General Motors – Inland Fisher Guide Site Operable Unit 1 Site Code: 734057

Subsite of the Onondaga Lake Superfund Site

Towns of Salina and DeWitt, Onondaga County, New York

NEW YORK STATE | Department of Environmental Conservation

July 2023

EPA Region 2

PURPOSE OF THIS DOCUMENT & SUMMARY OF PREFERRED CLEANUP PLAN

This Proposed Plan describes the remedial alternatives considered for the contaminated soil/fill material, groundwater, and soil vapor at Operable Unit (OU) 1, the former plant property and groundwater portion of the General Motors – Inland Fisher Guide (GM-IFG) subsite (Subsite), which is part of the Onondaga Lake Superfund site, and identifies the preferred remedial alternative with the rationale for this preference.

This Proposed Plan was developed by the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (EPA) in consultation with the New York State Department of Health (NYSDOH). NYSDEC and EPA are issuing this Proposed Plan as part of their public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at OU1 is described in the *Remedial Investigation General Motors Inland Fisher Guide Operable Unit 1* (RI) and the remedial alternatives summarized in this Proposed Plan are described in the *General Motors Inland Fisher Guide Operable Unit 1 Feasibility Study Report* (FS), contained in the Administrative Record file for OU1. NYSDEC and EPA encourage the public to review these documents to gain a more comprehensive understanding of the Subsite and the Superfund activities that have been conducted in connection with OU1.

This Proposed Plan is being provided as a supplement to the reports listed above to inform the public of NYSDEC and EPA's preferred remedy and to solicit public comments pertaining to all the remedial alternatives evaluated, including the preferred remedy.

NYSDEC and EPA's preferred remedy includes a combination of removal and off-site disposal of soils that exceed 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) for industrial use, in-situ treatment to address residual source areas (i.e., Former Thinner Tanks Area and beneath and northeast of the former manufacturing building), groundwater collection and treatment along the northern perimeter of the former GM-IFG facility property, evaluation of the sub-slab depressurization system (SSDS) to determine if it can be supplemented with a soil vapor extraction (SVE) system to enhance removal of source material in soil beneath the former manufacturing building, treatment of the contaminated groundwater that is collected by the existing State Pollution Discharge Elimination System (SPDES) treatment system prior to being discharged to Ley Creek, development of a Site Management Plan (SMP), implementation of institutional controls (ICs), and long-term operation and maintenance (O&M) of these actions and previously-performed cleanup actions identified as Interim Remedial Measures (IRMs).[1]

The remedy described in this Proposed Plan is the preferred remedy for OU1. Changes to the preferred remedy, or a change from the preferred remedy to another remedy, may be made if public comments or additional data indicate that such a change will result in a more appropriate and effective remedial action. The final decision regarding the selection of a remedy will be made after NYSDEC and EPA have taken into consideration all public comments. NYSDEC and EPA are soliciting public comment on all the alternatives presented in this Proposed Plan and in the detailed analysis section of the FS report because NYSDEC and EPA may ultimately select a remedy other than the preferred remedy.

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[1] An IRM is a New York State law term for an environmental response that is synonymous with the CERCLA environmental response term "removal action." The use of the term "IRM" in this document is used solely for consistency with underlying documents, but references actions that are in fact removal actions under CERCLA.

Community Role in the Selection Process

NYSDEC and EPA rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, this Proposed Plan has been made available to the public for a public comment period which begins on July 28, 2023 and concludes on August 27, 2023.

As noted above, an open house and a public meeting will be held during the comment period. At the public meeting, NYSDEC will present the conclusions of the RI and FS, elaborate further on the rationale for recommending the preferred remedy, and receive public comments.

The open house will be less formal and will provide the public a chance to receive printed information and discuss the cleanup options with NYSDEC and EPA representatives on a one-on-one basis.

Comments received at the public meeting and in writing during the comment period will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document that formalizes the selection of the remedy. Written comments on this Proposed Plan should be addressed to:

Jacky Luo
New York State Department of Environmental Conservation
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Albany, NY 12233-7013
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MARK YOUR CALENDAR

Public comment period on the Proposed Plan: ***July 28, 2023 – August 27, 2023***

Open House: 5:00-6:00 PM *on Wednesday, August 16, 2023*

Public Meeting: *6:00 PM on Wednesday, August 16, 2023*

Location: *Town of Salina Town Hall,*
201 School Road, Liverpool, New York 13088

INFORMATION REPOSITORIES

The administrative record file, which contains copies of the Proposed Plan and supporting documentation, are available online through the DECinfo Locator at: https://www.dec.ny.gov/data/DecDocs/734057/ and at the following locations:

Onondaga County Public LibrarySyracuse Branch at the Galleries
447 South Salina Street
Syracuse, NY 13204
315-435-1800

Salina Library
100 Belmont Street
Mattydale, NY 13211
315-454-4524

Atlantic States Legal Foundation
658 West Onondaga Street
Syracuse, NY 13204
315-475-1170

New York State Department of EnvironmentalConservation
5786 Widewaters Parkway
Syracuse, NY 13214-1867
315-426-7400

New York State Department of EnvironmentalConservation
Attn.: Jacky Luo
625 Broadway
Albany, NY 12233-7013
518-402-9676
E-mail: jacky.luo@dec.ny.gov

SUBSITE BACKGROUND

On June 23, 1989, the Onondaga Lake site was added to the New York State Registry of Inactive Hazardous Waste Disposal Sites. On December 16, 1994, Onondaga Lake, its tributaries and the upland hazardous waste sites which have contributed or are contributing contamination to the lake (subsites) were added to EPA's National Priorities List (NPL). This NPL listing means that the lake system is among the nation's highest priorities for remedial evaluation and response under the federal Superfund law for sites where there has been a release of hazardous substances, pollutants, or contaminants.

In 1997, General Motors Corporation (GM), the facility's owner at the time, and NYSDEC entered into an Administrative Order on Consent to conduct an RI/FS for the Subsite (NYSDEC site code 734057). Following GM's filing for bankruptcy in 2009, an RI/FS Order on Consent was executed between the Revitalizing Auto Communities Environmental Response Trust[2] (RACER) and NYSDEC in 2015. The Order requires RACER to conduct an RI/FS and risk assessments for the Subsite. The Subsite was classified by NYSDEC as a Class 2 Site in the New York State Registry of Inactive Hazardous Waste Disposal Sites (a Class 2 site represents a signification threat to public health or the environment; action is required). The Subsite includes two OUs. OU1, which is the focus of this Proposed Plan, addresses the former GM-IFG facility property soil and soil vapor and on- and off-property contaminated groundwater; OU2 addresses off-property contaminated sediments and floodplain soils. A remedy was selected for OU2 in March 2015; however, based on a significant increase in the overall volume of soil requiring remediation in the OU2 area, and the associated cost, after considering alternatives to the selected remedy, two separate Explanations of Significant Differences (ESDs) were issued by EPA and NYSDEC in September 2022 and April 2023 memorializing the increased volume and cost. The design of the OU2 remedy is currently underway; it is anticipated that it will be completed in late 2023.

<u>OU1 Description and History</u>

Location: The former GM-IFG property comprises approximately 65 acres that include the 800,000 square foot (sf) former GM manufacturing building located at 1 General Motors Drive in the Towns of Salina and Dewitt, Onondaga County, New York (collectively, facility). See Figure 1, Site Location.

Features: Various paved parking lots and green spaces are present at the facility. These areas surround the former manufacturing building and related outbuildings. The facility is bounded to the south by CSX railroad tracks, a wood pallet recycling facility, and an automobile dealership; to the east and northeast by Military Circle (formerly GM Circle) and Townline Road; to the west by a National Grid (formerly Niagara Mohawk Power Corporation) electrical transfer station and the state regulated wetland SYE-6; and to the north by Factory Avenue and the Ley Creek PCB Dredging subsite (NYSDEC site code; 734044). Many of these features can be seen on Figure 2, Property Areas of the Former GM-OU1 Site.

Geology and Hydrogeology: The local geology for the Subsite consists of fill, glaciolacustrine deposits, and lodgment till underlain by red shale bedrock. Beneath the facility, the thickness of the glaciolacustrine unit increases toward the facility's northern boundary. The glaciolacustrine deposit has three units: the upper unit (silt and fine-grained sand); the middle unit (silt and clay); and the lower unit (silt and fine-grained sand).

The Subsite has two distinct groundwater zones:

- A shallow groundwater zone (at a depth of approximately 1 foot to 15 feet [ft] below ground surface [bgs]) within the fill layer and the upper glaciolacustrine unit; and
- A deep groundwater zone (at a depth of approximately 20 to 45 ft bgs) within the lower glaciolacustrine unit and the sand and gravel layer.

Between the two groundwater zones is the middle glaciolacustrine layer, which acts as a low permeability zone that separates the shallow and deep groundwater zones. This low permeability glaciolacustrine layer extends from near the northern edge of the former manufacturing building to the northern portion of the facility. The deep and shallow groundwater zones are connected in the vicinity of the building where the glaciolacustrine layer is absent. Shallow and deep groundwater generally flow in a northeast direction across the facility toward Ley Creek.

History of the GM-IFG Facility: GM built the facility to manufacture metal automotive trim components such as bumpers, grills, wheel disks, and hubcaps. The facility began operations in 1952 as GM's Brown-Lipe-Chapin Division. Facility operations included metal die casting; nickel, chromium, and copper cyanide electroplating; stamping; polishing; buffing; painting; and machining. In 1961, Brown-Lipe-Chapin merged with another GM division, Ternstedt, and in 1968 became part of GM's Fisher Body Division. During the early 1960s, injection molding operations were added to the metal operations. Metal finishing and

[2] RACER was created by a U.S. Bankruptcy Court to clean up and position for redevelopment former GM properties.

diecasting were subsequently reduced and replaced by plastic injection molding by the early 1970's. The facility operated as the Fisher Body Division until 1984, when it became the Fisher Guide Division. The facility then operated as GM's IFG Division from 1989 until it ceased manufacturing operations in 1993. After the cessation of manufacturing operations, the facility was reassigned to GM's North American Operations Property Management Group, later re-designated the Worldwide Facilities Group. Beginning in 1997, GM implemented a facility cleanup program to decontaminate surfaces and decommission unneeded systems. GM redeveloped the facility, starting in 2000, as commercial/light industrial multi-tenant spaces; use of these spaces continues today. In 2009, GM filed for bankruptcy and, soon after, RACER took over the ownership and remediation activities of the facility.

Interim Remedial Measures: IRMs are activities to address both emergency and nonemergency site conditions, which can be undertaken without extensive investigation and evaluation, to prevent, mitigate, or remedy environmental damage or the consequences of environmental damage attributable to a site before a final remedy is selected. Many IRMs have already been completed at the facility. Based on the operational history and compounds identified, several components of the IRMs address media of concern at the facility, including the Former Thinner Tanks Area Groundwater IRM, the low permeability landfill cover installed as part of the Former Landfill IRM, facility stormwater treatment, and the Soil Staging Area and Soil Consolidation Area soil covers installed as part of the SPDES Treatment System IRM, the former manufacturing building Sub-Slab Depressurization System/Vapor Intrusion Mitigation IRM, soil removals completed as part of the Drainage Swale IRM and various Redevelopment IRMs, and closure of Surface Impoundment #1. The IRMs, all of which have been performing as designed and constructed, are described in more detail below:

- Oil/Water Collection Sump System – In the 1980s, oil containing polychlorinated biphenyls (PCBs) was discovered in the facility's discharge to Ley Creek and within the underground storm sewer system beneath the former manufacturing building. The storm sewers beneath the former manufacturing building were decommissioned and collection pumps were installed at locations where the sewers formerly exited the building. These sumps collected residual oil/water present within the sewer lines.
- Storm Sewer Rehabilitation – GM rehabilitated select storm sewers located outside the facility buildings. The effort included cleaning the sewer lines and abandonment and repair/replacement of some storm sewer sections on the west side of the facility. This work was completed in 2001.
- Former Thinner Tanks Area Groundwater Recovery System – Following a spill in the conveyance piping of three underground storage tanks in 1987, GM installed a groundwater collection system to collect shallow overburden groundwater with elevated concentrations of toluene, ethylbenzene, and xylenes in the Former Thinner Tanks Area. The recovery system consists of two groundwater collection trenches. The collected groundwater is piped to the facility stormwater treatment system and treated using filtration and granulated activated carbon prior to discharge to Ley Creek under a SPDES permit. To assess the effectiveness of this IRM, RACER implements an annual monitoring program including the collection and laboratory analysis of groundwater samples from eight monitoring wells for toluene, ethylbenzene, and xylene.
- Former Landfill IRM – An industrial landfill located at the facility contains chromium and PCB-contaminated material. Areas within the landfill with high concentrations of contaminants were excavated and transported off-site for disposal at a licensed facility and the landfill was capped in 2004. RACER maintains the landfill integrity by performing operation and maintenance (O&M) activities, including inspections and repairs, as needed, and mowing the vegetative cover.
- Former Drainage Swale IRM – GM used a drainage swale in the 1950s-60s as a conduit for the discharge of liquid process waste to Ley Creek. The swale was subsequently filled in, but highly contaminated soil remained. This IRM involved the removal of the contaminated soil from the former drainage swale in 2004. As part of this IRM, GM removed over 26,000 tons of soil containing PCBs from this area of the facility. Soils with PCB concentrations less than 50 parts per million (ppm) were placed in the landfill (described above) before it was capped. Soils with PCB concentrations greater than 50 ppm were transported off-site for disposal at a licensed facility.
- Surface Impoundment #1 closure – In 1989, GM closed and covered Surface Impoundment #1 with a clay and soil cover consistent with Resource Conservation and Recovery Act requirements and this area was subsequently paved. The cover in this area limits infiltration and prevents direct contact with subsurface soil in this area. To evaluate the effectiveness of this IRM, RACER conducts annual monitoring of two wells for volatile organic compounds (VOCs) and PCBs.
- SPDES Treatment System IRM – The purpose of this IRM was to stop the intermittent discharge of PCBs and other contaminants originating from the Subsite to Ley Creek during storm events. This IRM involved GM's construction of a retention basin and associated water treatment system that was completed in 2003. This retention basin collects surface water runoff that accumulates on the GM-IFG property in the storm sewers or abandoned process sewers. The basin water is treated by RACER at the treatment plant prior to discharge to Ley Creek. As part of this IRM, vegetated soil covers were placed over the Soil Staging Area and the Soil Consolidation Area.

- Vapor Intrusion Mitigation IRM – In 2011, RACER completed the installation of two sub-slab depressurization systems beneath the facility's concrete slab to prevent the migration of soil vapors containing VOCs into the building. Since operation began, RACER has performed routine O&M of the system and periodic air monitoring.
- Redevelopment IRMs – Multiple IRMs have been performed over the years to facilitate the redevelopment of the facility. These IRMs include the removal of soil and surface paving at the former temporary hazardous waste storage area located west of the Mold Storage building, removal of surface soil containing high concentrations of site contaminants south of the former Industrial Wastewater Treatment Plant (IWTP), demolition of the IWTP clarifiers, construction of two truck loading docks, and regrading at the former CDM Outdoor Storage Area.
- Decommissioning Activities IRM – Following a facility assessment, decommissioning activities were performed in the early 2000s that consisted of cleaning the floors (and applying epoxy floor coating in some areas) and aboveground surfaces, cleaning and dismantling various process systems, and removing residue from facility sumps and drains. The demolition of the IWTP on the facility's south side was completed in 2006.

As described above, many of these IRMs have and continue to address potential risks identified in media at the Subsite through removal, control, and/or treatment. It should also be noted that as part of a property transfer in 2020, an environmental easement under Article 71, Title 36 of New York State Environmental Conservation Law (ECL) was recorded for the property. This environmental easement controls future activities at the property, limits land use to industrial, and prohibits the use of groundwater.

Current Zoning and Land Use: The facility is located in an area zoned for industrial use in the Town of Salina; a small portion of the facility (entrance gate area and a portion of the parking lot) is located in the Town of DeWitt. Currently, the former manufacturing building is occupied by a variety of tenants performing commercial and light industrial activities. The area surrounding the facility can generally be characterized as commercial/industrial. The general area is characterized by a high degree of industrial activity, as evidenced by the presence of past/current manufacturing facilities. Numerous small industrial businesses are present along Factory Avenue and Route 298. Syracuse International Airport-Hancock Field is located approximately 1.5 miles north of the facility.

RESULTS OF THE REMEDIAL INVESTIGATION

To evaluate the nature and extent of contamination at the Subsite, the RI included the collection and laboratory analysis of soil and groundwater samples from several areas at the facility. Also, as documented in the RI, investigations spanned many years and included analysis of soil, soil vapor, groundwater, and indoor air. As shown on Figure 2, for purposes of NYSDEC and EPA management, the facility is divided into six areas plus the former manufacturing building. These areas are the Northern, Northeast, Southeast, former IWTP, Southwest, and Former Thinner Tanks Areas. Based on a comparison to Title 6 New York Code of Rules and Regulations (6 NYCRR) Part 375 soil cleanup objectives (SCOs) for Industrial Use, Protection of Groundwater, New York State Class GA groundwater standards, and New York State's Guidance for Evaluating Soil Vapor Intrusion the following was concluded:

Soil

The sampling activities and associated results from various investigations conducted facility-wide indicate that surface and subsurface soils in certain locations on the site contained PCBs, VOCs, semi-volatile organic compounds (SVOCs) and site-related metals (*i.e.,* arsenic, chromium, copper, nickel, and zinc) exceeding Standards, Criteria, and Guidance (SCGs). Figure 3 shows the sample locations where there are exceedances of SCOs in the surface and subsurface soil. Table 1 and Table 2 summarize the detected concentrations and frequency of SCO exceedances for surface and subsurface soil, respectively.

Surface Soil
PCBs were detected above their Part 375 Industrial Use SCO (25 ppm) in the Northern Property Area at maximum concentrations 37 ppm.

SVOCs were detected above the Part 375 Industrial Use SCOs in the Former Thinner Tanks Area and Northern Property Area. Specifically, in the Former Thinner Tanks Area, benzo(a)pyrene (SCO of 1.1 ppm), chrysene (SCO of 110 ppm), and fluoranthene (SCO of 1,000 ppm) were detected at maximum concentrations of 300 ppm, 380 ppm, and 1,200 ppm, respectively. In the Northern Property Area, benzo(a)anthracene (SCO of 11 ppm), and benzo(a)pyrene were detected at maximum concentrations of 1.8 ppm, and 1.7 ppm respectively.

In the Southeast Property Area, arsenic was detected above the Part 375 Industrial Use SCO (16 ppm) at a maximum concentration of 92.8 ppm.

Subsurface Soil
PCBs were detected in subsurface soil in different areas of the facility at concentrations above Part 375 Protection of Groundwater SCO (3.2 ppm). Specifically, PCBs were detected in the northeast area at a maximum concentration of 24 ppm, in the IWTP area at a maximum concentration of 190 ppm, beneath the former manufacturing building at a maximum concentration of 4,300 ppm, in the Northern Property Area at maximum concentration of 79 ppm beneath the landfill. Field screening using ultraviolet irradiation suggested that Non-Aqueous Phase Liquid (NAPL) may be present in three soil sample locations along an abandoned sewer under the former manufacturing building. The area beneath the building may represent a potential source area for PCBs.

VOCs detected above Part 375 Protection of Groundwater SCOs were limited to toluene (SCO of 0.7 ppm), xylene (SCO of 1.6 ppm), ethylbenzene (SCO of 1 ppm), methylene chloride (SCO of 0.05 ppm), trichloroethene ((TCE) (SCO of 0.47 ppm)), cis-1,2-dichloroethene ((cis-1,2-DCE) (SCO of 0.25 ppm)), and vinyl chloride (SCO of 0.02 ppm), across the facility. Specifically, toluene, xylene, and ethylbenzene were detected respectively at maximum concentrations of 720 ppm, 317 ppm, and 61 ppm in subsurface soil samples collected from the Former Thinner Tanks Area. Methylene chloride, ethyl benzene, toluene, xylene, cis-1,2-DCE, and vinyl chloride were detected respectively at maximum concentrations of 0.14 ppm, 11 ppm, 110 ppm, 110 ppm, 0.45 ppm, and 0.12 ppm in the northern property area. TCE was detected at a maximum concentration of 1.5 ppm in the northeast property area. Methylene chloride, TCE, cis-1,2-DCE, and vinyl chloride were detected at a maximum concentration of 7.8 ppm, 9,800 ppm, 5.1 ppm, and 7.8 ppm, respectively, beneath the former manufacturing building at depths ranging from 0.5 ft to 15 ft below the concrete slab, generally in the center of the building in the vicinity of the former paint room.

SVOCs were detected above the Part 375 Protection of Groundwater SCOs in subsurface soil beneath the transformer/switch area located in the Former Thinner Tanks Area, former landfill in the Northern Property Area, and in the Northeast Property Area. Benzo(a)anthracene (SCO of 1 ppm), benzo(a)pyrene (SCO of 22 ppm), and benzo(b)fluoranthene (SCO of 1.7), were detected respectively at maximum concentrations of 150 ppm, 110 ppm, and 140 ppm, in the Former Thinner Tanks Area. P-Cresol (SCO of 0.33 ppm) was found at a maximum concentration of 3.9 ppm in the Northern Property Area. Benzo(a)anthracene, benzo(b)fluoranthene, and chrysene (SCO of 1 ppm) were detected at maximum concentrations of 9.3 ppm, 16 ppm, and 11 ppm, respectively, in the Northeast Property Area.

Site-related metals (*i.e.,* arsenic, chromium, copper, lead, nickel, zinc, and cyanide) were detected above the Part 375 Protection of Groundwater SCOs in limited areas in subsurface soil near the Northern, Northeast, Southeast, Southwest, IWTP Property Areas, and beneath the former manufacturing building. Specifically, arsenic (SCO of 16 ppm), chromium (SCO of 19 ppm), copper (SCO of 1,720 ppm), lead (SCO of 450 ppm), nickel (SCO of 130 ppm), and zinc (SCO of 2,480 ppm) were detected respectively at a maximum concentration of 65 ppm, 17,200 ppm, 3,920 ppm, 7,940 ppm, 243 ppm, and 53,300 ppm in the Northern Property Area beneath the landfill IRM cover. Arsenic was detected at a maximum concentration of 16.3 ppm in the Northeast Property Area. Arsenic was detected at a maximum concentration of 16.4 ppm in the Southeast Property Area. Chromium was at maximum concentrations of 1,220 ppm the Southwest Property Area. Chromium was detected at a maximum concentration of 44 ppm in the IWTP Property Area. Chromium, cyanide (SCO of 40 ppm), and nickel were detected respectively at a maximum concentration of 120 ppm, 247 ppm, and 4,000 ppm beneath the former manufacturing building.

The majority of subsurface soil locations identified as having site contaminants at concentrations exceeding SCOs are located beneath covers/caps within the Former Landfill, Soil Staging Area, or Soil Consolidation Area and were previously addressed by the earlier IRMs (discussed above).

Groundwater

The groundwater analytical results indicate that the shallow overburden groundwater contains VOCs and PCBs at concentrations exceeding SCGs and the deep overburden groundwater contains VOCs, SVOCs, and metals at concentrations exceeding SCGs.

Shallow Groundwater Zone
PCBs were detected above New York State Class GA groundwater standard (0.09 parts per billion [ppb]) in groundwater samples collected from monitoring wells located in the Northeast Property Area at a maximum concentration of 0.72 ppb. An elevated concentration of PCBs was detected in groundwater immediately north of the former manufacturing building at a maximum concentration of 55 ppb in the vicinity of a closed surface impoundment. Otherwise, PCBs are present at concentrations marginally above New York State Class GA groundwater standard in a few localized areas in the shallow overburden groundwater zone.

Chlorinated VOCs, consisting mainly of TCE (SCG of 5 ppb), cis-1,2-DCE (SCG of 5 ppb), and vinyl chloride (SCG of 2 ppb) were detected in facility groundwater at maximum concentrations of 25,000 ppb, 4,700 ppb, 23 ppb, respectively, in samples collected from beneath the former manufacturing building (see Figure 4). Field screening techniques suggest that residual VOC NAPL may exist beneath the former manufacturing building and may be a continuing source for groundwater contamination. The TCE detected may be associated with the former TCE storage area/IWTP previously located south of the former manufacturing building and possible solvent storage and usage within the former manufacturing building. Figure 4 provides site-wide shallow groundwater sample results for VOCs. As shown on Figure 4, the possible residual VOC NAPL beneath the building has not resulted in a shallow overburden groundwater plume north of the former manufacturing building.

Non-chlorinated VOCs, including toluene, ethylbenzene, and xylene, are present in the shallow groundwater zone in the Former Thinner Tanks Area at concentrations above the SCG of 5 ppb for these compounds. Specifically, the 2021 annual groundwater sampling detected these constituents at maximum concentrations of 3,400 ppb, 39,000 ppb, and 190,000 ppb, respectively. While residual NAPL is suspected to be present in the Former Thinner Tanks Area based on these groundwater concentrations, this groundwater is contained by the two recovery trenches and is not migrating off-property.

Arsenic was detected above the groundwater SCG in the Northern Property Area and Chromium was detected above the groundwater SCG beneath the former manufacturing building. In addition, other non-site-related metals, including iron, magnesium, manganese, and sodium, were also detected at concentrations above groundwater SCGs.

Deep Groundwater Zone

PCBs (*i.e.,* Aroclor 1242) were detected above New York State Class GA groundwater standard (0.09 ppb) in the Northeast Property Area at a maximum concentration of 0.18 ppb.

TCE, cis-1,2-DCE, and vinyl chloride were detected in the deep overburden groundwater at concentrations exceeding SCGs immediately north of the former manufacturing building, in the Northern Property Area, and off-property beneath the Ley Creek floodplain area (see Figure 5). North of the former manufacturing building and in the Northern Property Area, TCE, cis-1,2-DCE, and vinyl chloride were detected in the deep overburden groundwater at maximum concentrations of 170,000 ppb, 11,000 ppb and 120 ppb, respectively, compared to their respective groundwater standards of 5 ppb for TCE and cis-1,2-DCE and 2 ppb for vinyl chloride.

Off-property, TCE, cis-1,2-DCE, and vinyl chloride were detected at maximum concentrations of 3,500 ppb, 570 ppb and 140 ppb, respectively in monitoring wells located approximately 200 ft. north of the property. NAPL source material may be present at areas between the northern extent of the former manufacturing building and the northern facility perimeter based upon the suspected movement of the TCE plume along the top of the till and the concentrations of TCE detected in deep groundwater. Figure 5 provides site-wide deep groundwater zone sample results for VOCs.

SVOCs and site-related metals were not detected above SCGs in the deep groundwater.

Soil Vapor

As part of the June 16, 2010 Vapor Intrusion Mitigation IRM, sub-slab vapor and indoor air samples were collected. The investigation identified elevated levels of chlorinated VOCs above air guidelines and other criteria referenced in the State's Guidance for Evaluating Soil Vapor Intrusion (NYSDOH, 2006 w/ updates). The data required the installation of an SSDS to address the soil vapor intrusion. The sub-slab and indoor air sampling results are summarized below:

Sub-Slab
1,1,1-Trichloroethane (1,1,1-TCA), Tetrachloroethene (PCE), TCE, and cis-1,2-DCE were detected in the sub-slab vapor samples at concentrations exceeding NYSDOH guidance beneath the former manufacturing building at maximum concentrations of 1,400 micrograms per cubic meter (µg/m^3), 2,800 µg/m^3, 1,900,000 µg/m^3, and 270 µg/m^3, respectively.

Indoor Air
PCE, TCE and cis-1,2-DCE were detected in the indoor air at concentrations exceeding NYSDOH guidance at maximum concentrations of 540 µg/m^3, 130 µg/m^3, and 0.23 µg/m^3, respectively.

Suspected Nonaqueous Phase Liquids

Chlorinated VOC NAPLs may be present in some areas of the facility property based on the elevated concentrations (TCE at 25,000 ppb) that were detected in the shallow groundwater beneath the former manufacturing building and in the deep groundwater near the property boundary (TCE at 160,000 ppb). Chlorinated VOC NAPLs, if present beneath the former manufacturing building, would be expected to flow along the till down into the deep groundwater unit. In fact, and as described above, analytical results from the shallow overburden groundwater north of the former manufacturing building show that the residual VOC NAPL under the building has not resulted in a shallow overburden groundwater plume.

Suspected PCB NAPL may be present underneath the former manufacturing building due to past releases of PCB-containing hydraulic fluid to sumps and to leaking process sewers during the manufacturing processes.

A past leak from the underground paint thinner storage tanks/piping in the Former Thinner Tanks Area is a potential source of non-chlorinated VOC NAPL that may be present in this area. As part of the Thinner Tanks System Area Groundwater Recovery IRM, GM installed two groundwater collection trenches and associated piping to collect and treat the contaminated groundwater. While the IRM has contained the plume, there may be a residual source (*e.g.,* NAPL) that remains based on contaminant levels in groundwater in this area (including concentrations of total xylenes greater than 100,000 ppb since 1999).

If present, chlorinated NAPLs would be a principal threat waste (for an explanation of a principal threat waste, see the textbox, “What is a Principal Threat?” below). It should be noted that actual VOC-related NAPL was not observed during the RI. While PCB-related NAPL was observed during field screening, widespread PCB contamination in groundwater was not observed during the RI. These areas are discussed in detail in the RI and FS reports.

“What is a Principal Threat?”

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to ground water, surface water, or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, NAPLs in groundwater may be viewed as source material.

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

Natural Attenuation

In 2001, GM conducted a preliminary evaluation of natural attenuation at the facility as part of a supplemental RI. The evaluation analyzed for VOCs, dissolved oxygen, oxidation-reduction potential, dissolved light hydrocarbons (*i.e.,* methane, ethane, and ethene), dissolved carbon dioxide gas, volatile fatty acids, sulfide, sulfate, nitrate, nitrite, and total iron in seven deep wells. This evaluation found that limited natural attenuation processes were evident in the groundwater and TCE daughter products, such as cis-1,2-DCE and vinyl chloride, were observed.

Remedial Investigation Conclusions

Based on the results of the various iterations of the RI from 2010 through 2022 and prior investigations, the contamination at OU1 is summarized as follows:

- Approximately 2,580 cubic yards (CY) of soil has been identified as exceeding the Industrial Use SCOs and/or the Protection of Groundwater SCOs for PCBs and VOCs. All but approximately 340 CY of this material is currently covered as part of completed IRMs or located below the building. Of the material not covered by IRMs, approximately 241 CY is covered by paving (roadways or parking lots). Of the remaining uncovered soil exhibiting concentrations greater than the Protection of Groundwater SCO, approximately 15 CY are located in the top 1 ft and 84 CY are at depths greater than 1 ft. Approximately 38 CY of material is to be removed in the surface soil and 1500 CY of material is to be removed in the surface and subsurface soil with the assumption of over excavation of 10 ft for locations shallower than 5ft and extended 20 ft for locations between 5 and 15 ft bgs.
- Three residual source areas may exist at the facility: potential residual non-chlorinated VOC NAPL in shallow overburden soil within the Former Thinner Tanks Area; potential residual chlorinated VOC NAPL and PCB NAPL in shallow/deep overburden soil beneath the former manufacturing building; and potential residual chlorinated VOC NAPL in deep overburden soil within the Northeast Property Area. From calculations based on the groundwater data, the Former Thinner

Tanks Area VOC residual source area is approximately 35,800 sf by 10 ft thick, the former manufacturing building VOC residual source area is approximately 115,100 sf by 10 ft thick, and the VOC residual source in the Northeast Property Area is approximately 56,200 sf by 1-ft thick.

- Shallow and deep groundwater is contaminated with chlorinated VOCs and PCBs and there are high concentrations of toluene, ethylbenzene, and xylene in the Former Thinner Tanks Area. Specifically:

  - Residual VOC NAPL is potentially located under the former manufacturing building but has not resulted in a shallow overburden groundwater plume.
  - In general, PCBs are present at concentrations above New York State Class GA groundwater standards in a few localized areas in the shallow overburden groundwater zone (PCBs up to 55 ppb as compared to the groundwater standard of 0.09 ppb) and in one location in the deep overburden groundwater zone. Given that most of the PCB detections were associated with PCBs observed in subsurface soils, the groundwater detections are likely indicative of localized conditions.
  - Chlorinated VOCs were detected at elevated concentrations (TCE up to 25,000 ppb as compared to the groundwater standard of 5 ppb) in the shallow overburden groundwater beneath the former manufacturing building.
  - Chlorinated VOCs were detected at elevated concentrations (TCE up to 170,000 ppb as compared to the groundwater standard of 5 ppb) in the deep overburden groundwater north of the former manufacturing building and off-property beneath the Ley Creek floodplain area.
  - Toluene, ethylbenzene, and xylene contamination in the shallow overburden groundwater are contained by operation of the Former Thinner Tanks Area Groundwater Recovery System.

SCOPE OF ACTION

As part of the cleanup of the Onondaga Lake NPL site, the following subsites are being addressed:

- General Motors – Inland Fisher Guide (the subject of this Proposed Plan) (site code 734057);
- Geddes Brook/Ninemile Creek (site code 734030);
- LCP Bridge Street (site code 734049);
- Ley Creek PCB Dredgings (site code 734044);
- Lower Ley Creek (site code 734123);
- Niagara-Mohawk Hiawatha Blvd (site code 734059);
- Onondaga Lake Bottom (which includes Geddes Brook/Ninemile Creek as an OU) (site code 734030);
- Salina Landfill (site code 734036);
- Semet Residue Ponds (site code 734008);
- Wastebeds 1-8 (site code 734081);
- Wastebed B/Harbor Brook (site code 734075); and
- Willis Avenue (site code 734072).

Remedial actions have been fully implemented at the Semet Residue Ponds, Wastebeds 1-8 OU1, Wastebed B/Harbor Brook OU1, Geddes Brook/Ninemile Creek, Niagara-Mohawk Hiawatha Boulevard, LCP Bridge Street, Ley Creek PCB Dredgings, Onondaga Lake Bottom, and Salina Landfill subsites. These subsites are undergoing long-term site management. Remedial activities for portions of the Wastebeds 1-8, GM-IFG, and Wastebed B/Harbor Brook subsites have been completed or are in progress. The Lower Ley Creek and Willis Avenue subsites are in the Remedial Design (RD) phase.

The scope of the action for OU1 of this Subsite is to incorporate actions undertaken as IRMs as final actions, address the contaminated soil/fill material and shallow and deep groundwater not addressed under the IRMs discussed above, and implement additional actions where needed. NYSDEC and EPA expect this remedy to be a final, comprehensive remedy for OU1.

The 2015 ROD for OU2 of this Subsite called for, among other things, excavation of approximately 9,600 CY of contaminated upper Ley Creek channel sediments and approximately 2,900 CY of adjacent contaminated floodplain soil/dredged materials in the reach from Townline Road to the Route 11 bridge. The remedy also included excavating contaminated soils/sediments in an adjacent wetland called the National Grid Wetland and roadway shoulders near the facility and on the northern side of Factory Avenue in the vicinity of LeMoyne Avenue. In 2016, RACER excavated and disposed of at a licensed facility contaminated floodplain soil from residential properties (located adjacent to the creek) and in 2017 performed the remediation of the Factory Avenue and National Grid Wetland soils. Based on the results of pre-RD investigation (PDI) sampling, it was determined that the ROD-estimated volume of contaminated soil/dredged materials requiring excavation and off-site disposal increased from approximately 15,000 CY to approximately 142,500 CY. In September 2022, an ESD was issued by EPA and NYSDEC regarding OU2 of this Subsite. The modified soil remedy includes the excavation and off-site disposal of floodplain soils exhibiting contaminant concentrations greater than restricted SCOs and is adjusted to reflect increased soil volumes and associated remedial costs, consistent with current and reasonably anticipated future land use. This modification did not address a 13.9-acre forested area because, at that time, an alternative in-situ remedial approach was being evaluated for this area. Following the completion of the evaluation, EPA and NYSDEC concluded that it is unlikely that the in-situ treatment would be an effective remedy in the forested area. Therefore, the soil remedy selected in the ROD remains the most suitable approach for addressing the forested area, notwithstanding the increased soil volumes and associated remedial costs. This decision was documented in an April 2023 ESD. The design of the sediment and soil remedy is currently underway; it is anticipated that it will be completed in late 2023.

Summary of Quantitative Subsite OU1 Risk Assessments

As part of the original 2010 RI and in subsequent iterations of the RI, baseline quantitative risk assessments were conducted for OU1 to estimate the potential risks to human health and the environment (see the "What is Human Health Risk and How is it Calculated?" and "What is Ecological Risk and How is it Calculated?" textboxes below). The baseline risk assessments consisted of a human health risk assessment (HHRA), which evaluated potential risks to humans, and a fish and wildlife impact analysis (FWIA), which evaluated potential risks to ecological receptors, analyzed the potential for adverse effects caused by hazardous substance releases assuming no further actions to control or mitigate exposure to these hazardous substances are taken.

Human Health Risk Assessment

OU1 is zoned industrial and exposure scenarios were developed based on this current and likely future land use. The baseline HHRA considered exposure to soil, outdoor air (via dusts) and groundwater through several current and future exposure scenarios. Receptors and pathways that were evaluated included the following: exposure to surface soil and outdoor air by older children and adult trespassers as well as industrial workers and construction workers; and exposure to shallow groundwater by construction workers; and exposures to groundwater used as drinking water by future child and adult residents.

Exposure scenarios were developed for these populations and considered exposure through incidental ingestion and inhalation of and dermal contact with surface and, subsurface soil, and ingestion of groundwater as a hypothetical drinking water source in the future. Human health risks associated with the ingestion of groundwater are based on groundwater data from the RI. Risks from exposure to volatile contaminants within indoor air via vapor intrusion were also evaluated in the HHRA.

Total cancer risk for the adult trespasser, industrial worker and construction worker exceeded the 10^{-4} – 10^{-6} risk range (see the *Risk Characterization* discussion in the "What is Human Health Risk and How is it Calculated?" textbox, below), primarily driven by exposure to polycyclic aromatic hydrocarbons (particularly benzo(a)pyrene) in surface soil. Noncancer hazard for the industrial worker and construction worker also exceeded the threshold of 1 due primarily to PCBs in surface soil. For the construction worker, exposure to ethylbenzene in groundwater also contributed to elevated hazard. Furthermore, hypothetical future residential exposure to groundwater as potable water resulted in elevated cancer risk and noncancer hazards. These estimates were driven by exposure to ethylbenzene, TCE, cis-1,2-DCE, xylenes, vinyl chloride, arsenic, chromium, and PCBs in groundwater. A summary of the cancer risks and noncancer hazards above threshold levels for each population in each of the OU1 areas, along with the contaminants of concern (COCs) that contribute the most to the risk or hazard can be found in the Facility Risk and Hazard Summary table of the HHRA.

As referenced above, however, the vapor mitigation system as installed, operated, and maintained by RACER continues to prevent vapor intrusion from the soil and groundwater beneath the former manufacturing building into the building's indoor air.

The HHRA included a recommendation that, based on the vapor intrusion screening presented in the HHRA, a vapor intrusion evaluation should be conducted if any buildings (new or existing) will be occupied on the facility property. The vapor intrusion screening identified chemicals with a potential to migrate to indoor air, based on factors such as the chemical- specific vapor pressure. Because these factors apply to chemicals present in media such as soil, fill material, and groundwater, all media with these chemicals have the potential for future vapor intrusion concerns. A full discussion of the HHRA evaluation and conclusions is presented in the HHRA Report (Appendix I of RI report).

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the Contaminants of Potential Concern (COPCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" (RME) scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures and the relationship between magnitude of exposure (dose) and severity of adverse effects (response) are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals can cause both cancer risks and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people because of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a non-cancer HI is that a threshold (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as COCs in the ROD.

Ecological Risk Assessment

The industrialized nature of OU1 (*i.e.,* presence of buildings, paved surfaces, and stormwater management facilities) minimizes its value as fauna habitat. The undeveloped portions of OU1 consist primarily of turf grass that is periodically mowed, minimizing its availability and suitability for wildlife use, such as nesting and foraging. The grassed habitats of OU1 range in value to wildlife in relation to their sizes and locations. Grassed areas surrounding facility-related structures are not likely frequently used by wildlife. Larger open lawns provide invertebrate and vegetative food sources for a limited number of small mammals and birds, such as mice, voles, American robin, and killdeer that may forage there. Waterfowl, reptiles, and small mammals may forage and/or rest in the grass areas adjacent to the retention basin and bats may forage on insects flying above the basin. However, given the limited habitat and utilization by area wildlife, the FWIA concludes that site-related impacts to ecological receptors are minimal within OU1. A full discussion of the FWIA evaluation and conclusions is presented in the FWIA Report (Appendix J of RI report)

WHAT IS ECOLOGICAL RISK AND HOW IS IT CALCULATED?

A Superfund baseline ecological risk assessment is an analysis of the potential adverse health effects to biota caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future land and resource uses. The process used for assessing site-related ecological risks includes:

Problem Formulation: In this step, the contaminants of potential ecological concern (COPECs) at the site are identified. Assessment endpoints are defined to determine what ecological entities are important to protect. Then, the specific attributes of the entities that are potentially at risk and important to protect are determined. This provides a basis for measurement in the risk assessment. Once assessment endpoints are chosen, a conceptual model is developed to provide a visual representation of hypothesized relationships between ecological entities (receptors) and the stressors to which they may be exposed.

Exposure Assessment: In this step, a quantitative evaluation is made of what plants and animals are exposed to and to what degree they are exposed. This estimation of exposure point concentrations includes various parameters to determine the levels of exposure to a chemical contaminant by a selected plant or animal (receptor), such as area use (how much of the site an animal typically uses during normal activities); food ingestion rate (how much food is consumed by an animal over a period of time); bioaccumulation rates (the process by which chemicals are taken up by a plant or animal either directly from exposure to contaminated soil, sediment or water, or by eating contaminated food); bioavailability (how easily a plant or animal can take up a contaminant from the environment); and life stage (*e.g.,* juvenile, adult).

Ecological Effects Assessment: In this step, literature reviews, field studies or toxicity tests are conducted to describe the relationship between chemical contaminant concentrations and their effects on ecological receptors, on a media-, receptor- and chemical-specific basis. To provide upper and lower bound estimates of risk, toxicological benchmarks are identified to describe the level of contamination below which adverse effects are unlikely to occur and the level of contamination at which adverse effects are more likely to occur.

Risk Characterization: In this step, the results of the previous steps are used to estimate the risk posed to ecological receptors. Individual risk estimates for a given receptor for each chemical are calculated as a hazard quotient (HQ), which is the ratio of contaminant concentration to a given toxicological benchmark. In general, an HQ above 1 indicates the potential for unacceptable risk. The risk is described, including the overall degree of confidence in the risk estimates, summarizing uncertainties, citing evidence supporting the risk estimates and interpreting the adversity of ecological effects.

Summary of Human Health and Ecological Risks

The results of the human health risk assessment indicate that the contaminated soil, indoor air, and groundwater present current and/or potential future exposure risks. Based on the industrial nature of OU1 and its limited habitat available for area wildlife, the ecological risk assessment indicates that site-related impacts to ecological receptors is minimal. Many of the risks to human health associated with contaminated soil have been mitigated, in part, by the implemented IRMs. While potential ecological and human health risks have been mitigated by OU1 IRMs, long-term O&M will be necessary to maintain protectiveness. Also, as noted above, ICs in the form of an environmental easement have been recorded for the property controlling and limiting site use and prohibiting groundwater use in its current state.

Based upon the results of the RI and the risk assessments, NYSDEC and EPA have determined that actual or threatened releases of hazardous substances at or from OU1, if not addressed by the preferred remedy or one of the other active measures considered, may present a current or potential threat to human health and the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as Applicable or Relevant and Appropriate Requirements (ARARs), To-Be-Considered guidance, and site-specific risk-based levels established using the risk assessments.

The following RAOs have been established for OU1:

- Prevent ingestion/direct contact with contaminated soil/fill material.
- Prevent inhalation of or exposure to contaminants volatilizing from contaminants in soil/fill material.
- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Restore groundwater to levels that meet state and federal standards.
- Prevent contact with, or inhalation of, volatiles from contaminated groundwater.
- Prevent the discharge of contaminants to surface water and sediment in Ley Creek.
- Prevent contaminants in soil/fill material from impacting groundwater above drinking water standards.

NYSDEC's SCOs have been identified as remediation goals for soil to attain these RAOs. SCOs are risk-based criteria that have been developed by New York State following methods consistent with EPA's methods/protocols/guidance and they are set at levels consistent with EPA's acceptable levels of risk that are protective of human health, ecological exposure, or the groundwater depending upon the existing and anticipated future use of the Subsite. The land use of the Subsite has historically been industrial, and current and anticipated future uses can be reasonably expected to remain industrial. Groundwater remedial goals are the lower of the federal Maximum Contaminant Levels (MCLs) and the New York State Ambient Water Quality Standards. The lower of the New York State Guidance Values and EPA's Vapor Intrusion Screening Levels will be used to evaluate future potential for vapor intrusion.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA § 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment, as a principal element, to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA § 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA § 121(d)(4), 42 U.S.C. § 9621(d)(4).

Based on anticipated future development at OU1, expectations of the reasonably anticipated land use, as described above, were considered in the FS to facilitate the development and evaluation of remedial alternatives. Given current zoning and the present and historical use of the property, the reasonably anticipated land use is to remain an industrially zoned property.

All the alternatives, other than Alternative 1, No Further Action, include the long-term site management of the IRMs.[3] The long-term site management would include maintenance activities and performance monitoring to ensure that the IRMs are operating effectively and efficiently and to identify the need to implement corrective action(s) specific to the IRMs. Corrective actions for the IRM covers, as well as the existing paved surfaces (*i.e.,* roadways or parking lots) and the former manufacturing building that currently serve as a cover for impacted shallow soils, may consist of repair in areas of disturbance or re-application of vegetation in areas of non-survival.

Each active remedial alternative (Alternatives 2 through 5 below) includes the following common components:

Environmental Easement: An existing environmental easement would be maintained that requires land use and groundwater use restrictions for the facility. Land use restrictions would restrict activities that could result in unacceptable exposure to contaminated soil. Groundwater use restrictions would preclude the use of groundwater without prior notification and approval

[3] The annual site management cost estimates are included in the cost estimates for each of the alternatives.

from NYSDEC. The existing environmental easement also includes requirements that necessary engineering controls be operated, maintained, and monitored to provide protectiveness to human health and the environment.

Site Management Plan: A SMP would guide future activities at the facility by addressing use restrictions and by developing requirements for periodic reviews; operation, maintenance, and monitoring of engineering controls; and groundwater monitoring. The periodic site management reviews would focus on evaluating the on-site conditions regarding the continuing protection of human health and the environment as evidenced by information such as groundwater monitoring and documentation of field inspections.

Soil Management Plan: A soil management plan would be implemented to outline the implementation of engineering and institutional controls for the handling and management of soil during remedial, maintenance, or site redevelopment activities. The soil management plan would detail the implementation of on-site consolidation (temporary or permanent), off-site disposal, soil characterization procedures, and hot spot excavation.

Shallow and Deep Groundwater Monitoring: *A* monitoring program for shallow and deep groundwater and/or adjacent surface water would be performed to determine effectiveness of the implemented remedy.

Excavation and Off-Site Disposal of Soil: Excavation would be conducted to remove contaminated surface and/or subsurface soil that would be required by the alternative. Excavated soils would be disposed of at an offsite permitted facility.

The remedial alternatives are as follows:

Alternative 1 – No Further Action

The Superfund program requires that the "no action" alternative be considered as a baseline for comparison with the other alternatives. The no further action remedial alternative would not include any additional remedial measures to address the soil and groundwater contamination at OU1.

As this alternative does not involve further actions, there are no estimated capital, annual, and present-worth costs. The costs of this alternative are as follows

Capital Cost:	$0
Annual O&M Cost:	$0
Present-Worth Cost:	$0

Alternative 2 – Perimeter and Targeted Shallow Groundwater Collection and Treatment, Perimeter and Targeted Deep Groundwater Extraction and Treatment, and Soil Excavation with Off-Site Disposal

This alternative would include the construction of a perimeter shallow groundwater collection trench (approximately 1,800 ft in length and 15 ft deep) and the installation of deep groundwater extraction wells (approximately 35 ft deep) along the northern perimeter of the facility property. These two systems would collect contaminated groundwater and prevent further off-property migration. This alternative would also include targeted deep groundwater extraction to address the contamination beneath and immediately northeast of the former manufacturing building, excavation and off-site disposal of contaminated soil, restoration of the excavated areas with clean fill, and an enhancement and expansion of the Former Thinner Tanks Area Groundwater Recovery System to target the shallow groundwater contamination in that area. All collected groundwater would be treated at the current SPDES treatment system to meet discharge criteria prior to being discharged to Ley Creek. Groundwater monitoring would be performed to evaluate the effectiveness of the groundwater extraction systems.

This alternative would also include the excavation and off-site disposal of unsaturated surface soil exhibiting contaminant concentrations greater than the Industrial Use SCOs in areas not currently addressed by an approved IRM or covered by facility paved surfaces (roadways or parking lots) or the former manufacturing building. The approximate volume of material associated with this excavation would be 38 CY. The excavated areas would be restored to grade with certified clean fill following confirmatory sampling.

The enhancement to the Former Thinner Tanks Area Groundwater Recovery System would include the installation of a flow meter with a totalizer on each of the two existing collection trenches to monitor effluent withdrawn from each trench and conveyed to the SPDES treatment system. The Former Thinner Tanks Area Groundwater Recovery System would be expanded with the installation of an additional collection trench or groundwater extraction wells to help increase the removal of VOC (*i.e.,* xylene, ethylbenzene, and toluene) mass and to restore groundwater quality in this area. While the FS cost estimate assumes that two wells would be installed, the appropriate method for extracting the groundwater would be determined during the RD.

During the RD, studies would be performed to determine the well placement, pumping rates, and drawdown levels that would allow for optimal capture for the three groundwater extraction systems (perimeter shallow, perimeter deep, and the targeted deep northeast of the former manufacturing building).

This alternative would also include an evaluation of the existing SSDS during the RD to determine whether enhancements to the system could effectively improve the removal of elevated VOCs in the unsaturated soil beneath the former manufacturing building.

As part of the long-term groundwater quality monitoring, COC concentration and natural attenuation data would be collected from the shallow and deep groundwater throughout the Subsite. Following the operation of the new perimeter groundwater extraction system for a period up to five years, an evaluation would be performed to determine whether the system is effectively reducing COC concentrations in off-property groundwater. If it is determined that continued groundwater extraction at the property perimeter alone would not achieve the remediation goals for the off-property groundwater within a reasonable timeframe, then off-property in-situ treatment and/or extraction and treatment would be considered and incorporated into the remedy as determined to be appropriate.

The evaluations of the SSDS, targeted groundwater extraction system, and perimeter extraction system would be documented and the implementation of any of the contingent remedies (e.g., SSDS enhancement and off-property groundwater treatment) would be documented via an ESD.

Imposition of an IC in the form of the existing environmental easement for the controlled property which would:

- require the submission of a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- restrict the use and development of the property to industrial use as defined by Part 375-1.8(g), subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water without appropriate treatment as determined by the NYSDOH or the Onondaga County Health Department; and
- require compliance with the approved SMP.

Under this alternative, a SMP would be required that would include the following components:

1) An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
    - an excavation plan that details the provisions for management of future excavations in areas of remaining contamination;
    - a provision for further investigation and remediation should large-scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable would be immediately and thoroughly investigated pursuant to an approved plan. Based on the investigation results and a determination of the need for a remedy, a Remedial Action Work Plan (RAWP) would be developed for the final remedy for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities would continue through this process. Any necessary remediation would be completed prior to, or in association with, redevelopment. This includes the former manufacturing building;
    - descriptions of the provisions of the environmental easement including any land use and groundwater use restriction;
    - provisions for the management and inspection of the identified engineering controls;
    - maintain site access controls and notification; and
    - steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

2) A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
    - monitoring of groundwater to assess the performance and effectiveness of the remedy;
    - a schedule of monitoring and frequency of submittals;
    - monitoring for vapor intrusion for any buildings on the facility property, as may be required by the Institutional and Engineering Control Plan described above.

3) An O&M Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
    - procedures for operating and maintaining the remedy;

- compliance monitoring of treatment systems to ensure proper O&M, as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and required notification; and
- provide access to the site and O&M records.

Because this alternative would result in contaminants remaining above levels that would otherwise allow for unrestricted use and unlimited exposure, CERCLA requires that the Subsite be reviewed at least once every five years. A conceptual depiction of Alternative 2 is presented in Figure 6.

The estimated construction time for this alternative is one year.

The estimated capital, annual, and present-worth costs of this alternative are as follows:

Capital Cost:	$5,560,000
Annual O&M Cost:	$264,000
Present-Worth Cost:	$8,990,000

Alternative 3 –Targeted Shallow Groundwater Collection and Treatment, Perimeter and Targeted Deep Groundwater Extraction and Treatment and Soil Excavation with Off-Site Disposal

Alternative 3 is similar to Alternative 2, except there would be no shallow groundwater trench installed at the property perimeter. Alternative 3 would rely on a deep groundwater extraction and treatment system at the property perimeter combined with a targeted deep groundwater extraction system to address the contamination in the areas beneath and immediately northeast of the manufacturing building combined with the enhancements to the Former Thinner Tanks Area Groundwater Recovery System to target shallow groundwater in this area. A conceptual depiction of Alternative 3 is presented in Figure 7.

The estimated construction time of this alternative is one year.

The estimated capital, annual, and present-worth costs of this alternative are as follows:

Capital Cost:	$3,890,000
Annual O&M Costs:	$266,000
Present-Worth Cost:	$7,340,000

Alternative 4 – *In-Situ* Treatment of Residual Source Areas, Perimeter Deep Groundwater Extraction and Treatment, and Soil Excavation with Off-Site Disposal

Alternative 4 is similar to Alternative 2, except there would be no shallow groundwater collection trench installed at the property perimeter, no expansion of the Former Thinner Tanks Groundwater Recovery System, and in-situ treatment would be employed instead of groundwater extraction and treatment to significantly reduce contaminant concentrations in the residual source areas (the Former Thinner Tanks Area, northeast of the manufacturing building, and beneath the former manufacturing building). In-situ treatment would involve injecting amendment(s) using horizontal drilling techniques to promote contaminant degradation in the residual source area present beneath the building. Injection points would be positioned at the perimeter of the manufacturing building and extended horizontally to target the contamination beneath the building. A conceptual depiction of Alternative 4 is presented in Figure 8.

The estimated construction time of this alternative is one year.

The estimated capital, annual, and present-worth costs of this alternative are as follows:

Capital Cost:	$18,600,000
Annual O&M Costs:	$264,000
Present-Worth Cost:	$22,200,000

Alternative 5 -- *In-Situ* Treatment of Residual Source Areas, Perimeter Shallow Groundwater Collection and Deep Groundwater Extraction and Treatment, and Soil Excavation with Off-Site Disposal

Alternative 5 includes the same elements as Alternative 4, except, instead of using horizontal in-situ injection techniques at the building perimeter to address site contaminants present beneath the building, vertical injection techniques would be used to address the site contaminants present beneath the building. As such, Alternative 5 would require drilling through the former manufacturing building floor. In addition, a shallow groundwater collection trench at the property perimeter would be installed as described under Alternative 2.

Alternative 5 would also include the excavation and off-site disposal of surface and subsurface soil exhibiting concentrations greater than the Industrial Use SCOs, including areas currently covered by an approved IRM, or paved surfaces (roadways or parking lots). The approximate total volume of material associated with this excavation would be 1,500 CY. The excavated areas would be restored to grade with certified clean fill following confirmatory sampling. A conceptual depiction of Alternative 5 is presented in Figure 9.

The estimated construction time of this alternative is one year.

The estimated capital, annual, and present-worth costs of this alternative are as follows:

Capital Cost:	$22,600,000
Annual O&M Costs:	$259,200
Present-Worth Cost:	$26,000,000

COMPARATIVE ANALYSIS OF ALTERNATIVES

The detailed analysis of alternatives consists of an assessment of the individual alternatives against each of the nine evaluation criteria (see box below) set forth in the NCP and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

A comparative analysis of these alternatives based upon the evaluation criteria noted below follows.

NINE EVALUATION CRITERIA FOR FEDERAL SUPERFUND REMEDIAL ALTERNATIVES
Overall protection of human health and the environment means a determination of whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs means an evaluation whether the alternative would meet all the applicable or relevant and appropriate requirements of federal and state environmental statutes and other requirements that pertain to the site or provide grounds for invoking a waiver.
Long-term effectiveness and permanence means the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of toxicity, mobility, or volume through treatment means the anticipated performance of the treatment technologies an alternative may employ.
Short-term effectiveness means the period of time needed to implement an alternative and the risks the alternative may pose to workers, residents, and the environment during implementation.
Implementability means the technical and administrative feasibility of implementing the alternative, including the availability of materials and services.
Cost means the estimated capital and annual O&M costs, as well as present-worth costs. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
State acceptance means whether NYSDOH (the support agency for NYSDEC) concurs with, opposes, or has no comments on the preferred remedy.
Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in this Proposed Plan and the RI/FS reports. Comments received on the Proposed Plan are an important indicator of community acceptance.

Overall Protection of Human Health and the Environment

Alternative 1 would not be protective of human health and the environment because it would not address contaminated soil or groundwater. Alternatives 2 through 5 would be protective of human health and the environment because each of these alternatives would rely upon remedial strategies and/or treatment technologies capable of eliminating exposure to contaminated soil and groundwater. The ICs under Alternatives 2 through 5 would provide protection of public health.

Compliance with Applicable or Relevant and Appropriate Requirements

SCOs are identified in 6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6, effective December 14, 2006.

Because the contaminated soils would not be addressed under Alternative 1, this alternative would not achieve the cleanup objectives for soil. Alternatives 2 through 5 would provide active measures for meeting the SCOs. Because Alternatives 2 through 5 would involve the excavation of contaminated soils, these alternatives would require compliance with fugitive dust and volatile organic compound emission requirements in accordance with an approved Community Air Monitoring Plan (CAMP).

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10NYCRR, Chapter 1), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). Although the groundwater at the Subsite is not presently being utilized as a potable water source, achieving groundwater MCLs is an applicable standard.

Alternative 1 would not provide for any direct remediation of groundwater and would, therefore, not achieve chemical-specific ARARs for groundwater. Alternatives 2 through 5 would be more effective in reducing groundwater contaminant concentrations below MCLs because each option includes active remediation of the contaminated groundwater.

There are no action or location-specific ARARs that were identified for Alternative 1. With regard to location-specific ARARs for Alternatives 2 through 5, they would be conducted in a manner consistent with federal and state freshwater wetlands and floodplain requirements. ICs would be implemented under Alternatives 2 through 5 in general conformance with NYSDEC's DER-33 guidance. Additionally, continued maintenance of cover systems included as part of Alternatives 2 through 5 (and existing cover systems) would prevent erosion and exposure to contaminated soil. Cover systems would be implemented in general conformance with NYSDEC's DER-10 guidance. Procedures would be implemented to adhere to the location-specific ARARs related to federal and state requirements for cultural, archeological, and historical resources. The need for a scope of cultural resources survey, as required by the National Historic Preservation Act, would be evaluated during the RD. With respect to action-specific ARARs, proposed cover systems and excavation activities would be conducted consistent with applicable standards; earth moving/excavation activities would be conducted consistent with air quality standards; transportation and disposal activities would be conducted in accordance with applicable state and federal requirements by licensed and permitted haulers.

Compliance with action-specific ARARs related to hazardous waste management requirements for treatment residuals and SPDES requirements for treated water discharged to Ley Creek would be addressed in Alternatives 2 through 5 during the continued operation of the Former Thinner Tanks Area shallow groundwater collection and SPDES Treatment System IRM. Action-specific ARARs related to subsurface injection of chemical oxidation amendments under Alternatives 4 and 5 would be met during remedy implementation.

The provisions of ECL Section 27-1318, Institutional and Engineering Controls, is applicable to the environmental easement under Alternatives 2 through 5.

Long-Term Effectiveness and Permanence

Alternative 1 would involve no active remedial measures and, therefore, would not be effective in eliminating the potential exposure to contaminants in the soil and groundwater and would allow for the continued release of contaminants from the soil to the groundwater and the continued migration of contaminated groundwater.

Alternatives 2 through 5 would be effective in the long term and would provide permanent remediation by removing the contaminated soil and treating/disposing of the contaminated soil at a licensed disposal facility. Alternatives 2 and 3 would be effective in the long term because there would be continuous extraction and treatment of the source material in the groundwater. Alternatives 4 and 5 would be more effective at removing the source material in the groundwater than Alternatives 2 and 3 through the application of in-situ treatment techniques. Use of in-situ techniques under Alternative 4 and 5 would also reduce the need to continuously operate groundwater extraction and treatment systems. Alternatives 4 and 5 would also be more effective than Alternatives 2 and 3 at removing contamination beneath the former manufacturing building through the use of in-situ treatment techniques. By actively addressing site contamination, Alternatives 2 through 5 would maintain reliable protection of human health and the environment over time. Under Alternatives 2 through 5, the groundwater treatment residues would have to be appropriately handled by the on-site SPDES Treatment Facility. Alternative 1 would not generate such treatment residual. Alternative 4 would generate the least amount of greenhouse gases in the long term because there would only be the perimeter deep groundwater extraction and treatment system operating as part of site management compared to the other alternatives with multiple extraction and treatment systems; thereby increasing the use of energy and the production of greenhouse gas emissions. The long-term performance of Alternatives 2 through 5 could be at risk during severe storms/weather events and associated flooding. Potential flooding-related threats to the in-situ treatment injection and groundwater extraction and treatment systems would need to be evaluated during the RD to ensure adequate resiliency to the potential effects of climate change.

Reduction in Toxicity, Mobility, or Volume Through Treatment

There would be no reduction in toxicity, mobility, or volume under Alternative 1. Alternatives 2 through 5 would afford similar reductions in toxicity, mobility, and volume through the collection and treatment of contaminated groundwater, thereby satisfying CERCLA's preference for treatment. Alternatives 4 and 5, and possibly Alternatives 2 and 3 (should contingencies be needed), would rely upon in-situ treatment techniques to address the contamination in certain portions of the groundwater.

In-situ treatment, a remedial element included in Alternatives 4 and 5 and a possible treatment technology under Alternatives 2 and 3, would address contaminants in areas where high concentrations of site contaminants exist. In-situ treatment relies on a chemical reaction or biological processes to permanently destroy VOC contamination. Therefore, it would effectively reduce the toxicity, mobility, and volume of the site contamination.

Short-Term Effectiveness

Because Alternative 1 does not include any physical construction measures in any areas of contamination, it would not present any potential adverse impacts to remediation workers or the community as a result of its implementation.

There could be potential adverse impacts to remediation workers and nearby employees and visitors at the former manufacturing building under Alternatives 2 through 5 through dermal contact, incidental ingestion, and inhalation related to the removal, handling, and processing of contaminated groundwater and soil. Noise from the soil excavation work associated with these alternatives could present some limited adverse impacts to remediation workers and nearby employees. In addition, soil and groundwater sampling activities would pose some risk. The risks to remediation workers and nearby employees under all of the action alternatives could, however, be mitigated by following appropriate health and safety protocols, exercising standard construction and engineering practices, and utilizing proper protective equipment.

Potential environmental impacts related to dust, volatile emission, and surface runoff would be mitigated through appropriate control measures and adherence to a CAMP.

Implementation of Alternative 1 would result in the smallest environmental footprint, as no remediation would be performed. There is an environmental footprint inherent in implementation of each of the action alternatives as it relates to construction and long-term operation. The implementation installation and long-term use of a shallow groundwater collection trench included in Alternatives 2 and 5 would result in greater direct emissions and fuel consumption needed for construction equipment, transporting necessary material, and long-term extraction and treatment of groundwater from the shallow groundwater collection trench as compared to the other action alternatives. Under Alternatives 4 and 5, in-situ treatment would have higher initial greenhouse gas emissions than Alternatives 2 and 3, due to the use of heavy construction equipment needed for drilling and introducing in-situ amendments. Alternatives 2, 3, 4, and 5 would be able to utilize the existing SPDES treatment system. Specifically, instead of constructing a new treatment plant, these Alternatives would be able to upgrade and retrofit the existing treatment system to accommodate the additional volume of extracted groundwater. Green remediation techniques would be considered to help minimize the environmental footprint related to the implementation of the remedial alternatives.

For all the action alternatives, there is a potential for stormwater runoff and erosion during construction and excavation activities that would have to be properly managed to prevent or minimize any adverse impacts. For these alternatives, appropriate measures would have to be taken during excavation activities to prevent transport of fugitive dust and exposure of remediation workers and employees at the former manufacturing building and surrounding community.

Alternatives 2 through 5 would address exposure-related RAOs upon implementation. Alternatives 2 through 5 are expected to address the off-property migration RAO within approximately one year of implementation of the remedies. Alternative 1 would not address the RAO associated with adult trespassers or groundwater use.

The former manufacturing building is currently being utilized by tenants conducting commercial and light industrial activities. Out of Alternatives 2 through 5, Alternative 5, would be the most disruptive to these businesses, as it would likely necessitate intrusive actions within the building to treat the underlying contamination.

Because no actions would be performed under Alternative 1, there would be no implementation time. It is estimated that Alternatives 2 through 5 would require one year to implement.

Although it would likely take greater than 30 years to attain groundwater standards for each of the alternatives, Alternatives 4 and 5, which include the use of in-situ treatment to address areas with elevated VOC concentrations combined with groundwater extraction and treatment, would likely achieve the groundwater standards in the shortest amount of time relative to the other alternatives. Alternative 4 would achieve groundwater standards with less disruption to the businesses than Alternative 5.

Implementability

Alternative 1 would be the easiest alternative to implement, as there are no activities to undertake. Soil excavation would be readily implementable under Alternatives 2 through 5.

Construction of the shallow perimeter trench under Alternatives 2 and 5 would require excavation in the vicinity of utilities, including a National Grid high pressure gas line that runs the length of the property border along Factory Ave; National Grid overhead power lines along the property line along Factory Avenue; National Grid overhead high voltage power lines that traverse Factory Avenue from the former landfill at the facility; an Onondaga County sanitary sewer located on the southern shoulder of Factory Avenue; and the former landfill (and associated low permeability membrane). Construction in the vicinity of the above-noted utilities would require offsets and are likely to require measures to protect workers and the utilities during construction activities. These measures would not be necessary under Alternative 3 and 4, which do not include the installation of the shallow groundwater collection system. Installation of the extraction wells associated with the perimeter deep groundwater extraction system under Alternatives 2 through 5, would, to a lesser extent, require measures to protect workers and the utilities during construction activities, as compared to the construction of the shallow groundwater perimeter extraction system included under Alternatives 2 and 5.

In-situ treatment, a remedial element of Alternatives 4 and 5, and a possible treatment technology under Alternatives 2 and 3, would require a treatability study. Subsurface soil conditions and the presence of underground utilities would need to be evaluated as they might interfere with the injection of reagents.

The former manufacturing building is currently being utilized by tenants conducting commercial and light industrial activities. Implementation of Alternative 5, which would necessitate intrusive actions within the building to treat the underlying contamination, would be more difficult to implement than Alternatives 2, 3, and 4.

Each alternative would require coordination with EPA, NYSDEC, Onondaga County, the Town of Salina, the Town of DeWitt, and the former manufacturing building's tenants.

Off-site facilities for treatment, storage, and disposal of treatment residuals and excavated soil would be readily available for each alternative. The necessary equipment, specialists, and materials would be readily available.

Cost

The estimated present-worth costs were calculated using a discount rate of seven percent and a 30-year[4] time interval for the post-construction monitoring and maintenance period.

The estimated capital, annual O&M, and present-worth costs using a 7% discount factor for each of the alternatives are presented in the table below.

[4] Although O&M would continue as needed beyond the 30-year period, 30 years is the typical period used when estimating costs for a comparative analysis.

Alternatives	Capital	Annual O&M	Total Present Worth
1 – No Further Action	$0	$0	$0
2 – Perimeter and Targeted Shallow Groundwater Collection; Perimeter and Targeted Deep Groundwater Extraction and Treatment; and Soil Excavation and Disposal	$5,560,000	$264,000	$8,990,000
3 – Targeted Shallow Groundwater Collection; Perimeter and Targeted Deep Groundwater Extraction and Treatment; Soil Excavation and Disposal	$3,890,000	$266,000	$7,340,000
4 – In-Situ Treatment of Residual Source Areas; Perimeter Deep Groundwater Extraction and Treatment; Soil Excavation and Disposal	$18,600,000	$264,000	$22,200,000
5 – In-Situ Treatment of Residual Source Areas; Perimeter Shallow Groundwater Collection and Treatment; Perimeter Deep Groundwater Extraction and Treatment; Soil Excavation and Disposal	$22,600,000	$259,000	$26,000,000

Support Agency Acceptance

NYSDOH has reviewed this Proposed Plan and concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred alternative will be addressed in the ROD following review of the public comments received on this Proposed Plan.

PREFERRED ALTERNATIVE

Based upon an evaluation of the various alternatives, NYSDEC and EPA recommend Alternative 4 – *In-Situ* Treatment of Three Residual Source Areas, Perimeter Deep Groundwater Extraction and Treatment, and Soil Excavation with Off-Site Disposal, as the preferred alternative. The components of the proposed remedy are described below. A conceptual depiction of the preferred alternative is presented in Figure 8.

Under this alternative, three areas where high concentrations of residual VOC contamination exist would be addressed using in-situ treatment. These three areas contain contaminants at concentrations greater than 10,000 ppm and represent continuing sources of groundwater contamination. Specifically, these areas include the Former Thinner Tanks Area, where non-chlorinated VOC residual contamination remains, and areas beneath and northeast of the former manufacturing building where residual chlorinated VOC contamination remains. As part of the RD, pre-design investigations will be performed in each of these areas to determine the volumes requiring treatment and the most-effective type of in-situ treatment(s).
This alternative would also include the installation of deep (approximately 20 to 35 feet beneath the ground surface; the exact depth intervals would be determined during the RD) extraction wells along the northern perimeter of the facility property. These extraction wells would be designed to collect contaminated groundwater that has migrated from the source areas identified above and to prevent off-property migration. Following extraction, the contaminated groundwater would be treated at the existing SPDES water treatment system (using filtration and granulated activated carbon) prior to being discharged to Ley Creek. The groundwater extraction system would be designed with a capture zone sufficient to address the areal and vertical extent of the contamination. During the RD, a study would be performed to determine the extraction well placement, groundwater pumping rates, and drawdown levels necessary to achieve optimal capture. To evaluate the effectiveness of the extraction system, a groundwater monitoring program would be implemented as part of this remedy.

Approximately 38 CY of unsaturated surface soil would be excavated and disposed of off-site at a licensed disposal facility. The soils requiring excavation contain contaminants at concentrations greater than the Industrial Use SCOs and are located in areas not currently addressed by an approved IRM or covered by facility paved surfaces (roadways or parking lots) or the former manufacturing building. Following confirmatory soil sampling to demonstrate that the SCOs have been achieved, the excavated areas would be restored to grade with clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d).

The existing SSDS beneath the former manufacturing building includes two sub-slab vapor extraction systems that withdraw air at a rate of approximately 195 cubic feet per minute for System 1 and 94 cubic feet per minute for System 2. An evaluation of the SSDS would be performed during the RD to determine whether enhancements to the system could further improve the removal of elevated VOCs in the unsaturated soil beneath the former manufacturing building. Data would be collected to determine if the existing SSDS can be upgraded to not only continue to prevent sub-slab vapors from entering the former manufacturing building, but to enhance the removal of chlorinated VOC contamination present in the vadose zone soil beneath the building.

As part of a long-term monitoring program, shallow and deep groundwater samples would be collected from monitoring wells throughout the Subsite to evaluate the performance of the groundwater extraction and treatment system, and the effectiveness of the in-situ treatment in the three residual source areas where high concentrations of site contaminants exist. The details of the monitoring program would be developed as part of the RD/Remedial Action and outlined in a Monitoring Plan.

The remedy would also include the imposition of an IC in the form of the existing environmental easement for the controlled property which would:

- require the submission of a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- restrict the use and development of the property to industrial use as defined by Part 375-1.8(g), subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water without appropriate treatment as determined by the NYSDOH or the Onondaga County Health Department; and
- require compliance with the approved SMP.

A SMP would be required which includes the following components:

1) An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
    - an excavation plan that details the provisions for management of future excavations in areas of remaining contamination;
    - a provision for further investigation and remediation should large-scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited (beneath the 800,000 sf former manufacturing building) or unavailable will would be immediately and thoroughly investigated pursuant to an approved plan. Based on the investigation results and a determination of the need for possible additional remedial actions, a RAWP would be developed for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation activities will continue through this process. Any necessary remediation would be completed prior to, or in association with, redevelopment. This includes the former manufacturing building;
    - descriptions of the provisions of the environmental easement including any land use or groundwater use restriction;
    - provisions for the management and inspection of the identified engineering controls;
    - maintain site access controls and notification; and
    - steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

2) A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
    - monitoring of groundwater to assess the performance and effectiveness of the remedy;
    - a schedule of monitoring and frequency of submittals; and
    - monitoring for vapor intrusion for any buildings on the facility property, as may be required by the Institutional and Engineering Control Plan described above.

3) An O&M Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

- procedures for operating and maintaining the remedy;
- compliance monitoring of treatment systems to ensure proper O&M, as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and required notification; and
- provide access to the site and O&M records.

Long-term O&M would be performed for the above-noted remedial actions as well as for the previously implemented IRMs, including the Former Landfill IRM; Surface Impoundment Cover #1 IRM; Former Thinner Tanks Groundwater Recovery System IRM; SPDES Treatment System IRM; and the Vapor Intrusion Mitigation IRM (i.e., sub-slab depressurization system).

Maintenance activities and performance monitoring would be conducted to ensure that the remedial elements and IRMs are operating effectively and efficiently and to identify the need to implement corrective action(s). Corrective actions for the IRM covers, as well as the existing paved surfaces (i.e., roadways or parking lots) and the former manufacturing building that currently serve as a cover for impacted shallow soils, may consist of repair in areas of disturbance or re-application of vegetation in areas of non-survival.

As part of the long-term groundwater quality monitoring, COC concentration and natural attenuation data would be collected in the shallow and deep groundwater throughout the Subsite. Following the operation of the perimeter groundwater extraction and treatment system for a period up to five years, an evaluation would be performed to determine whether the system is effectively reducing COC concentrations in the off-property groundwater. If it is determined that continued groundwater extraction at the property perimeter alone would not achieve the remediation goals for the off-property groundwater within a reasonable timeframe, then off-property in-situ treatment techniques and extraction and treatment would be considered and incorporated into the remedy as determined to be appropriate.

The evaluations of the SSDS and perimeter extraction system would be documented and the implementation of any of the contingent remedies would be documented via an ESD.

Because this alternative would result in contaminants remaining above levels that allow for unrestricted use and exposure, CERCLA requires that the Subsite be reviewed at least once every five years.

Green remediation techniques, as detailed in NYSDEC's Green Remediation Program Policy-DER-31,[5] and EPA Region 2's Clean and Green Policy[6] would be considered during the implementation of the preferred alternative to reduce short-term environmental impacts. Green remediation best practices such as the following may be considered:

- Use of renewable energy and/or purchase of renewable energy credits to power energy needs during construction and/or O&M of the remedy.
- Reduction in vehicle idling, including both on and off-road vehicles and construction equipment during construction and/or O&M of the remedy.
- Design of cover systems, to the extent possible, to be usable for alternate uses, require minimal maintenance (*e.g.,* less mowing), and/or be integrated with the planned use of the property.
- Beneficial reuse of material that would otherwise be considered a waste.
- Use of ultra-low sulfur diesel.

BASIS FOR THE REMEDY PREFERENCE

Alternative 1 does not satisfy the threshold criteria because it does not provide protection of human health or the environment or provide a means to attain ARARs. Alternative 3 is similar to Alternative 2, except there would be no shallow groundwater collection trench installed along the northern perimeter of the facility property (only a deep groundwater extraction and treatment system). Alternative 4 is similar to Alternative 2, except there would be no shallow groundwater collection trench installed at the property perimeter, no expansion of the Former Thinner Tanks Groundwater Recovery System, and in-situ treatment techniques would be employed instead of groundwater extraction and treatment to address residual VOC contamination in the Former Thinner Tanks Area, northeast of and beneath the former manufacturing building. Alternative 5 is similar to Alternative 4, except Alternative 5 would use traditional vertical well installation for the in-situ treatment remedy instead of horizontal wells and

[5] See http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf

[6] See http://epa.gov/region2/superfund/green_remediation

Alternative 5 would also include the installation of a shallow groundwater collection trench at the facility perimeter and soil removal beneath the cover systems and paved areas (parking lots and roads).

While approximately $1.65 million more expensive than Alternative 3, Alternative 2 would directly address contaminated shallow groundwater along the northern perimeter of the facility property, whereas Alternative 3 would not. Alternatives 4 and 5 are more costly ($22,200,000 and $26,000,000, respectively) than Alternative 2 ($8,990,000), but both Alternatives would be more effective than Alternative 2 in addressing the three residual source areas.

Alternative 4 includes active treatment of three separate residual source areas with in-situ treatment, therefore it does not include a shallow groundwater collection trench to address the low concentrations of shallow groundwater contamination at the property perimeter. Alternatives 4 and 5 would be equally effective in addressing the residual source area under the former manufacturing building. However, Alternative 5 would be more disruptive to the tenants because installing traditional vertical wells for the in-situ treatment would require drilling through the building concrete floor within tenant-occupied spaces inside of the former manufacturing building. Alternative 4 would rely on horizontal wells/directional drilling outside of the building footprint for the in-situ treatment. In summary, both Alternatives 4 and 5 would be more protective and significantly more costly than Alternatives 2 and 3. In comparing Alternative 4 and 5, however Alternative 4 would be less disruptive to building occupants and would cost approximately $3.8 million less than Alternative 5.

Based on information currently available, NYSDEC and EPA believe that Alternative 4 is the most appropriate alternative to address contamination at the OU1 portion of the GM IFG Subsite. This preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. NYSDEC and EPA expect the preferred alternative to satisfy the following statutory requirements of CERCLA Section 121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element (or justify not meeting the preference).

Table 1
GM Former Inland Fisher Guide Facility
Surface Soils 0-2 Feet (13 June 1985 - 31 December 2009)
Summary of Detected Concentrations and Part 375 SCO Exceedances

Parameter	Number of Samples	Number of Detects	Minimum Detected Conc.	Maximum Detected Conc.	NYSDEC Part 375 Unrestricted Use SCOS	Number of Unrestricted Use SCO Exceedances	NYSDEC Part 375 Restricted Use - Commercial SCOs	Number of Commercial SCO Exceedances	NYSDEC Part 375 Restricted Use - Industrial SCOs	Number of Industrial SCO Exceedances
Volatile Organic Compounds (mg/kg)										
Cis-1,2-Dichloroethylene	43	1	0.34	0.34	0.25	1	500	0	1000	0
TRICHLOROETHYLENE (TCE)	45	5	0.02	46	0.47	2	200	0	400	0
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	58	16	0.04	40	20	1	500	0	1000	0
Anthracene	58	28	0.041	230	100	1	500	0	1000	0
Benzo[a]anthracene	57	49	0.057	350	1	11	5.6	8	11	5
Benzo[a]pyrene	56	47	0.046	300	1	14	1	14	1.1	12
Benzo[b]fluoranthene	57	53	0.039	360	1	16	5.6	9	11	8
Benzo[g,h,i]perylene	54	39	0.043	310	100	1	500	0	1000	0
Benzo[k]fluoranthene	57	45	0.039	120	0.8	11	56	1	110	1
Chrysene	58	53	0.042	380	1	10	56	1	110	1
Dibenzo[a,h]Anthracene	44	11	0.077	39	0.33	5	0.56	4	1.1	3
Dibenzofuran	58	16	0.039	21	7	1	350	0	1000	0
Fluoranthene	58	57	0.04	1200	100	1	500	1	1000	1
Fluorene	58	17	0.039	65	30	1	500	0	1000	0
Indeno[1,2,3-cd]pyrene	54	40	0.038	190	0.5	14	5.6	4	11	2
Phenanthrene	58	51	0.04	670	100	1	500	1	1000	0
Pyrene	58	57	0.043	1000	100	1	500	1	1000	0
PCBs (mg/kg)										
Aroclor-1242	142	1	1.9	1.9	0.1	1	1	1	25	0
Aroclor-1248	142	95	0.002	54	0.1	90	1	71	25	5
Aroclor-1254	44	10	0.03	8	0.1	9	1	2	25	0
Aroclor-1260	142	0	0	0	0.1	0	1	0	25	0
Polychlorinated biphenyls	142	105	0.002	54	0.1	100	1	74	25	5
Metals (mg/kg)										
Arsenic	61	61	1.7	92.8	13	6	16	2	16	2
Chromium	64	64	6.5	1220	30	18	1500	0	6800	0
Copper	64	64	5.4	323	50	4	270	1	10000	0
Nickel	32	32	8.3	4000	30	12	310	1	10000	0
Zinc	61	61	13.2	892	109	15	10000	0	10000	0

NOTES

This table presents (1) soil data from 13 June 1985 - 31 December 2009, (2) the detected concentration data only, and (3) only parameters that exceeded the Part 375 Unrestricted, Restricted-Commercial, and Restricted-Industrial SCOs.

NC = No criteria available.

SCO = Soil Cleanup Objectives; NYSDEC = New York State Department of Environmental Conservation.

Table 2
GM Former Inland Fisher Guide Facility
Soils >2 Feet (13 June 1985 - 31 December 2009)
Summary of Detected Concentrations and Part 375 SCO Exceedances

Parameter	Number of Samples	Number of Detects	Minimum Detected Conc.	Maximum Detected Conc.	NYSDEC Part 375 Unrestricted Use SCOS	Number of Unrestricted Use SCO Exceedances	NYSDEC Part 375 Restricted Use - Commercial SCOs	Number of Commercial SCO Exceedances	NYSDEC Part 375 Restricted Use - Industrial SCOs	Number of Industrial SCO Exceedances
Volatile Organic Compounds (mg/kg)										
ACETONE	50	28	0.005	0.1	0.05	1	500	0	1000	0
Cis-1,2-Dichloroethylene	134	51	0.001	11	0.25	11	500	0	1000	0
ETHYLBENZENE	238	55	0.0008	61	1	27	390	0	780	0
METHYLENE CHLORIDE	149	55	0.001	7.8	0.05	8	500	0	1000	0
TOLUENE	239	74	0.001	720	0.7	16	500	1	1000	0
TRICHLOROETHYLENE (TCE)	148	80	0.001	9800	0.47	37	200	2	400	2
VINYL CHLORIDE	149	8	0.002	0.12	0.02	3	13	0	27	0
Xylenes (total)	238	61	0.002	330	0.26	40	500	0	1000	0
Semivolatile Organic Compounds (mg/kg)										
2-Methylphenol	86	5	0.1	0.44	0.33	1	500	0	1000	0
3&4-Methylphenol	86	11	0.043	3.9	0.33	7	500	0	1000	0
Acenaphthene	87	5	0.058	21	20	1	500	0	1000	0
Anthracene	87	6	0.043	170	100	1	500	0	1000	0
Benzo[a]anthracene	87	11	0.036	150	1	1	5.6	1	11	1
Benzo[a]pyrene	87	9	0.035	110	1	1	1	1	1.1	1
Benzo[b]fluoranthene	87	11	0.047	140	1	1	5.6	1	11	1
Benzo[g,h,i]perylene	87	4	0.039	130	100	1	500	0	1000	0
Benzo[k]fluoranthene	87	5	0.039	59	0.8	1	56	1	110	0
Chrysene	87	12	0.046	170	1	1	56	1	110	1
Dibenzo[a,h]Anthracene	87	2	0.18	65	0.33	1	0.56	1	1.1	1
Dibenzofuran	87	6	0.066	12	7	1	350	0	1000	0
Fluoranthene	87	14	0.038	560	100	1	500	1	1000	0
Fluorene	87	4	0.052	37	30	1	500	0	1000	0
Indeno[1,2,3-cd]pyrene	87	3	0.28	76	0.5	1	5.6	1	11	1
Phenanthrene	87	18	0.037	450	100	1	500	0	1000	0
Pyrene	87	18	0.04	480	100	1	500	0	1000	0
PCBs (mg/kg)										
Aroclor-1016	264	1	0.48	0.48	0.1	1	1	0	25	0
Aroclor-1242	264	7	0.04	1400	0.1	5	1	5	25	3
Aroclor-1248	265	139	0.002	4300	0.1	111	1	70	25	19
Aroclor-1254	168	5	0.027	99	0.1	3	1	2	25	2
Aroclor-1260	264	3	0.027	1.6	0.1	1	1	1	25	0
Polychlorinated biphenyls	274	152	0.002	4300	0.1	120	1	77	25	23
Metals (mg/kg)										
Arsenic	111	115	1.6	65.7	13	11	16	8	16	8
Chromium	117	122	3.1	17200	30	28	1500	6	6800	2
Copper	112	117	4.8	23200	50	25	270	17	10000	1
Cyanide (total)	85	20	0.68	614	27	8	27	8	10000	0
Lead	111	116	2.8	291	63	6	1000	0	3900	0
Nickel	114	119	5	14400	30	30	310	13	10000	1
Zinc	102	107	11.2	53300	109	19	10000	2	10000	2

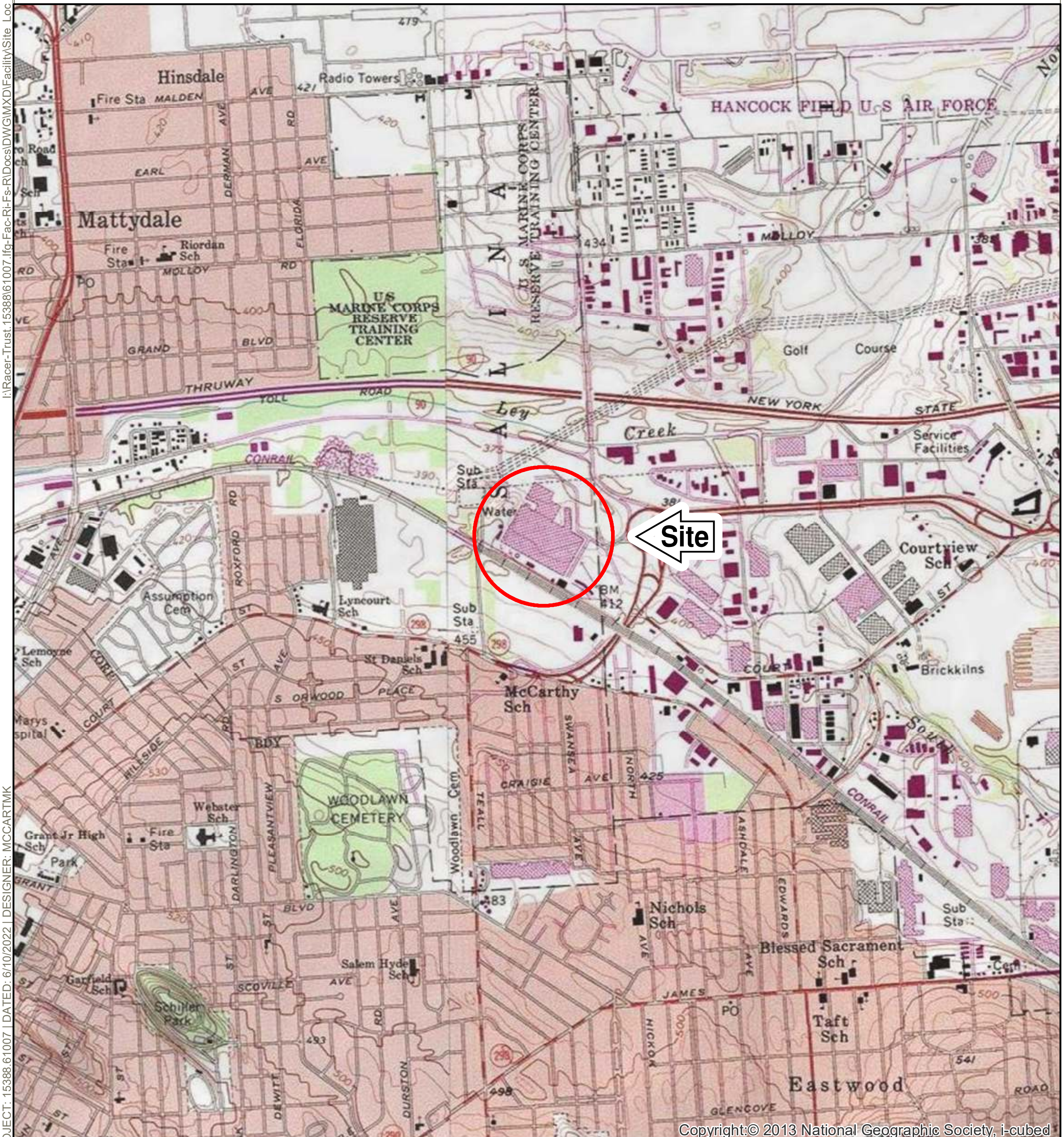
NOTES

This table presents (1) soil data from 13 June 1985 - 31 December 2009, (2) the detected concentration data only, and (3) only parameters that exceeded the Part 375 Unrestricted, Restricted-Commercial, and Restricted-Industrial SCOs.

NC = No criteria available.

SCO = Soil Cleanup Objectives; NYSDEC = New York State Department of Environmental Conservation.

FIGURE 1



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PROJECT: 15388 61007 | DATED: 6/10/2022 | DESIGNER: MCCARTMK

KEY MAP

1940101904
JUNE 2022

RACER TRUST
GM - IFG OU1
SYRACUSE, NEW YORK

SITE LOCATION

0 1,000 2,000 4,000 Feet

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL

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PROJECT: 1940101904 | DATED: 1/13/2023 | DESIGNER: VELIZCY

N

LEGEND

PROPERTY AREA LIMITS

RACER TRUST
FORMER IFG FACILITY
SYRACUSE, NEW YORK

PROPERTY AREAS OF THE FORMER GM-OU1 SITE

0 100 200 400 600 Feet

1940101904
JANUARY 2023

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL

FIGURE 3

N

LEGEND

- APPROXIMATE LIMITS OF LANDFILL
- APPROXIMATE LIMITS OF SOIL STAGING AREA
- PROPERTY AREA

SAMPLE LOCATION WITH EXCEEDANCE

- ▲ SUBSURFACE SAMPLE > IND/PROT. GW SCO
- ✦ SURFACE SAMPLE > IND/PROT. GW SCO

RACER TRUST
GM - IFG OU1
SYRACUSE, NEW YORK

LOCATIONS GREATER THAN SCOs

0 100 200 400 600 Feet

1940101904
JUNE 2022

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL

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PROJECT: 15388.61007 | DATED: 6/15/2022 | DESIGNER: MCCARTMK

OBG-27S	10/31/2006	8/24/2011	8/3/2016
PARAMETER	RESULTS		
Acetone	5 UJ	5 U	330
Chloromethane	2 U	0.75 J	0.5 U

MW-8	8/3/2016
PARAMETER	RESULTS
No Detections	

OBG-5	11/10/1999
PARAMETER	RESULTS
Methylene Chloride	8 NJ
Toluene	2 NJ

OBG-26S	10/31/2006	8/24/2011	8/2/2016	4/11/2019
PARAMETER	RESULTS			
Acetone	5 UJ	260	5.0 U	3.1 J
Vinyl Chloride	4 J	30	0.57	1 U

OBG-3	11/10/1999	8/2/2016
PARAMETER	RESULTS	
Acetone	---	8.0

OBG-25S	11/1/2006	8/25/2011	8/2/2016	4/9/2019
PARAMETER	RESULTS			
2-Butanone	3 J	5.0 U	5.0 U	10.0 U
Acetone	16 J	5.0 U	10	3.7 J

MW-12	10/31/2006	8/3/2016
PARAMETER	RESULT	
No Detections		

MW-13	10/31/2006	8/3/2016
PARAMETER	RESULT	
No Detections		

OBG-7A	11/9/1999
PARAMETER	RESULTS
No Detections	

OBG-W6SR	10/24/2006	4/10/2019
PARAMETER	RESULTS	
Acetone	5 U	10 U
cis-1,2-Dichloroethene	9	1 U
Trichloroethene	65	1 U
Vinyl Chloride	4	1 U

OBG-23S	10/24/2006
PARAMETER	RESULTS
Trichloroethene	1 J

OBG-9SR	10/25/2006	4/11/2019
PARAMETER	RESULTS	
Benzene	2	5.7 U

OBG-8SR	10/27/2006
PARAMETER	RESULTS
Chlorobenzene	2
cis-1,2-Dichloroethene	1 J

W-1S	11/10/1999	11/10/1999
PARAMETER	RESULTS	
No Detections		

OBG-24S	10/23/2006
PARAMETER	RESULTS
No Detections	

MWI-1	8/18/1999
PARAMETER	RESULTS
cis-1,2-Dichloroethene	2
Trichloroethene	3
Vinyl Chloride	6

OBG-15	11/11/1999
PARAMETER	RESULTS
cis-1,2-Dichloroethene	36
Methylene Chloride	11 NJ
Trichloroethene	230

OBG-11	11/8/1999
PARAMETER	RESULTS
No Detections	

OBG-12	11/8/1999
PARAMETER	RESULTS
No Detections	

OBG-13	11/4/1999
PARAMETER	RESULTS
Chloroform	4 NJ

MWI-2	8/18/1999
PARAMETER	RESULTS
cis-1,2-Dichloroethene	47
Trichloroethene	13

MWI-3	8/18/1999	6/21/2000	11/3/2006
PARAMETER	RESULTS		
1,1-Dichloroethene	1000 U	500 U	3
cis-1,2-Dichloroethene	4700	3500	1100
trans-1,2-Dichloroethene	1000 U	500 U	11
Trichloroethene	25000	21000	5700
Vinyl Chloride	1000 U	500 U	23

WT-3R	8/18/1999
PARAMETER	RESULTS
cis-1,2-Dichloroethene	2
Trichloroethene	20

U-1S	11/3/1999	10/9/2003
PARAMETER	RESULTS	
Ethylbenzene	4 NJ	---
Xylenes (total)	31 NJ	0.5 U

OBG-7S	11/4/1999	10/27/2006	4/10/2019
PARAMETER	RESULTS		
Acetone	---	5 U	4.1 J

OBG-2	11/10/1999	10/30/2006	8/24/2011	8/2/2016
PARAMETER	RESULTS			
Acetone	---	5 UJ	19	31
Trichloroethene	1 U	2 U	0.5 U	2.8

OBG-1	10/30/2006	8/16/2011	8/2/2016
PARAMETER	RESULTS		
Acetone	5 UJ	21 J	5 U

MW-2S	1995	3/20/1996	June 1996 to September 1996	3/17/1997	6/12/1997	1997 to 1999	11/8/1999	2000 to 2006
PARAMETER	RESULTS							
Trichloroethene	No detection	660*	No Detections	1	5000*	No Detections	2	No Detection

OBG-6S	11/3/1999	10/26/2006	4/10/2019
PARAMETER	RESULTS		
Acetone	---	5 U	3.7 J

OBG-10S	11/8/1999	10/23/2006
PARAMETER	RESULTS	
cis-1,2-Dichloroethene	15	2 U

MW-1S	1995 to 1996	3/17/1997	June 1997 to 1999	6/2/2000	4/11/2001	4/11/2002	2003 to 2006	5/8/2007	2008 to 2009	6/23/2010
PARAMETER	RESULTS									
cis-1,2-Dichloroethene	No Detections	---	No Detections	---	No Detections	---	No Detections	1 U	No Detections	0.19 J
Ethylbenzene		1 U		5 U		8		1 U		0.5 U
Trichloroethene	No Detections	1	No Detections	110	No Detections	1 U	No Detections	1 U	No Detections	0.5 U
Xylenes (total)		3 U		15 U		38		3.7		1 U

W-11S	11/8/1999	10/25/2006
PARAMETER	RESULTS	
cis-1,2-Dichloroethene	380	2 U
trans-1,2-Dichloroethene	57	2 U

P-2	11/8/1999
PARAMETER	RESULTS
No Detections	

MONITORING WELL

MONITORING WELL STATUS UNKNOWN OR ABANDONED

Total CVOC* Concentrations (ug/L)
0 - 10
>10 - 100
>100 - 1000
>1000

Total CVOCs - 1,1-DCA, 1,1-DCE, cis-1,2-DCE (total), TCE, and VC

* - Color coding within data boxes refers to individual constituents

OBG-26S - Based on last sampling result

LOCATION ID

RESULTS IN ug/L

OBG-23D	10/24/2006
PARAMETER	RESULTS
1,1-Dichloroethene	12
Benzene	1
cis-1,2-Dichloroethene	3700
trans-1,2-Dichloroethene	10
Trichloroethene	1600
Vinyl Chloride	1300

BOLD RESULTS REPRESENT AN EXCEEDANCE

Chemical Name - VOCs	Class GA
1,1-Dichloroethane	5
1,1-Dichloroethene	5
1,2-Dichloroethane	0.6
2-Butanone	50 (G)
Acetone	50 (G)
Benzene	1
Bromodichloromethane	50 (G)
Chlorobenzene	5
Chloroform	7
cis-1,2-Dichloroethene	5
Ethylbenzene	5
Isopropylbenzene	5
Methylene Chloride	5
Toluene	5
trans-1,2-Dichloroethene	5
Trichloroethene	5
Vinyl Chloride	2
Xylenes (total)	5

Notes

"---" - Indicated compound not analyzed for.
" * " - Blind Duplicate
"B" - Compound found in associated blank
"D" - Diluted Sample
"U" - Not Detected.
"L" – Acceptable value, biased low
"J" - Indicates the compound was detected but below the reporting limit. The reported concentration is estimated.
"N" – Tentatively Identified
"G" – Guidance Value
Bold – Exceeds GW Class GA
- New York State Department of Environmental Conservation, Technical and Operational Guidance Series (TOGS) 1.1.1, Class GA Standards and Guidance Values, Revised June 1998.
- Routine annual monitoring results for Thinner Wells (T-13, T-15, T-21, T-24, T-26, T-29, T-33B) are not included on this figure.

0 100 200 Feet

SITE-WIDE SHALLOW AREA HISTORIC GROUNDWATER SAMPLE RESULTS VOCS

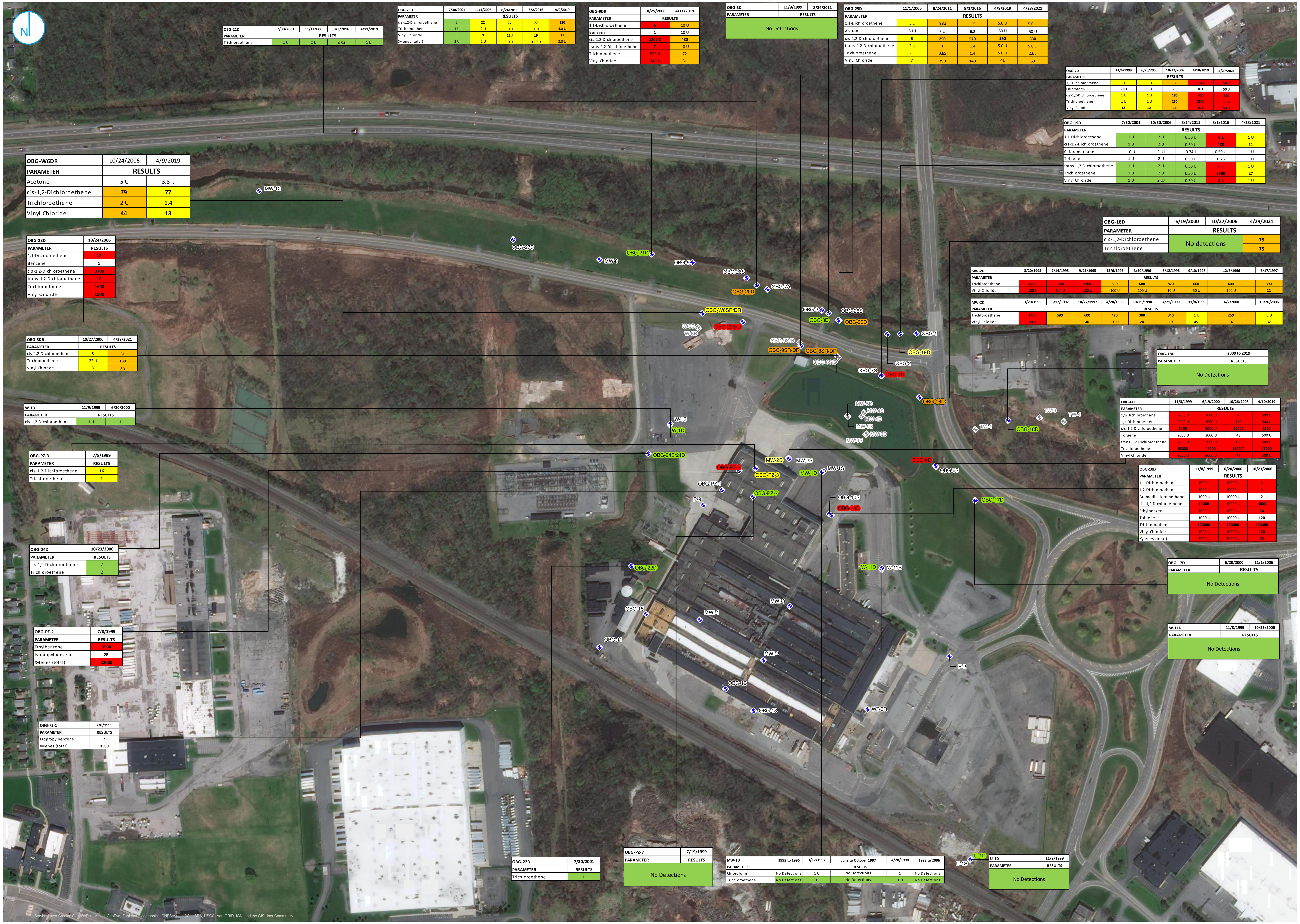
RACER TRUST
NYSDEC Site # 7-34-057
Operable Unit 1
SYRACUSE, NEW YORK

FIGURE 04

O'BRIEN & GERE ENGINEERS, INC.
A RAMBOLL COMPANY

RAMBOLL

I:\Racer-Trust\15388\71590.Fmr-ifg-Fac-Fs\Docs\DWG\MXD\2020GW_DataBox



OBG-21D	7/30/2001	11/1/2006	8/3/2016	4/11/2019
PARAMETER	RESULTS			
Trichloroethene	1 U	2 U	0.54	1 U

OBG-20D	7/30/2001	11/1/2006	8/24/2011	8/2/2016	4/9/2019
PARAMETER	RESULTS				
cis-1,2-Dichloroethene	2	**22**	**27**	**77**	**150**
Trichloroethene	1 U	2 U	0.50 U	0.91	4.0 U
Vinyl Chloride	**5**	**9**	**12 J**	**19**	**17**
Xylenes (total)	3 U	2 U	0.50 U	0.50 U	8.0 U

OBG-9DR	10/25/2006	4/11/2019
PARAMETER	RESULTS	
1,1-Dichloroethene	**6**	10 U
Benzene	**1**	10 U
cis-1,2-Dichloroethene	**1800 D**	**480**
trans-1,2-Dichloroethene	**7**	10 U
Trichloroethene	**520 D**	**72**
Vinyl Chloride	**240 D**	**31**

OBG-3D	11/9/1999	8/24/2011
PARAMETER	RESULTS	
No Detections		

OBG-25D	11/1/2006	8/24/2011	8/1/2016	4/9/2019	4/28/2021
PARAMETER	RESULTS				
1,1-Dichloroethene	5 U	0.64	1.5	5.0 U	5.0 U
Acetone	5 UJ	5 U	**6.8**	50 U	50 U
cis-1,2-Dichloroethene	**5**	**250**	**570**	**260**	**330**
trans-1,2-Dichloroethene	2 U	1	1.4	5.0 U	5.0 U
Trichloroethene	2 U	0.65	1.4	5.0 U	2.6 J
Vinyl Chloride	**7**	**79 J**	**140**	**41**	**53**

OBG-7D	11/4/1999	6/20/2000	10/27/2006	4/10/2019	4/29/2021
PARAMETER	RESULTS				
1,1-Dichloroethene	1 U	1 U	**3**	**6.3 J**	50 U
Chloroform	2 NJ	1 U	2 U	10 U	50 U
cis-1,2-Dichloroethene	1 U	1 U	**180**	**450**	**820**
Trichloroethene	1 U	1 U	**250**	**2300**	**3000**
Vinyl Chloride	**12**	**12**	**11**	10 U	50 U

OBG-19D	7/30/2001	10/30/2006	8/24/2011	8/1/2016	4/28/2021
PARAMETER	RESULTS				
1,1-Dichloroethene	1 U	2 U	0.50 U	**8.1**	1 U
cis-1,2-Dichloroethene	1 U	2 U	0.50 U	**480**	**11**
Chloromethane	10 U	2 UJ	0.74 J	0.50 U	1 U
Toluene	1 U	2 U	0.50 U	0.75	1 U
trans-1,2-Dichloroethene	1 U	2 U	0.50 U	4.7	1 U
Trichloroethene	1 U	2 U	0.50 U	**3500**	**27**
Vinyl Chloride	1 U	2 UJ	0.50 U	**5.2**	1 U

OBG-W6DR	10/24/2006	4/9/2019
PARAMETER	RESULTS	
Acetone	5 U	3.8 J
cis-1,2-Dichloroethene	**79**	**77**
Trichloroethene	2 U	1.4
Vinyl Chloride	**44**	**13**

OBG-16D	6/19/2000	10/27/2006	4/29/2021
PARAMETER	RESULTS		
cis-1,2-Dichloroethene	No detections		**79**
Trichloroethene			**75**

OBG-23D	10/24/2006
PARAMETER	RESULTS
1,1-Dichloroethene	**12**
Benzene	**1**
cis-1,2-Dichloroethene	**3700**
trans-1,2-Dichloroethene	**10**
Trichloroethene	**1600**
Vinyl Chloride	**1300**

MW-2D	3/20/1995	7/14/1995	9/21/1995	12/6/1995	3/20/1996	6/12/1996	9/10/1996	12/5/1996	3/17/1997
PARAMETER	RESULTS								
Trichloroethene	**1400**	**1500**	**1200**	**850**	**680**	**820**	**660**	**400**	**390**
Vinyl Chloride	100 U	100 U	100 U	100 U	100 U	10 U	50 U	100 U	**22**

MW-2D	3/20/1995	6/12/1997	10/27/1997	4/28/1998	10/29/1998	4/21/1999	11/8/1999	6/2/2000	10/26/2006
PARAMETER	RESULTS								
Trichloroethene	**1400**	**590**	**600**	**470**	**300**	**340**	1 U	**250**	5 U
Vinyl Chloride	100 U	**11**	**40**	50 U	**24**	**19**	**45**	**14**	**32**

OBG-8DR	10/27/2006	4/29/2021
PARAMETER	RESULTS	
cis-1,2-Dichloroethene	**8**	**31**
Trichloroethene	22 U	**130**
Vinyl Chloride	**3**	**7.9**

OBG-18D	2000 to 2019
PARAMETER	RESULTS
No Detections	

W-1D	11/9/1999	6/20/2000
PARAMETER	RESULTS	
cis-1,2-Dichloroethene	1 U	1

OBG-6D	11/3/1999	6/19/2000	10/26/2006	4/10/2019
PARAMETER	RESULTS			
1,1-Dichloroethane	2000 U	2000 U	**4**	500 U
1,1-Dichloroethene	2000 U	2000 U	**150**	500 U
cis-1,2-Dichloroethene	**3400**	2000 U	**10000**	**2300**
Toluene	2000 U	2000 U	**48**	500 U
trans-1,2-Dichloroethene	2000 U	2000 U	**130**	500 U
Trichloroethene	**65000**	**48000**	**130000**	**25000**
Vinyl Chloride	2000 U	2000 U	**75**	500 U

OBG-PZ-3	7/8/1999
PARAMETER	RESULTS
cis-1,2-Dichloroethene	**16**
Trichloroethene	**1**

OBG-10D	11/8/1999	6/20/2000	10/23/2006
PARAMETER	RESULTS		
1,1-Dichloroethane	1000 U	10000 U	**5**
1,2-Dichloroethane	1000 U	10000 U	**2**
Bromodichloromethane	1000 U	10000 U	**2**
cis-1,2-Dichloroethene	**11000**	10000 U	**10000**
Ethylbenzene	1000 U	10000 U	**24**
Toluene	1000 U	10000 U	**120**
Trichloroethene	**170000**	**160000**	**160000**
Vinyl Chloride	1000 U	10000 U	**120**
Xylenes (total)	3000 U	30000 U	**92**

OBG-24D	10/23/2006
PARAMETER	RESULTS
cis-1,2-Dichloroethene	2
Trichloroethene	2

OBG-17D	6/20/2000	11/1/2006
PARAMETER	RESULTS	
No Detections		

W-11D	11/8/1999	10/25/2006
PARAMETER	RESULTS	
No Detections		

OBG-PZ-2	7/8/1999
PARAMETER	RESULTS
Ethylbenzene	**3500**
Isopropylbenzene	**28**
Xylenes (total)	**22000**

OBG-PZ-1	7/8/1999
PARAMETER	RESULTS
Isopropylbenzene	**7**
Xylenes (total)	**1500**

OBG-22D	7/30/2001
PARAMETER	RESULTS
Trichloroethene	1

OBG-PZ-7	7/19/1999
PARAMETER	RESULTS
No Detections	

MW-1D	1995 to 1996	3/17/1997	June to October 1997	4/28/1998	1998 to 2006
PARAMETER	RESULTS				
Chloroform	No Detections	1 U	No Detections	1	No Detections
Trichloroethene	No Detections	1	No Detections	1 U	No Detections

U-1D	11/2/1999
PARAMETER	RESULTS
No Detections	

MONITORING WELL

MONITORING WELL STATUS UNKNOWN OR ABANDONED

Total CVOC* Concentrations (ug/L)	
	0 - 10
	>10 - 100
	>100 - 1000
	>1000

Total CVOCs - 1,1-DCA, 1,1-DCE, cis-1,2-DCE (total), TCE, and VC

* - Color coding within data boxes referes to individual constituents

OBG-19D - Based on last sampling result

LOCATION ID

RESULTS IN ug/L

OBG-23D	10/24/2006
PARAMETER	RESULTS
1,1-Dichloroethene	**12**
Benzene	**1**
cis-1,2-Dichloroethene	**3700**
trans-1,2-Dichloroethene	**10**
Trichloroethene	**1600**
Vinyl Chloride	**1300**

BOLD RESULTS REPRESENT AN EXCEEDANCE

Chemical Name - VOCs	Class GA
1,1-Dichloroethane	5
1,1-Dichloroethene	5
1,2-Dichloroethane	0.6
2-Butanone	50 (G)
Acetone	50 (G)
Benzene	1
Bromodichloromethane	50 (G)
Chlorobenzene	5
Chloroform	7
cis-1,2-Dichloroethene	5
Ethylbenzene	5
Isopropylbenzene	5
Methylene Chloride	5
Toluene	5
trans-1,2-Dichloroethene	5
Trichloroethene	5
Vinyl Chloride	2
Xylenes (total)	5

Notes

"---" - Indicated compound not analyzed for.
" * " - Blind Duplicate
"B" - Compound found in associated blank
"D" - Diluted Sample
"U" - Not Detected.
"L" – Acceptable value, biased low
"J" - Indicates the compound was detected but below the reporting limit. The reported concentration is estimated.
"N" – Tentatively Identified
"G" – Guidance Value
Bold – Exceeds GW Class GA
- New York State Department of Environmental Conservation, Technical and Operational Guidance Series (TOGS) 1.1.1, Class GA Standards and Guidance Values, Revised June 1998.
- Routine annual monitoring results for Thinner Wells (T-13, T-15, T-21, T-24, T-26, T-29, T-33B) are not included on this figure.

0 100 200 Feet

SITE-WIDE DEEP AREA HISTORIC GROUNDWATER SAMPLE RESULTS VOCS

RACER TRUST
NYSDEC Site # 7-34-057
Operable Unit 1
SYRACUSE, NEW YORK

FIGURE 05

O'BRIEN & GERE ENGINEERS, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 15388.71590 | DATED: 2/26/2021 | DESIGNER: VELIZCY

FIGURE 6

REMEDIAL ELEMENTS:
- PERIMETER SHALLOW GROUNDWATER COLLECTION TRENCH (1,800 LINEAR FEET BY 15-FT DEPTH);
- SIX PERIMETER AND TWO TARGETED DEEP GROUNDWATER RECOVERY WELLS (35-FT DEPTH, PROPOSED LOCATION OF WELLS TO BE VERIFIED AFTER THE PDI INVESTIGATION);
- RECOVERED GROUNDWATER DISCHARGED TO EXISTING SPDES TREATMENT SYSTEM;
- HOT SPOT EXCAVATION OF 38 CUBIC YARDS OF SURFACE SOIL (ASSUMES 1-FT OVER EXCAVATION); BACKFILL WITH CLEAN MATERIAL AND RESTORE AS VEGETATION;
- OFF-SITE DISPOSAL OF SPOILS;
- DOWNGRADIENT PERIMETER GROUNDWATER MONITORING (6 WELLS EACH, SHALLOW AND DEEP);
- CONTINUED CONSENT ORDER MONITORING.
- EXPANSION AND ENHANCEMENT OF THINNER AREA COLLECTION SYSTEM
- SSDS EVALUATION

CONTINGENCY REMEDIAL ELEMENTS:
- SSDS UPGRADE WITH SVE BASED ON SSDS EVALUATION
- IN-SITU TREATMENT OR PUMP AND TREAT FOR OFF-SITE GROUNDWATER BASED ON GROUNDWATER MONITORING DATA

N

LEGEND
- EXISTING MONITORING WELL
- PROPOSED MONITORING WELL
- PROPOSED DEEP GROUNDWATER RECOVERY WELL
- DEEP GROUNDWATER DISCHARGE PIPING
- PROPOSED SHALLOW GROUNDWATER RECOVERY TRENCH
- PROPOSED EXCAVATION AREA
- APPROXIMATE LOCATION OF EXISTING THINNER TANK TRENCH
- SSDS
- APPROXIMATE LIMITS OF EXISTING LANDFILL IRM
- APPROXIMATE LIMITS OF EXISTING SOIL STAGING AREA IRM
- PROPERTY AREA LIMITS

RACER TRUST
GENERAL MOTORS - INLAND FISHER GUIDE SUBSITE
SYRACUSE, NEW YORK

ALTERNATIVE 2

0 100 200 400 600 Feet

1940101904
MAY 2023

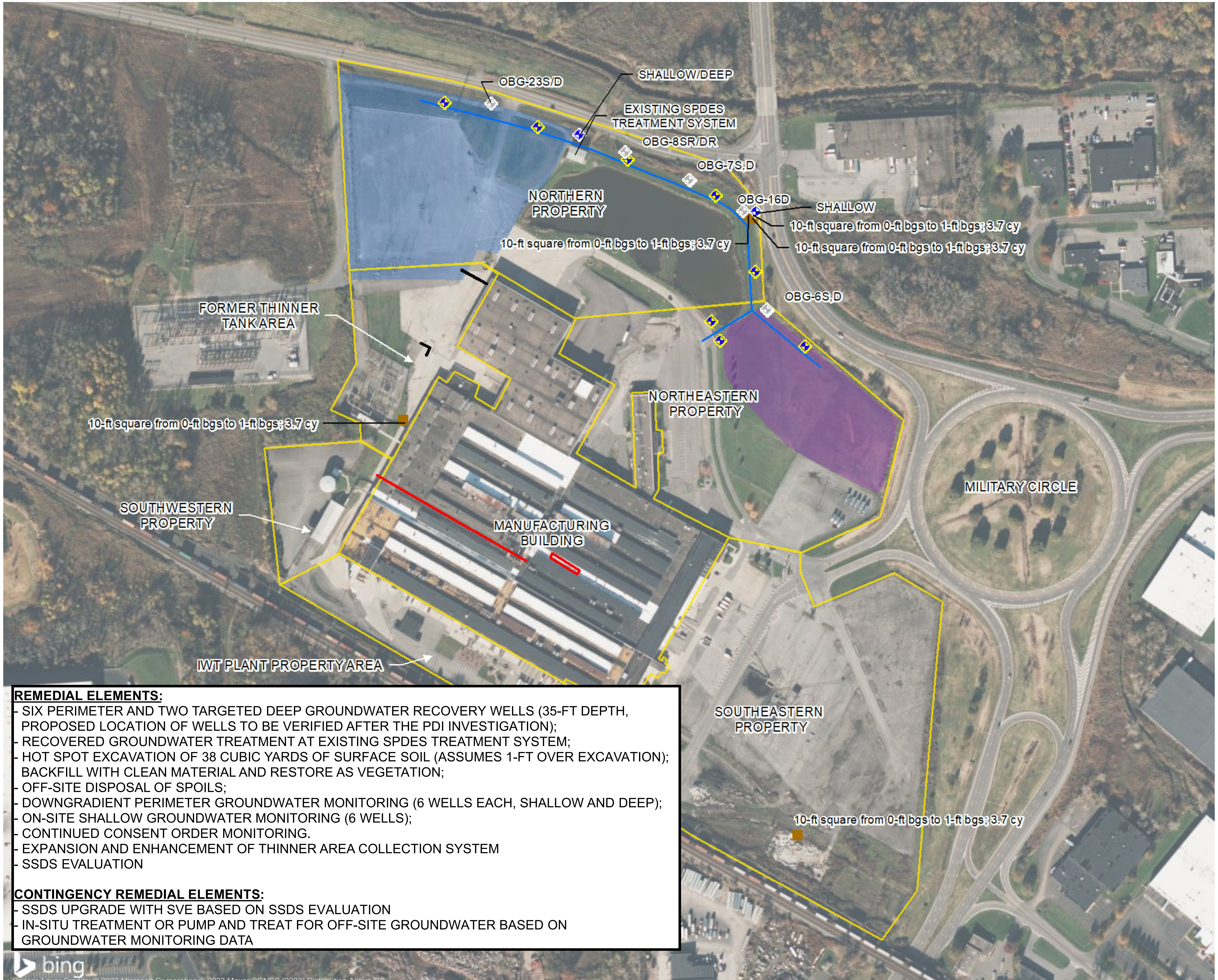
RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL

I:\Racer-Trust.15386\61007.Ifg-Fac-Ri-Fs-R\Docs\DWG\MXD\Facility\Alt_2.mxd

PROJECT: 1940101904 | DATED: 5/11/2023 | DESIGNER: SSOULE

FIGURE 7



REMEDIAL ELEMENTS:

- SIX PERIMETER AND TWO TARGETED DEEP GROUNDWATER RECOVERY WELLS (35-FT DEPTH, PROPOSED LOCATION OF WELLS TO BE VERIFIED AFTER THE PDI INVESTIGATION);
- RECOVERED GROUNDWATER TREATMENT AT EXISTING SPDES TREATMENT SYSTEM;
- HOT SPOT EXCAVATION OF 38 CUBIC YARDS OF SURFACE SOIL (ASSUMES 1-FT OVER EXCAVATION); BACKFILL WITH CLEAN MATERIAL AND RESTORE AS VEGETATION;
- OFF-SITE DISPOSAL OF SPOILS;
- DOWNGRADIENT PERIMETER GROUNDWATER MONITORING (6 WELLS EACH, SHALLOW AND DEEP);
- ON-SITE SHALLOW GROUNDWATER MONITORING (6 WELLS);
- CONTINUED CONSENT ORDER MONITORING.
- EXPANSION AND ENHANCEMENT OF THINNER AREA COLLECTION SYSTEM
- SSDS EVALUATION

CONTINGENCY REMEDIAL ELEMENTS:

- SSDS UPGRADE WITH SVE BASED ON SSDS EVALUATION
- IN-SITU TREATMENT OR PUMP AND TREAT FOR OFF-SITE GROUNDWATER BASED ON GROUNDWATER MONITORING DATA

N

LEGEND

- EXISTING MONITORING WELL
- PROPOSED MONITORING WELL
- PROPOSED DEEP GROUNDWATER RECOVERY WELL
- DEEP GROUNDWATER DISCHARGE PIPING
- PROPOSED EXCAVATION AREA
- APPROXIMATE LOCATION OF EXISTING THINNER TANK TRENCH
- SSDS
- APPROXIMATE LIMITS OF EXISTING LANDFILL IRM
- APPROXIMATE LIMITS OF EXISTING SOIL STAGING AREA IRM
- PROPERTY AREA LIMITS

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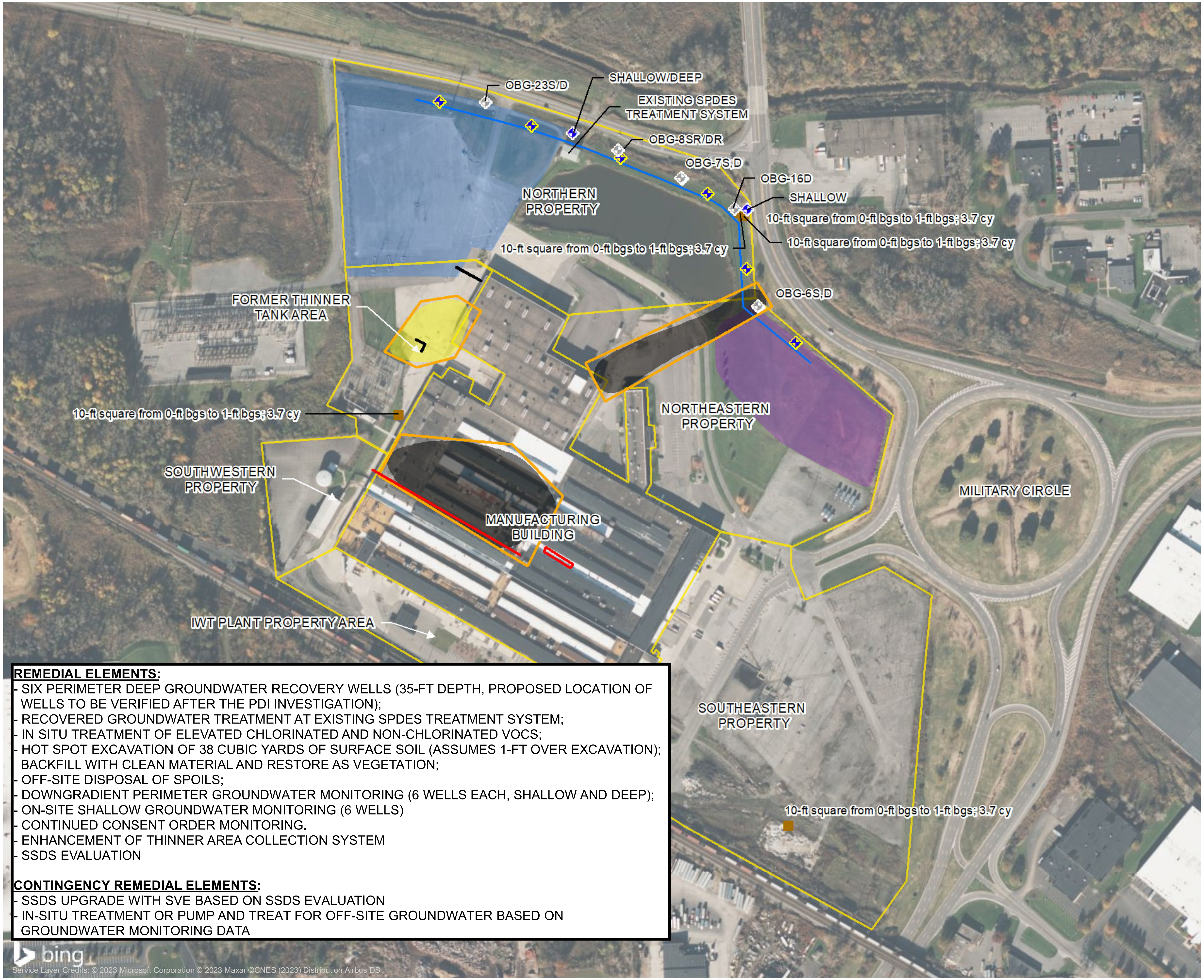
FIGURE 8



REMEDIAL ELEMENTS:
- SIX PERIMETER DEEP GROUNDWATER RECOVERY WELLS (35-FT DEPTH, PROPOSED LOCATION OF WELLS TO BE VERIFIED AFTER THE PDI INVESTIGATION);
- RECOVERED GROUNDWATER TREATMENT AT EXISTING SPDES TREATMENT SYSTEM;
- IN SITU TREATMENT OF ELEVATED CHLORINATED AND NON-CHLORINATED VOCS;
- HOT SPOT EXCAVATION OF 38 CUBIC YARDS OF SURFACE SOIL (ASSUMES 1-FT OVER EXCAVATION); BACKFILL WITH CLEAN MATERIAL AND RESTORE AS VEGETATION;
- OFF-SITE DISPOSAL OF SPOILS;
- DOWNGRADIENT PERIMETER GROUNDWATER MONITORING (6 WELLS EACH, SHALLOW AND DEEP);
- ON-SITE SHALLOW GROUNDWATER MONITORING (6 WELLS)
- CONTINUED CONSENT ORDER MONITORING.
- ENHANCEMENT OF THINNER AREA COLLECTION SYSTEM
- SSDS EVALUATION

CONTINGENCY REMEDIAL ELEMENTS:
- SSDS UPGRADE WITH SVE BASED ON SSDS EVALUATION
- IN-SITU TREATMENT OR PUMP AND TREAT FOR OFF-SITE GROUNDWATER BASED ON GROUNDWATER MONITORING DATA

N

LEGEND
- EXISTING MONITORING WELL
- PROPOSED MONITORING WELL
- PROPOSED DEEP GROUNDWATER RECOVERY WELL
- DEEP GROUNDWATER DISCHARGE PIPING
- PROPOSED EXCAVATION AREA
- APPROXIMATE LOCATION OF EXISTING THINNER TANK TRENCH
- SSDS
- APPROXIMATE LIMITS OF EXISTING LANDFILL IRM
- APPROXIMATE LIMITS OF EXISTING SOIL STAGING AREA IRM
- ELEVATED CHLORINATED VOCs AREA IN SITU TREATMENT - APPROXIMATE
- ELEVATED NON-CHLORINATED VOCs AREA IN SITU TREATMENT - APPROXIMATE
- PROPERTY AREA LIMITS

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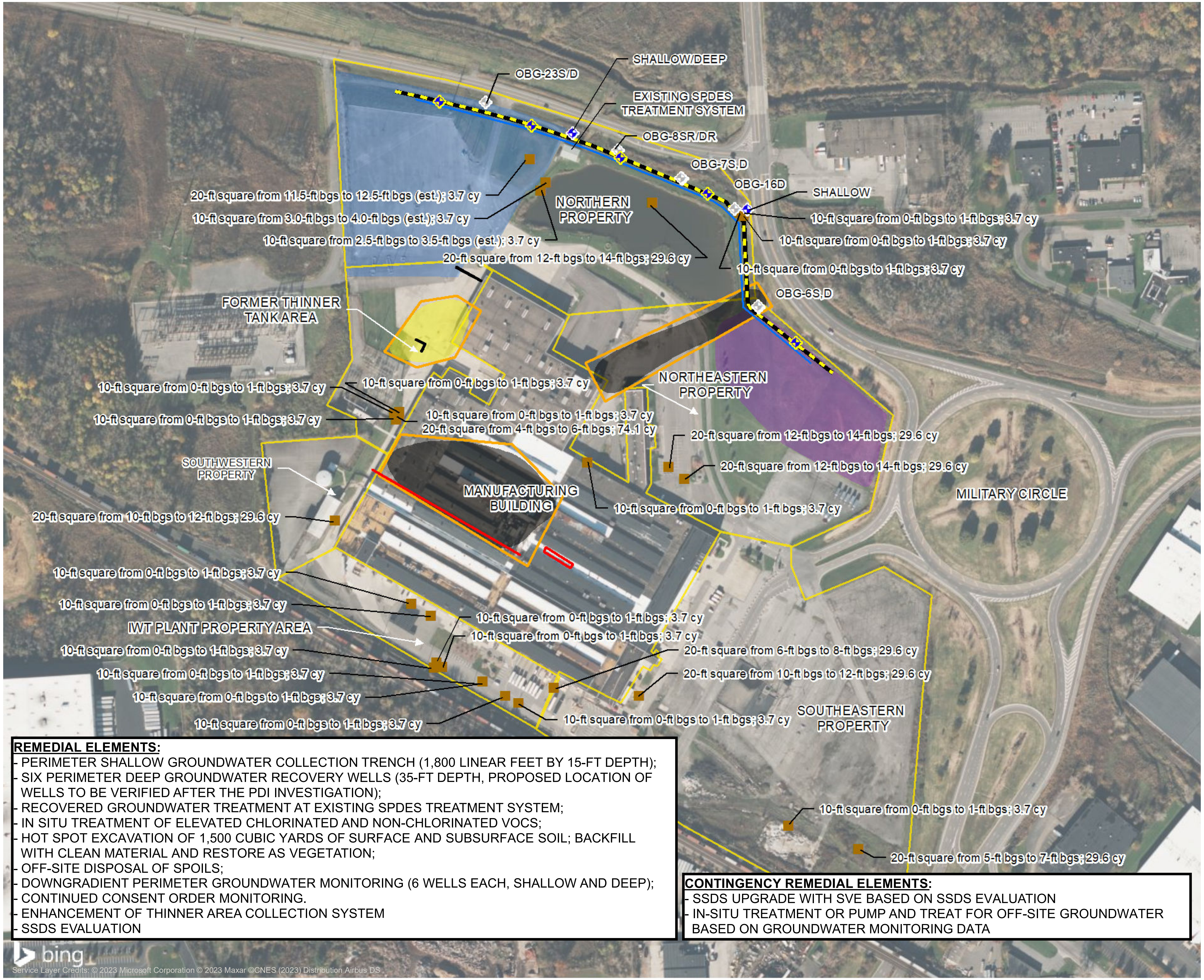
FIGURE 9



REMEDIAL ELEMENTS:

- PERIMETER SHALLOW GROUNDWATER COLLECTION TRENCH (1,800 LINEAR FEET BY 15-FT DEPTH);
- SIX PERIMETER DEEP GROUNDWATER RECOVERY WELLS (35-FT DEPTH, PROPOSED LOCATION OF WELLS TO BE VERIFIED AFTER THE PDI INVESTIGATION);
- RECOVERED GROUNDWATER TREATMENT AT EXISTING SPDES TREATMENT SYSTEM;
- IN SITU TREATMENT OF ELEVATED CHLORINATED AND NON-CHLORINATED VOCS;
- HOT SPOT EXCAVATION OF 1,500 CUBIC YARDS OF SURFACE AND SUBSURFACE SOIL; BACKFILL WITH CLEAN MATERIAL AND RESTORE AS VEGETATION;
- OFF-SITE DISPOSAL OF SPOILS;
- DOWNGRADIENT PERIMETER GROUNDWATER MONITORING (6 WELLS EACH, SHALLOW AND DEEP);
- CONTINUED CONSENT ORDER MONITORING.
- ENHANCEMENT OF THINNER AREA COLLECTION SYSTEM
- SSDS EVALUATION

CONTINGENCY REMEDIAL ELEMENTS:

- SSDS UPGRADE WITH SVE BASED ON SSDS EVALUATION
- IN-SITU TREATMENT OR PUMP AND TREAT FOR OFF-SITE GROUNDWATER BASED ON GROUNDWATER MONITORING DATA

N

LEGEND

- EXISTING MONITORING WELL
- PROPOSED MONITORING WELL
- PROPOSED DEEP GROUNDWATER RECOVERY WELL
- PROPOSED EXCAVATION AREA
- PROPOSED SHALLOW GROUNDWATER RECOVERY TRENCH
- DEEP GROUNDWATER DISCHARGE PIPING
- APPROXIMATE LOCATION OF EXISTING THINNER TANK TRENCH
- SSDS
- APPROXIMATE LIMITS OF EXISTING LANDFILL IRM
- APPROXIMATE LIMITS OF EXISTING SOIL STAGING AREA IRM
- ELEVATED CHLORINATED VOCs AREA IN SITU TREATMENT - APPROXIMATE
- ELEVATED NON-CHLORINATED VOCs AREA IN SITU TREATMENT - APPROXIMATE
- PROPERTY AREA LIMITS

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