Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Former Paulsen-Holbrook Site
State Superfund Project
Town of Guilderland, Albany County, New York
Site Number 401046

March 2010

New York State Department of Environmental Conservation
DAVID A. PATERSON, *Governor* ALEXANDER B. GRANNIS, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Former Paulsen-Holbrook Site
State Superfund Project
Town of Guilderland, Albany County, New York
Site No. 401046

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Former Paulsen-Holbrook site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law, 6 NYCRR Part 375, and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Former Paulsen-Holbrook site and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

Based on the results of the remedial investigation and feasibility study (RI/FS) for the site and the criteria identified for evaluation of alternatives, the Department has selected Alternative 6B, In Situ Soil Stabilization with In Situ Groundwater Source Treatment. The components of the remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. As part of the remedial design, limited additional investigation will determine the extent of contamination in the swale downgradient of the off-site storm drain discharge.

2. Bench scale treatability testing of soil samples to evaluate the valence state of metals and other geochemical parameters of soil at the site, assess which additives (e.g., Portland cement, ferrous iron salt, and/or other compounds) to use to stabilize the contaminated soil, and evaluate the post-treatment characteristics of the treated soil.

3. Remove drums likely containing investigation-derived waste from previous investigations.

4. Demolish two small buildings in the vicinity of the former wood treating facility. These buildings are surrounded by contaminated soil, and contaminated soil may also exist beneath them.

5. Conduct a pilot test, including installation of injection wells, to optimize the applicability of injections of a mixture of chemicals for reductive co-precipitation and adsorption of dissolved arsenic and other metals. The pilot application will be evaluated based on groundwater samples collected from the existing monitoring well network.

6. Inject chemicals to treat the groundwater from the water table to a depth of 40 feet below the surface. The treatment area will extend roughly 30 feet around the former containment building and approximately 120 feet to the southeast along the drainage swale. This area is where the highest concentrations of arsenic, chromium, and copper are found in the deeper soil below a depth of five feet, and represents the zone where water percolating through contaminated soil has affected the groundwater beneath it.

7. Remove and dispose off-site the top foot (approximately) of soil from areas contaminated above the commercial Soil Cleanup Objective for arsenic, chromium, and copper, including the area downgradient of the storm drain discharge. In certain areas, the footprint of contaminated soil remaining may be significantly minimized by minor additional excavation.

8. For those areas with soil remaining with arsenic, chromium, and copper concentrations above the commercial Soil Cleanup Objective from a depth of 1 to 13 feet below ground surface (i.e., contaminated soil above the water table), mix contaminated soil in situ with additives, as determined from bench scale testing, to achieve stabilization and solidification of the soil.

9. Cover solidified soil and other excavated areas with a one-foot thick cover consisting of clean soil underlain by a demarcation layer to delineate the cover soil from the subsurface soil. The top six inches of soil must be of sufficient quality to support vegetation. Clean soil is soil that is tested and meets the Division of Environmental Remediation's criteria for backfill or local site background.

10. Replace selected monitoring wells destroyed during stabilization/solidification and install two off-site monitoring well clusters (each containing one shallow and one deep monitoring well) downgradient of the source area.

11. Green remediation and sustainability efforts are considered in the design and implementation of the remedy to the extent practicable, including:

- use renewable energy sources
- reduce greenhouse gas emissions
- encourage low carbon technologies
- foster green and healthy communities
- conserve natural resources
- increase recycling and reuse of clean materials
- preserve open space and working landscapes

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

(a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
(b) land use is subject to local zoning laws, the remedy allows the use and development of the controlled property for
☐ residential use ☐ restricted residential use ☒ commercial use ☒ industrial use
(c) restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;
(d) prohibits agriculture or vegetable gardens on the controlled property;
(e) requires compliance with the Department-approved Site Management Plan;

13. Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required, which includes the following:

(a) An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls:

The Environmental Easement discussed in Paragraph 12, above.

Engineering Controls:

Maintain the soil cover over the solidified soil, as discussed in Paragraph 9, above.

This plan includes, but may not be limited to:

(i) Soil Management Plan which details the provisions for management of future excavations in areas of remaining contamination;
(ii) descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
(iii) provisions for the management and inspection of the identified engineering controls;
(iv) maintaining site access controls and Department notification; and
(v) the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

(b) A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

(i) monitoring of groundwater to assess the performance and effectiveness of the remedy;
(ii) a schedule of monitoring and frequency of submittals to the Department.

14. On completion of soil stabilization efforts, the Department shall erect a chain-link fence to encompass all soils within the CSXT property boundaries that, upon excavation, would be classified as an F035 listed hazardous waste. Signs shall be affixed to the fence that identify the soil as being contaminated and provide instructions to contact the CSXT Public Safety Coordination Center at 1-800-232-0144 prior to disturbing the soil.

New York State Department of Health Acceptance

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

Declaration

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

MAR 3 1 2010

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

RECORD OF DECISION
Former Paulsen-Holbrook Site
State Superfund Project}
Town of Guilderland, Albany County, New York
Site No. 401046
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SECTION 1: SUMMARY AND PURPOSE OF THE SELECTED REMEDY

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the above referenced site. The disposal of hazardous waste at the site has resulted in threats to public health and the environment that are addressed by this remedy presented in this Record of Decision (ROD). The disposal of hazardous wastes at this site, as more fully described in Section 5 of this document, have contaminated various environmental media. The remedy, discussed in detail in Section 8, is intended to attain the remedial action objectives identified for this site in Section 6 for the protection of public health and the environment. This ROD identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for the selected remedy. The Department has selected a final remedy for the site only after careful consideration of all comments received during the public comment period.

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

The Department has issued this ROD in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, 6 NYCRR Part 375.

SECTION 2: SITE DESCRIPTION AND HISTORY

2.1: Location and Description

The site consists of a half-acre area located along the southern property line of 54 Railroad Avenue in the Town of Guilderland. The site is a portion of an 8.8-acre property located in an industrial and commercial area centered on Railroad Avenue and bounded by Fuller Road to the west and the raised Amtrak main rail line to the south. Patroon Creek is located to the south of the railroad tracks and flows to the east-southeast (see Figure 1). Soil at the site consists of fine sand and the site topography is flat. Groundwater across the site is present at about 11-14 feet below grade.

A drainage swale slopes gently to the southeast just south of the fence separating the property from the railroad property. During the RI, a pipe connected to the property's storm drain system was discovered discharging collected runoff into the swale.

The property has been largely unoccupied since at least 2002. Several warehouses and storage buildings are located on or around the site. Due to years of neglect, several of the buildings on the property are in very poor condition.

The 8.8-acre property was being investigated under the Voluntary Cleanup Program (under the name Albany Miron) but the volunteer never submitted an acceptable Remedial Action Plan. A cash-out settlement with the responsible parties and volunteer was executed in March 2007, and the half-acre site was referred to the State Superfund to complete the remedial program.

Figure 2 is an aerial photo showing the site.

2.2: Operational/Disposal History

Various lumber companies occupying the property ran a wood treatment operation at the site from the early 1950s until some time before 1978. Wood was preserved by treating it with chromated copper arsenate (CCA - a solution of chromic acid, cupric oxide, and arsenic pentoxide) in a large pressure vessel housed in a containment building. After treatment, the batches of lumber were removed from the pressure vessel and allowed to air dry on site. An estimated 2,000- to 3,000-gallon spill of CCA occurred at the site in 1965 when the pressure vessel was opened before it was pumped out. Soil contamination resulted from spills and excess CCA solution dripping off the wood and/or from being washed off by rain. Groundwater is impacted under the site. According to available aerial photographs, the building containing the pressure vessel was removed some time between 1982 and 1985. The foundation and slab of the containment building, now covered with soil, still exist at the site.

2.3: Remedial History

1. Remedial Parties and Program.

The following companies operated at this address through the years and may have operated the pressure treating facility while in business: May-Chris, Mayfield Building Corp., Paulsen & Sons, Holbrook Lumber Company, and Albany Miron Lumber Co. The property owner initially entered into the Voluntary Cleanup Program in December 1998 to investigate the entire 8.8-acre property, which included the half-acre site. After a number of investigations and lawsuits between former operators and owners, the potentially responsible parties entered into dispute resolution with the Department. They ultimately settled with the Department in March 2007 and signed a consent order which included a payment of $910,000. As part of the consent order, the Voluntary Cleanup agreement was terminated and the site was referred to the State Superfund for action.

Several underground storage tanks have been removed from the property and the resulting spilled petroleum products have been cleaned up. Between these cleanups and numerous

investigations of the property, fourteen on-site groundwater monitoring wells and two off-site wells have been constructed to investigate groundwater quality.

As a result of identified hazardous waste disposal, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York in October 2000. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

2. Investigation/Actions.

The following investigations and actions were carried out under the Voluntary Cleanup Program.

- Soil investigation completed in 1999.
- Baseline Investigation completed in 2001.
- Site Investigation Report and Proposed Soils Remediation Plan completed in 2003.
- Phase I Groundwater Investigation completed in 2003.
- Supplemental Site Investigation and Focused Feasibility Study completed in 2005.

SECTION 3: LAND USE

The Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings when assessing the nature and extent of contamination. For this site, alternatives that may restrict the use of the site to commercial criteria as described in Part 375-1.8 (g) are being evaluated in addition to unrestricted SCGs because of the current commercial zoning of the property and the adjacent vicinity.

A comparison of the appropriate SCGs for the identified land use against the unrestricted use SCGs for the site contaminants is included in the tables for the media being evaluated in Section 5.1.2.

SECTION 4: ENFORCEMENT STATUS

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

The PRPs for the site signed a consent order which resolved the respondents' legal liability for any investigation and remediation of the site by means of a cash settlement paid to the Department in full satisfaction of the respondents' alleged liability for the site.

SECTION 5: SITE CONTAMINATION

A remedial investigation has been conducted to determine the nature and extent of contamination and to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the Remedial Investigation (RI) was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between June 2008 and July 2009. The field activities and findings of the investigation are described in the RI Report.

The following general activities were conducted during the RI:

- Research of historical information and aerial photographs,
- Soil borings with samples of surface and subsurface soils analyzed in the field and the laboratory,
- Installation of one new monitoring well and development of all old monitoring wells,
- Collection and analysis of groundwater, surface water, and sediment samples.

5.1.1: Standards, Criteria, and Guidance (SCGs)

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

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and surface and subsurface soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in the following sections list the applicable SCG in the footnotes. For a full listing of all SCGs see:

http://www.dec.ny.gov/regulations/61794.html

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2. More complete information can be found in the RI Report.

5.1.2: Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation. As described in the RI report, waste/source materials were identified at the site and are impacting groundwater and soil.

Waste/Source Areas

Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source areas are defined in 6 NYCRR Part 375-1.2 (au). Source areas are areas of concern at a site where substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and source areas identified at the site include the area around the former containment building which housed the pressure vessel, and the loading and unloading area outside the building. The waste is defined as "wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes that use inorganic preservatives containing arsenic and chromium." These constitute a listed hazardous waste (F035) under the Resource Conservation and Recovery Act (RCRA).

The waste/source areas identified will be addressed in the remedy selection process.

This section describes the findings for all environmental media that were evaluated. As described in the RI report, groundwater, soil, surface water, and sediment samples were collected to characterize the nature and extent of contamination.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compare the data with the applicable SCGs for the site. For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 3 are also presented.

Groundwater

Groundwater samples were collected from one new monitoring well and fourteen existing monitoring wells. The samples were collected to assess groundwater conditions on and off-site. The new monitoring well was installed to a depth of 40 feet to assess the groundwater quality below the uppermost portion of the aquifer. The results indicate that contamination in shallow groundwater at the site exceeds the SCGs for inorganics. Arsenic and chromium in the deeper groundwater are above SCGs, but at lower concentrations than the shallow groundwater.

Although it was anticipated that the only contaminants of concern at the site would be related to the pressure treating operation (i.e., metals), some of the groundwater samples were analyzed for volatile organics, semi-volatile organics, and pesticides/PCBs.

Both filtered and unfiltered water samples were analyzed in the lab to assess the impact of suspended solids in the water. The filtered and unfiltered groundwater results were similar, likely due to the low turbidity of the samples. The filtered results were used in compiling Table 1.

Table 1 - Groundwater			
Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Metals			
Antimony	ND[c] - 50	3	3 of 15
Arsenic	ND - 21,900	25	5 of 15
Copper	ND - 320	200	1 of 15
Chromium	ND - 1,000	50	4 of 15
Iron	ND - 1,500	300	5 of 15
Magnesium	ND - 50,100	35,000	1 of 15
Manganese	ND - 1,300	300	6 of 15
Sodium	ND - 60,500	20,000	8 of 15

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standards Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).
c - ND: Compound not detected above analytical laboratory's instrument detection limit.

The primary groundwater contaminants are arsenic, copper, and chromium which are associated with operation of the former pressure treatment facility. It also appears that antimony may be associated with the pressure treating operation, as it was found in three downgradient monitoring wells and was the highest closest to the foundation of the former containment building. As noted on Figure 3, the primary groundwater contamination is associated with the CCA used in the former pressure vessel containment building.

The other inorganic compounds found in the groundwater were either also found in upgradient monitoring wells (sodium) or are not generally associated with hazardous waste disposal (iron, magnesium, and manganese). These other naturally occurring inorganics are considered to represent site background conditions. Therefore, the metal compounds found in groundwater other than arsenic, copper, chromium, and antimony are not considered site-specific contaminants of concern.

No volatile organics, semi-volatile organics, or pesticides/PCBs were detected in the groundwater above SCGs.

Based on the findings of the RI, the disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: arsenic, copper, chromium, and antimony.

Soil

A direct-push drilling rig was used to collect soil cores from a grid across the site, including onto the railroad property to the south. Soil cores were collected continuously from each of the soil borings from ground surface to the total boring depth of 15 feet below the ground surface. One boring was advanced to a depth of 40 feet and was completed as a groundwater monitoring well.

Each boring was analyzed in the field at approximately one-foot intervals using a portable X-ray fluorescence (XRF) analyzer. The XRF yielded analytical results for a wide range of metals including chromium, copper, arsenic, cadmium, zinc, cobalt, mercury, iron, lead, tin, silver, and manganese. To evaluate the accuracy of the XRF measurements, a total of 21 confirmation soil samples were collected and submitted to an analytical laboratory for metals analysis. Confirmation soil samples were chosen such that there was a range in the concentration of metals in the soil samples collected. The comparison of confirmation samples to field measurements revealed that the two methods yielded comparable results. Table 2, below, reports only the laboratory's analytical results.

Although it was anticipated that the only contaminants of concern at the site would be related to the pressure treating operation (i.e., metals), five of the confirmation soil samples were analyzed for volatile organics, semi-volatile organics, and pesticides/PCBs.

The results show that soils at the site exceed the unrestricted SCGs only for metals. No volatile organics, semi-volatile organics, or pesticides/PCBs were detected in soil above the unrestricted Soil Cleanup Objectives.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted SCG[c] (ppm)	Frequency Exceeding Restricted SCG
Metals					
Arsenic	1.1 - 3,500	13	17 of 21	16	17 of 21
Barium	7.6 - 2,200	350	2 of 21	400	2 of 21
Beryllium	0.22 - 10.7	7.2	1 of 21	590	0 of 21
Cadmium	ND[d] - 6.9	2.5	9 of 21	9.3	0 of 21
Chromium	5.1 - 2,860	30	15 of 21	1,500	2 of 21
Copper	2.2 - 5,590	50	6 of 21	270	2 of 21
Lead	0.92 - 541	63	2 of 21	1,000	0 of 21
Mercury	ND - 3.2	0.18	3 of 21	2.8	1 of 21

Selenium	ND - 17.1	3.9	10 of 21	1,500	0 of 21
Silver	ND - 5.1	2	10 of 21	1,500	0 of 21
Zinc	ND - 1,310	109	2 of 21	10,000	0 of 21

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Commercial Soil Cleanup Objectives.
d - ND: Compound not detected above analytical laboratory's instrument detection limit.

The primary soil contaminants are chromium, arsenic, and copper associated with the pressure treating operation. Figures 4A through 4F use XRF results to show the chromium concentration in soil at one-foot intervals from the surface down to a depth of six feet. Similarly, Figures 5A through 5F show arsenic concentrations and Figures 6A through 6F show copper concentrations. As noted on these figures, the primary soil contamination is associated with the former containment building and lumber loading and unloading area. Additional contamination was found in the soil in the drainage swale along the fence line.

Although the contamination is widespread in the shallower soil, the footprint of soil contamination decreases with depth until it converges on the containment building at a depth of about 4-5 feet. This pattern of contamination present just around the containment building continues down to the water table. In general, the pattern of arsenic contamination can be used as an indicator of contamination with other metals; there are few locations where other metals are not associated with arsenic contamination in the soil.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil up to a depth of at least 40 feet. The site contaminant identified in soil which is considered to be the primary contaminant of concern, to be addressed by the remedy selection process is arsenic.

Surface Water

Surface water samples were collected during the RI from nearby Patroon Creek, south of the site, in upstream and downstream locations. The samples were collected to assess the surface water conditions off-site and were analyzed for metals only. Contaminants in surface water in Patroon Creek exceed the Department's SCG for iron upstream and downstream of the site and are indicative of natural surface water conditions.

Table 3 - Surface Water

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Metals			
Iron	330 - 650	300	3 of 3

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.

b-SCG: Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1) and 6NYCRR Part 703: Surface Water and Groundwater Quality Standards.

No site-related surface water contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for surface water.

Sediments

Sediment samples were collected during the RI from Patroon Creek at locations upstream and downstream of the site. The samples were collected to assess the potential for impacts to creek sediment from the site and were analyzed for metals only. An additional sample was collected at the end of the storm drain discharge pipe discovered off-site. Although this sample was called a sediment sample in the RI report, this location is only a drainage swale and the sample is more characteristic of surface soil. This location will be addressed with the contaminated soil in the immediate vicinity. No site-related sediment contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for sediment.

5.2: Interim Remedial Measures

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

There were no IRMs performed at this site during the RI.

5.3: Summary of Human Exposure Pathways:

This section describes the current or potential human exposures (the way people may come in contact with contamination) that may result from the site contamination. A more detailed discussion of the human exposure pathways can be found in the FS report available at the document repository. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

On-site surface and sub-surface soil is contaminated with metals, mainly arsenic and chromium. Direct contact with contaminated soil from on-site and one isolated off-site area is a potential exposure pathway for trespassers. Inhalation of windblown contaminated dust is also a potential exposure pathway for people working near this site and trespassers.

On-site groundwater is contaminated with metals. Ingestion of contaminated groundwater is not expected since the area is served by municipal water which originates away from the site.

5.4: Summary of Environmental Assessment

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

The RI did not identify any current or potential impacts to ecological resources.

Patroon Creek is located a minimum of 560 feet south of the site; however the raised railroad bed and Fuller Road exit ramp off I-90 lie between the site and the creek, precluding any direct impact from site runoff.

No current or potential site-related surface water impacts have been identified.

Groundwater resources at the site consist of a shallow overburden aquifer in the fine sand. The groundwater surface is approximately 11-14 feet below grade, depending on the season. Groundwater flow direction is to the south. This overburden aquifer may be partially underlain in places by brown, dense clay which was encountered in two borings, although not in the deepest on-site boring (40 feet). The borings for the two existing off-site monitoring wells (closer to Patroon Creek) encountered a few layers of clay up to about 6 feet thick. Bedrock below the overburden aquifer is reported to be Normanskill shale, although bedrock was not encountered during the RI or any other investigations of this site.

Site-related contamination is impacting groundwater, although the groundwater is not used as a source of potable water. Protection of the groundwater resource will be addressed in the remedy selection process.

SECTION 6: SUMMARY OF THE REMEDIATION OBJECTIVES

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

The remedial objectives for this site are:

Public Health Protection

Groundwater

- Prevent people from drinking groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with contaminated groundwater.

Soil

- Prevent ingestion/direct contact with contaminated soil.

Environmental Protection

Groundwater

- Restore the groundwater aquifer to meet ambient groundwater quality criteria, to the extent feasible.
- Prevent discharge of contaminated groundwater to surface water.

Soil

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the site were identified, screened and evaluated in the feasibility study which is available at the document repositories established for this site.

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

7.1: Description of Remedial Alternatives

The following alternatives were considered to address the contaminated media identified at the site as described in Section 5:

Alternative 1: No Action

The No Action alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative 2: Site Management

The Site Management alternative requires only institutional controls for the site. This alternative includes institutional controls, in the form of an environmental easement and a Site Management Plan, necessary to protect public health and the environment from any contamination identified at the site.

Present Worth:.....*$530,000*
Capital Cost:.....*$70,800*
Annual Costs:.....*$30,000*

Alternative 3: Asphalt Cover with Long-Term Monitoring

This alternative would include removal of drums containing waste derived from previous investigations. Two buildings in the vicinity of the wood treating facility would be demolished in order to remove contaminated soil around them and to access potentially contaminated soil beneath the structures. The top two feet of soil containing arsenic at concentrations greater than the Commercial Use SCOs would be excavated and disposed off-site in accordance with applicable federal, state, and local regulations. The excavation would be backfilled with 6 inches of clean fill, followed by an engineered cover consisting of geotextile fabric, one foot of crushed stone, and 6 inches of asphalt top course.

Two off-site monitoring well clusters consisting of one shallow and one deep monitoring well would be installed down-gradient of the source area, followed by post-excavation groundwater monitoring and periodic cover inspections/maintenance. Institutional controls from Alternative 2 would also be a part of this alternative.

Design and implementation of this alternative could be accomplished in approximately one and a half years. A 30-year groundwater monitoring period was used for this alternative.

Present Worth:.....*$2,180,000*
Capital Cost:.....*$1,720,000*
Annual Costs:.....*$30,000*

Alternative 4: Excavation with Long-Term Monitoring

This alternative would include removal of drums containing waste from previous investigations and demolition of two buildings in the vicinity of the wood treating facility. Approximately 6,500 yd^3 of soil that contains arsenic at concentrations greater than Commercial Use SCOs would be excavated up to the depth of the water table (approximately 13 feet below the ground

surface). Excavated soil would be disposed off-site in accordance with applicable federal, state, and local regulations.

The excavation would be backfilled with clean fill following confirmation sampling to show that impacted soil was removed. Selected monitoring wells destroyed in the excavation area would be replaced, and the two off-site monitoring well clusters, consisting of one shallow and one deep monitoring well, would be installed down-gradient of the source area, followed by post-excavation groundwater monitoring. Institutional controls from Alternative 2 would also be a part of this alternative.

Design and implementation of this alternative could be accomplished in approximately one and a half years. A 30-year groundwater monitoring period was used for this alternative.

Present Worth: *$4,050,000*
Capital Cost: *$3,590,000*
Annual Costs: *$30,000*

Alternative 5: Excavation and In Situ Groundwater Source Treatment

This alternative would include all of the components of Alternative 4 with the addition of in situ treatment of the groundwater to a depth of 40 feet through injection of chemicals to immobilize the soluble metals in the aquifer through chemical reactions and microbial activity. The area treated would be the primary source area - the contaminated groundwater beneath the locations of highest soil contamination. Because the groundwater in the vicinity of the site is not being used, the off-site groundwater plume would not be directly addressed.

Design and implementation of this alternative could be accomplished in approximately two years. A 5-year monitoring period was selected for this alternative to evaluate the groundwater plume downgradient of the site.

Present Worth: *$3,990,000*
Capital Cost: *$3,860,000*
Annual Costs: *$30,000*

Alternative 6A: In Situ Soil Stabilization to Depth

This alternative would include bench scale treatability testing of soil samples to evaluate the valence state of
metals and other geochemical parameters of soil at the site, assess which compounds (i.e. Portland cement, ferrous iron salt, and/or other compounds) to use to achieve soil stabilization, and to evaluate the post-treatment geotechnical characteristics of the treated soil. As with the other alternatives, drums from previous investigations would be removed and two buildings demolished.

Approximately 10 percent of the total volume of soil to be treated would need to be disposed off-site as hazardous waste in accordance with applicable federal, state, and local regulations. This

would allow for the final soil cover and the increase in volume resulting from treatment. Contaminated soil would be mixed with compounds, as determined from bench scale testing, to achieve stabilization and solidification. The soil treated in this alternative would include contaminated soil above and below the water table to a maximum depth of 40 feet below ground surface. The solidified soil would be covered with a foot of clean soil.

Groundwater would be sampled prior to and after the mixing. Selected monitoring wells destroyed while excavating would be replaced and two off-site monitoring well clusters would be installed down-gradient of the source area, followed by post-remediation groundwater monitoring. Institutional controls from Alternative 2 would also be a part of this alternative. Because the groundwater in the vicinity of the site is not being used, the off-site groundwater plume would not be directly addressed.

Design and implementation of this alternative could be accomplished in approximately two years. A 5-year monitoring period was selected for this alternative to evaluate the groundwater plume downgradient of the site.

Present Worth:.....*$2,470,000*
Capital Cost:.....*$2,340,000*
Annual Costs:.....*$30,000*

Alternative 6B: In Situ Soil Stabilization to Water Table and In Situ Groundwater Source Treatment

This alternative would include all the components of Alternative 6A, except that instead of stabilizing the soil to a depth of 40 feet below the surface, soil would only be stabilized to the water table (approximately 13 feet). As with Alternative 5, groundwater would be treated in situ to a depth of 40 feet through injection of chemicals to immobilize the soluble metals in the aquifer through chemical reactions and microbial activity. The area treated would be the primary source area - the contaminated groundwater beneath the areas of highest soil contamination. Because the groundwater in the vicinity of the site is not being used, the off-site groundwater plume would not be directly addressed.

Design and implementation of this alternative could be accomplished in approximately two years. A 5-year monitoring period was selected for this alternative to evaluate the groundwater plume downgradient of the site.

Present Worth:.....*$1,980,000*
Capital Cost:.....*$1,850,000*
Annual Costs:.....*$30,000*

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which sets forth the requirements for the remediation of inactive hazardous waste disposal

sites in New York. A detailed discussion of the evaluation criteria and comparative analysis is included in the feasibility study.

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

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

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

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

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

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

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

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

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in the Remedial Alternative Cost Table 4.

Table 4
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1 - No Action	0	0	0
2 - Site Management	70,800	30,000	530,000
3 - Asphalt Cover	1,720,000	30,000	2,180,000
4 - Excavation	3,590,000	30,000	4,050,000
5 - Excavation with Groundwater Treatment	3,860,000	30,000	3,990,000
6A - Stabilization to Depth	2,340,000	30,000	2,470,000
6B - Stabilization to Water Table with Groundwater Treatment	1,850,000	30,000	1,980,000

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

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

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the Department addressed the concerns raised.

Comments received generally pertained to post-remedial development of the property and the fate of the stabilized soil.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the Department has selected Alternative 6B, In Situ Soil Stabilization with In Situ Groundwater Source Treatment, as the remedy for this site. Figure 7 shows the areas to be addressed with this remedy. The elements of this remedy are described at the end of this section.

8.1 **Basis for Selection**

The selected remedy is based on the results of the RI and the evaluation of alternatives.

Alternative 6B is being selected because, as described below, it satisfies the threshold criteria and provides the best balance of the balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by immobilizing the metal contaminants in the soil above the water table, keeping them from leaching into the groundwater. Groundwater in the source area would be treated to precipitate the dissolved metals, effectively making them insoluble and reducing their mobility. Alternative 1 (No Action) does not provide any protection to public health and the environment and will not be evaluated further.

Alternative 2 (Site Management) provides little overall protection except by providing control of potential exposure pathways. Alternatives 3 (Asphalt Cover) and 4 (Excavation) would be more protective than Alternative 2 because direct contact with on-site source material would be eliminated through placement of a barrier or waste removal. Alternative 5 (Excavation with Groundwater Treatment), 6A (Stabilization to Depth), and 6B (Stabilization to Water Table with Groundwater Treatment) would be protective of human health because each alternative would provide the protective measures of Alternatives 3 and 4 in addition to addressing contaminants in the saturated soil below the water table, thereby reducing exposure pathways for construction/utility workers.

Alternative 2 would not meet the unrestricted or commercial use Soil Cleanup Objectives or Class GA Groundwater Standards (SCGs). Alternatives 3 and 4 would address the shallow soil and Alternative 4 may meet the groundwater SCGs with time, but these two alternatives would not treat contamination below the water table. Alternatives 5, 6A, and 6B are capable of meeting SCGs.

Alternative 2 would be effective in the long-term through control of exposure pathways. Alternatives 3, 4, 5, 6A, and 6B would also be effective in the long-term, however, Alternatives 4 and 5 include physical removal of the soil and would be more permanent than Alternatives 6A and 6B which consist of stabilization/solidification technologies. Alternative 5 would be the most effective in the long-term, and most permanent, because contaminated soil would be removed and groundwater in the source area would be treated.

Alternative 2 would not reduce the toxicity, mobility, or volume of the contaminants. Alternative 3 would reduce both the contaminant volume, by removal of two feet of contaminated soil, and the mobility, by reducing infiltration of precipitation through contaminated soil in the covered area. Alternatives 4 and 5 would effectively reduce contaminant volume through removal of contaminated soil to the water table. Alternative 5 would reduce the mobility of contaminants to a greater extent than Alternative 4 by also treating the groundwater in the source area. Alternative 6A and 6B would reduce the mobility of the contaminants through the use of stabilization/solidification, which would incorporate the contaminants into a cement matrix from which they would not leach. Alternative 6B would further reduce the mobility of contaminants in the saturated soil through in-situ groundwater

treatment. Alternatives 6A and 6B would slightly reduce the contaminant volume by removal of about 10 percent of the volume of soil before the rest is treated.

Short-term effectiveness is measured by community and worker protection, environmental impacts, and time required to implement the alternative. All the alternatives would have little impact on the community due to the location of the site in an industrial/commercial zone, although Alternatives 3, 4, and 5 would involve more traffic in and out of the site compared to the other alternatives. Alternative 2 would be effective in the short-term through control of exposure pathways, low environmental impact, and short implementation time. Alternative 3 would have a moderate impact on workers implementing the remedy, while Alternatives 4, 5, 6A, and 6B would have a greater impact on workers due to increased contact with the contaminated soil. All the alternatives would result in impacts to the environment to some degree, with the excavation alternatives having the greatest potential. Alternatives 5, 6A, and 6B would take longer to implement than Alternatives 3 and 4 because pilot and bench scale tests would be necessary. Each of the alternatives could be readily implemented using regionally available resources.

The estimated present worth of each alternative is shown in Table 4 in Section 7.2 of this document. The costs associated with the alternatives run from a low of $0 (Alternative 1, No Action) to over $4,000,000 (Alternative 4, Excavation).

The estimated present worth cost to implement the remedy is $1,980,000. The cost to construct the remedy is estimated to be $1,850,000 and the estimated average annual costs for 5 years is $30,000.

8.2 **Elements of the Selected Remedy**

The elements of the selected restricted use remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. As part of the remedial design, limited additional investigation will determine the extent of contamination in the swale downgradient of the off-site storm drain discharge.

2. Bench scale treatability testing of soil samples to evaluate the valence state of metals and other geochemical parameters of soil at the site, assess which additives (e.g., Portland cement, ferrous iron salt, and/or other compounds) to use to stabilize the contaminated soil, and evaluate the post-treatment characteristics of the treated soil.

3. Remove drums likely containing investigation-derived waste from previous investigations.

4. Demolish two small buildings in the vicinity of the former wood treating facility. These buildings are surrounded by contaminated soil, and contaminated soil may also exist beneath them.

5. Conduct a pilot test, including installation of injection wells, to optimize the applicability of injections of a mixture of chemicals for reductive co-precipitation and adsorption of dissolved arsenic and other metals. The pilot application will be evaluated based on groundwater samples collected from the existing monitoring well network.

6. Inject chemicals to treat the groundwater from the water table to a depth of 40 feet below the surface. The treatment area will extend roughly 30 feet around the former containment building and approximately 120 feet to the southeast along the drainage swale. This area is where the highest concentrations of arsenic, chromium, and copper are found in the deeper soil below a depth of five feet, and represents the zone where water percolating through contaminated soil has affected the groundwater beneath it.

7. Remove and dispose off-site the top foot (approximately) of soil from areas contaminated above the commercial Soil Cleanup Objective for arsenic, chromium, and copper, including the area downgradient of the storm drain discharge. In certain areas, the footprint of contaminated soil remaining may be significantly minimized by minor additional excavation.

8. For those areas with soil remaining with arsenic, chromium, and copper concentrations above the commercial Soil Cleanup Objective from a depth of 1 to 13 feet below ground surface (i.e., contaminated soil above the water table), mix contaminated soil in situ with additives, as determined from bench scale testing, to achieve stabilization and solidification of the soil.

9. Cover solidified soil and other excavated areas with a one-foot thick cover consisting of clean soil underlain by a demarcation layer to delineate the cover soil from the subsurface soil. The top six inches of soil must be of sufficient quality to support vegetation. Clean soil is soil that is tested and meets the Division of Environmental Remediation's criteria for backfill or local site background.

10. Replace selected monitoring wells destroyed during stabilization/solidification and install two off-site monitoring well clusters (each containing one shallow and one deep monitoring well) downgradient of the source area.

11. Green remediation and sustainability efforts are considered in the design and implementation of the remedy to the extent practicable, including:

- use renewable energy sources
- reduce greenhouse gas emissions
- encourage low carbon technologies
- foster green and healthy communities
- conserve natural resources
- increase recycling and reuse of clean materials
- preserve open space and working landscapes

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

(a) requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
(b) land use is subject to local zoning laws, the remedy allows the use and development of the controlled property for
☐ residential use ☐ restricted residential use ☒ commercial use ☒ industrial use
(c) restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;
(d) prohibits agriculture or vegetable gardens on the controlled property;
(e) requires compliance with the Department-approved Site Management Plan;

13. Since the remedy results in contamination remaining at the site that does not allow for unrestricted use, a Site Management Plan is required, which includes the following:

(a) An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to assure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls:

The Environmental Easement discussed in Paragraph 12, above.

Engineering Controls:

Maintain the soil cover over the solidified soil, as discussed in Paragraph 9, above.

This plan includes, but may not be limited to:

(i) Soil Management Plan which details the provisions for management of future excavations in areas of remaining contamination;
(ii) descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
(iii) provisions for the management and inspection of the identified engineering controls;
(iv) maintaining site access controls and Department notification; and
(v) the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls;

(b) A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

(i) monitoring of groundwater to assess the performance and effectiveness of the remedy;
(ii) a schedule of monitoring and frequency of submittals to the Department.

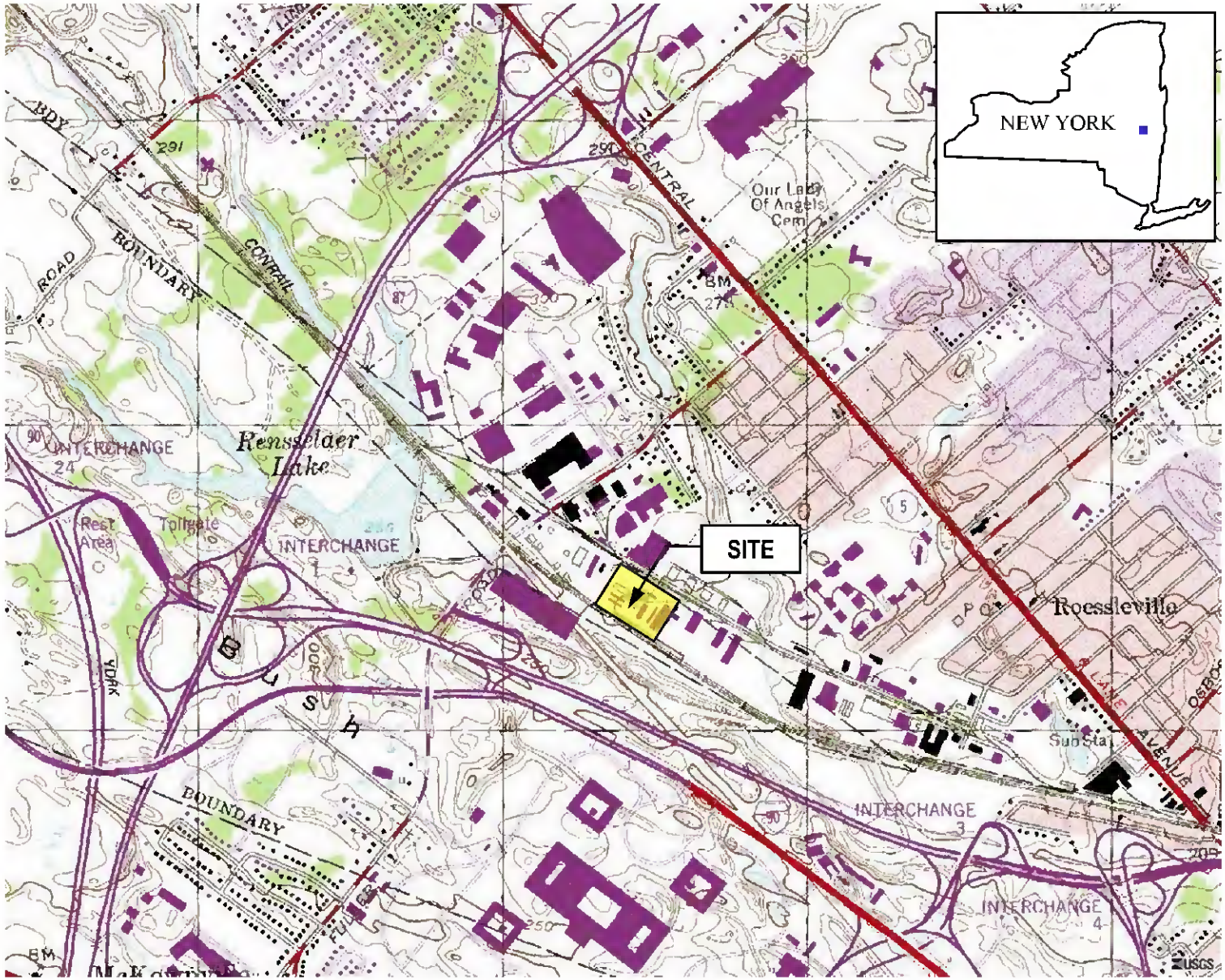
14. On completion of soil stabilization efforts, the Department shall erect a chain-link fence to encompass all soils within the CSXT property boundaries that, upon excavation, would be classified as an F035 listed hazardous waste. Signs shall be affixed to the fence that identify the

soil as being contaminated and provide instructions to contact the CSXT Public Safety Coordination Center at 1-800-232-0144 prior to disturbing the soil.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.
- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.
- A fact sheet summarizing the proposed remedial action plan and announcing the public meeting date was sent to the public contact list.
- A public meeting was held on March 17, 2010 to present and receive comment on the PRAP.
- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.



0 1500 3000 6000

APPROXIMATE SCALE IN FEET

Source: USGS 7.5 minute Topographic Map
Albany, NY. 1994

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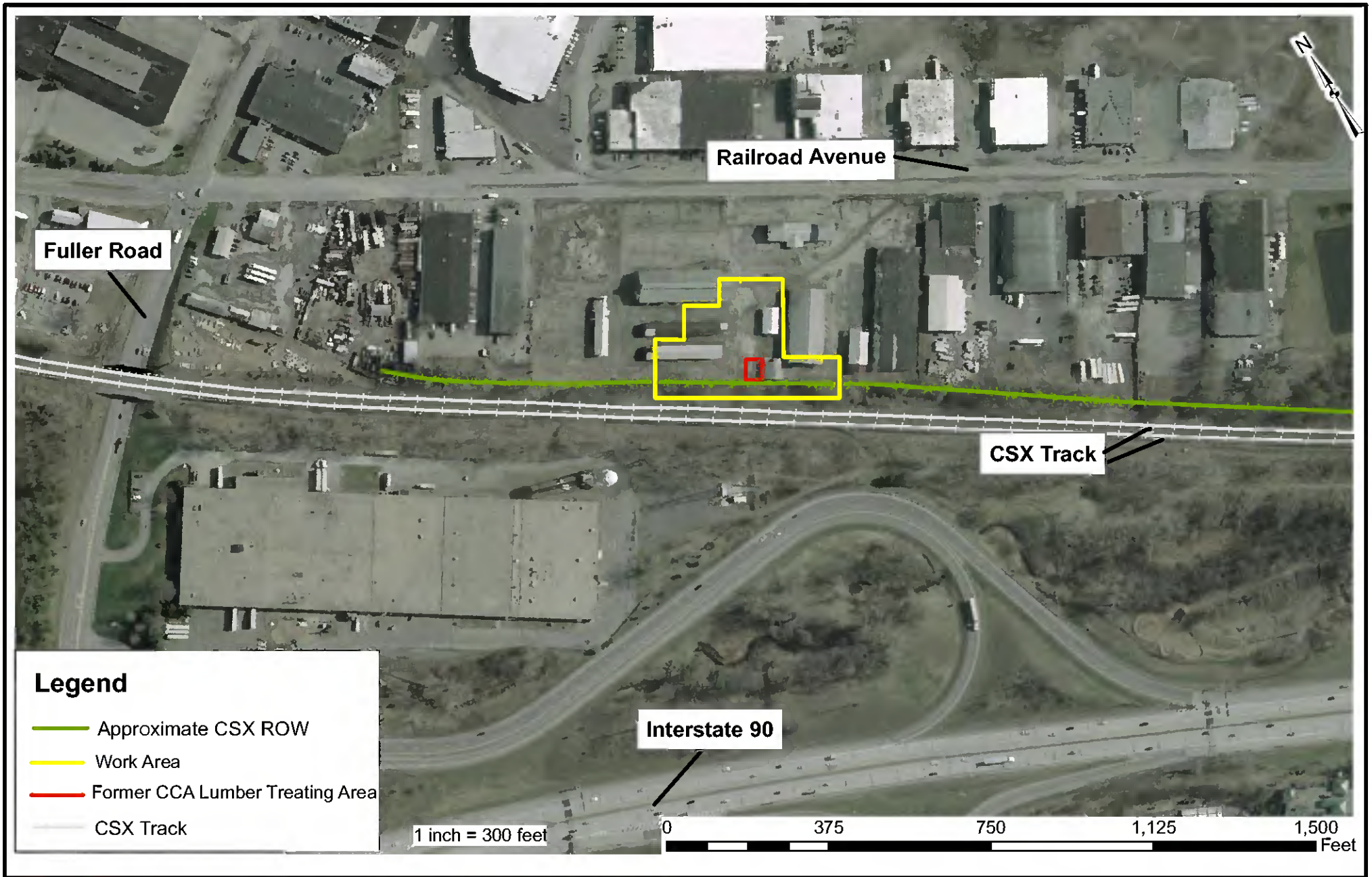
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSEN-HOLBROOK SITE (# 401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK
REMEDIAL INVESTIGATION REPORT

SITE LOCATION

© 2008 Malcolm Pirnie, Inc.

FIGURE 1

M:\GISMOD\0266376\Figure1-WorkArea.mxd



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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSEN HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK STATE

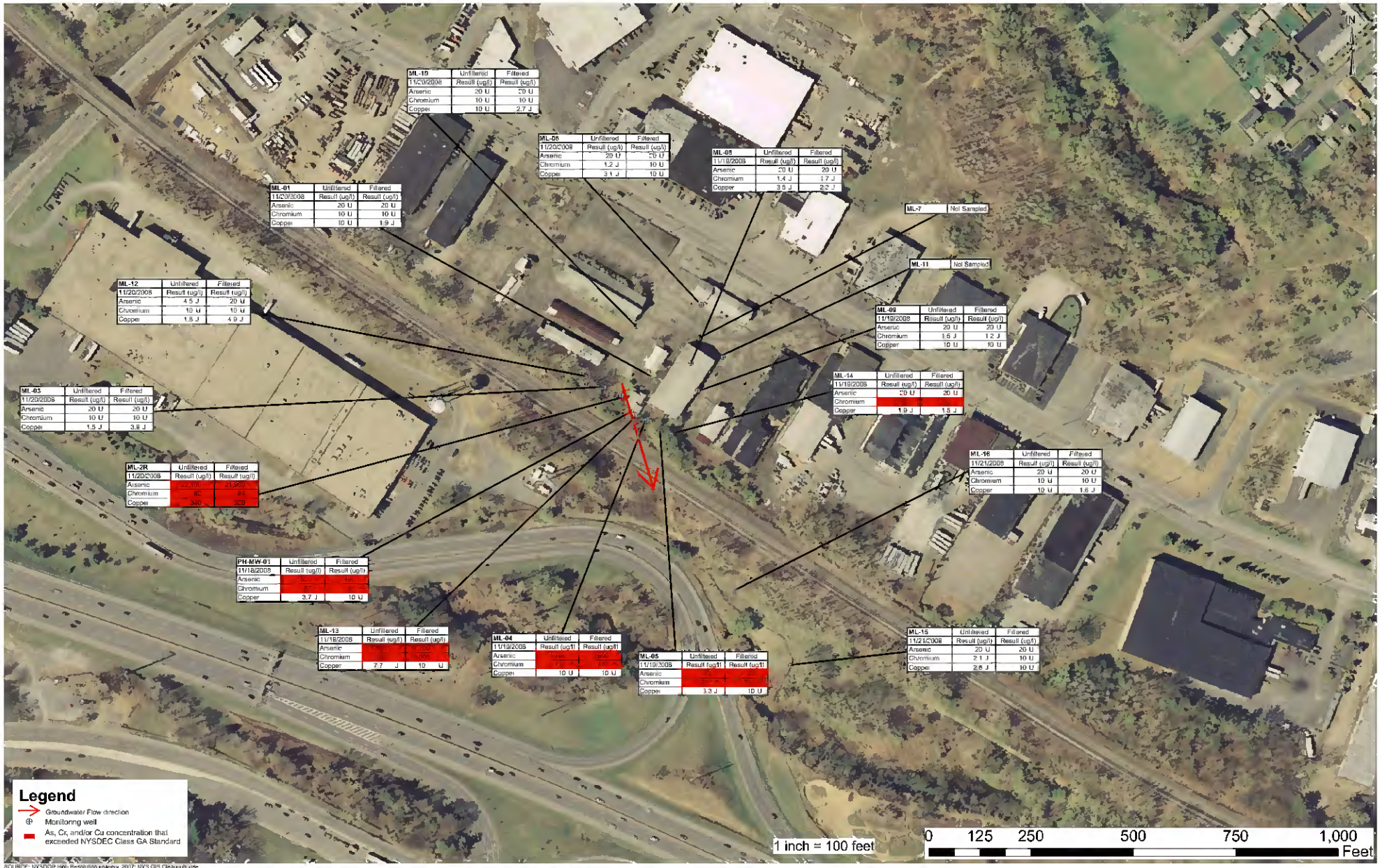
REMEDIAL INVESTIGATION REPORT

WORK AREA

MALCOLM PIRNIE, INC.

JULY 2009

FIGURE 2



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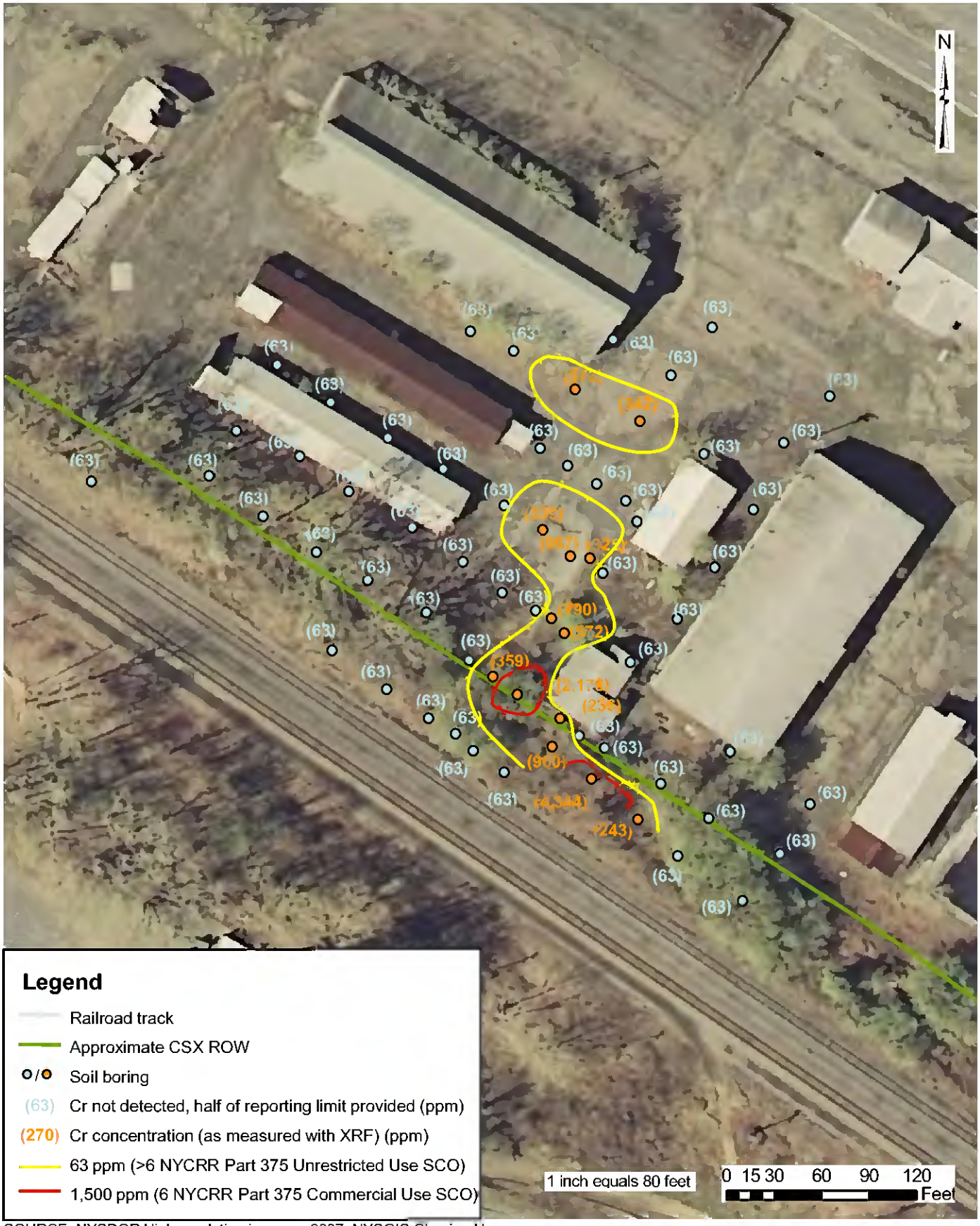
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSEN HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK STATE

SUMMARY OF VALIDATED ARSENIC, CHROMIUM, AND COPPER RESULTS IN GROUNDWATER

MAY 2009

FIGURE 3



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House
NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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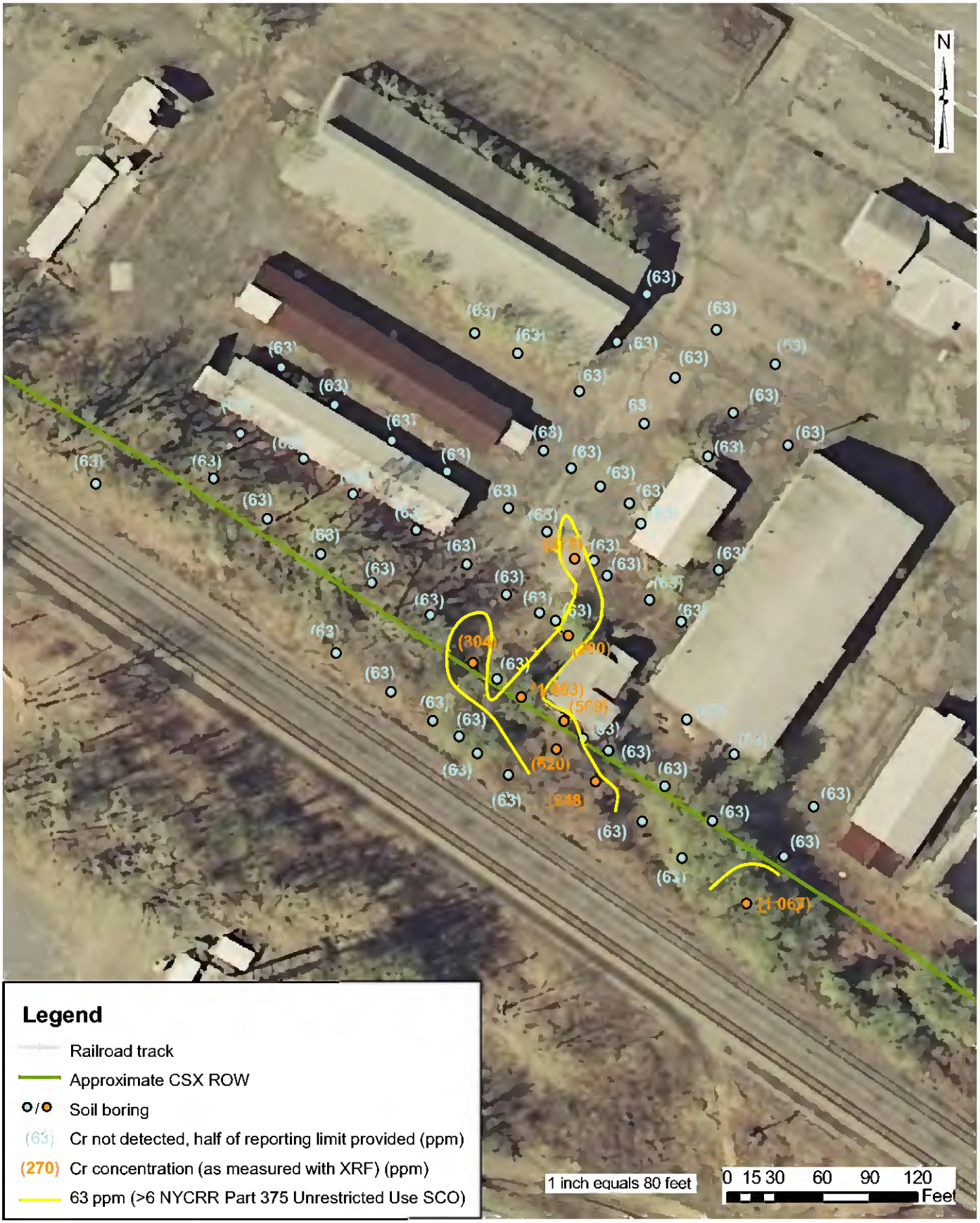
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK
CHROMIUM CONCENTRATIONS (PPM) 0-1 FT BGS

JULY 2009

FIGURE 4A



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House
NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK
CHROMIUM CONCENTRATIONS (PPM) 1-2 FT BGS

JULY 2009

FIGURE 4B

SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House
NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

CHROMIUM CONCENTRATIONS (PPM) 2-3 FT BGS

JULY 2009

FIGURE 4C

SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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CHROMIUM CONCENTRATIONS (PPM) 3-4 FT BGS

JULY 2009

FIGURE 4D

SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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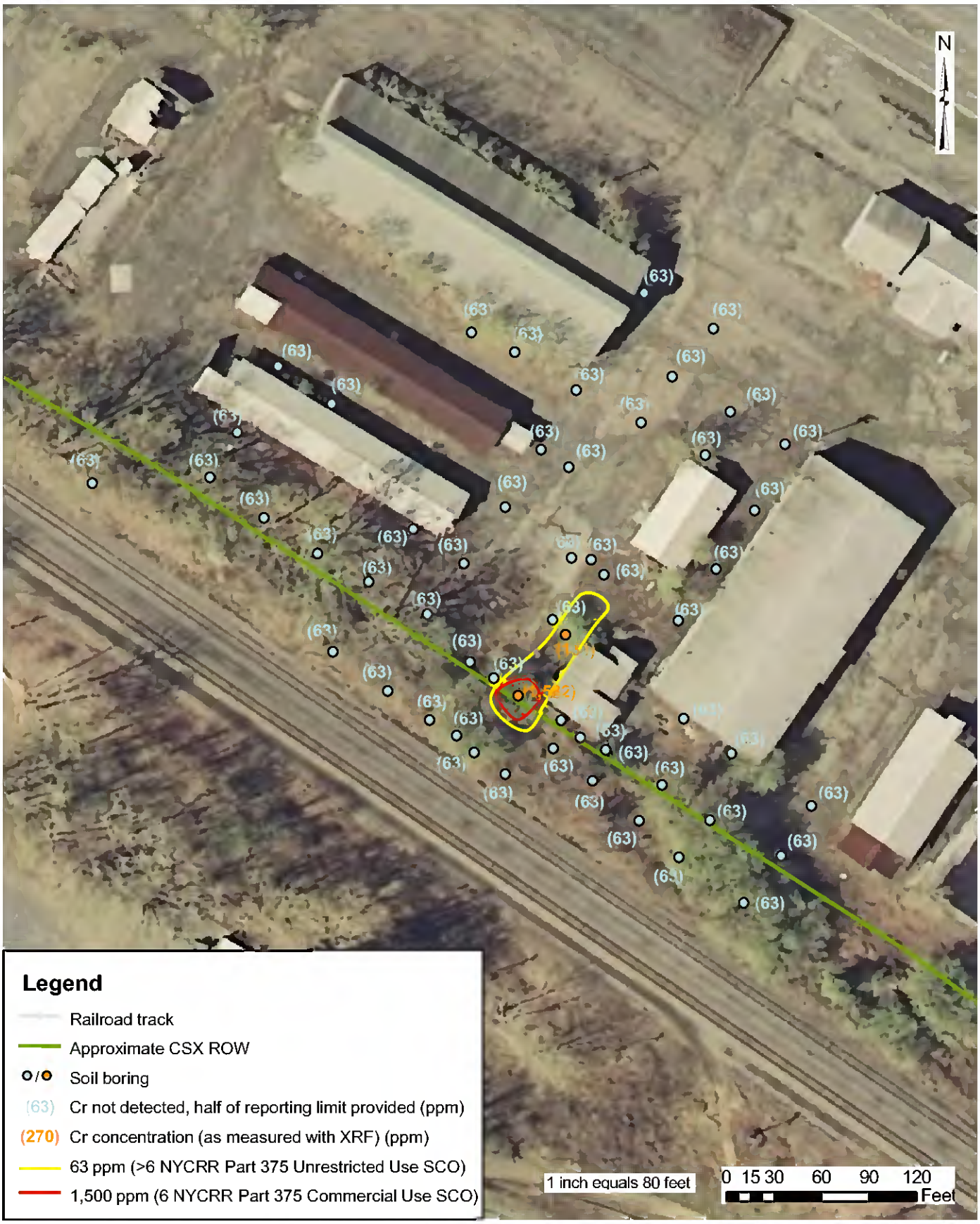
CHROMIUM CONCENTRATIONS (PPM) 4-5 FT BGS

JULY 2009

FIGURE 4E



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House
NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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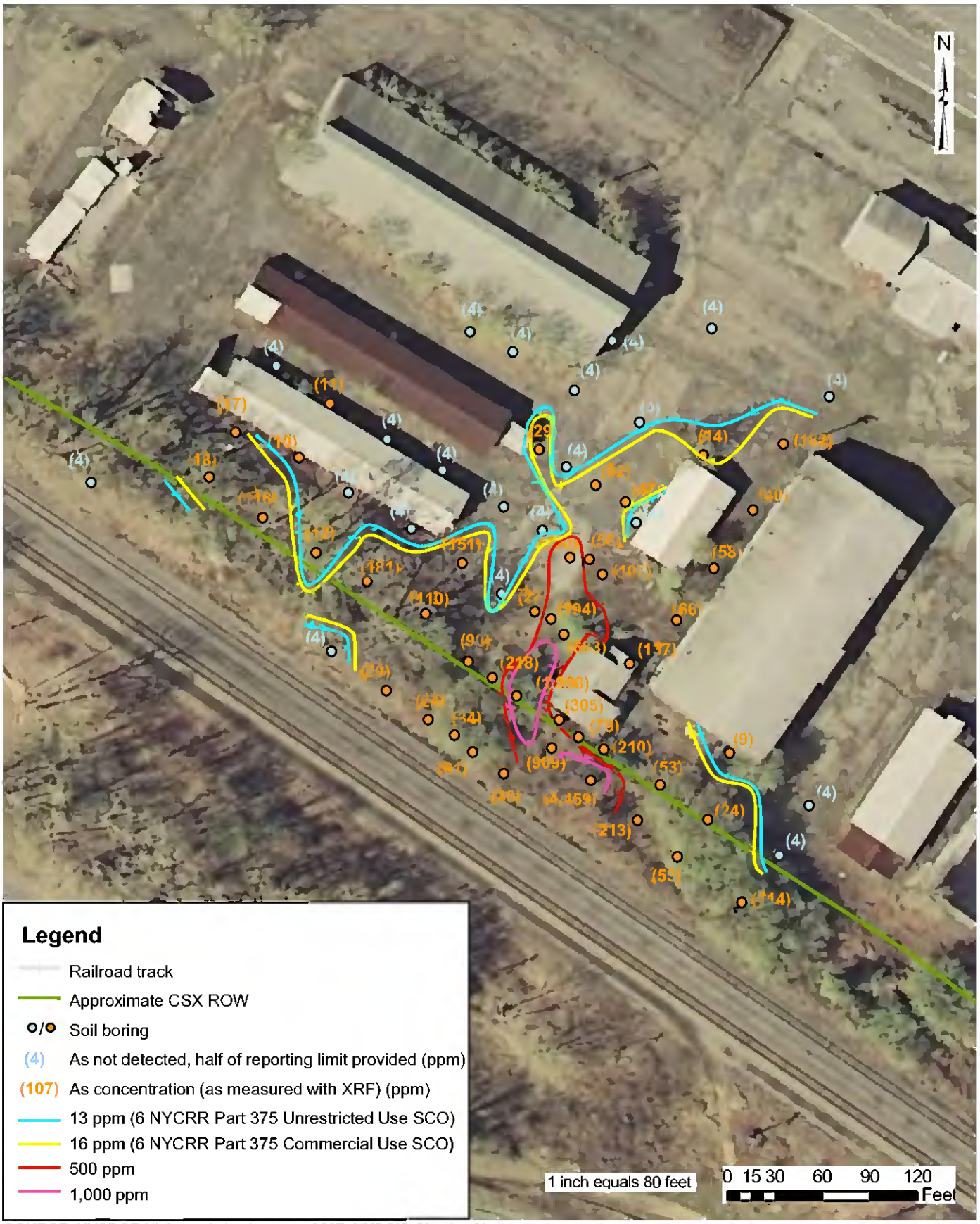
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK
CHROMIUM CONCENTRATIONS (PPM) 5-6 FT BGS

JULY 2009

FIGURE 4F



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House
NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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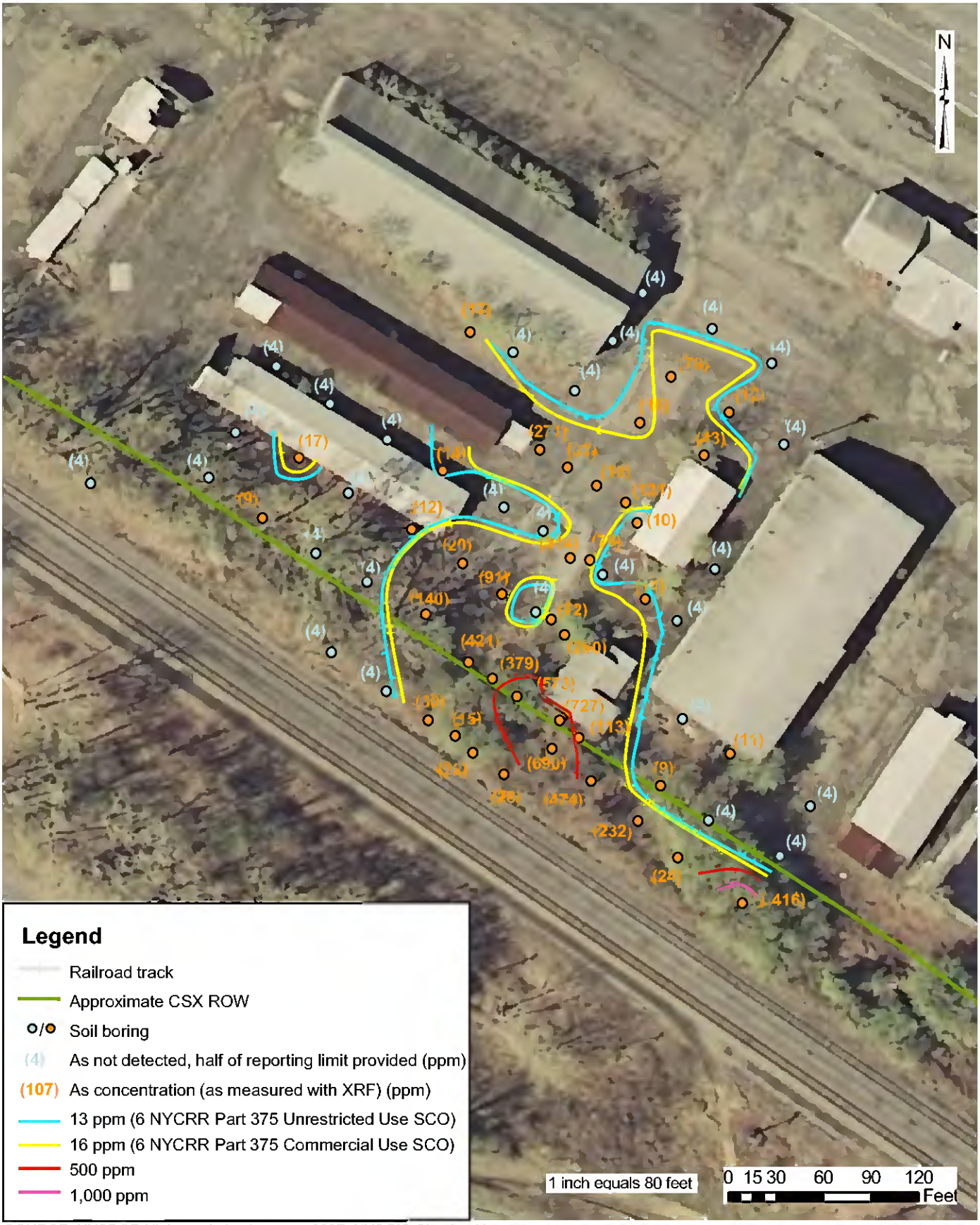
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

ARSENIC CONCENTRATIONS (PPM) 0-1 FT BGS

JULY 2009

FIGURE 5A



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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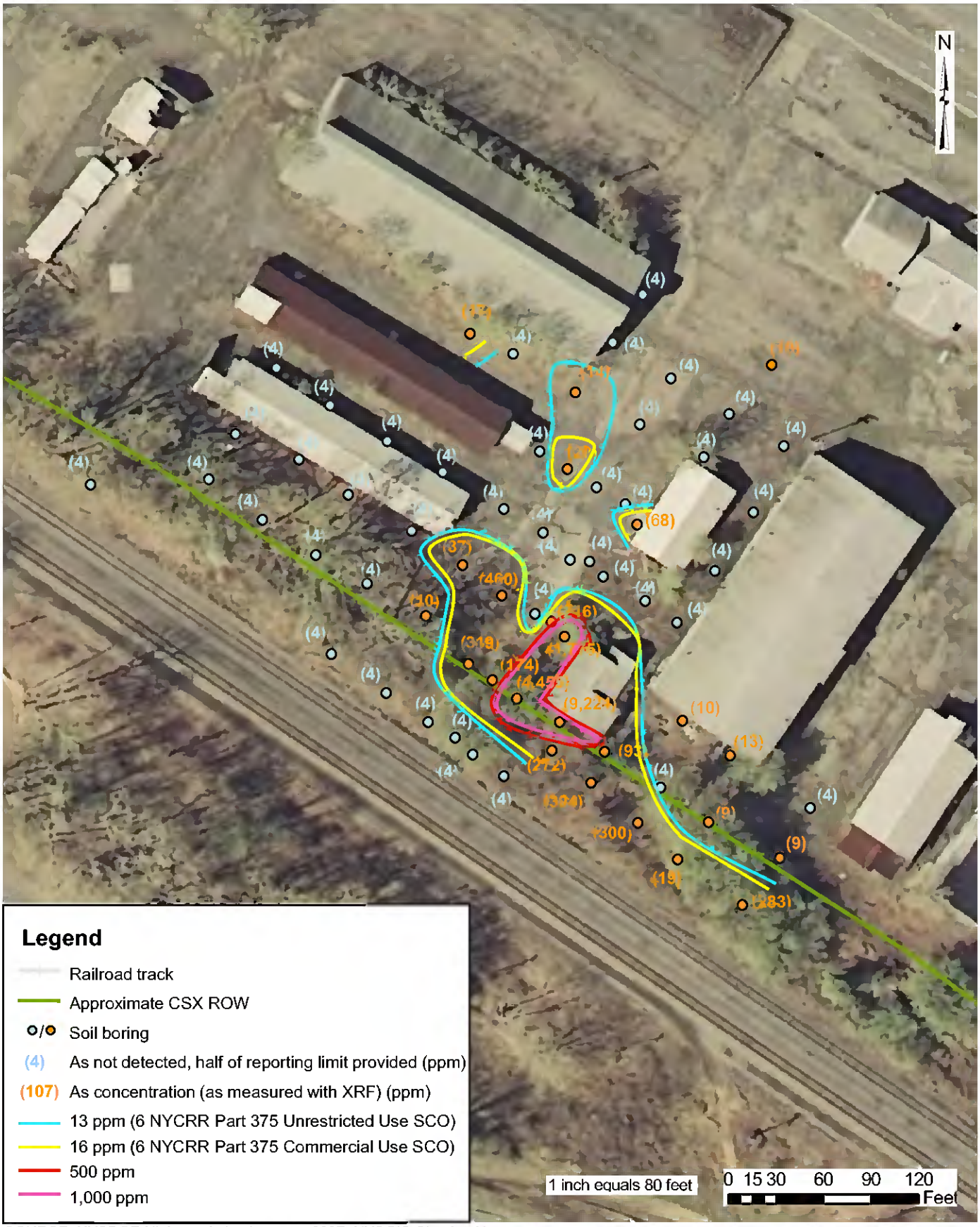
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

ARSENIC CONCENTRATIONS (PPM) 1-2 FT BGS

JULY 2009

FIGURE 5B



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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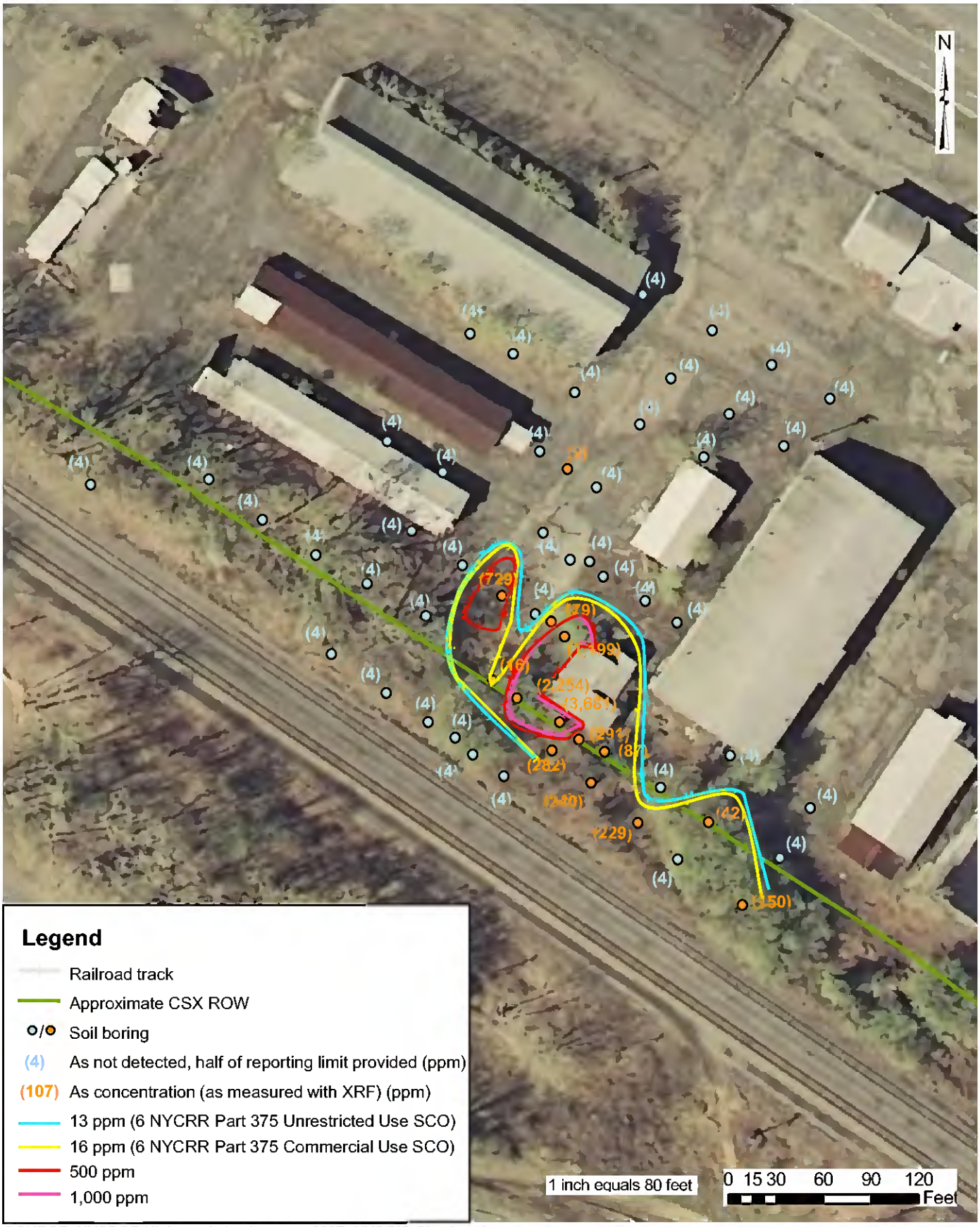
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

ARSENIC CONCENTRATIONS (PPM) 2-3 FT BGS

JULY 2009

FIGURE 5C



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

ARSENIC CONCENTRATIONS (PPM) 3-4 FT BGS

JULY 2009

FIGURE 5D

SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

ARSENIC CONCENTRATIONS (PPM) 4-5 FT BGS

JULY 2009

FIGURE 5E

SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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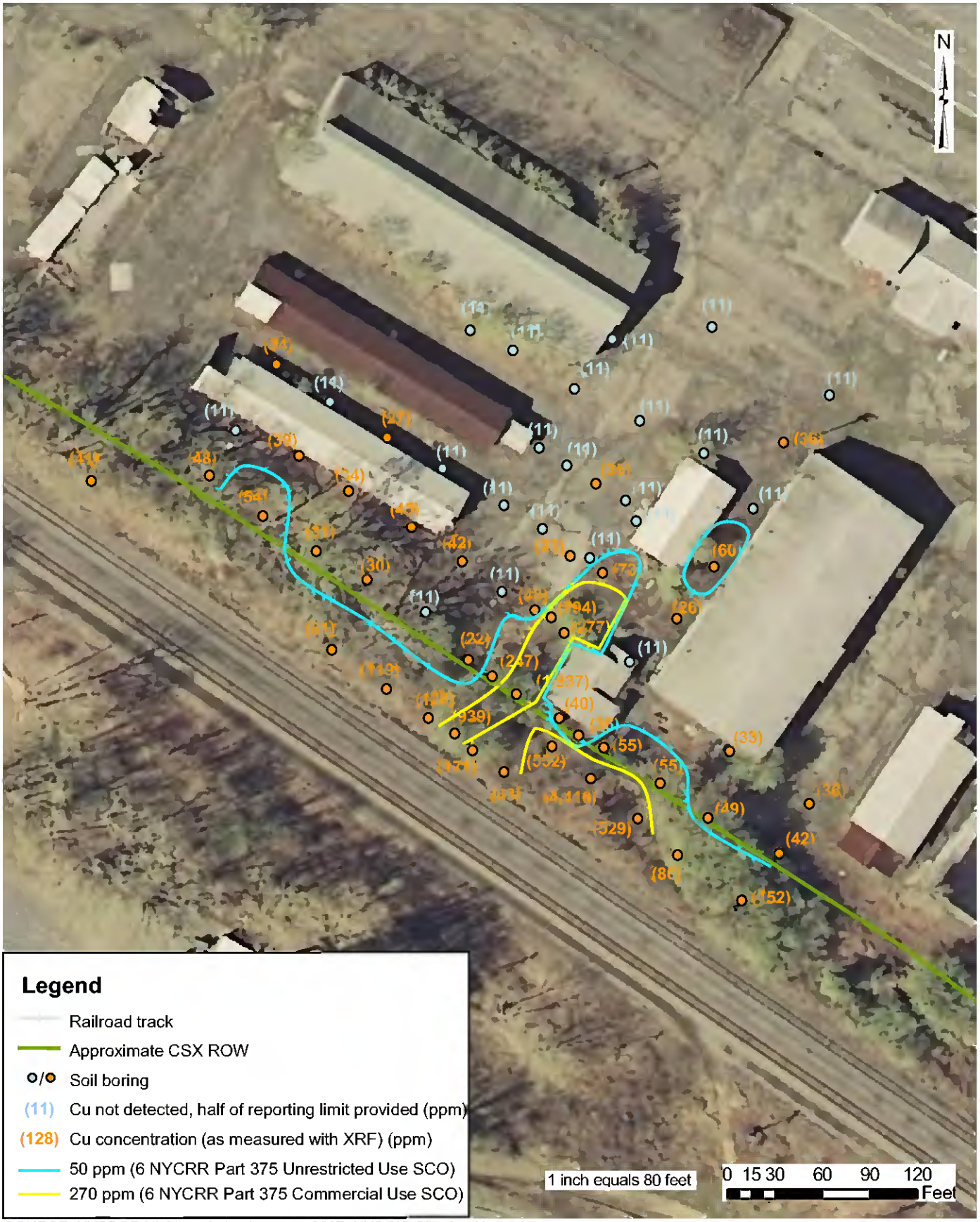
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

ARSENIC CONCENTRATIONS (PPM) 5-6 FT BGS

JULY 2009

FIGURE 5F



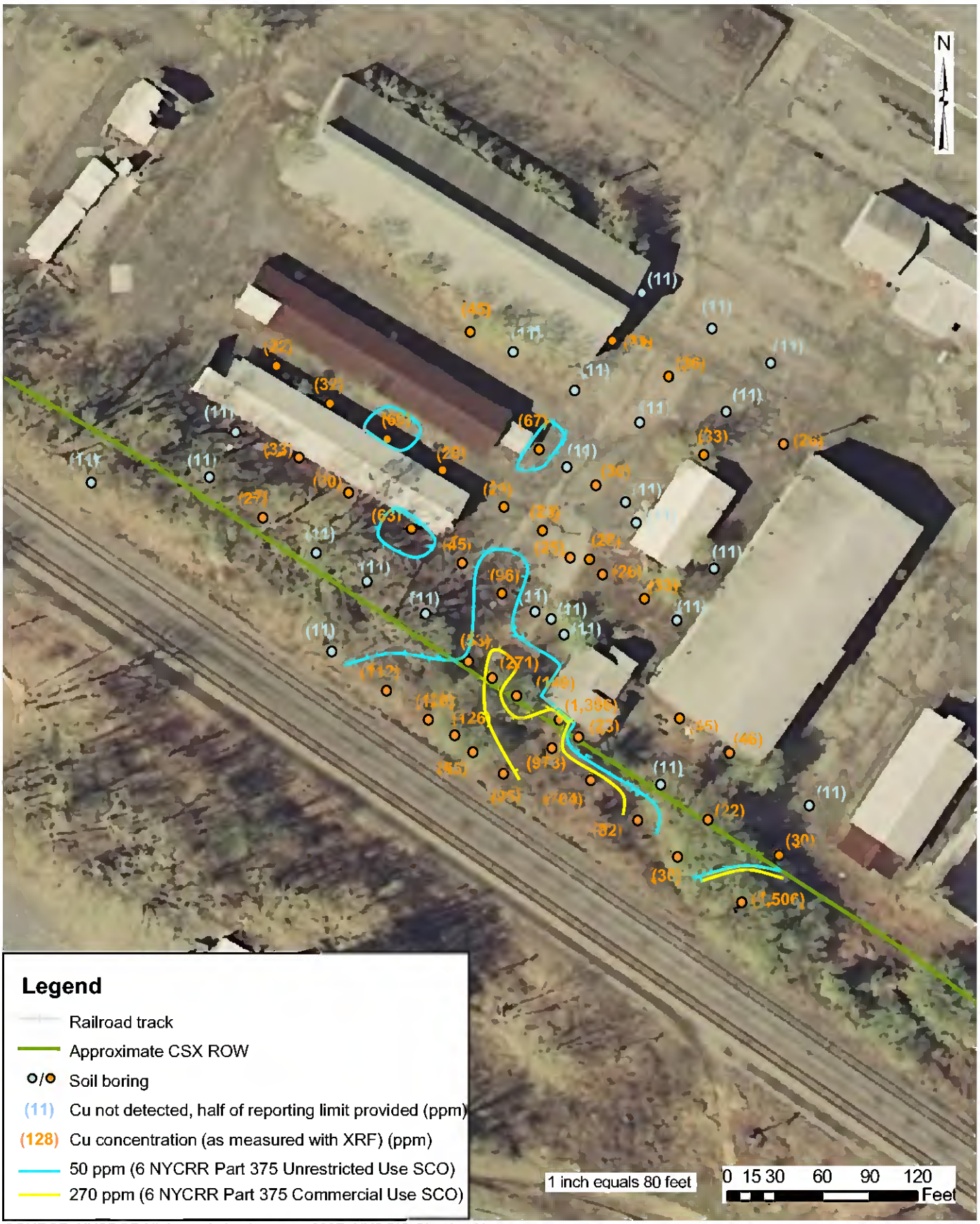
SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House
NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK
COPPER CONCENTRATIONS (PPM) 0-1 FT BGS

JULY 2009

FIGURE 6A



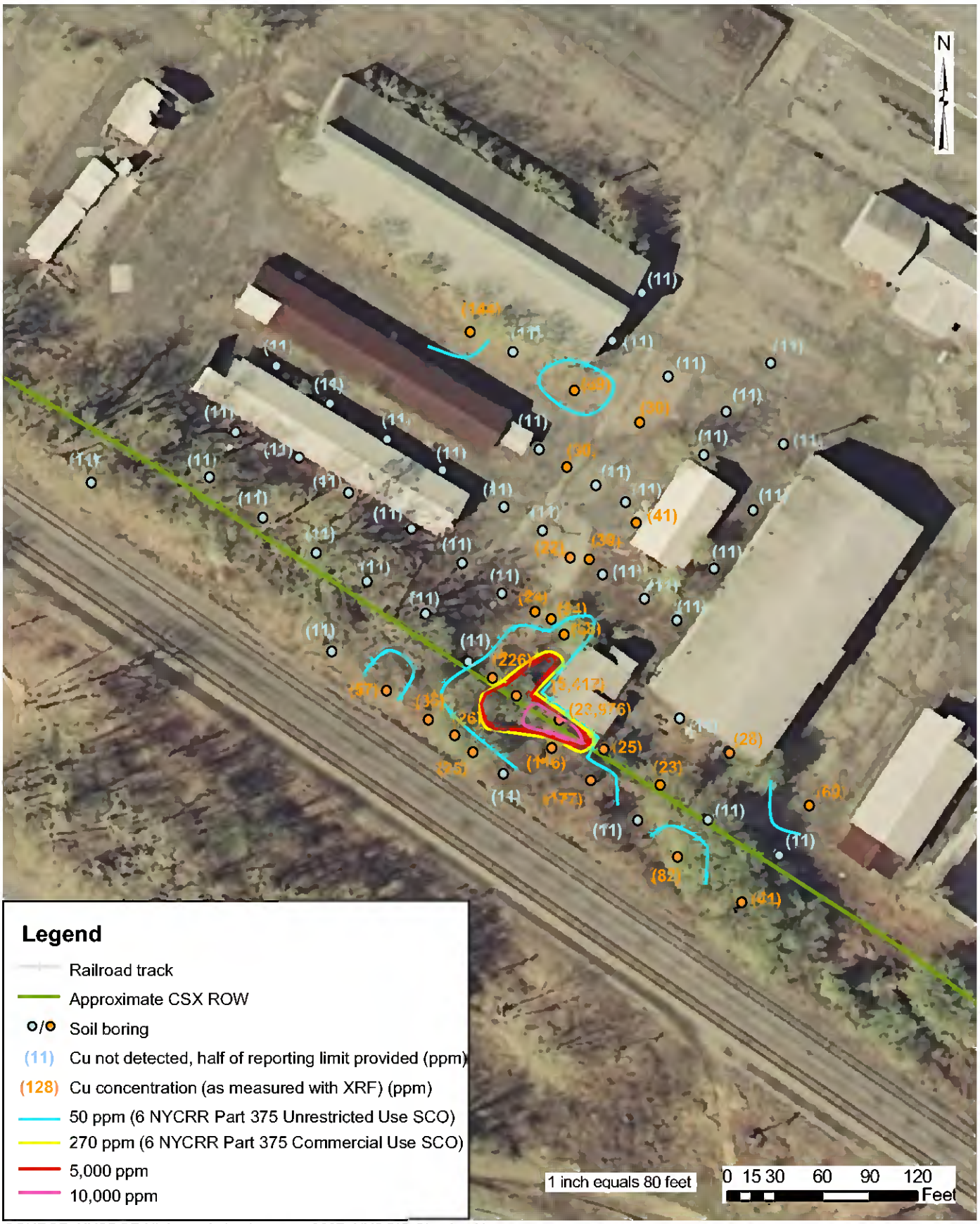
SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House
NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK
COPPER CONCENTRATIONS (PPM) 1-2 FT BGS

JULY 2009

FIGURE 6B



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

COPPER CONCENTRATIONS (PPM) 2-3 FT BGS

JULY 2009

FIGURE 6C

SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORMER PAULSON-HOLBROOK SITE (#401046)

TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

COPPER CONCENTRATIONS (PPM) 3-4 FT BGS

JULY 2009

FIGURE 6D

SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

COPPER CONCENTRATIONS (PPM) 4-5 FT BGS

JULY 2009

FIGURE 6E

SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House
NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK
COPPER CONCENTRATIONS (PPM) 5-6 FT BGS

JULY 2009

FIGURE 6F

SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

OVERVIEW OF REMEDIAL ALTERNATIVES

DECEMBER 2009

FIGURE 7

APPENDIX A

Responsiveness Summary

Responsiveness Summary

Former Paulsen-Holbrook Site
State Superfund Project
Town of Guilderland, Albany County, New York
Site No. 401046

The Proposed Remedial Action Plan (PRAP) for the Former Paulsen-Holbrook site was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 26, 2010. The PRAP outlined the remedial measure proposed for the contaminated soil and groundwater at the site.

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

A public meeting was held on March 17, 2010, which included a presentation of the remedial investigation and feasibility study (RI/FS) for the Former Paulsen-Holbrook site as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 27, 2010.

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

COMMENT 1: How soon could the property be developed?

RESPONSE 1: The estimated time to design and implement the proposed remedy is two years.

COMMENT 2: Does this proposed remedy restrict use of the rest of the property?

RESPONSE 2: Areas not targeted for remediation could be used as long as that use does not interfere with implementation of the remedy.

COMMENT 3: Would it be possible for another party to remove two feet of soil before the remedy is implemented?

RESPONSE 3: If that party agreed to abide by an approved Remedial Plan and do the work under the Department’s direction, this might be possible, although it would not be the Department’s preference to have a partial cleanup of the site done this way.

COMMENT 4: Would the easement need to extend out to Railroad Avenue?

RESPONSE 4: The environmental easement would ensure that the constructed remedy is adequately protected and that there is no incompatible use of the portion of the site that is subject

to the easement. Only the on-site contaminated area targeted for remediation would need to have an environmental easement placed on it.

David W. Meyers, counsel for the site owner, submitted a letter dated March 23, 2010 which included the following comments (the complete letter is attached at the end of this Responsiveness Summary for reference):

COMMENT 5: My client's goal is to maximize the utility of the property post-cleanup as quickly as possible. Therefore, my client requests that NYSDEC remove all of the contaminated near-surface soils found between 0' to 3' below ground surface outside of the hot zone.

My client feels that the description in the PRAP [regarding minor additional excavation to minimize the footprint] is too vague and does not assure my client that the footprint of the contaminated soils remaining on-site after excavation will be minimized to the extent practicable.

My client estimates that an additional 3,800 square feet of property could be returned to productive use if NYSDEC would commit to excavating approximately an additional 140 cubic yards of contaminated soil from the highlighted areas [outside of the immediate vicinity of the former containment building as outlined on a figure provided by the letter writer]. Even if this work cost the NYSDEC $100 per cubic yard, this would amount to only an additional $14,000 of remedial costs in a $1,980,000 project. For a mere 0.7% of the cost of the remedy, the remedy would cleanup significantly more of the site which could be utilized in the future without having to worry about disturbing solidified stabilized contaminants.

RESPONSE 5: A quick examination of the areas in question shows that the actual square footage affected by the letter writer's proposal is about 30,000 square feet. Approximately 1,110 cubic yards (cy) of contaminated soil would be removed from the 0-1 foot interval. An additional 870 cy would need to be removed from the 1-2 foot interval and 250 cy from the 2-3 foot interval under the letter writer's proposal. The estimated cost to excavate, remove, and properly dispose of the additional 1,120 cy of contaminated soil from the 1-3 foot interval is as follows: $6/cy for excavation and $125/ ton for loading, transport, and disposal of contaminated soil as non-hazardous waste. Using a conversion factor of 1.6 tons/cy of soil yields an added cost of approximately $230,000, or a 12% increase in the cost of the remedy. If the additional soil were disposed as hazardous waste at $225/ton, the $410,000 cost would represent a 21% increase in the cost of the remedy.

We have concluded that the proposed remedy, as it is currently outlined in the PRAP, is protective of human health and the environment. We will consider during remedial design if the footprint of contaminated soil remaining may be significantly minimized in a cost-effective manner by minor additional excavation.

COMMENT 6: My client also believes that these soils could be cost-effectively excavated in the Summer of 2010 while NYSDEC is engaged in determining the vertical and horizontal extent of groundwater contamination off-site, conducting its bench scale testing to determine the best way to achieve chemical stabilization/solidification of the remaining impacted soil, and its pilot

test to optimize injection into the impacted groundwater of a compound that would precipitate out and chemically fix the arsenic.

RESPONSE 6: The estimated time to design and implement the proposed remedy is two years. Before the remediation can proceed, it will take time to prepare the remedial design documents, conduct additional investigations, and put the project out to bid. Remediation of the site as a single construction project would be much more efficient and productive and would create less disturbance and inconvenience to the nearby community than if it were done as several smaller construction projects. To be fully protective of human health and the environment, it is not in the best interest to remediate the site in a piecemeal fashion.

The Department received an e-mail from Ten Eyck Powell III, owner of an adjacent parcel, sent on March 1, 2010 which included the following comment:

COMMENT 7: I am concerned that the contamination at 54 Railroad does not migrate downstream when remediation occurs at 54 Railroad and contaminate my property [at 50 Railroad Avenue].

RESPONSE 7: Based on the location of the source material, the contaminants from the site are not anticipated to affect 50 Railroad Avenue. We will evaluate the possibility that contamination would migrate during the remediation and will take steps to eliminate that possibility. The remedial contractor will follow a community air monitoring plan that will include particulate monitoring and dust suppression measures in order to protect the nearby and downwind community from off-site migration of contaminants.

The Department received several e-mails and a letter dated March 26, 2010 from Kevin Boland, representing CSX Transportation, Inc. (CSXT), owner of an adjacent parcel, which included the following comments:

COMMENT 8: CSXT leases its corridors to utility (e.g., fiber optics, gas mains, etc.) companies. Utility installations typically require trenching to depths of 6 to 8 feet. Utility easements are a significant revenue stream for the railroad. I need to ensure that the proposed remedy does not impact our ability to grant such easements. Will CSXT be allowed to disturb (i.e., trench through) the stabilized soils?

RESPONSE 8: The proposed remedy does not preclude CSXT from disturbing stabilized soils. These situations will be managed on the site property through a Site Management Plan, which will include a soil management section which would outline exactly what needs to be done to be protective of human health and the environment if site soils are disturbed. The Department can provide the on-site Site Management Plan to you or your contractors and excavation of stabilized soils would be acceptable if the soil management requirements in that plan are adhered to.

COMMENT 9: What will be the exposure concerns for the utility workers?

RESPONSE 9: If a trench were excavated through the stabilized contaminated soil, workers could be exposed to contaminants. This potential exposure would be managed through proper health and safety procedures and adherence to the approved Site Management Plan. One of the

goals of the Site Management Plan is that prior notification be given to all future workers likely to come in contact with remaining contamination so that they may take necessary safety precautions.

COMMENT10: Once excavated, will the soils need to be managed/disposed?

RESPONSE 10: Even though the soil would be solidified/stabilized, it would still be listed hazardous waste (F035), and once excavated, would need to be properly disposed at a permitted facility.

COMMENT 11: We respectfully request that the remediation plan be modified as follows:
On completion of soil stabilization efforts, NYSDEC shall erect a chain-link fence to encompass all soils within the CSXT property boundaries that, upon excavation, would be classified as an F035 listed hazardous waste. Signs shall be affixed to the fence that identify the soil as being contaminated and provide instructions to contact the CSXT Public Safety Coordination Center at 1-800-232-0144 prior to disturbing the soil.

RESPONSE 11: The requested language has been added to the description of the remedy in the Record of Decision document.

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PLEASE REPLY TO:

☒ ALBANY
☐ SARATOGA

March 23, 2010

Via Electronic Mail
(ljalden@gw.dec.state.ny.us)
and First Class U.S. Mail

Lawrence J. Alden, P.E.
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, New York 12233-7016

Re: Comment, Proposed Remedial Action Plan
Former Paulsen-Holbrook Site
Site ID #401046
Town of Guilderland, New York

Dear Mr. Alden:

As you know, our office represents Albany Miron Lumber Corp., the owner of the property commonly known as 54 Railroad Avenue, Town of Guilderland, State of New York. Please accept this letter as my client's Comment to the New York State Department of Environmental Conservation's (NYSDEC) proposed remedy described in a draft cleanup plan called a Proposed Remedial Action Plan (PRAP) developed under New York's State Superfund Program.

Summary

My client's goal is to maximize the utility of the property post-cleanup as quickly as possible. Therefore, my client's requests that (a) NYSDEC remove all of the contaminated near surface soils found between 0' to 3' below ground surface (bgs) outside of the hot zone, and (b) perform that removal work by the end of Summer, 2010.

Discussion

The PRAP states that Alternative 6B: In Situ Soil Stabilization to Water Table and In Situ Groundwater Source Treatment (the "remedy") is the preferred remedy of NYSDEC. The remedy is described as follows:

a. a limited off-site investigation downgradient from the swale along the railroad tracks to determine extent of off-site contamination;

b. demolishing the two small buildings in the vicinity of the wood treating area;

c. excavating and off-site disposal of the top foot of impacted soils with arsenic levels above NYSDEC's soil cleanup objectives for sites to be used commercially;

d. excavating and off-site disposal of contaminated soil remaining above the water table in certain areas that may significantly minimize the footprint of the remaining contamination;

e. a bench scale test to determine the best way to achieve chemical stabilization/solidification of the remaining impacted soil above the water table, and then, injection of the chosen formula;

f. a pilot test comprised of on-site injections to optimize injection into the impacted groundwater of a compound that would precipitate out and chemically fix the arsenic, and then, implementing the optimal injections from the top of the water table which is 11' bgs down to 40' bgs;

g. placement of one (1) foot of clean cover over the remaining impacted soils (with a demarcation layer between the clean soil and the contaminated soil);

h. restricting the drinking of the water and/or disturbance of the stabilized soils;

I. abiding by a site management plan; and

j. semi-annual monitoring.

My client's comment as to this remedy relates to remedial measure "d" above. My client feels that the description in the PRAP is too vague and does not assure my client that the footprint of the contaminated soils remaining on-site after excavation will be minimized to the extent practicable.

I am enclosing Figures 5A and 7 from the PRAP. These figures indicate that the area outside of the area around the former CCA treatment building has only shallow (0'-3' bgs) subsurface contamination, all of which can be cost-effectively removed. According to the proposed remedy, NYSDEC is already committing to remove the top twelve (12) inches. The remaining contaminated soils from 1' to 3' bgs in the highlighted area can be removed at the same time.

My client's property would be much more saleable if the area to the north of the former CCA lumber treatment area and the area to the west of the former CCA lumber treatment area (which both basically have impacted soils from the ground surface to 2' bgs) were excavated and disposed off-site. The end result would be that the contaminated area would be pulled back from the center and western portions of the property.

As you know, NYSDEC is required to attain pre-disposal conditions to the extent feasible. My client estimates that an additional 3,800 square feet of property could be returned to productive use if NYSDEC would commit to excavating approximately an additional 140 cubic yards of contaminated soil from the highlighted areas. Even if this work cost the NYSDEC $100 per cubic yard, this would amount to only an additional $14,000 of remedial costs in a $1,980,000 project. For a mere 0.7% of the cost of the remedy, the remedy would cleanup significantly more of the site which could be utilized in the future without having to worry about disturbing solidified / stabilized contaminants.

My client also believes that these soils could be cost-effectively excavated in the Summer of 2010 while NYSDEC is engaged in determining the vertical and horizontal extent of groundwater contamination off-site, conducting its bench scale testing to determine the best way to achieve chemical stabilization/solidification of the remaining impacted soil, and its pilot test to optimize injection into the impacted groundwater of a compound that would precipitate out and chemically fix the arsenic.

As you know, my client has been actively engaged in trying to sell the property for the past several years. Because of the uncertainty and time associated with NYSDEC's remediation process to date, we have had several proposed buyers (some of whom were under contract) walk

away from proposed transactions. Therefore, anything that the NYSDEC can do to increase the post-cleanup use of the property, and the timely excavation of contaminated soles, would be very much appreciated by my client.

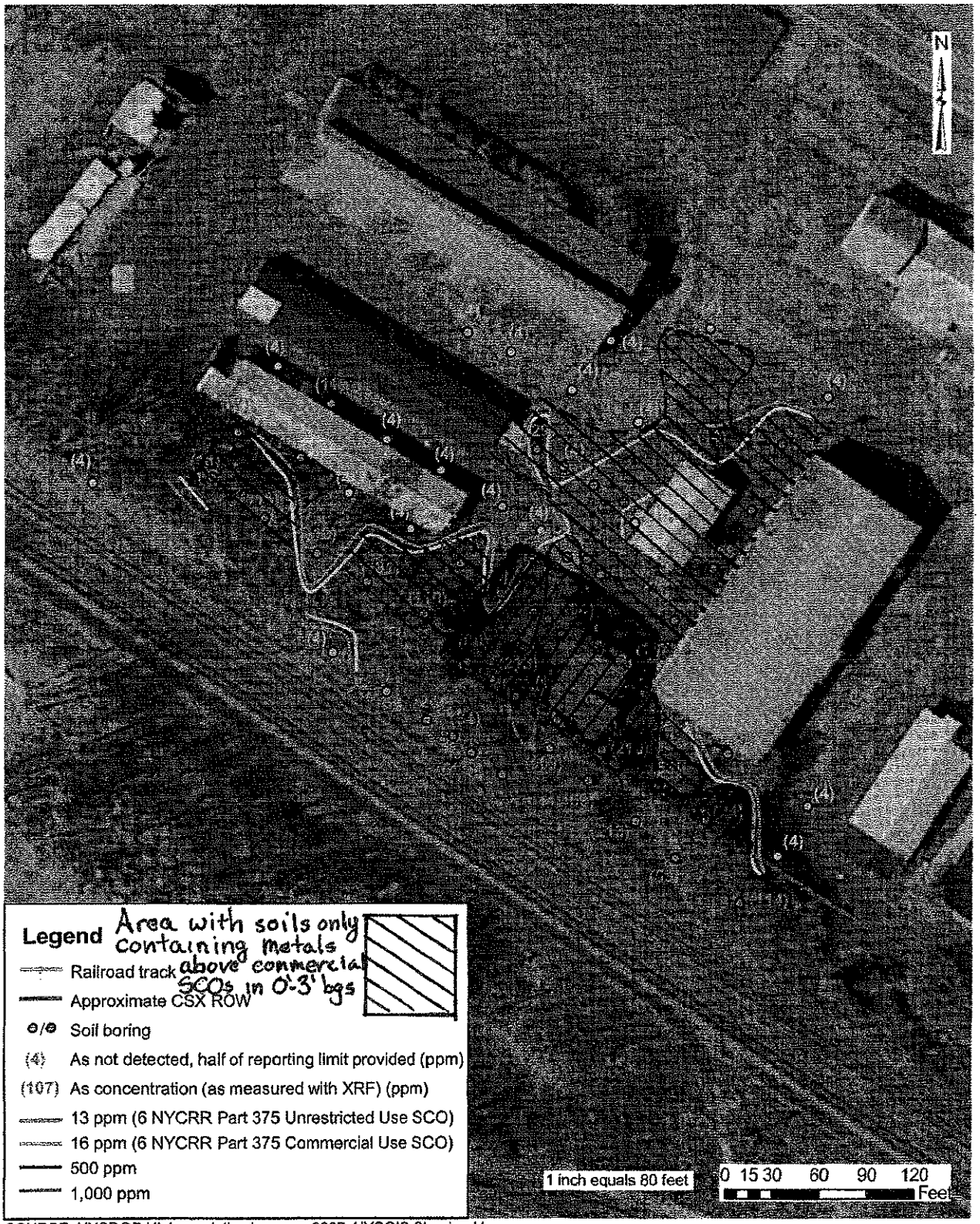
If I can answer any questions regarding this matter, please feel free to contact me at your convenience.

Very truly yours,

David W. Meyers

DWM/dg
Encs.

cc: Stephen E. Miron, Esq. (w/ enclosures)
Michael A. Oropallo, Esq. (w/ enclosures)



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

NOTE: Mapped chromium concentrations are interpolated from concentrations as shown at individual sampling locations. Actual conditions may vary.

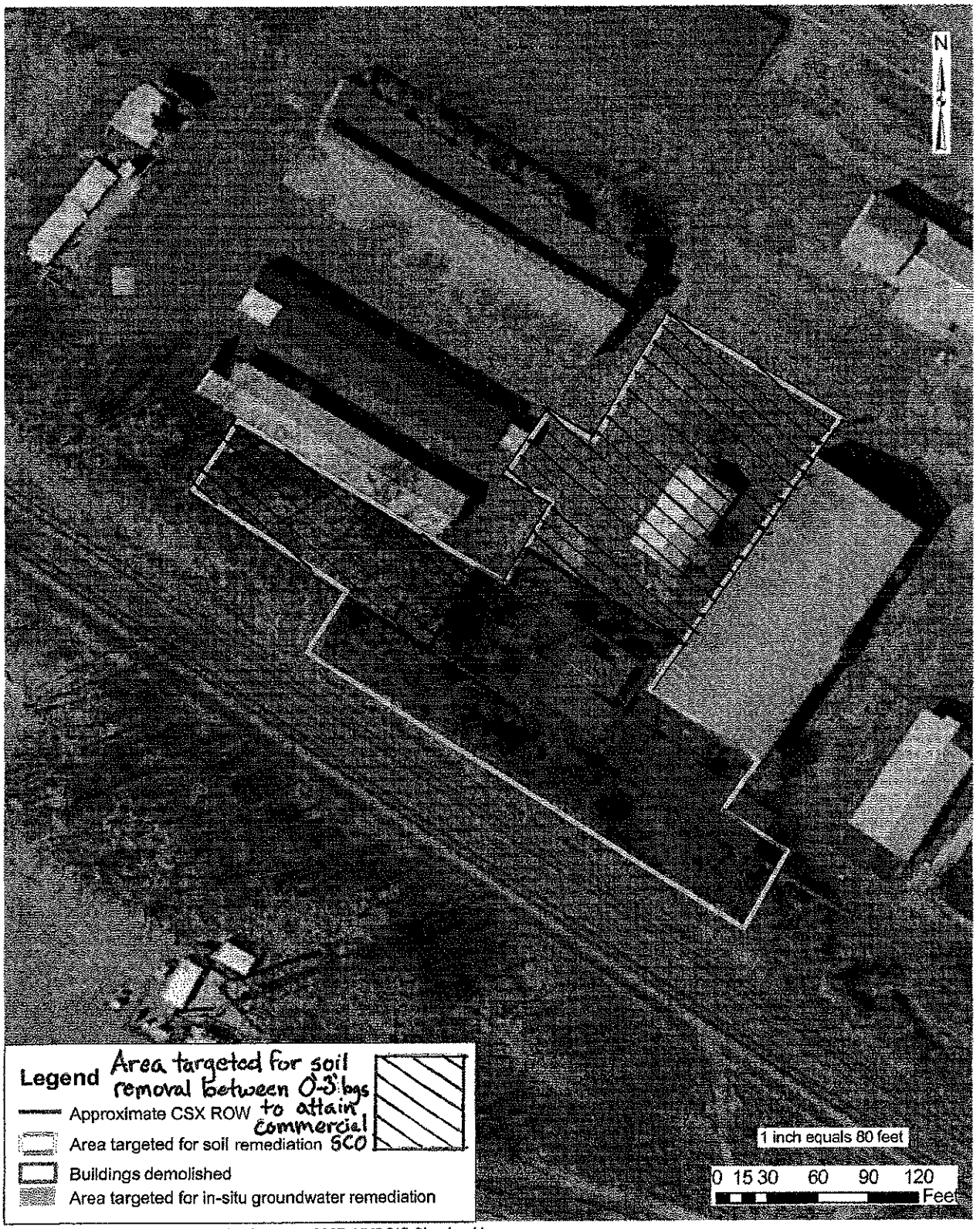
MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

ARSENIC CONCENTRATIONS (PPM) 0-1 FT BGS

JULY 2009

FIGURE 5A



SOURCE: NYSDOP High resolution imagery, 2007; NYSGIS Clearing House

MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FORMER PAULSON-HOLBROOK SITE (#401046)
TOWN OF GUILDERLAND, ALBANY COUNTY, NEW YORK

OVERVIEW OF REMEDIAL ALTERNATIVES

DECEMBER 2009

FIGURE 7

APPENDIX B

Administrative Record

Administrative Record

Former Paulsen-Holbrook Site
State Superfund Project
Town of Guilderland, Albany County, New York
Site No. 401046

"Proposed Remedial Action Plan for the Former Paulsen-Holbrook Site", dated February 2010, prepared by the Department.

Order on Consent dated March 13, 2007 In the Matter of the Settlement for the Reimbursement of Administrative Costs for an Inactive Hazardous Waste Disposal Site, Under Article 27, Title 13, and Article 71, Title 27 of the Environmental Conservation Law of the State of New York.

Referral Memorandum dated March 14, 2007 for development and implementation of a Remedial Investigation/Feasibility Study of the site.

"Immediate Activation Work Assignment Work Plan", dated June 2008, prepared by Malcolm Pirnie, Inc.

"Remedial Investigation Report - Former Paulsen-Holbrook Site", dated July 2009, prepared by Malcolm Pirnie, Inc.

"Feasibility Study - Former Paulsen-Holbrook Site", dated December 2009, prepared by Malcolm Pirnie, Inc.