740
Silver	2	6.85 UND	**3.09**	R	6.93 UND	8.07 UND	**4.25**	**3.78**	**3.20**
Zinc	109	**947 D**	90.3	**2,600 D**	**2,430 D**	**202 D**	**987**	**838**	**118**

TABLE 4-10A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC**	**East**							
Sample Name	**Unrestricted Use**	**SB-51(0-1')**	**SB-51(1-2')**	**SB-52(0-1')**	**SB-52(1-2')**	**SB-53(0-1')**	**SB-53(1-2')**	**SB-54(0-1')**	**SB-54(1-2')**
Sample Date	**SCOs[(a)] (mg/kg)**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**
Arsenic	13	**20.7**	10.5	**21.7**	9.02	**29.5**	**37.6**	**34.5**	**34.8**
Barium	350	350	125	**718**	134	**498**	**411**	**473**	**598**
Cadmium	2.5	**12.9**	**2.66**	**20.3**	2.24	**27.7**	**17.5**	**23.3**	**57.5**
Chromium	30	**44.9**	22.0	**55.2**	19.5	**68.5**	**51.9**	**73.1**	**146**
Copper	50	**104**	25.8	**427**	14.8	**407**	**394**	**588**	**1,470**
Cyanide, Total	27	NA	NA	NA	NA	NA	NA	NA	NA
Lead	63	**1,310**	**79.6**	**3,530**	62.5	**1,620**	**1,170**	**1,670**	**3,340**
Mercury	0.18	**0.506**	0.084	0.151	0.060	0.170	0.132	0.056	**0.232**
Nickel	30	**45.0**	**42.9**	**90.8**	**40.0**	**134**	**125**	**125**	**250**
Selenium	3.9	0.880	0.800	0.570 U	0.900	0.550 U	0.500 U	0.480 U	0.540 U
Silver	2	**6.99**	**3.64**	**12.7**	**3.76**	**14.6**	**11.2**	**14.5**	**19.1**
Zinc	109	**1,520**	**195**	**2,830**	**355**	**1,360**	**862**	**1,850**	**1,580**

TABLE 4-10A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	NYSDEC	East							
Sample Name	Unrestricted Use	SB-55(0-1')	SB-55(1-2')	SB-55(2-3')	SB-55(10-11')	SB-56(0-1')	SB-56(1-2')	SB-56(2-3')	SB-56(3-4')
Sample Date	SCOs[(a)] (mg/kg)	2/21/2014	2/21/2014	2/21/2014	2/21/2014	2/21/2014	2/21/2014	2/21/2014	2/21/2014
Arsenic	13	**18.4**	6.33	**42.2**	4.00	9.80	7.06	6.87	5.25
Barium	350	300	72.1	**787**	47.6	117	106	105	66.0
Cadmium	2.5	**6.67**	1.87	**47.5**	0.165 JN	2.09	1.15	0.680	0.525
Chromium	30	**39.1**	12.4	**132**	11.7	18.3	19.3	19.9	13.3
Copper	50	**205**	**89.3**	**484**	17.2	**55.4**	29.2	25.6	20.4
Cyanide, Total	27	NA	NA	NA	NA	NA	NA	NA	NA
Lead	63	**1,780**	**339**	**8,210**	10.88	**141**	56.0	17.7	14.3
Mercury	0.18	0.173	0.061	**0.199**	0.018	0.053	0.046	0.035	0.031
Nickel	30	**57.2**	24.6	**245**	23.9	**35.1**	**45.8**	**46.3**	**33.7**
Selenium	3.9	1.6	UN	UN	0.653 JN	1.20	1.33	1.46	0.639 JN
Silver	2	1.28	0.348 J	U	U	0.376 J	0.519 J	0.550	0.235 J
Zinc	109	U	**284**	U	63.0	**357**	**161**	**110**	75.2

TABLE 4-10A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC**	**East**							
Sample Name	**Unrestricted Use**	**SB-57(0-1')**	**SB-57(1-2')**	**SB-57(2-3')**	**SB-58(0-1')**	**SB-58(1-2')**	**SB-58(2-3')**	**SB-58(2-3') (DUP)**	**SB-59(0-1')**
Sample Date	**SCOs[(a)] (mg/kg)**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/24/2014**	**2/21/2014**
Arsenic	13	9.48	6.77	7.79	7.90	6.43	6.95	6.49	10.97
Barium	350	89.1	111	89.7	60.2	77.2	71.1	73.3	71.6
Cadmium	2.5	1.38	0.654	0.910	1.10	0.465	0.573	0.380	0.901
Chromium	30	19.5	22.0	18.6	13.5	14.5	14.9	15.2	18.3
Copper	50	34.4	23.1	23.0	25.0	17.4	20.7	21.2	29.6
Cyanide, Total	27	NA	NA	NA	NA	NA	NA	NA	NA
Lead	63	**79.5**	18.3	21.5	58.3	14.9	21.1	18.0	30.5
Mercury	0.18	0.032	0.048	0.040	0.038	0.037	0.059	0.064	0.030
Nickel	30	**41.0**	**48.2**	**42.3**	**31.1**	**33.6**	**33.3**	**34.4**	**40.1**
Selenium	3.9	1.06	1.52	1.41	0.779 J	1.04 J	1.26	1.19	1.18
Silver	2	0.322 J	0.603	0.472 J	0.253 J	0.289 J	0.292 J	0.316 J	0.218 J
Zinc	109	**193**	**121**	107	**152**	82.3	101	87.2	**122**

TABLE 4-10A COMPARISON OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS TO UNRESTRICTED USE SOIL CLEANUP OBJECTIVES - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC**	**East**			**North**			
Sample Name	**Unrestricted Use**	**SB-59(1-2')**	**SB-60(0-1')**	**SB-60(1-2')**	**SD-06FP**	**SD-10FP**	**SD-11FP**	**SD-12FP**
Sample Date	**SCOs[(a)] (mg/kg)**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**10/18/2012**	**4/15/2013**	**4/15/2013**	**4/15/2013**
Arsenic	13	6.57	6.79	6.35	6.53	6.72	7.86	7.48
Barium	350	74.5	103	98.9	91.2 J	63.8	90.7	90.1
Cadmium	2.5	0.639	0.989	0.706	0.900	0.320 UJ	0.360 UJ	0.340 UJ
Chromium	30	18.5	20.3	18.8	16.4 J	15.9 J	18.8 J	17.2 J
Copper	50	18.2	25.1	22.6	43.8 J	19.8 J	22.4 J	19.9 J
Cyanide, Total	27	NA	NA	NA	0.052 J	0.315 U	0.342 U	0.128 J
Lead	63	18.7	25.9	22.8	**97.1**	16.4	35.0	16.7
Mercury	0.18	0.039	0.044	0.055	0.060	0.010 J	0.010 J	0.013 U
Nickel	30	**36.3**	**44.5**	**43.3**	**36.5**	**42 J**	**45.7 J**	**41.5 J**
Selenium	3.9	1.08	1.02 J	1.49	**4.14**	0.590 J	0.640 J	1.14 U
Silver	2	U	U	0.315 J	0.550	1.16	1.39	1.10
Zinc	109	86.4	**163**	**119**	**198 J**	86.6 J	**119 J**	85.7 J

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TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR

Area	NYSDEC SCOs[a] (mg/kg)		Northwest				West		
Sample Name	**Protection of Ecological Resources**	**Restricted Residential**	**MW-08(0-2')**	**MW-08(0-2') (DUP)**	**MW-08(2-4')**	**MW-08(6-8')**	**SB-19(0-2')**	**SB-19(2-4')**	**SB-19(2-4') (DUP)**
Sample Date			**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**4/15/2013**	**4/15/2013**	**4/15/2013**
Arsenic	13	16	**18.0**	11.0	**80.0**	6.70	6.55	**48.2 J**	10.6 J
Barium	433	400	250	210	**8,800**	71.0	83.5	**461**	422
Cadmium	4	4.3	1.90	1.50	**5.50**	0.720 U	0.310 UJ	**5.88 J**	**6.18 J**
Chromium	41	180	26 J	24 J	**74 J**	18 J	16.2 J	**46.8 J**	**50.6 J**
Copper	50	270	**130 J**	**770 J**	**410 J**	29 J	19.3 J	**854 J**	**324 J**
Cyanide, Total	NC	27	100 J	110 J	NA	NA	NA	NA	NA
Lead	63	400	**320 J**	**290 J**	**790 J**	13 J	34.6	**818**	**793**
Mercury	0.18	0.81	0.180	0.160	**0.390**	0.100 U	0.035	**1.3 D**	**2.09 D**
Nickel	30	310	**36 J**	**35 J**	**92 J**	28 J	**38.1 J**	**70.3 J**	**90.2 J**
Selenium	3.9	180	2.2 U	2.2 U	2.2 U	2.2 U	0.470 J	0.990 U	0.960 U
Silver	2	180	**3.2 J**	1.8 U	1.9 U	1.8 U	1.10	0.150 J	**2.41 J**
Zinc	109	10,000	**440**	**450**	**2,700**	73.0	101 J	**1,350 J**	**757 J**

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Protection of Ecological Resources and Restricted Residential SCOs. December.

NOTE:
- NYSDEC = New York State Department of Environmental Conservation
- SCO = Soil Cleanup Objective
- mg/kg = Milligrams per kilogram
- DUP = Duplicate field sample.
- J = Estimated concentration.
- U = Not detected; the associated value is the detection limit.
- NC = No criterion available.
- NA = Not analyzed.
- D = Result obtained from a diluted sample analysis.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000 series and total cyanide by 9010.
Data Validation completed by Data Validation Services.
Table includes constituents that exceed SCOs in one or more samples.
Bolded concentrations exceed the Protection of Ecological Resources SCOs.
Shaded concentrations exceed the Restricted Residential SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[a] (mg/kg)**		**West**						
Sample Name	**Protection of**	**Restricted**	**SB-19(4-6')**	**SB-19(6-7')**	**SB-34(0-1')**	**SB-34(1-2')**	**SB-34(2-3')**	**SB-34(2-3') (DUP)**	**SB-34(3-4')**
Sample Date	**Ecological Resources**	**Residential**	**4/15/2013**	**4/15/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**
Arsenic	13	16	10.9	9.65	6.16	11.2	8.50	6.41	8.34
Barium	433	400	59.7	66.0	102 J	249 J	81.1 J	128 J	66.5 J
Cadmium	4	4.3	0.320 UJ	0.290 UJ	2.14 J	3.75 J	1.57 J	2.05 J	2.32 J
Chromium	41	180	16.4 J	16.6 J	15 J	22.5 J	15.9 J	19.3 J	15.6 J
Copper	50	270	19.7 J	19.3 J	38.4 J	**103 J**	27.7 J	27.3 J	27.8 J
Cyanide, Total	NC	27	NA	NA	0.297 U	0.709	0.307 U	0.302 U	0.303 U
Lead	63	400	18.1	16.6	**136**	**356**	20.1	16.4	22.3
Mercury	0.18	0.81	0.015	0.015	**0.275**	**0.826 D**	0.010 J	0.022	0.010 J
Nickel	30	310	**46.5 J**	**48.6 J**	28.9 J	**35.6 J**	**33.5 J**	**45.3 J**	**31.6 J**
Selenium	3.9	180	0.500 J	0.540 J	3.46 J	**5.21 J**	3.52 J	3.7 J	3.51 J
Silver	2	180	1.39	1.48	R	0.804 J	R	R	R
Zinc	109	10,000	95 J	94.7 J	**175 J**	**462 J**	76 J	71.9 J	70 J
NOTE:	R	= The data are rejected.							

TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[a] (mg/kg)**		**west**							
Sample Name	**Protection of**	**Restricted**	**SB-35(0-1')**	**SB-35(1-2')**	**SB-35(2-3')**	**SB-35(3-4')**	**SB-36(0-1')**	**SB-36(1-2')**	**SB-36(2-3')**	**SB-36(3-4')**
Sample Date	**Ecological Resources**	**Residential**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**
Arsenic	13	16	8.63	**28.0**	**42.3**	7.09	6.57	9.72	9.14	12.1
Barium	433	400	90.3 J	**468 J**	**1,050 J**	58.5 J	72.8 J	74.9 J	80.9 J	70.5 J
Cadmium	4	4.3	2.33 J	**15.4 J**	**11.9 J**	1.47 J	2.09 J	2.11 J	2.05 J	2.09 J
Chromium	41	180	18.4 J	**46.5 J**	**60.3 J**	14.6 J	14.7 J	13.9 J	18.1 J	16.6 J
Copper	50	270	30.5 J	**447 J**	**1,030 J**	23.9 J	22.9 J	21.7 J	27.8 J	30.6 J
Cyanide, Total	NC	27	0.298 U	1.42	4.72	0.067 J	0.306 U	0.310 U	0.300 U	0.303 U
Lead	63	400	53.0	**1,370**	**892**	13.8	**101**	19.1	16.2	19.9
Mercury	0.18	0.81	**0.681 D**	**1.48 D**	**1.5 D**	0.015	0.036	0.034	0.012	0.008 J
Nickel	30	310	**36.5 J**	**50 J**	**64.2 J**	**31.1 J**	19.9 J	28.7 J	**36.8 J**	**35.4 J**
Selenium	3.9	180	3.69 J	**9.72 J**	**13 J**	3.18 J	3.12 J	3.87 J	3.48 J	3.68 J
Silver	2	180	R	R	R	R	R	R	R	R
Zinc	109	10,000	**130 J**	**1,320 J**	**1,960 J**	67.6 J	**166 J**	54.7 J	77 J	75.2 J

TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[a] (mg/kg)**		**Cemetery**						
Sample Name	**Protection of**	**Restricted**	**SB-37(0-1')**	**SB-37(0-1') (DUP)**	**SB-37(1-2')**	**SB-38(0-1')**	**SB-38(1-2')**	**SB-39(0-1')**	**SB-39(1-2')**
Sample Date	**Ecological Resources**	**Residential**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**	**7/1/2013**
Arsenic	13	16	5.84	7.70	6.91	6.99	6.79	8.48	6.57
Barium	433	400	73.6 J	92.8 J	87.7 J	86.5 J	86.6 J	91.9 J	75.7 J
Cadmium	4	4.3	1.58	2.22	1.92	1.94	2.03	2.34	1.71
Chromium	41	180	12.3 J	16.6 J	14.4 J	16.4 J	15.1 J	16.2 J	14.3 J
Copper	50	270	25.9	27.6	28.8	29.8	28.3	36.6	26.6
Cyanide, Total	NC	27	NA	NA	NA	NA	NA	NA	NA
Lead	63	400	34.0	**472 J**	43.4	**65.9**	36.7	**71.9**	35.8
Mercury	0.18	0.81	0.030	0.054	0.071	0.057	0.026	0.038	0.030
Nickel	30	310	27.6	**31.8**	**33.8**	**33.4**	**33.3**	**36.5**	**30.9**
Selenium	3.9	180	2.66	3.44	3.17	3.55	3.72	3.80	3.14
Silver	2	180	0.243 UJ	0.285 UJ	0.249 UJ	0.295 UJ	0.282 UJ	0.273 UJ	0.282 UJ
Zinc	109	10,000	84.5 J	**139 J**	106 J	**166 J**	**205 J**	**136 J**	89.1 J

TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**North of Baker**						
Sample Name	**Protection of**	**Restricted**	**SB-40(0-1')**	**SB-40(1-2')**	**SB-43(0-1')**	**SB-43(1-2')**	**SB-43(2-3')**	**SB-46(0-1')**	**SB-46(0-1') (DUP)**
Sample Date	**Ecological Resources**	**Residential**	**7/1/2013**	**7/1/2013**	**7/2/2013**	**7/2/2013**	**8/13/2013**	**7/2/2013**	**7/2/2013**
Arsenic	13	16	**36.9**	6.12	**21.8 D**	9.72 JD	11.0	**24.8 D**	**17 D**
Barium	433	400	**598 J**	115 J	**1,010 D**	**509 D**	73.5	**857 D**	**892 D**
Cadmium	4	4.3	**12.3**	1.94	**4.55 JD**	2.14 JD	1.46	**7.02 D**	**7.25 D**
Chromium	41	180	**43.9 J**	14.5 J	**61.4 J**	**38.8 J**	16.9	**92.3 D**	**76.8 J**
Copper	50	270	**1,820**	17.2	**513 D**	**173 D**	18.5	**480 D**	**765 D**
Cyanide, Total	NC	27	NA	NA	NA	NA	NA	NA	NA
Lead	63	400	**1,880**	49.9	**1,380 D**	**976 D**	16.8	**1,480 D**	**1,880 D**
Mercury	0.18	0.81	0.053	0.050	**1.58 D**	0.107	0.017	**0.239**	**0.229**
Nickel	30	310	**76.7**	22.6	**58 ND**	**40.1 ND**	**38.3**	**92.5 J**	**65.7 ND**
Selenium	3.9	180	**6.18**	3.57	15.4 UJ	13.7 UJ	0.700	15.8 UJ	13.9 UJ
Silver	2	180	0.258 UJ	0.270 UJ	7.72 UND	6.85 UND	**3.09**	R	6.93 UND
Zinc	109	10,000	**1,230 J**	91.1 J	**2,310 D**	**947 D**	90.3	**2,600 D**	**2,430 D**
NOTE:	N	= The constituent is tentatively identified.							

TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[a] (mg/kg)**		**North of Baker**	**East**					
Sample Name	**Protection of**	**Restricted**	**SB-46(1-2')**	**SB-50(0-1')**	**SB-50(0-1') (DUP)**	**SB-50(1-2')**	**SB-51(0-1')**	**SB-51(1-2')**	**SB-52(0-1')**
Sample Date	**Ecological Resources**	**Residential**	**7/2/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**
Arsenic	13	16	8.44 JD	**13.8**	**13.3**	6.83	**20.7**	10.5	**21.7**
Barium	433	400	173 D	**600**	**475**	116	350	125	**718**
Cadmium	4	4.3	4.84 UD	**5.61**	**5.88**	1.85	**12.9**	2.66	**20.3**
Chromium	41	180	27.3 J	**42.6**	**35.7**	19.9	**44.9**	22.0	**55.2**
Copper	50	270	26.6 D	**54.8**	**63.7**	10.2	**104**	25.8	**427**
Cyanide, Total	NC	27	NA	NA	NA	NA	NA	NA	NA
Lead	63	400	60.8 D	**1,620**	**1,290**	**63.3**	**1,310**	**79.6**	**3,530**
Mercury	0.18	0.81	0.073	**0.269**	**0.318**	0.057	**0.506**	0.084	0.151
Nickel	30	310	**39.2 ND**	**44.5**	**39.7**	**36.2**	**45.0**	**42.9**	**90.8**
Selenium	3.9	180	16.1 UJ	1.45	0.830	0.740	0.880	0.800	0.570 U
Silver	2	180	8.07 UND	**4.25**	**3.78**	**3.20**	**6.99**	**3.64**	**12.7**
Zinc	109	10,000	**202 D**	**987**	**838**	**118**	**1,520**	**195**	**2,830**

TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**East**						
Sample Name	**Protection of**	**Restricted**	**SB-52(1-2')**	**SB-53(0-1')**	**SB-53(1-2')**	**SB-54(0-1')**	**SB-54(1-2')**	**SB-55(0-1')**	**SB-55(1-2')**
Sample Date	**Ecological Resources**	**Residential**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**8/13/2013**	**2/21/2014**	**2/21/2014**
Arsenic	13	16	9.02	**29.5**	**37.6**	**34.5**	**34.8**	**18.4**	6.33
Barium	433	400	134	**498**	411	**473**	**598**	300	72.1
Cadmium	4	4.3	2.24	**27.7**	**17.5**	**23.3**	**57.5**	**6.67**	1.87
Chromium	41	180	19.5	**68.5**	**51.9**	**73.1**	**146**	**39.1**	12.4
Copper	50	270	14.8	**407**	**394**	**588**	**1,470**	**205**	**89.3**
Cyanide, Total	NC	27	NA	NA	NA	NA	NA	NA	NA
Lead	63	400	62.5	**1,620**	**1,170**	**1,670**	**3,340**	**1,780**	**339**
Mercury	0.18	0.81	0.060	0.170	0.132	0.056	**0.232**	0.173	0.061
Nickel	30	310	**40.0**	**134**	**125**	**125**	**250**	**57.2**	24.6
Selenium	3.9	180	0.900	0.550 U	0.500 U	0.480 U	0.540 U	1.6	UN
Silver	2	180	**3.76**	**14.6**	**11.2**	**14.5**	**19.1**	1.28	0.348 J
Zinc	109	10,000	**355**	**1,360**	**862**	**1,850**	**1,580**	U	**284**

TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[a] (mg/kg)**		**East**						
Sample Name	**Protection of**	**Restricted**	**SB-55(2-3')**	**SB-55(10-11')**	**SB-56(0-1')**	**SB-56(1-2')**	**SB-56(2-3')**	**SB-56(3-4')**	**SB-57(0-1')**
Sample Date	**Ecological Resources**	**Residential**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**
Arsenic	13	16	**42.2**	4.00	9.80	7.06	6.87	5.25	9.48
Barium	433	400	**787**	47.6	117	106	105	66.0	89.1
Cadmium	4	4.3	**47.5**	0.165 JN	2.09	1.15	0.680	0.525	1.38
Chromium	41	180	**132**	11.7	18.3	19.3	19.9	13.3	19.5
Copper	50	270	**484**	17.2	**55.4**	29.2	25.6	20.4	34.4
Cyanide, Total	NC	27	NA	NA	NA	NA	NA	NA	NA
Lead	63	400	**8,210**	10.9	**141**	56.0	17.7	14.3	**79.5**
Mercury	0.18	0.81	**0.199**	0.018	0.053	0.046	0.035	0.031	0.032
Nickel	30	310	**245**	23.9	**35.1**	**45.8**	**46.3**	**33.7**	**41.0**
Selenium	3.9	180	UN	0.653 JN	1.20	1.33	1.46	0.639 JN	1.06
Silver	2	180	U	U	0.376 J	0.519 J	0.550	0.235 J	0.322 J
Zinc	109	10,000	U	63.0	**357**	**161**	**110**	75.2	**193**

TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**East**						
Sample Name	**Protection of Ecological Resources**	**Restricted Residential**	**SB-57(1-2')**	**SB-57(2-3')**	**SB-58(0-1')**	**SB-58(1-2')**	**SB-58(2-3')**	**SB-58(2-3') (DUP)**	**SB-59(0-1')**
Sample Date			**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**2/24/2014**	**2/21/2014**
Arsenic	13	16	6.77	7.79	7.90	6.43	6.95	6.49	10.97
Barium	433	400	111	89.7	60.2	77.2	71.1	73.3	71.6
Cadmium	4	4.3	0.654	0.910	1.10	0.465	0.573	0.380	0.901
Chromium	41	180	22.0	18.6	13.5	14.5	14.9	15.2	18.3
Copper	50	270	23.1	23.0	25.0	17.4	20.7	21.2	29.6
Cyanide, Total	NC	27	NA	NA	NA	NA	NA	NA	NA
Lead	63	400	18.3	21.5	58.3	14.9	21.1	18.0	30.5
Mercury	0.18	0.81	0.048	0.040	0.038	0.037	0.059	0.064	0.030
Nickel	30	310	**48.2**	**42.3**	**31.1**	**33.6**	**33.3**	**34.4**	**40.1**
Selenium	3.9	180	1.52	1.41	0.779 J	1.04 J	1.26	1.19	1.18
Silver	2	180	0.603	0.472 J	0.253 J	0.289 J	0.292 J	0.316 J	0.218 J
Zinc	109	10,000	**121**	107	**152**	82.3	101	87.2	**122**

TABLE 4-10B SUMMARY OF SUBSURFACE SOIL INORGANIC CONSTITUENT RESULTS - SMOKES CREEK CORRIDOR (CONTINUED)

Area	**NYSDEC SCOs[(a)] (mg/kg)**		**East**			**North**			
Sample Name	**Protection of**	**Restricted**	**SB-59(1-2')**	**SB-60(0-1')**	**SB-60(1-2')**	**SD-06FP**	**SD-10FP**	**SD-11FP**	**SD-12FP**
Sample Date	**Ecological Resources**	**Residential**	**2/21/2014**	**2/21/2014**	**2/21/2014**	**10/18/2012**	**4/15/2013**	**4/15/2013**	**4/15/2013**
Arsenic	13	16	6.57	6.79	6.35	6.53	6.72	7.86	7.48
Barium	433	400	74.5	103	98.9	91.2 J	63.8	90.7	90.1
Cadmium	4	4.3	0.639	0.989	0.706	0.900	0.320 UJ	0.360 UJ	0.340 UJ
Chromium	41	180	18.5	20.3	18.8	16.4 J	15.9 J	18.8 J	17.2 J
Copper	50	270	18.2	25.1	22.6	43.8 J	19.8 J	22.4 J	19.9 J
Cyanide, Total	NC	27	NA	NA	NA	0.052 J	0.315 U	0.342 U	0.128 J
Lead	63	400	18.7	25.9	22.8	**97.1**	16.4	35.0	16.7
Mercury	0.18	0.81	0.039	0.044	0.055	0.060	0.010 J	0.010 J	0.013 U
Nickel	30	310	**36.3**	**44.5**	**43.3**	**36.5**	**42 J**	**45.7 J**	**41.5 J**
Selenium	3.9	180	1.08	1.02 J	1.49	**4.14**	0.590 J	0.640 J	1.14 U
Silver	2	180	U	U	0.315 J	0.550	1.16	1.39	1.10
Zinc	109	10,000	86.4	**163**	**119**	**198 J**	86.6 J	**119 J**	85.7 J

TABLE 4-11 SUMMARY OF SUBSURFACE SOIL ORGANIC COMPOUND RESULTS - SMOKES CREEK CORRIDOR

Area	**NYSDEC SCOs[a] (mg/kg)**			**Northwest**				**North**
Sample Name	**Unrestricted**	**Protection of Ecological**	**Restricted**	**MW-08(0-2')**	**MW-08(0-2') (DUP)**	**MW-08(2-4')**	**MW-08(6-8')**	**SD-06FP**
Sample Date	**Use**	**Resources**	**Residential**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**11/6/2012**	**10/18/2012**
SEMIVOLATILE ORGANIC COMPOUNDS								
Benzo(a)anthracene	1	NC	1	0.042 U	0.077	0.120	0.040 U	0.460 U
Benzo(a)pyrene	1	2.6	1	0.042 U	0.073	0.100	0.040 U	0.460 U
Benzo(b)fluoranthene	1	NC	1	0.052	0.110	0.140	0.040 U	0.190 J
Benzo(g,h,i)perylene	100	NC	100	0.042	0.078	0.088	0.040 U	0.460 U
Benzo(k)fluoranthene	0.8	NC	3.9	0.042 U	0.041 U	0.058	0.040 U	0.460 U
Chrysene	1	NC	3.9	0.042 UJ	0.084 J	0.120	0.040 U	0.460 U
Fluoranthene	100	NC	100	0.056	0.110	0.200	0.040 U	0.240 J
Indeno(1,2,3-cd)pyrene	0.5	NC	0.5	0.042 U	0.065	0.076	0.040 U	0.460 U
Phenanthrene	100	NC	100	0.042 U	0.051	0.140	0.040 U	0.460 U
Pyrene	100	NC	100	0.068	0.130	0.210	0.040 U	0.210 J
PESTICIDES								
DDE, p,p'-	0.0033	0.0033	8.9	**0.016**	**0.019**	NA	NA	0.002 U
DDT, p,p'-	0.0033	0.0033	7.9	**0.012 NJ**	**0.014 NJ**	NA	NA	0.002 U

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use and Restricted Residential SCOs. December.

NOTE:

NYSDEC	= New York State Department of Environmental Conservation
SCO	= Soil Cleanup Objective
mg/kg	= Milligrams per kilogram
DUP	= Duplicate field sample.
NC	= No criterion.
U	= Not detected; the associated value is the detection limit.
J	= Estimated concentration.
DDE	= Dichlorodiphenyldichloroethylene
DDT	= Dichlorodiphenyltrichloroethane
NA	= Not analyzed.
N	= Tentatively identified constituent.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 8270 and 8082.
Data Validation completed by Data Validation Services.
Table includes only those contituents that were detected in one or more samples and for which SCOs have been established.
Bolded concentrations exceed the Unrestricted Use SCOs.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

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TABLE 4-12 SUMMARY OF SURFACE SOIL INORGANIC CONSTITUENT RESULTS - BACKGROUND AREA

Area	NYSDEC Unrestricted Use SCOs(a) (mg/kg)	Western			Eastern		
Sample Name		**SS-28**	**SS-29**	**SS-30**	**SS-31**	**SS-32**	**SS-33**
Sample Date		**4/16/2013**	**4/16/2013**	**4/16/2013**	**4/16/2013**	**4/16/2013**	**4/16/2013**
Aluminum	NC	11,400 J	8,150 J	9,970 J	9,420 J	11,200 J	11,400 J
Antimony	NC	2.8 UJ	2.81 UJ	2.91 UJ	3.28 UJ	3.32 UJ	3.38 UJ
Arsenic	13	7.36	6.07	9.75	6.62	8.82	8.73
Barium	350	97.0	75.1	72.4	41.0	57.1	58.6
Beryllium	7.2	0.630 J	0.200 J	0.250 J	0.160 J	0.150 J	0.160 J
Cadmium	2.5	0.340 U	0.340 U	0.350 U	0.390 U	0.400 U	0.410 U
Calcium	NC	16,800 J	9,270 J	7,640 J	1,640 J	2,030 J	2,580 J
Chromium	30	15.7	13.8	22.8	14.4	19.4	19.6
Cobalt	NC	13.4 J	6.01 J	12.7 J	4.28 J	5.06 J	5.24 J
Copper	50	16.6	16	24.4	8.46	10.9	11.8
Iron	NC	26,800	18,800	34,100	20,100	26,700	25,800
Lead	63	55.6	38.2	**148**	52.6	58.7	58.6
Magnesium	NC	4,520 J	2,570 J	5,300 J	1,360 J	1,660 J	1,800 J
Manganese	1,600	672 J	626 J	418 J	141 J	261 J	303 J
Mercury	0.18	0.054	0.055	0.070	0.060	0.075	0.063
Nickel	30	**30.2**	17.6	**39.9**	14.3	16.3	17.1
Potassium	NC	1,180	821	1,530	680	725	636
Selenium	3.9	1.28 J	0.670 J	0.820 J	0.570 J	0.580 J	0.710 J
Silver	2	1.07	0.570	1.33	0.450 J	0.500 J	0.580 J
Sodium	NC	54.6 J	35.7 J	16.9 J	76.5 J	14.8 J	75.4 J
Thallium	NC	0.880 J	0.560 J	1.19 J	0.570 J	1.07 J	0.950 J
Vanadium	NC	20.1	14.1	20.3	21.5	24.6	23.8
Zinc	109	**143 J**	**113 J**	**278 J**	**141 J**	**152 J**	**164 J**

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use Soil Cleanup Objectives. December.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
mg/kg = Milligrams per kilogram
NC = No criterion available.
J = Estimated concentration.
U = Not detected; the associated value is the detection limit.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000.
Data Validation completed by Data Validation Services.
All concentrations reported in mg/kg equivalent to parts per million (ppm).
Bolded values exceed NYSDEC Part 375 Unrestricted Use SCOs.

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TABLE 4-13 SUMMARY OF SURFACE SOIL SEMIVOLATILE ORGANIC COMPOUND RESULTS - BACKGROUND AREA

Area	NYSDEC	Western			Eastern		
Location	Unrestricted Use	SS-28	SS-29	SS-30	SS-31	SS-32	SS-33
Sample Date	SCOs[(a)] (mg/kg)	4/16/2013	4/16/2013	4/16/2013	4/16/2013	4/16/2013	4/16/2013
Anthracene	100	0.410 U	0.220 J	0.460 U	0.480 U	0.520 U	0.520 U
Benzo(a)anthracene	1	0.380 J	0.440 J	0.250 J	0.480 U	0.520 U	0.520 U
Benzo(a)pyrene	1	0.350 J	0.440 J	0.250 J	0.480 U	0.520 U	0.520 U
Benzo(b)fluoranthene	1	0.510	0.640	0.390 J	0.480 U	0.520 U	0.520 U
Benzo(g,h,i)perylene	100	0.220 J	0.310 J	0.460 U	0.480 U	0.520 U	0.520 U
Benzo(k)fluoranthene	0.8	0.170 J	0.190 J	0.460 U	0.480 U	0.520 U	0.520 U
Chrysene	1	0.430	0.540	0.290 J	0.480 U	0.520 U	0.520 U
Dibenzo(a,h)anthracene	0.33	0.410 U	0.450 U	0.230 J	0.480 U	0.520 U	0.520 U
Dimethylphthalate	NC	0.280 J	0.340 J	0.210 J	0.390 J	0.300 J	1.10
Fluoranthene	100	0.570	1.30	0.530	0.230 J	0.520 U	0.520 U
Indeno(1,2,3-cd)pyrene	0.5	0.200 J	0.270 J	0.290 J	0.480 U	0.520 U	0.520 U
Phenanthrene	100	0.410 U	1.00	0.260 J	0.480 U	0.520 U	0.520 U
Pyrene	100	0.460	0.900	0.450 J	0.480 U	0.520 U	0.520 U

(a) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use SCOs. December.

NOTE:

NYSDEC	= New York State Department of Environmental
SCO	= Soil Cleanup Objective
mg/kg	= Milligrams per kilogram
U	= Not detected; the associated value is the detection limit.
J	= Estimated concentration.
NC	= No criterion available.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Method 8270.
Data Validation completed by Data Validation Services.
Table includes detected semivolatile organic compounds.
All concentrations reported in mg/kg equivalent to parts per million (ppm).

TABLE 4-14 SUMMARY OF GROUNDWATER INORGANIC CONSTITUENT RESULTS

Area	NYSDEC Class GA Standards and Guidance Values[a] (µg/L)	On-Site				Upgradient		
Sample Location		MW-02A	MW-02A	MW-03A	MW-03A	MW-04	MW-04 (Filtered)[b]	MW-04
Sample Date		11/29/2012	4/17/2013	11/28/2012	4/16/2013	11/28/2012	11/28/2012	4/17/2013
Aluminum	NC	2,650 J	88.8 J	193 J	240	7,040 J	25 U	231 J
Antimony	3	**5.48 J**	25 U	**6.08 J**	25 U	**4.56 J**	**6.34 J**	25 U
Arsenic	25	9.3 J	16.4	12.3 J	13.7	6.9 J	5 UJ	10 U
Barium	1,000	248	314	250	255 J	145	106 J	180
Beryllium	3 G	1.5 UJ	3 U	1.5 UJ	3 U	1.5 UJ	1.5 UJ	3 U
Cadmium	5	1.5 UJ	3 U	1.5 UJ	3 U	1.5 UJ	1.5 UJ	3 U
Calcium	NC	59,500	72,200 J	92,300	58,200	74,800	79,300 J	113,000 J
Chromium	50	64.6 U	22.8 J	24.2 U	2.58 J	**293 J**	2.5 U	21.5 J
Cobalt	NC	3.33 J	15 U	7.5 U	15 U	9.02	7.5 UJ	15 U
Copper	200	15.7 UJ	8.76 JN	5.58 UJ	2.92 J	23.2 UJ	5 UJ	11.6
Cyanide, Total	200	3 J	5 U	3 J	5 U	4 J	NA	5 U
Iron	300	**4,200**	**896 J**	993 U	**655**	**12,300**	25 U	**723 J**
Lead	25	4.94 J	2.89 J	3 UJ	6 U	7.26 J	3 UJ	5.09 J
Magnesium	35,000 G	30,600	**48,800 J**	**53,000**	**41,700**	**36,100**	**37,200 J**	**59,500 J**
Manganese	300	147 J	106 J	**342 J**	69.9	**364 J**	191 J	187 J
Mercury	0.7	0.200 UJ	0.200 U	0.200 UJ	0.200 U	0.200 UJ	0.200 UJ	0.200 U
Nickel	100	43.6 U	13.8 J	20.7 U	10.7 J	**195**	10 U	17.2 J
Potassium	NC	2,490 J	3,080 J	7,090 J	50,000	6,130 J	4,880 J	6,150 J
Sodium	20,000	**30,800**	**57,500 J**	**214,000**	**254,000**	**27,400 J**	**32,700 J**	**38,700 J**
Vanadium	NC	5.48 J	20 UN	10 UJ	20 U	13.5 J	10 UJ	20 UN
Zinc	2,000 G	33.2 U	20 U	29.4 U	13.1 J	44 U	10 U	145

(a) 6 New York Code of Rules and Regulations Part 703.5 Class GA Groundwater Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended.

(b) Due to elevated turbidity observed in samples collected from MW-04, MW-06, and MW-08 in November 2012, unpreserved samples were submited to the laboratory where the samples were filtered, preserved, and analyzed.

NOTE:
- NYSDEC = New York State Department of Environmental Conservation
- µg/L = Micrograms per liter
- NC = No criteria.
- J = Estimated concentration.
- U = The constituent was not detected. The associated value is the detection limit.
- G = Guidance Value
- N = Indicates the spiked sample recovery is not within control limits.
- NA = Not analyzed.

Table includes only those inorganic constituents that were detected in one or more samples.
Analytical data results obtained by Chemtech Consulting Group using SW-846 Method Series 6000/7000 and EPA Method 300.
Data Validation completed by Data Validation Services.
All concentrations reported in micrograms per liter (µg/L) equivalent to parts per billion (ppb).
Bolded values indicate exceedance of Class GA groundwater standards or guidance values.

TABLE 4-14 SUMMARY OF GROUNDWATER INORGANIC CONSTITUENT RESULTS (CONTINUED)

Area	NYSDEC Class GA	Baker Hall			On-Site		
Sample Location	**Standards and Guidance Values[a]**	**MW-05**	**MW-05**	**MW-05 (DUP)**	**MW-06**	**MW-06 (Filtered)[b]**	**MW-06**
Sample Date	**(µg/L)**	**11/29/2012**	**4/17/2013**	**4/17/2013**	**11/28/2012**	**11/28/2012**	**4/16/2013**
Aluminum	NC	145 J	50 UJ	50 UJ	8,100 J	25 UJ	2,200
Antimony	3	**4.84 J**	25 U	25 U	12.5 UJ	**6.27 J**	25 U
Arsenic	25	8.4 J	18.7	14.3	13.6 J	5 J	**30.2**
Barium	1,000	177	262	198	255	169 J	221 J
Beryllium	3 G	1.5 UJ	3 U	3 U	1.5 UJ	1.5 UJ	3 U
Cadmium	5	1.5 UJ	3 U	3 U	1.5 UJ	1.5 UJ	3 U
Calcium	NC	46,900	80,700 J	60,700 J	76,000	56,500 J	60,700
Chromium	50	10 J	7.18 J	4.27 J	69.9 U	2.5 U	11.2
Cobalt	NC	7.5 U	15 U	15 U	5.78 J	7.5 UJ	15 U
Copper	200	5.46 J	4.11 JN	2.92 JN	15.6 UJ	5 UJ	7.08 J
Cyanide, Total	200	4 J	5 U	5 U	4 J	NA	5 U
Iron	300	196	**852 J**	**653 J**	**12,100**	25 U	**4,040**
Lead	25	3 UJ	6 U	6 U	7.08 J	3 UJ	2.6 J
Magnesium	35,000 G	27,800	**44,800 J**	33,100 J	**37,600**	31,200 J	34,300
Manganese	300	50 J	121 J	91.6 J	283 J	158 J	125
Mercury	0.7	0.200 UJ	0.200 U	0.200 U	0.200 UJ	0.200 UJ	0.200 U
Nickel	100	6.8 J	20 U	20 U	52.2 U	24.6 U	22.3
Potassium	NC	2,190 J	2,800 J	1,910 J	4,820 J	2,430 J	2,680
Sodium	20,000	**32,000**	**47,500 J**	**35,300 J**	**48,800**	**43,600 J**	**38,200**
Vanadium	NC	10 UJ	20 UN	20 UN	15 J	10 UJ	20 U
Zinc	2,000 G	23.9 U	20 U	20 U	41 U	10 UJ	79.1

TABLE 4-14 SUMMARY OF GROUNDWATER INORGANIC CONSTITUENT RESULTS (CONTINUED)

Area	NYSDEC Class GA Standards and Guidance Values[(a)] (µg/L)	On-Site		Downgradient			
Sample Location		MW-07	MW-07	MW-08	MW-08 (DUP)	MW-08 (Filtered)[(b)]	MW-08
Sample Date		11/28/2012	4/17/2013	11/29/2012	11/29/2012	11/29/2012	4/17/2013
Aluminum	NC	8,220 J	680 J	866 J	592 J	25 UJ	5,690 J
Antimony	3	12.5 UJ	25 U	**5.62 J**	**5.5 J**	**5.4 J**	25 U
Arsenic	25	12.3 J	**43.7**	2.9 J	2.5 J	5 UJ	17
Barium	1,000	290	403	279	284	278 J	389
Beryllium	3 G	0.420 J	3 U	1.5 UJ	1.5 UJ	1.5 UJ	3 U
Cadmium	5	0.290 J	3 U	1.5 UJ	1.5 UJ	1.5 UJ	3 U
Calcium	NC	123,000	110,000 J	90,700	93,700	91,200 J	199,000 J
Chromium	50	175 U	9.3 J	7.68 J	2.38 J	1.62 J	27.7 J
Cobalt	NC	7.72	15 U	7.5 U	7.5 U	7.5 UJ	15 U
Copper	200	27.7 UJ	19.8	2.66 J	1.62 J	5 UJ	15.8
Cyanide, Total	200	3 J	5 U	3 J	5 U	NA	5 U
Iron	300	**15,000**	**3,380 J**	**949**	**728**	27.7 J	**14,200 J**
Lead	25	**30.5 J**	18.4	3 UJ	3 UJ	3 UJ	17
Magnesium	35,000 G	**43,500**	**57,100 J**	**52,200**	**53,200**	**53,200 J**	**72,800**
Manganese	300	**338 J**	99.1 J	65.8 J	66.3 J	58.6 J	291 J
Mercury	0.7	0.109 J	0.200 U	0.200 UJ	0.200 UJ	0.200 UJ	0.200 U
Nickel	100	**123**	9.08 J	5.89 J	2.49 J	10 UJ	22.1
Potassium	NC	4,940 J	1,660 J	2,810 J	2,740 J	2,440 J	2,910 J
Sodium	20,000	**35,300**	**54,800 J**	**29,600**	**30,500**	**31,100 J**	**33,400 J**
Vanadium	NC	16.6 J	20 UN	10 UJ	10 UJ	10 UJ	11.5 JN
Zinc	2,000 G	86.2 U	20 U	9.22 U	6.01 U	10 UJ	20 U

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TABLE 4-15 SUMMARY OF GROUNDWATER GEOCHEMISTRY RESULTS

Area	NYSDEC Class GA Standards and Guidance Values[a] (µg/L)	On-Site				Upgradient	
Sample Location		MW-02A	MW-02A	MW-03A	MW-03A	MW-04	MW-04
Sample Date		11/29/2012	4/17/2013	11/28/2012	4/16/2013	11/28/2012	4/17/2013
Alkalinity, Total (as $CaCO_3$)	NC	380,000	367,000	410,000	304,000	380,000	351,000
Chloride	250,000	26,000 D	26,000 D	**410,000 D**	**430,000 D**	48,000 D	31,000 D
Demand, Biological Oxygen[c]	NC	2,000 U	NA	17,000	6,300	41,000	NA
Demand, Chemical Oxygen	NC	5,370	159,000	10,400	15,900	6,380	40,500
Hardness, Total	NC	274,000	NA	449,000	NA	335,000	NA
Nitrogen, Nitrate (as N)	10,000	100 U	424 J	100 U	100 U	100 U	1,330 J
Nitrite	1,000	150 U	150 UJ	150 U	150 U	150 U	150 UJ
Sulfate	250,000	18,000	NA	34,000	NA	120,000 D	NA
Sulfide	50 G	1,000 U	1,000 U	1,000 U	1,000 U	**1,120**	1,000 U
Total Organic Carbon	NC	NA	53,000 D	NA	7,100	NA	15,000
FIELD PARAMETERS							
Oxidation-reduction potential, millivolts	NC	62	-46	-31	-67	31	37
pH, Standard Units	NC	7.10	7.97	7.85	9.07	7.45	7.28

(a) 6 New York Code of Rules and Regulations Part 703.5 Class GA Groundwater Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended.

(b) Due to elevated turbidity observed in samples collected from MW-04, MW-06, and MW-08 in November 2012, unpreserved samples were submited to the laboratory where the samples were filtered, preserved, and analyzed.

(c) Biological oxygen demand samples collected from MW-02A, MW-07, MW-05, and MW-08 in April 2013 arrived at the laboratory outside of holding time due to a shipping issue and were not analyzed.

NOTE:

NYSDEC = New York State Department of Environmental Conservation
µg/L = Micrograms per liter
NC = No criteria.
D = Result obtained from a dilution run.
U = The constituent was not detected. The associated value is the detection limit.
NA = Not analyzed.
J = Estimated concentration.
G = Guidance Value

Table includes only those inorganic constituents that were detected in one or more samples.

Analytical data results obtained by Chemtech Consulting Group for total organic carbon by Method SM5310; biological oxygen demand by Method SM5210B; chemical oxygen demand by Method 5220D; alkalinity by Method SM2320B; chloride, nitrate, nitrite, and sulfate by U.S. Environmental Protection Agency Method 300; and sulfide by Method SM4500.

Data Validation completed by Data Validation Services.

All concentrations reported in µg/L equivalent to parts per billion (ppb).

Bolded values indicate exceedance of Class GA groundwater standards or guidance values.

TABLE 4-15 SUMMARY OF GROUNDWATER GEOCHEMISTRY RESULTS (CONTINUED)

Area	NYSDEC Class GA Standards and Guidance Values[a] (µg/L)	Baker Hall			On-Site	
Sample Location		MW-05	MW-05	MW-05 (DUP)	MW-06	MW-06
Sample Date		11/29/2012	4/17/2013	4/17/2013	11/28/2012	4/16/2013
Alkalinity, Total (as $CaCO_3$)	NC	360,000	365,000	364,000	460,000	396,000
Chloride	250,000	8,300	7,550	7,600	29,000 D	31,000 D
Demand, Biological Oxygen[c]	NC	14,000	NA	NA	6,500	3,200
Demand, Chemical Oxygen	NC	9,390	9,990	13,900	33,500	5,070
Hardness, Total	NC	232,000	NA	NA	344,000	NA
Nitrogen, Nitrate (as N)	10,000	353	266 J	282 J	318	376
Nitrite	1,000	150 U	150 UJ	150 UJ	150 U	150 U
Sulfate	250,000	15,000	NA	NA	25,000	NA
Sulfide	50 G	**1,280**	1,000 U	1,000 U	**1,120**	1,000 U
Total Organic Carbon	NC	NA	7,600	7,400	NA	4,300
FIELD PARAMETERS						
Oxidation-reduction potential, millivolts	NC	46	-71	NA	-20	-61
pH, Standard Units	NC	7.06	7.70	NA	7.56	7.47

TABLE 4-15 SUMMARY OF GROUNDWATER GEOCHEMISTRY RESULTS (CONTINUED)

Area	**NYSDEC Class GA Standards and Guidance Values[a] (µg/L)**	**On-Site**		**Downgradient**			
Sample Location		**MW-07**	**MW-07**	**MW-08**	**MW-08 (DUP)**	**MW-08 (Filtered) [b]**	**MW-08**
Sample Date		**11/28/2012**	**4/17/2013**	**11/29/2012**	**11/29/2012**	**11/29/2012**	**4/17/2013**
Alkalinity, Total (as $CaCO_3$)	NC	360,000	371,000	400,000	400,000	400,000	435,000
Chloride	250,000	110,000 D	140,000 D	78,000 D	77,000 D	78,000 D	140,000 D
Demand, Biological Oxygen[c]	NC	34,000	NA	19,000	22,000	19,000	NA
Demand, Chemical Oxygen	NC	18,400	57,300	5,000 U	5,000 U	5,000 U	18,900
Hardness, Total	NC	485,000	NA	441,000	453,000	441,000	NA
Nitrogen, Nitrate (as N)	10,000	288	720 J	100 U	100 U	100 U	855 J
Nitrite	1,000	150 U	150 UJ	150 U	150 U	150 U	150 UJ
Sulfate	250,000	22,000	NA	47,000	45,000	47,000	110,000
Sulfide	50 G	1,000 U	1,000 U	**1,440**	**1,280**	**1,440**	1,000 U
Total Organic Carbon	NC	NA	20,000	NA	NA	NA	5,700
FIELD PARAMETERS							
Oxidation-reduction potential, millivolts	NC	-47	-98	-76	NA	NA	-64
pH, Standard Units	NC	7.46	7.45	7.15	NA	NA	7.23

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TABLE 4-16 SUMMARY OF SURFACE WATER INORGANIC CONSTITUENT RESULTS - SMOKES CREEK

Area	NYSDEC Class C	Upstream (North of Baker Hall Property)	Near Northeast Corner of On-Site Area		Midstream (North of On-Site Area)	Near Northwest Corner of On-Site Area	Downstream (North of Stadium Property)
Sample Name	**Criteria (µg/L)[a]**	**SW-05**	**SW-06**	**SW-06 (DUP)**	**SW-08**	**SW-07**	**SW-09**
Sampling Date	**Aquatic Chronic A(C)**	**4/18/2013**	**4/18/2013**	**4/18/2013**	**4/18/2013**	**4/18/2013**	**4/18/2013**
INORGANICS (µg/L) (ppb)							
Aluminum	100	**107 N**	91.9 N	**100 N**	**100 N**	85.2 N	**111 N**
Barium	NC	55	49.5 J	54.3	49 J	47 J	53.1
Calcium	NC	64,900	58,100	61,000	56,500	54,000	60,700
Copper	74.89-87.56[b]	10 UN	10 UN	10 UN	10 UN	10 UN	2.3 JN
Iron	300	268	225	248	219	209	277
Magnesium	NC	9,520	8,510	8,820	8,190	7,950	8,820
Manganese	NC	40.1	34.2	35.9	34	31.1	41.5
Nickel	80.66-93.88[b]	20 U	20 U	6.64 J	20 U	20 U	15.6 J
Potassium	NC	1,120	874 J	1,020	842 J	690 J	966 J
Sodium	NC	69,000	61,800	65,700	59,500	59,500	66,400
Zinc	78.4-91.22[b]	15.8 JN	11.9 JN	20 UN	20 UN	20 UN	8.96 JN
GENERAL CHEMISTRY (mg/L) (ppm)							
Hardness, Total	NC	201	180	185	175	168	190

(a) 6 New York Code of Rules and Regulations Part 703.5 Class C Surface water Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as amended.

(b) These constituents have hardness-specific criteria. The range of hardness-corrected criteria for these samples is provided.

NOTE:
- NYSDEC = New York State Department of Environmental Conservation
- µg/L = Micrograms per liter
- DUP = Duplicate field sample
- ppb = Parts per billion
- N = Tentatively identified.
- NC = No criterion.
- J = Estimated concentration.
- U = The constituent was not detected. The associated value is the detection limit.
- mg/L = Milligrams per liter
- ppm = Parts per million

Table includes only those constituents that were detected in one or more samples.
Analytical data results obtained by Chemtech Consulting Group using SW-846 Method 6000/7000 series for metals, total cyanide by 9010, and hardness by SM300.
Data Validation completed by Data Validation Services.
Concentrations reported in µg/L equivalent to parts per billion (ppb), except for hardness, which is reported in mg/L, equivalent to ppm.
Bolded values indicate exceedance of Class C surface water standards or guidance values.

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TABLE 4-17 SUMMARY OF SEDIMENT INORGANIC CONSTITUENT RESULTS - SMOKES CREEK

Area	NYSDEC Sediment Criteria[(a)]		Upstream (North of Baker Hall Property)		Near Northeast Corner of On-Site Area		Near Northwest Corner of On-Site Area		
Sample Name			**SD-05A**	**SD-05B**	**SD-06A**	**SD-06B**	**SD-07A**	**SD-07B**	**SD-07B (DUP)**
Sample Date	**Class A**	**Class C**	**10/18/12**	**10/18/12**	**10/18/12**	**10/18/12**	**10/18/12**	**10/18/12**	**10/18/12**
Arsenic	10	33	6.23	6.29	6.46	6.74	4.72	3.65	3.85
Cadmium	1	5	0.260	0.410	0.240	0.230	0.390	0.360	0.270
Chromium	43	110	13.0 J	13.0 J	13.3 J	13.9 J	11.5 J	12.1 J	10.8 J
Copper	32	150	26.7 J	26.9 J	27.2 J	28.3 J	23.9 J	25.6 J	24.6 J
Lead	36	130	19.2	18.9	19.5	20.3	23.0	20.0	22.0
Mercury	0.2	1	0.018	0.021	0.019	0.022	0.039	0.029	0.025
Nickel	23	49	**28.4**	**28.1**	**29.1**	**30.2**	**22.8**	**22.6**	**22.5**
Silver	1	2.2	0.270 J	0.330 U	0.340	0.360 J	0.110 J	0.390 U	0.270 J
Zinc	120	460	84.8 J	78.5 J	88.2 J	91.4 J	107 J	92.3 J	98.8 J

(a) NYSDEC. 2013. Division of Fish, Wildlife and Marine Resources; Bureau of Habitat. Screening and Assessment of Contaminated Sediments. January.

NOTE:
NYSDEC = New York State Department of Environmental Conservation
DUP = Duplicate field sample
J = Estimated concentration.
U = Not detected; the associated number is the reporting limit.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 6000/7000.

Data Validation completed by Data Validation Services.

Table includes constituents detected in one or more samples and for which criterion have been developed.

All concentrations reported in milligrams per kilogram (mg/kg) equivalent to parts per million (ppm).

Bolded values indicate exceedance of NYSDEC Class A levels.

TABLE 4-17 SUMMARY OF SEDIMENT INORGANIC CONSTITUENT RESULTS - SMOKES CREEK (CONTINUED)

Area	**NYSDEC Sediment Criteria[(a)]**		**Midstream (North of On-Site Area)**		**(North of Stadium Property)**
Sample Name			**SD-08**	**SD-08 (DUP)**	**SD-09**
Sample Date	**Class A**	**Class C**	**4/16/2013**	**4/16/2013**	**4/16/2013**
Arsenic	10	33	6.37	5.98	7.60
Cadmium	1	5	0.380 U	0.430 U	0.370 U
Chromium	43	110	19.2 J	18.4 J	11.3 J
Copper	32	150	18.0	22.9	18.9
Lead	36	130	14.9	20.0	11.9
Mercury	0.2	1	0.013 J	0.027	0.020
Nickel	23	49	**42.1**	**36.6**	**30.1**
Silver	1.0	2.2	**1.10**	0.480 J	0.450 J
Zinc	120	460	81.9 J	94.1 J	64.1 J

TABLE 4-18 SUMMARY OF STORMWATER OUTFALL INORGANIC CONSTITUENT RESULTS

Area	NYSDEC Class C	**Smokes Creek Floodplain**		
Sample Name	**Criteria (µg/L)[(a)]**	**SW-03**	**SW-04**	**SW-04 (DUP)**
Sample Date	**Aquatic Chronic A(C)**	**11/07/12**	**11/07/12**	**11/07/12**
INORGANICS (µg/L)				
Aluminum	100	27.3	13.7 J	8.55 J
Cadmium[(b)]	107-142 [(b)]	0.270 J	1.5 U	1.5 U
Copper[(b)]	188-254 [(b)]	7.90	1.34 J	1.4 J
Cyanide, Total	5.2	**8.00**	**32.0**	NA
Iron	300	62.4	**2,290**	**2,380**
Potassium	NC	18,100 J	8,020 J	8,350 J
Selenium	4.6	**6.98**	3.09 JN	4.2 JN
Zinc[(b)]	193-259 [(b)]	23.5	91.3	89.9
GENERAL CHEMISTRY (mg/L)				
Hardness	NC	487	690	687

(a) 6 New York Code of Rules and Regulations Part 703.5 Class C Surface water Quality Regulations, as presented in the Division of Water Technical and Operational Guidance Series 1.1.1, 1998, as
(b) These constituents have hardness-specific criteria. The range of hardness-corrected criteria for these samples is provided.

NOTE:

NYSDEC	= New York State Department of Environmental Conservation
µg/L	= Micrograms per liter
DUP	= Duplicate field sample
J	= Estimated concentration
U	= The constituent was not detected. The associated value is the detection limit.
NA	= Not analyzed
NC	= No criterion
N	= Tentatively identified
mg/L	= Milligrams per liter

Table includes only those constituents that were detected in one or more samples and for which criteria have been developed.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Method 6000/7000 series for metals, total cyanide by 9010, and hardness by SM300.

Data Validation completed by Data Validation Services.

Concentrations reported in µg/L equivalent to parts per billion (ppb), except for hardness, which is reported in mg/L, equivalent to parts per million (ppm).

Bolded values indicate exceedance of Class C surface water standards or guidance values.

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TABLE 4-19 SUMMARY OF OUTFALL SURFACE SOIL RESULTS

Area / Sample Location / Sample Date	NYSDEC Unrestricted Use SCOs[a] (mg/kg)	NYSDEC Ecological SCOs[a] (mg/kg)	Storm Sewer Outfall (Upstream of Site)	(North of Northeast Corner of Site)	(North of Northwest Corner of Site)
Sample Location			**SD-03A (0-6")**	**SD-03 (0-6")**	**SD-04 (0-6")**
Sample Date			**10/18/2012**	**10/26/2012**	**10/18/2012**
INORGANICS					
Lead	63	63	**65.3**	**138**	53.8
Zinc	109	109	**238 J**	**298 J**	**235 J**
VOLATILE ORGANIC COMPOUNDS					
Acetone	0.05	2.2	**0.064**	0.039 U	**0.075**
SEMIVOLATILE ORGANIC COMPOUNDS					
Benzo(b)fluoranthene	1	NC	1.2 J	0.510 U	0.550 U
Chrysene	1	NC	1.00	0.510 U	0.550 U
Indeno(1,2,3-cd)pyrene	0.5	NC	0.540	0.510 U	0.550 U

(a) NYSDEC Division of Environmental Remediation. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. December 2006. Unrestricted Use and Protection of Ecological Resources SCOs.

NOTE:

NYSDEC	= New York State Department of Environmental Conservation
SCO	= Soil Cleanup Objective
mg/kg	= Milligrams per kilogram
J	= Estimated concentration.
U	= Not detected; the associated number is the method detection limit.
NC	= No criterion.

Analytical data results obtained by Chemtech Consulting Group using SW-846 Methods 8260, 8270, 8081, 8082, and 6000/7000.
Data Validation completed by Data Validation Services.

Table includes only those target compound list/target analyte list constituents detected at or above the indicated SCOs in one or more samples.

All concentrations reported in mg/kg equivalent to parts per million (ppm).

Bolded values exceed Unrestricted Use SCOs.

Shaded values exceed Protection of Ecological Resources SCOs.

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TABLE 4-20 SUMMARY OF INDOOR AIR AND SUB-SLAB SOIL VAPOR RESULTS

Sample Matrix	NYSDOH Air Guideline Values[(a)]	Sub-Slab Soil Vapor			Indoor Air			Outdoor Air
Sample Name		**SS-01**	**SS-01 (DUP)**	**SS-02**	**IA-01**	**IA-01 (DUP)**	**IA-02**	**OA-01**
Sample Date		**03/12/13**	**03/12/13**	**03/12/13**	**03/12/13**	**03/12/13**	**03/12/13**	**03/12/13**
Methylene chloride	60	2.95 J	32.29 J	12.36 J	0.31 J	0.22 UJ	0.56 J	**163.06 J**
Tetrachloroethene	100	0.41 U	1.22	1.42	0.41 U	0.47 J	0.41 U	0.41 UJ
Trichloroethene	5	0.32 J	4.35 J	0.28 U	0.28 U	1.83 J	0.32 J	0.28 UJ

(a) NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. October 2006. Table 3.1 Air guideline values derived by the NYSDOH.

NOTE:
NYSDOH = New York State Department of Health
DUP = Duplicate field sample
J = Estimated concentration.
U = Not detected; the associated number is the method detection limit.

Table includes only those volatile organic compounds detected in one or more samples and for which criteria have been developed.
Analytical data results obtained by Spectrum Analytical, Inc. using U.S. Environmental Protection Agency Method TO-15.
All concentrations reported in micrograms per meter cubed ($\mu g/m^3$).
Bolded values indicate exceedance of guidance values.

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TABLE 5-1 ENVIRONMENTAL FATE AND TRANSPORT PARAMETERS FOR CHEMICALS OF CONCERN[(a)]

Analyte	Water Solubility of Pure Compound (mg/L @ 25°C)	Vapor Pressure (mm Hg @ 25°C)	Henry's Law Constant (atm-m^3/L, @ 25°C)	K_{ow} (L/kg)	K_{oc} (L/kg)
METALS					
Arsenic	0.00E+00	0.00E+00	0.00E+00	NA	NA
Barium	0.00E+00	0.00E+00	0.00E+00	NA	NA
Cadmiuim	0.00E+00	0.00E+00	0.00E+00	NA	NA
Chromium	0.00E+00	0.00E+00	0.00E+00	NA	NA
Copper	0.00E+00	0.00E+00	0.00E+00	NA	NA
Lead[(c)]	0.00E+00	0.00E+00	0.00E+00	5.36E+00	1.00E+01
Manganese[(c)]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.01E+01
Nickel	0.00E+00	0.00E+00	0.00E+00	NA	NA
Zinc[(b)]	0.00E+00	0.00E+00	0.00E+00	3.38E-01	1.60E+01

[(a)] Adapted from U.S. Environmental Protection Agency (EPA). 1996. *Soil Screening Guidance: Technical Background Document* , Office of Emergency and Remedial Response, Washington, D.C., EPA/540/R95/128

[(b)] Cornell University, 2005. Material Safety Data Sheets.

[(c)] National Oceanic and Atmospheric Administration. 2010. Cameo Chemicals Database of Hazardous Materials.

NOTE: NA = Not Applicable

TABLE 6-1 SUMMARY OF CONTAMINANTS OF CONCERN

Medium	Pesticides	Volatile Organic Compounds	Semivolatile Organic Chemicals	Metals
Surface Soil	p,p'-DDE; p-p'-DDT	NA	Benzo(a)anthracene; Benzo(a)pyrene; Benzo(b)fluoranthene; Chyrsene; Dibenzo[a,h]anthracene; Indeno(1,2,3-c,d)pyrene; 2-Methylphenol; Phenol	Primary: Lead Secondary: Arsenic; Barium; Cadmium; Chromium; Copper; Cyanide; Manganese; Mercury; Nickel; Selenium; Silver; Zinc
Subsurface Soil	p,p'-DDE; p-p'-DDT	NA	Benzo(a)anthracene; Benzo(a)pyrene; Benzo(b)fluoranthene; Chyrsene; Dibenzo[a,h]anthracene; Indeno(1,2,3-c,d)pyrene; 2-Methylphenol; Phenol	Primary: Lead Secondary: Arsenic; Barium; Cadmium; Chromium; Copper; Cyanide; Manganese; Mercury; Nickel; Selenium; Silver; Zinc
Groundwater	NA	Acetone	NA	Primary: Lead Secondary: Antimony; Arsenic; Chromium; Iron; Magnesium; Manganese; Nickel; Sodium
Sediment	NA	NA	NA	Primary: Lead Secondary: Cadmium; Copper; Manganese; Nickel; Silver; Zinc
Surface Water	NA	NA	NA	Aluminum
Stormwater	NA	NA	NA	Cyanide; Selenium

NOTE: DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
NA = Not Applicable

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TABLE 6-2 EXPOSURE MATRIX

Environmental Media & Exposure Route	Human Exposure Assessment
SMOKES CREEK CORRIDOR	
Direct contact with surface soil (and incidental ingestion)	▪ Recreational users and construction workers could come in contact with surface soil. ▪ Most likely exposure route is via dermal contact or particulate inhalation.
Direct contact with subsurface soil (and incidental ingestion)	▪ Construction workers could be exposed to subsurface soil if ground intrusive work is conducted at the site.
Ingestion of and/or direct contact with groundwater	▪ There is no current or likely future use of groundwater in the immediate vicinity of the site. ▪ Groundwater from the Smokes Creek Corridor likely discharges to Smokes Creek. Recreational users could be exposed to groundwater via seeps.
Direct contact with surface water	▪ People could potentiallly be exposed to surface water during recreational use of Smokes Creek. ▪ Ponded water has been observed in the northern area of the Baker Hall Property. Direct contact to site workers or trespassers is possible.
ON-SITE AREA / BAKER HALL PROPERTY	
Direct contact with surface soil (and incidental ingestion)	▪ Workers could come in contact with surface soil. ▪ Most likely exposure route is via dermal contact or particulate inhalation. ▪ On-site Area access is limited by partial site fencing, which discourages public access. Baker Hall Property is accessible to trespasses from the city park, located to the east.
Direct contact with subsurface soil (and incidental ingestion)	▪ Construction workers could be exposed to subsurface soil if ground intrusive work is conducted at the site. ▪ If left in an un-remediated state, and future redevelopment of the property were to occur, potential for exposure to subsurface soil would exist for site-workers and vistors to the site.
Ingestion of and/or direct contact with groundwater	▪ There is no current or likely future use of groundwater in the immediate vicinity of the site.
Direct contact with surface water	▪ Ponded water has been observed in the northern area of the Baker Hall Property. Direct contact to site workers or trespassers is possible.

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TABLE 7-1 FISH AND WILDLIFE RESOURCES IMPACT ANALYSIS DECISION KEY

	Yes	No
1) Is the site or area of concern a discharge or spill event?	x	
2) Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas?		x
3) Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?		x
4) Does the site contain habitat of an endangered, threatened, or special concern species?	x	
5) Has the contamination gone off-site?	x	
6) Is there any discharge or erosion of contamination or the potential for discharge or erosion of contamination?	x	
7) Are the site contaminants PCBs, pesticides, or other persistent, bioaccumulable substances?		x
8) Does contamination exist at concentrations that could exceed SCGs or be toxic to aquatic life if discharged to surface water?		x
9) Does the site or any adjacent or downgradient property contain any of the following resources?		
a. Any endangered, threatenend, or special concern species or rare plants or their habitats	x	
b. Any NYSDEC designated significant habitats or rare NYS ecological communities		x
c. Tidal or freshwater wetlands	x	
d. Streams, creeks, or river	x	
e. Pond, lake, or lagoon		x
f. Drainage ditch or channel	x	
g. Other surface water features	x	
h. Other marine or freshwater habitats	x	
i. Forest	x	
j. Grassland or grassy field	x	
k. Parkland or woodland	x	
l. Shrubby area	x	
m. Urban wildlife habitat		x
n. Other terresrial habitat	x	
10) Is the lack of resources due to contamination?		x
11) Is the contamination a localized source which has not migrated from the source to impact any on-site or off-site resources?		x
12) Does the site have widespread soil contamination that is not confined under and around buildings or paved areas?	x	
13) Does the contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened, or special concern species or other fish and wildlife resources?		x
14) Fish and wildlife resources impact analysis needed?	x	

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TABLE 8-1A SUMMARY OF SOIL CLEANUP OBJECTIVE EXCEEDANCES – ON-SITE AREA SURFACE SOIL

Detected Constituents[(a)]	Concentration Range Detected (mg/kg)	NYSDEC Unrestricted Use SCOs[(b)] (mg/kg)	Frequency Exceeding Unrestricted Use SCOs	NYSDEC Commercial SCOs[(b)] (mg/kg)	Frequency Exceeding Commercial SCOs
INORGANIC CONSTITUENTS					
Barium	24.4 - 399	350	1 of 10	400	0 of 10
Cadmium	0.400 - 22.0	2.5	4 of 10	9.3	1 of 10
Chromium	8.32 - 513	30.0	3 of 10	1,500	0 of 10
Copper	13.2 - 406	50	4 of 10	270	1 of 10
Lead	28.5 - 2,330	63	7 of 10	1,000	1 of 10
Manganese	163 - 4,190	1,600	2 of 10	10,000	0 of 10
Mercury	0.030 - 0.326	0.18	2 of 10	3	0 of 10
Nickel	11.8 - 80.6	30	3 of 10	310	0 of 10
Selenium	2.21 - 15.2	3.9	5 of 10	6,800	0 of 10
Zinc	67.9 - 1,840	109	7 of 10	10,000	0 of 10
ORGANIC CONSTITUENTS					
DDT, p,p'-	0.0039 - 0.0039	0.0033	1 of 10	47	0 of 10

(a) Table includes only those constituents exceeding the Unrestricted Use SCO in one or more samples.

(b) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Restricted Unrestricted Use and Commercial Use SCOs. December.

NOTE:
mg/kg = Milligrams per kilogram
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
DDT = Dichlorodiphenyltrichloroethane
All concentrations reported in mg/kg equivalent to parts per million (ppm).

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TABLE 8-1B SUMMARY OF SOIL CLEANUP OBJECTIVE EXCEEDANCES – ON-SITE AREA SUBSURFACE SOIL

Detected Constituents[(a)]	Concentration Range Detected (mg/kg)	NYSDEC Unrestricted Use SCOs[(b)] (mg/kg)	Frequency Exceeding Unrestricted Use SCOs[(c)]	NYSDEC Commercial SCOs[(b)] (mg/kg)	Frequency Exceeding Commercial SCOs
INORGANIC CONSTITUENTS					
Arsenic	1.51 - 51.5	13	15 of 68	16	7 of 68
Barium	21.3 - 1,500	350	9 of 68	400	7 of 68
Cadmium	0.170 - 42.7	2.5	12 of 68	9.3	3 of 68
Chromium	5.87 - 148	30	14 of 68	1,500	0 of 68
Copper	4.47 - 1,510	50	16 of 68	270	5 of 68
Cyanide, Total	0.096 - 170	27	3 of 13	27	4 of 13
Lead	9.70 - 6,820	63	31 of 68	1,000	6 of 68
Manganese	69.8 - 2,080	1,600	2 of 68	10,000	0 of 68
Mercury	0.011 - 1.00	0.18	9 of 68	2.8	0 of 68
Nickel	5.17 - 342	30	57 of 68	310	1 of 68
Silver	0.290 - 26.0	2	16 of 68	1,500	0 of 68
Zinc	20.8 - 4,910	109	38 of 68	10,000	0 of 68
ORGANIC CONSTITUENTS					
Acetone	0.030 - 0.300	0.05	4 of 12	500	0 of 12
Methylene chloride	0.0031 - 0.050	0.05	1 of 12	500	0 of 12
Benzo(a)anthracene	0.048 - 1.20	1	3 of 67	5.6	0 of 67
Benzo(a)pyrene	0.042 - 1.20	1	3 of 67	1	3 of 67
Benzo(b)fluoranthene	0.054 - 1.70	1	4 of 67	5.6	0 of 67
Chrysene	0.047 - 1.20	1	2 of 67	56	0 of 67
Indeno(1,2,3-cd)pyrene	0.046 - 0.820	0.5	3 of 67	5.6	0 of 67
Methylphenol, 2-	1.20 - 1.20	0.33	1 of 67	500	0 of 67
Phenol	7.00 - 7.00	0.33	1 of 67	500	1 of 67
DDD, p,p'-	0.006 - 0.0098	0.0033	2 of 12	92	0 of 12
DDE, p,p'-	0.0068 - 0.0068	0.0033	1 of 12	62	0 of 12

(a) Table includes only those constituents exceeding the Unrestricted Use SCO in one or more samples.
(b) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use and Commercial Use SCOs. December.
(c) Soil samples were collected for analyses from 13 soil boring locations.

NOTE:
mg/kg = Milligrams per kilogram
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
DDD = Dichlorodiphenyldichloroethane
DDE = Dichlorodiphenyldichloroethylene
All concentrations reported in mg/kg equivalent to parts per million (ppm).

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TABLE 8-2A SUMMARY OF SOIL CLEANUP OBJECTIVE EXCEEDANCES – BAKER HALL PROPERTY SURFACE SOIL

Detected Constituents[a]	Concentration Range Detected (mg/kg)	NYSDEC Unrestricted Use SCOs[b] (mg/kg)	Frequency Exceeding Unrestricted Use SCOs	NYSDEC Restricted Residential SCOs[b] (mg/kg)	Frequency Exceeding Restricted Residential SCOs
INORGANIC CONSTITUENTS					
Arsenic	5.43 - 25.4	13	5 of 14	16	3 of 14
Barium	55.8 - 806	350	4 of 14	400	3 of 14
Cadmium	0.720 - 11.1	2.5	6 of 14	4.3	5 of 14
Chromium	11.3 - 135	30	6 of 14	180	0 of 14
Copper	11.6 - 553	50	8 of 14	270	2 of 14
Lead	54.0 - 2,460	63	10 of 14	400	6 of 14
Mercury	0.033 - 0.695	0.18	6 of 14	0.81	0 of 14
Nickel	9.99 - 141	30	6 of 14	310	0 of 14
Selenium	0.602 - 11.3	3.9	4 of 14	180	0 of 14
Silver	0.102 - 5.35	2	3 of 14	180	0 of 14
Zinc	108 - 2,170	109	14 of 14	10,000	0 of 14
ORGANIC CONSTITUENTS					
Benzo(a)anthracene	0.450 - 4.80	1	2 of 10	1	2 of 10
Benzo(a)pyrene	0.370 - 4.40	1	2 of 10	1	2 of 10
Benzo(b)fluoranthene	0.240 - 5.80	1	2 of 10	1	2 of 10
Benzo(k)fluoranthene	0.340 - 2.20	0.8	2 of 10	3.9	0 of 10
Chrysene	0.200 - 5.00	1	2 of 10	3.9	1 of 10
Dibenzo(a,h)anthracene	0.240 - 0.670	0.33	2 of 10	0.33	2 of 10
Indeno(1,2,3-cd)pyrene	0.340- 2.70	0.5	3 of 10	0.5	3 of 10
DDE, p,p'-	0.0041 - 0.0043	0.0033	2 of 3	8.9	0 of 10
DDT, p,p'-	0.0095 - 0.0400	0.0033	2 of 3	7.9	0 of 10

(a) Includes only those constituents detected in exceedance of the Unrestricted Use SCOs in one or more samples.

(b) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Restricted Unrestricted Use and Restricted Residential Use SCOs. December.

NOTE:
mg/kg = Milligrams per kilogram
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
All concentrations reported in mg/kg equivalent to parts per million (ppm).

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TABLE 8-2B SUMMARY OF SOIL CLEANUP OBJECTIVE EXCEEDANCES – BAKER HALL PROPERTY SUBSURFACE SOIL

Detected Constituents[a]	Concentration Range Detected (mg/kg)	NYSDEC Unrestricted Use SCOs[b] (mg/kg)	Frequency Exceeding Unrestricted Use SCOs[c]	NYSDEC Restricted Residential SCOs[b] (mg/kg)	Frequency Exceeding Restricted Residential SCOs
INORGANIC CONSTITUENTS					
Arsenic	2.89 - 41.7	13	5 of 45	16	4 of 45
Barium	29.7 - 960	350	6 of 45	400	6 of 45
Cadmium	0.210 - 13.6	2.5	5 of 45	4.3	5 of 45
Chromium	5.63 - 87.4	30	4 of 45	180	0 of 45
Copper	3.06 - 1,010	50	7 of 45	270	3 of 45
Lead	5.04 - 2,030	63	29 of 45	400	18 of 45
Mercury	0.006 - 0.860	0.18	5 of 45	0.81	1 of 45
Nickel	9.59 - 121	30	19 of 45	310	0 of 45
Selenium	0.220 - 11.0	3.9	1 of 45	180	0 of 45
Silver	0.163 - 4.13	2	4 of 45	180	0 of 45
Zinc	28.5 - 4,180	109	12 of 45	10,000	0 of 45
ORGANIC COMPOUNDS					
Benzo(a)anthracene	0.094 - 7.00	1	2 of 35	1	2 of 35
Benzo(a)pyrene	0.086 - 7.30	1	2 of 35	1	2 of 35
Benzo(b)fluoranthene	0.140 - 8.50	1	2 of 35	1	2 of 35
Benzo(k)fluoranthene	0.053 - 3.20	0.8	1 of 35	3.9	0 of 35
Chrysene	0.110 - 7.10	1	2 of 35	3.9	1 of 35
Indeno(1,2,3-cd)pyrene	0.081 - 4.30	0.5	2 of 35	0.5	2 of 35

(a) Table includes only those constituents exceeding the Unrestricted Use SCO in one or more samples.

(b) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use and Restricted Residential Use SCOs. December.

(c) Subsurface soil samples were collected for analyses from 14 soil boring locations.

NOTE:
mg/kg = Milligrams per kilogram
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
All concentrations reported in mg/kg equivalent to parts per million (ppm).

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TABLE 8-3A SUMMARY OF SOIL CLEANUP OBJECTIVE EXCEEDANCES – SMOKES CREEK CORRIDOR SURFACE SOIL

Detected Constituents[a]	Concentration Range Detected (mg/kg)	NYSDEC Unrestricted Use SCOs[b] (mg/kg)	Frequency Exceeding Unrestricted Use SCOs	NYSDEC Protection of Ecological Resources SCOs[b] (mg/kg)	Frequency Exceeding Protection of Ecological Resources SCOs	NYSDEC Restricted Residential SCOs[b] (mg/kg)	Frequency Exceeding Restricted Residential SCOs
INORGANIC CONSTITUENTS							
Arsenic	6.11 - 38.1	13	9 of 22	13	9 of 22	16	8 of 22
Barium	67.4 - 1,200	350	9 of 22	433	6 of 22	400	7 of 22
Cadmium	0.957 - 18.4	2.5	11 of 22	4	9 of 22	4.3	9 of 22
Chromium	12.8 - 85.6	30	11 of 22	41	9 of 22	180	0 of 22
Copper	18.6 - 8,180	50	12 of 22	50	12 of 22	270	6 of 22
Lead	42.0 - 2,720	63	20 of 22	63	20 of 22	400	9 of 22
Manganese	389 - 2,490	1,600	1 of 22	1,600	1 of 22	2,000	1 of 22
Mercury	0.044 - 0.851	0.18	7 of 22	0.18	7 of 22	0.81	1 of 22
Nickel	16.5 - 143	30	20 of 22	30	20 of 22	310	0 of 22
Selenium	0.390 - 9.00	3.9	2 of 22	3.9	2 of 22	180	0 of 22
Silver	0.135 - 12.0	2	5 of 22	2	5 of 22	180	0 of 22
Zinc	88.8 - 2,730	109	20 of 22	109	20 of 22	10,000	0 of 22

(a) Includes only those constituents detected in exceedance of the Unrestricted Use SCOs in one or more samples.

(b) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use, Protection of Ecological Resources, and Restricted Residential Use SCOs. December.

NOTE:
mg/kg = Milligrams per kilogram
NYSDEC = New York State Department of Environmental Conservation
SCO = Soil Cleanup Objective
All concentrations reported in mg/kg equivalent to parts per million (ppm).

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TABLE 8-3B SUMMARY OF SOIL CLEANUP OBJECTIVE EXCEEDANCES – SMOKES CREEK CORRIDOR SUBSURFACE SOIL

Detected Constituents[(a)]	Concentration Range Detected (mg/kg)	NYSDEC Unrestricted Use SCOs[(b)] (mg/kg)	Frequency Exceeding Unrestricted Use SCOs	NYSDEC Protection of Ecological Resources SCOs[(b)] (mg/kg)	Frequency Exceeding Protection of Ecological Resources SCOs	NYSDEC Restricted Residential SCOs[(b)] (mg/kg)	Frequency Exceeding Restricted Residential SCOs
INORGANIC CONSTITUENTS							
Arsenic	4.00 - 80.0	13	19 of 64	13	19 of 64	16	16 of 64
Barium	47.6 - 8,800	350	19 of 64	433	14 of 64	400	14 of 64
Cadmium	0.165 - 57.5	2.5	21 of 64	4	16 of 64	4.3	16 of 64
Chromium	11.7 - 146	30	20 of 64	41	20 of 64	180	0 of 64
Copper	10.2 - 1,820	50	25 of 64	50	25 of 64	270	14 of 64
Cyanide, Total	0.052 - 110	27	2 of 5	NC	NC	27	2 of 5
Lead	10.88 - 8,210	63	34 of 64	63	34 of 64	400	18 of 64
Manganese	103 - 1,450	1,600	0 of 64	1,600	0 of 64	2,000	0 of 64
Mercury	0.008 - 2.09	0.18	17 of 64	0.18	17 of 64	0.81	6 of 64
Nickel	19.9 - 250	30	63 of 64	30	63 of 64	310	0 of 64
Selenium	0.470 - 13.0	3.9	5 of 64	3.9	5 of 64	180	0 of 64
Silver	0.150 - 19.1	2	14 of 64	2	14 of 64	180	0 of 64
Zinc	54.7 - 2,830	109	44 of 64	109	44 of 64	10,000	0 of 64
ORGANIC CONSTITUENTS							
DDE, p,p'-	0.016 - 0.019	0.0033	2 of 2	0.0033	2 of 2	8.9	0 of 2
DDT, p,p'-	0.012 - 0.014	0.0033	2 of 2	0.0033	2 of 2	7.9	0 of 2

(a) Includes only those constituents detected in exceedance of the Unrestricted Use SCOs in one or more samples.

(b) NYSDEC Division of Environmental Remediation. 2006. 6 New York Code of Rules and Regulations Part 375 Environmental Remediation Programs. Unrestricted Use, Protection of Ecological Resources, and Restricted Residential Use SCOs. December.

NOTE:

mg/kg	= Milligrams per kilogram
NYSDEC	= New York State Department of Environmental Conservation
SCO	= Soil Cleanup Objective
NC	= No criterion
DDE	= Dichlorodiphenyldichloroethylene
DDT	= Dichlorodiphenyltrichloroethane

All concentrations reported in mg/kg equivalent to parts per million (ppm).

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APPENDIX A

SUPPLEMENTAL DELINEATION

APPENDIX B

DAILY FIELD REPORTS

APPENDIX C

GEOPHYSICAL SURVEY REPORTS

APPENDIX D

SITE SURVEY DATA AND BASE MAP

APPENDIX E

SURFACE SOIL SAMPLING FORMS

APPENDIX F

SOIL BORING LOGS

APPENDIX G

MONITORING WELL CONSTRUCTION LOGS

APPENDIX H

MONITORING WELL DEVELOPMENT FORMS

APPENDIX I

GROUNDWATER PURGING AND SAMPLING FORMS

APPENDIX J

STORMWATER AND SURFACE WATER SAMPLING FORMS

APPENDIX K

SEDIMENT SAMPLING FORMS

APPENDIX L

SUBSLAB AND INDOOR AIR SAMPLING FORMS

APPENDIX M

LABORATORY ANALYTICAL REPORTS

APPENDIX N

DATA USABILITY SUMMARY REPORTS

APPENDIX O

REMEDIAL INVESTIGATION VALIDATED DATA TABLES

APPENDIX P

FISH AND WILDLIFE RESPONSES