DECISION DOCUMENT

1130 Niagara Street Site
Brownfield Cleanup Program
Buffalo, Erie County
Site No. C915284
June 2021

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

DECLARATION STATEMENT - DECISION DOCUMENT

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Statement of Purpose and Basis

This document presents the remedy for the 1130 Niagara Street Site (site), a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the 1130 Niagara Street Site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

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

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

2. IN-SITU THERMAL TREATMENT
In-situ thermal treatment will be implemented to destroy or volatilize volatile organic

compounds (VOCs) in the source area located in the central portion of Parcel 1 and an adjoining portion of Parcel 2 as indicated on Figure 3. Electrical resistance heating (ERH) will be utilized to perform the treatment. An electrical current will be produced in the treatment area between electrodes installed underground. Heat will be generated as movement of the current meets resistance from the soil. An area of approximately 30,000 square feet will be treated with ERH. The gases produced by the thermal treatment will be collected by vapor extraction wells and treated in an ex-situ treatment unit by condensing the vapor and treating with adsorption on granular activated carbon.

3. COVER SYSTEM

A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of one foot of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs. In areas where building foundations or building slabs, which preclude contact with soil exist, the requirement for a site cover will be deferred until such time that they are removed.

4. MONITORED NATURAL ATTENUATION

Groundwater contamination (remaining after active remediation) will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of the biological activity breaking down the remaining contamination. It is anticipated that contamination will decrease by an order of magnitude in a reasonable period of time (5 to 10 years). Reports of the attenuation will be provided annually until data suggests that monitoring is no longer necessary (5 to 10 years), and active remediation will be proposed if it appears that natural processes alone will not address the contamination. The contingency remedial action will depend on the information collected. An assessment of natural bacteria capable of consuming chlorinated VOCs in the site groundwater will be implemented and if required, the groundwater will be inoculated with bacteria capable of consuming chlorinated VOCs as a contingency remedial action in order for MNA to be effective.

5. ENVIRONMENTAL EASEMENT

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a Track 4 commercial use cleanup at a minimum and will include an environmental easement and site management plan as described below.

Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

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

6. SITE MANAGEMENT PLAN

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

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

Institutional Controls: The Environmental Easement discussed in remedial element 5 above.

Engineering Controls:
The site cover discussed in remedial element 3

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision that should an existing or future building or building foundation be demolished in the future, a cover system consistent with that described in remedial element 3 above will be placed in any areas where the upper one foot of exposed surface soil exceed the applicable SCOs;
- provisions for the management and inspection of the identified engineering controls;
- a provision for evaluation of the potential for soil vapor intrusion for any new buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- maintaining site access controls and Department notification; and
- steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- monitoring for vapor intrusion for any new buildings on the site, as may be required by the Institutional Control Plan discussed above; and
- a schedule of monitoring and frequency of submittals to the Department.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

6/18/21 — Date

michael j cruden — Michael Cruden, Director
Remedial Bureau E

DECISION DOCUMENT

1130 Niagara Street Site
Buffalo, Erie County
Site No. C915284
June 2021

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant.

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

SECTION 2: CITIZEN PARTICIPATION

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

DECInfo Locator - Web Application
https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C915284

Buffalo & Erie County Public Library - Niagara Branch
Attn: Kathryn Galvin
280 Porter Ave
Buffalo, NY 14201
Phone: 716-882-1537

Receive Site Citizen Participation Information By Email

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

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The 1130 Niagara Street site is a 2.62-acre site located in an urban light industrial/commercial/residential area at 1130 Niagara Street in the City of Buffalo, Erie County. The site is south of the Ferry Street intersection with Niagara Street. The western side of the site borders an active railroad track and NYS I-190. There are residential and commercial properties to the east across Niagara St. and commercial properties to the north and south.

Site Features: The site is comprised of three separate parcels with two parcels contiguous, and the other separated by Gull Street.

Parcel 1 (1144 Niagara Street) is an L shaped lot that is currently vacant but formerly contained a 63,000 sq. ft. one story L-shaped masonry warehouse/manufacturing building that covered most of the parcel. The building was demolished in early 2016, but the concrete floor slab remains and has been partially repurposed for parking. The ground surface on the western side of the parcel abruptly drops off near the railroad tracks with an embankment. The embankment is supported by a limestone block wall at the base. Due to the sloping topography toward the Niagara River, the back side of the former building has a built-up foundation to maintain a level floor elevation from the front side facing Niagara Street. The building had a small basement area which was used to house boiler equipment. The basement area has been filled in with hard fill.

Parcel 2 (17 Gull Street) is a vacant open lot contiguous with Parcel 1. It formerly contained a three-story masonry building that was destroyed by a fire in 2008. The eastern third of the lot is paved with asphalt and several loading docks for the former 1144 Niagara Street building. The balance of the parcel is vacant and is covered with a mix of soil, gravel and small pieces of hard demolition debris. The parcel slopes westerly toward the railroad tracks.

Parcel 3 (103 West Ferry Street - currently named Robert Rich Way) is covered by an approximately 38,000 sq. ft. asphalt paved parking lot and a 1,500 sq. ft. one story masonry building located at the southwest corner of the parcel. This parcel is separated from the other two parcels by Gull Street and is bounded by Robert Rich Way to the north, railroad tracks to the west, and Haggert Alley to the east. The parking lot is nearly level with Niagara Street and is built up with fill resulting in embankments that drop off to north, west and south.

Current Zoning and Land Use: The site is zoned M-1, light industrial. Zoning across Niagara Street to the east is commercial. The site is currently being partially used for parking with the

remainder of the site vacant.

Past Use of the Site: The three parcels that comprise this site have historically been utilized for residential and commercial/industrial operations since the late 1880s.

Parcel 1: 1144 Niagara Street has been occupied by several industrial and commercial businesses since approximately 1925, including a medical equipment manufacturing company, a bowling alley, an auto parts supplier and service station, a contractor yard area, a screw machine parts manufacturer, and warehousing for a swimming pool supply products distribution company. Curtis Screw operated the facility as a manufacturing facility from 1906 to 2005. Various lubricants and solvents were used in the manufacturing of screws and small machine components during that time.

Parcel 2: Prior to 1906, a manufacturing company and a typewriter manufacturer occupied the west side of the 17 Gull Street parcel. Prior to 1925, the mid-section of this parcel contained residential dwellings, and until 1951, residential dwellings occupied the east side of the parcel. Curtis Screw occupied parts of this site from 1906 to 2005. In approximately 1940, Curtis Screw expanded their facilities by the addition of a building that occupied the mid-section of this parcel and was interconnected with the building on the 1140 Niagara Street parcel. A pool equipment supplier used these buildings from 2005 until 2008 when the complex was destroyed by a fire. The fire damaged building was subsequently demolished in 2008 and the ground surface was graded with imported fill. The parcel has remained vacant since the fire.

Parcel 3: 103 West Ferry Street was occupied in the late 1880s by a number of various structures. Prior to 1925, a foundry-iron works facility occupied the southern half of the parcel. Sometime before 1951, the foundry facility was demolished and a smaller factory building for annealing steel occupied the southeast section of the parcel. This building has since been demolished. Prior to 1925, a boarding house and several residential dwellings occupied the northern half of the parcel. By 1951, some of these dwellings had been demolished and the area filled and paved for parking.

Site Geology: The overburden geology in the immediate vicinity of the site is classified as urban land and is mostly covered by streets, parking lots, and buildings. The native regional overburden consists of glacial till and glacial lacustrine deposits, predominately silts and clays. The site overburden geology was found to be generally consistent with the regional overburden geology. The overburden consists of the following materials listed from the ground surface to bedrock:

- Ground surface covering consisting of concrete, asphalt, or soil;
- Fill material consisting of a mixture of varying amounts of sand and gravel with brick fragments, wood, and cinders. This material is typical of historic urban fill;
- Native clay with fine gravel and sand; and
- Discontinuous sand with silt was observed in a few soil boring/well locations at the bedrock interface.

The overburden at the site ranges in thickness from approximately 4.5 feet thick on Parcel 2 to 18 feet thick on Parcel 3. In general, the overburden is thinnest on Parcel 2, the location of a

building that was destroyed by fire in 2008. The fill material within the overburden at the site ranges in thickness from approximately 4.5 feet thick on Parcel 3 to 7.5 feet thick on Parcel 1.

The bedrock at the site is encountered at depths ranging from 4.5 feet below ground surface (bgs) on Parcel 2 to 18 feet bgs on Parcel 3. The bedrock encountered during the remedial investigation (RI) is consistent with the regional bedrock, with the upper unit consisting of limestone.

Hydrology: Groundwater was encountered in the overburden and in bedrock. The groundwater in both units flows generally in a westerly direction towards the Blackrock Canal/Niagara River.

A site location map is attached as Figure 1 and site location in Figure 2.

SECTION 4: LAND USE AND PHYSICAL SETTING

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

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant under the Brownfield Cleanup Agreement is a Volunteer. The Volunteer does not have an obligation to address off-site contamination. The Department has determined that this site poses a significant threat to human health and the environment and there are off-site impacts that require remedial activities; accordingly, enforcement actions are necessary.

The Department will seek to identify any parties (other than the Volunteer) known or suspected to be responsible for contamination at or emanating from the site, referred to as Potentially Responsible Parties (PRPs). The Department will bring an enforcement action against the PRPs. If an enforcement action cannot be brought, or does not result in the initiation of a remedial program by any PRPs, the Department will evaluate the off-site contamination for action under the State Superfund. The PRPs are subject to legal actions by the State for recovery of all response costs the State incurs or has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- air
- groundwater
- soil
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

6.1.2: RI Results

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

trichloroethene (TCE)
1,1-dichloroethane
1,1,1-trichloroethane
1,1 dichloroethene
chloroethane
lead
barium
petroleum products
benzo(a)pyrene
benzo(b)fluoranthene
dibenz[a,h]anthracene
arsenic
phenol

The contaminants of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

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

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

IRM - Petroleum Contaminated Soil Removal

An IRM completed at the site included excavation of grossly petroleum impacted soils and fill from the southeast section of Parcel 1 in an area of the former building described as the chip removal corridor. During the RI, an area containing petroleum impacted soil and free phase product was discovered adjacent to an area where a similar measure was completed before the site entered the BCP program. Excavation of impacted fill was completed to depths between 4 and 14 feet below grade. Excavation proceeded vertically and horizontally until no visible petroleum was observed in the fill or when foundation footers or the property boundary was reached. At the east end of the area, excavation extended into the clay to a depth of 9 feet below grade. Although gross petroleum impacts were not observed in this area, the deeper excavation into the clay was completed to remove suspected chlorinated VOC-impacted soil contributing to contamination in the groundwater. Approximately 580 tons of impacted soil, mixed fill, and concrete were removed from this area. Impacted soil and debris was disposed off-site at a permitted landfill.

A network of 4-inch PVC standpipes was installed for future groundwater monitoring, oil recovery, if necessary, and injection of in-situ chemical/biological treatment products, if necessary. The network consists of six individual standpipes finished with J-plugs and curb boxes. This allows for monitoring of or product removal from the two deeper portions of the excavation and to provide better distribution of enhancements should future in situ treatment be required. The observation standpipes provide an opportunity to evaluate groundwater quality within the IRM footprint and assess the presence of free phase petroleum product.

The excavation was backfilled with pea gravel to 4 feet below grade. The pea gravel was then covered with crushed stone to grade. A demarcation layer was added (polyethylene sheeting) within the crushed stone approximately 16 inches below grade. The area was paved with asphalt to cap the excavation and match the surrounding parking area to allow use for car parking. The IRM work was completed in 2016. The IRM work is documented in RI report issued in 2020.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Based upon investigations conducted to date, the primary contaminants of concern include chlorinated volatile organic compounds (VOCs) in soil and groundwater, petroleum impacted soil and groundwater to a limited extent, and chlorinated VOCs in sub-slab soil vapor and indoor air in a building that was subsequently demolished after the RI. Several metals and SVOCs were detected in a fill layer present across the site.

Surface and Near Surface Soil/Fill
Surface and near surface (1-2 feet below ground surface (bgs)) soil samples from across the site were analyzed for semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides and herbicides.

Several SVOCs, mainly polycyclic aromatic hydrocarbons (PAHs), were detected above commercial use soil cleanup objectives (CUSCOs) in surface and near surface soils, including:

- benzo (a) pyrene at up to 7.6 parts per million (ppm)(CUSCO 1 ppm); and
- benzo (b) fluoranthrene at up to 20 ppm (CUSCO 5.6 ppm).

The only metal detected above CUSCOs in surface and near surface soils was barium at 411 ppm (CUSCO 400 ppm) found beneath the asphalt paving on Parcel 3.

There were no detected levels of PCBs or pesticides and herbicides in surface and near surface soil/fill that exceeded CUSCOs.

Subsurface Overburden Soil/Fill (greater than 2 feet bgs)
Fill was identified across the site varying in thickness from 2 to 8 feet, mostly on Parcel 3. Fill on Parcel 3 consists of distinct and mixed layers, lenses and pockets of sandy lean clay fill soil, foundry sand, ash, stained soil-like fill, and construction and demolition debris. Parcel 2 fill consists mostly of imported fill soil with some hard demolition debris fragments. Fill was also encountered below the floor slab of the former building on Parcel 1. Subsurface overburden soil/fill samples from across the site were analyzed for VOCs, semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides and herbicides.

SVOCs detected above CUSCOs in subsurface overburden soils included:

- benzo (a) pyrene at up to 20 ppm (CUSCO 1 ppm);
- benzo (b) fluoranthene at up to 23 ppm (CUSCO 5.6 ppm); and
- dibenzo (ah) anthracene at up to 3.5 ppm (CUSCO 0.56 ppm).

Metals detected above CUSCOs in subsurface overburden soils included:

- arsenic at up to 38.0 ppm (CUSCO 16 ppm);
- barium at up to 3,230 ppm (CUSCO 400 ppm);
- lead at up to 3,880 ppm (CUSCO 1000 ppm);
- a single exceedance of cadmium at 230 ppm (CUSCO 9.3 ppm); and
- a single exceedance of mercury at 10.4 ppm (CUSCO 2.8 ppm).

There were no detected levels of PCBs or pesticides and herbicides in subsurface overburden soil/fil that exceeded CUSCOs.

A pre-design source delineation investigation was completed in which soil samples were field screened for the presence of separate phase solvent contamination in the form of dense non-aqueous phase liquid (DNAPL). Out of 177 samples collected for field screening, 16 exhibited results indicating potential for the presence of DNAPL. A total of 121 soil samples were analyzed for VOCs, which were detected above CUSCOs in 8 of those samples. Since groundwater has been impacted by VOCs, the results were compared with protection of groundwater SCOs (POGWSCOs) which have significantly lower threshold values. There were several more soil sample locations that had values exceeding POGWSCOs. Detected VOC compounds exceeding both POGWSCOs and CUSCOs include:

- Trichloroethene (TCE) at up to 3,400 ppm (CUSCO 200 ppm) (0.47 ppm POGWSCO); and
- 1,1,1-Trichloroethane (TCA) at up to 1,400 ppm (CUSCO 500 ppm) (0.68 ppm POGWSCO).

Only one additional detected VOC compound exceeding POGWSCOs includes 1,1-dichloroethane (DCA) in several additional soil sampling points at up to 130 ppm (0.33 ppm POGWSCO).

All exceedances for VOCs in soil occurred in the vicinity of the former degreaser.

Waste and Source Materials (pre-IRM):
Trace amounts of petroleum were observed during the RI as a sheen on silt material located within micro-fractures in the clay matrix in the southeast corner of the site. These micro-fractures are discontinuous, thus limiting the potential for mobility. Free petroleum product was encountered at an initial location for a monitoring well in the former chip removal corridor. During drilling, fill was encountered throughout the entire boring and refusal was encountered at 11 feet bgs, shallower than the approximate 14 to 17-foot depth to bedrock at other borings in the immediate vicinity. The 8 to 11-foot interval was saturated with what appeared to be free petroleum product. The borehole location was re-designated and abandoned, and a new monitoring well was moved approximately 20 feet west. No petroleum was observed at the new well and encountered soils consisted of a shallow layer of fill below the floor slab, underlain by native clay.

The data also indicated the presence of chlorinated VOCs in groundwater hydraulically upgradient from the primary source area surrounding the former degreaser. This suggested that a secondary source may be present in the overburden beneath the former chip removal corridor area. This potential secondary source area could account for the variation in chlorinated VOC concentrations observed in the southeast portion of the site.

Post-Petroleum IRM
Following the IRM to remove petroleum impacted soil, a limited groundwater sampling event took place. Groundwater samples were collected from several overburden wells, a standpipe installed during the IRM and a bedrock well, and analyzed for VOCs. No exceedances of groundwater quality standards were observed in any of the overburden locations. In addition, all the observation standpipes were inspected for the presence of free phase petroleum product. Only one of the four standpipes exhibited a sheen layer of oil less than 0.01 feet in thickness.

Groundwater - Overburden
Chlorinated VOCs are the predominant groundwater contaminants at the site. The greatest concentrations of chlorinated VOCs were in the degreaser area on Parcel 1 and consisted mainly of TCE, and its degradation compounds. TCE was found in the greatest concentrations in the most widespread area. The highest TCE concentrations observed were at a monitoring well in close proximity to the former degreaser area. VOC concentrations have decreased from earlier sampling events. VOCs in overburden groundwater from the most recent sampling include:

- TCE at up to 67,000 parts per billion (ppb) (GWQS 5 ppb);
- 1,1,1 trichloroethane (TCA) at up to 20,000 ppb (GWQS 5 ppb);
- 1,1 dichloroethene (DCE) at up to 4,600 ppb (GWQS 5 ppb);
- Chloroethane at up to 15 ppb (GWQS 5 ppb); and
- Cis-1,2 DCE at up to 1,700 ppb (GWQS 5 ppb);

Petroleum related VOCs (benzene, toluene, ethylbenzene, xylenes) were detected above groundwater quality standards (GWQS) in overburden groundwater. There were limited detections of petroleum related VOCs and acetone in the former chip storage area.

SVOCs were detected at concentrations above GWQS at four of the overburden monitoring wells. The compounds showing exceedances included:

- 4-methylphenol at up to 10 ppb (GWQS 1 ppb) at two wells;
- Benzo (b) fluoranthene at up to 0.33 ppb (GWQS 0.002 ppb) at one well; and
- Phenol at up to 22 ppb (GWQS 1 ppb) at two wells.

Dissolved metals contamination in groundwater was limited to manganese, sodium and zinc at concentrations above GWQSs. The presence of manganese and zinc is likely due to the mineral content of the soil and the sodium may be from pavement deicing.

Emerging Contaminants were sampled and analyzed from four overburden groundwater wells (one upgradient perimeter wells and three downgradient perimeter wells) sampled for these compounds and included:

- Perfluorooctanoic acid (PFOA) at up to 13 parts per trillion (ppt) (10 ppt drinking water maximum contaminant level MCL) in one well; and
- Perfluorooctanesulfonic acid (PFOS) at an estimated concentration of 10 ppt (10 ppt MCL) in one other well.

1,4-dioxane was not detected above applicable water quality criteria in any of the sampled wells.

Groundwater - Bedrock

There are site-wide detections of VOCs in bedrock groundwater, consisting mainly of TCE, 1,1,1 TCA, and their degradation compounds. TCE was detected in all but three bedrock monitoring wells at concentrations above criteria. VOC compounds in bedrock groundwater from the most recent sampling include:

- TCE at up to 65,000 ppb (GWQS 5 ppb);
- 1,1,1 TCA at up to 42,000 ppb (GWQS 5 ppb);
- 1,1 dichloroethane (DCA) at up to 3,700 ppb (GWQS 5 ppb);
- 1,1 DCE at up to 12,000 ppb (GWQS 5 ppb);
- Chloroethane at up to 140 ppb (GWQS 5 ppb);
- Cis-1,2 DCE at up to 82,000 ppb (GWQS 5 ppb);
- Trans-1,2 DCE at up to 11 ppb (GWQS 5 ppb); and
- Vinyl chloride at up to 150 ppb (GWQS 5 ppb).

Low level SVOC concentrations were detected in three of the bedrock monitoring wells. Dissolved metals contamination was limited to manganese and sodium at concentrations above respective GWQSs. Similar to the overburden wells, the presence of manganese and zinc is likely due to the mineral content of the soil and the sodium may be from pavement deicing.

Groundwater Contaminant Migration

Contaminants of concern (COCs) are present in site groundwater. TCE levels as high as 18,000 ppb were found in bedrock at the western edge of Parcel 1. The groundwater is flowing westward toward the Black Rock Canal. The hydraulic conductivity of site overburden and

bedrock was evaluated and found to be relatively low (on the order of 10-5 cm/sec and 10-6 cm/sec, respectively). Groundwater flow and transport modeling was also completed to evaluate the potential transport of TCE, the most prevalent of the site COCs, to the Black Rock Canal and determine potential impacts to surface water quality, aquatic life, and human health. In summary, a TCE concentration of 1.3 ppb is predicted to reach the Black Rock Canal, below applicable regulatory criteria.

Sub-Slab Vapor and Indoor Air
Five sub-slab soil vapor samples and four indoor air samples were collected at various locations within and below the former 1130 Niagara Street structure prior to demolition. One outdoor air sample was collected for comparison. TCE was detected at five of the sub-slab samples, ranging from 240 micro-grams/cubic meter (ug/m^3) to 56,000 ug/m^3. TCE was detected in three indoor air samples ranging from 1.8 to 10 ug/m^3. 1,1,1-TCA was found in four of the sub-slab samples ranging from 10 to 7,000 ug/m^3 and in three indoor air samples ranging from 1.9 to 13 ug/m^3.

Following the demolition of the 1130 Niagara Street building, a supplemental sub-slab vapor sample was collected below the remaining concrete floor slab along the southern property boundary to assess potential offsite vapor migration. TCE was detected at a concentration of 7,600 ug/m^3. The sub-slab vapors in this location are confined by the concrete floor slab and building footer, and are not directly relatable to potential impacts from soil vapors located off-site to the south.

6.4: Summary of Human Exposure Pathways

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

Access to the site is unrestricted. However, human contact with contaminated soil or groundwater is unlikely unless they dig below the ground surface. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the groundwater and/or soil may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because the site is vacant, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern. However, environmental sampling indicates soil vapor intrusion is a concern for off-site buildings.

6.5: Summary of the Remediation Objectives

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

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

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 4: Restricted use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Thermal Treatment, Cover System and Institutional Controls remedy.

The elements of the selected remedy, as shown in Figure 3, are as follows:

1. REMEDIAL DESIGN

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

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

2. IN-SITU THERMAL TREATMENT

In-situ thermal treatment will be implemented to destroy or volatilize volatile organic compounds (VOCs) in the source area located in the central portion of Parcel 1 and an adjoining portion of Parcel 2 as indicated on Figure 3. Electrical resistance heating (ERH) will be utilized to perform the treatment. An electrical current will be produced in the treatment area between electrodes installed underground. Heat will be generated as movement of the current meets resistance from the soil. An area of approximately 30,000 square feet will be treated with ERH. The gases produced by the thermal treatment will be collected by vapor extraction wells and treated in an ex-situ treatment unit by condensing the vapor and treating with adsorption on granular activated carbon.

3. COVER SYSTEM

A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of one foot of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs. In areas where building foundations or building slabs, which preclude contact with soil exist, the requirement for a site cover will be deferred until such time that they are removed.

4. MONITORED NATURAL ATTENUATION

Groundwater contamination (remaining after active remediation) will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of the biological activity breaking down the remaining contamination. It is anticipated that contamination will decrease by an order of magnitude in a reasonable period of time (5 to 10 years). Reports of the attenuation will be provided annually until data suggests that monitoring is no longer necessary (5 to 10 years), and active remediation will be proposed if it appears that natural processes alone will not address the contamination. The contingency remedial action will depend on the information collected. An assessment of natural bacteria capable of consuming chlorinated VOCs in the site groundwater will be implemented and if required, the groundwater will be inoculated with bacteria capable of consuming chlorinated VOCs as a contingency remedial action in order for MNA to be effective.

5. ENVIRONMENTAL EASEMENT

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a Track 4 commercial use cleanup at a minimum and will include an environmental easement and site management plan as described below.

Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

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

6. SITE MANAGEMENT PLAN

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

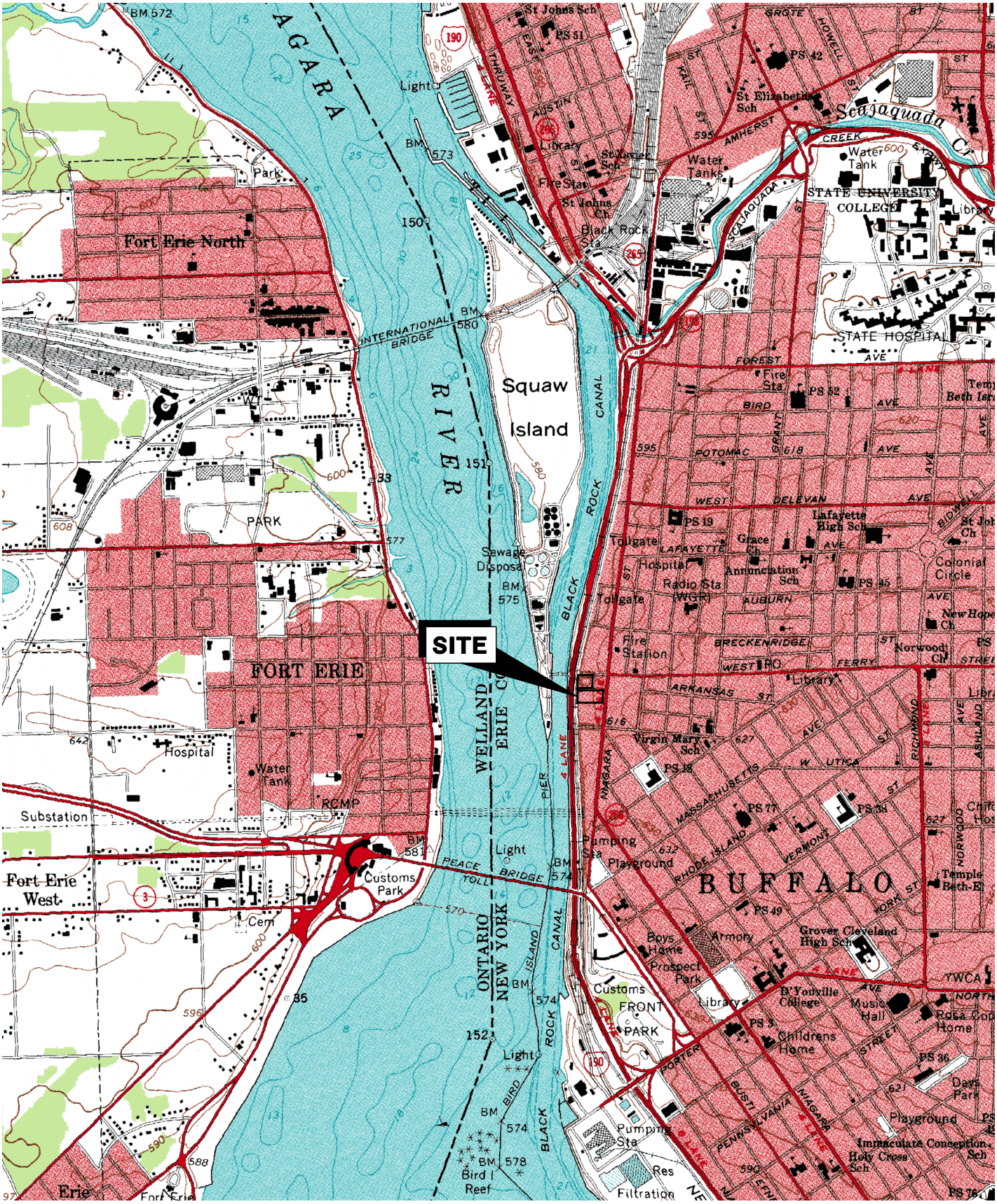
a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

   Institutional Controls: The Environmental Easement discussed in remedial element 5 above.
   Engineering Controls:
   The site cover discussed in remedial element 3

   This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision that should an existing or future building or building foundation be demolished in the future, a cover system consistent with that described in remedial element 3 above will be placed in any areas where the upper one foot of exposed surface soil exceed the applicable SCOs;
- provisions for the management and inspection of the identified engineering controls;
- a provision for evaluation of the potential for soil vapor intrusion for any new buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
    - monitoring of groundwater to assess the performance and effectiveness of the remedy;
    - monitoring for vapor intrusion for any new buildings on the site, as may be required by the Institutional Control Plan discussed above; and
    - a schedule of monitoring and frequency of submittals to the Department.



SOURCE: USGS 7.5 MINUTE SERIES, TOPO QUAD: BUFFALO NW, NY 1965

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BUFFALO, NEW YORK
1130 NIAGARA STREET SITE - C915284
RI/AA/IRM REPORT

SITE LOCATION MAP

Project No. **11119593**
Report No. **01**
Date **JULY 2020**

FIGURE 1

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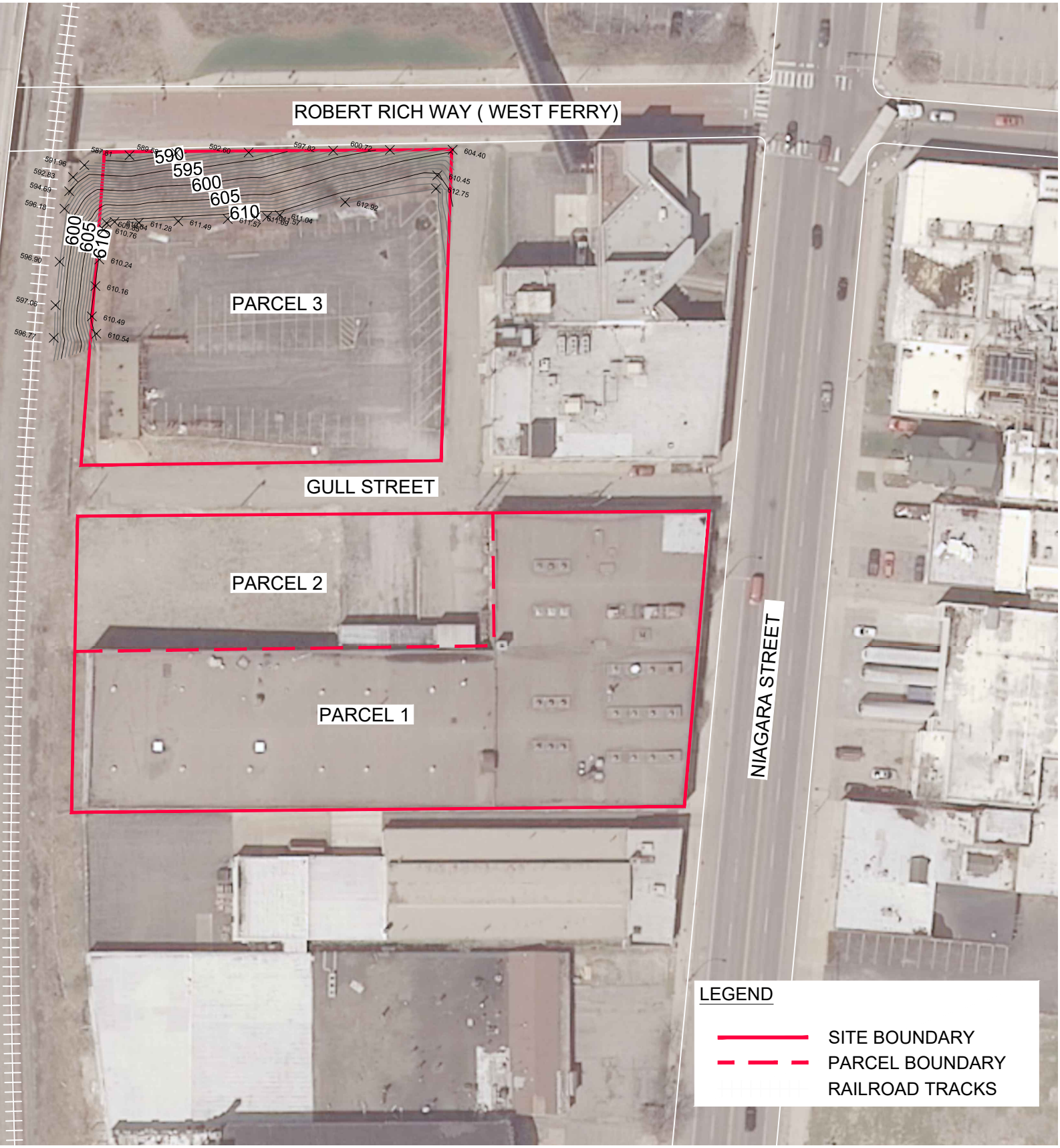

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BUFFALO, NEW YORK
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SITE PLAN

Project No. **11119593**
Report No. **01**
Date **AUGUST 2020**

FIGURE 2

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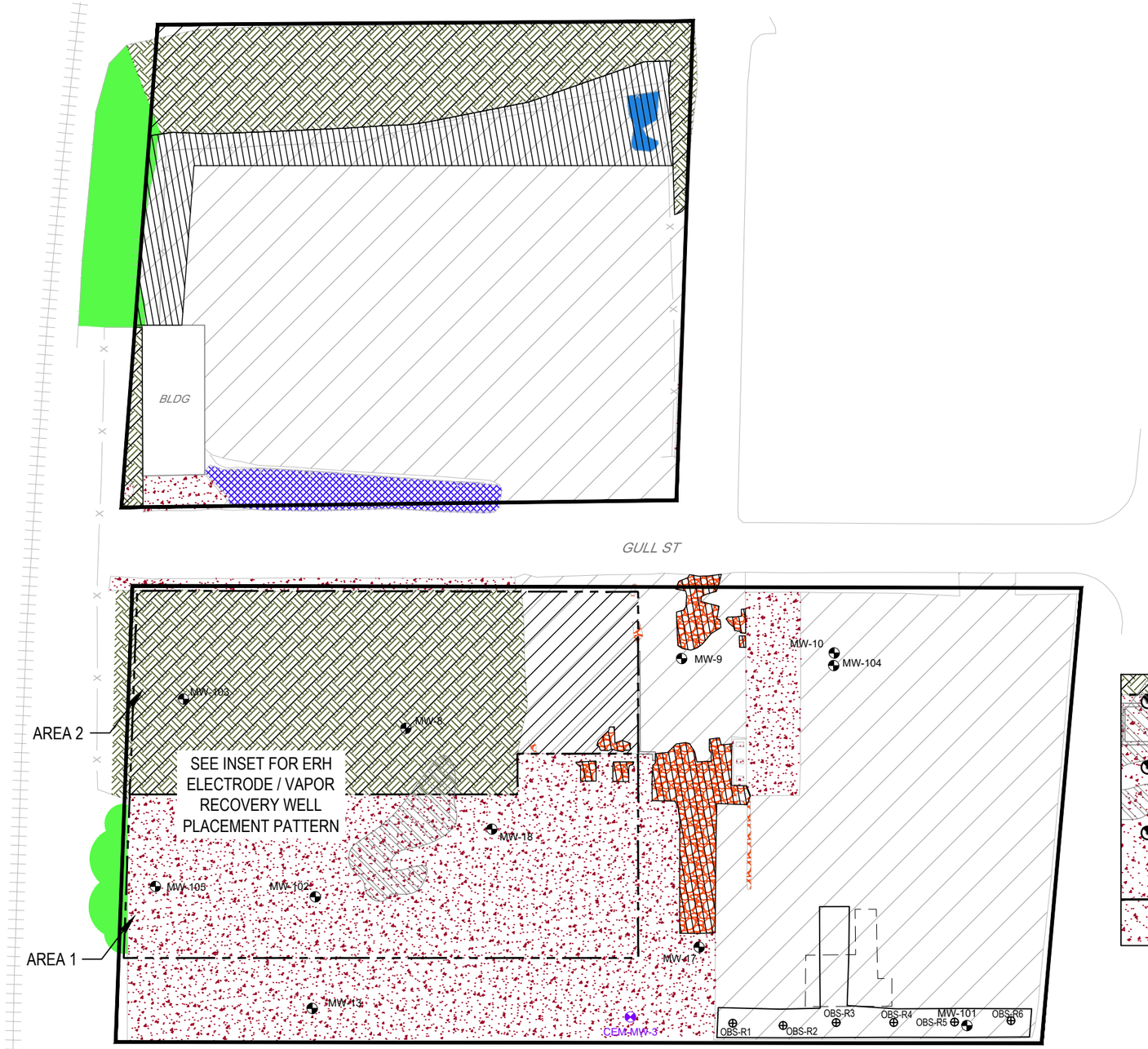
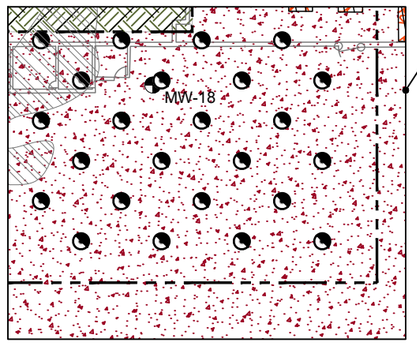


LEGEND

- BCP SITE BOUNDARY
- RAILROAD TRACKS
- LIMIT OF CEM EXCAVATION
- IRM EXCAVATION
- MW-104 GROUNDWATER MONITORING WELL LOCATIONS
- AREA OF SUBSURFACE SOIL EXCEEDING RUSCO-C CRITERIA FOR VOCs
- PROPOSED ERH ELECTRODE AND VAPOR RECOVERY WELL
- TREATMENT AREA
- PROPOSED AREAS TO BE CAPPED WITH 1 FT CLEAN COVER / VEGETATION OR ARMOR STONE
- PROPOSED AREAS TO BE REPAVED

INSET



TYPICAL PLACEMENT OF ERH ELECTRODES / VAPOR RECOVERY WELLS WITHIN AREAS 1 AND 2. THE ACTUAL PLACEMENT AND NUMBER TO BE DETERMINED BASED ON THE PRE-DESIGN INVESTIGATION

SITE COVER LEGEND:

- ASPHALT
- EXPOSED SOIL/VEGETATION
- BRUSH
- CRUSHED STONE
- ARMOR STONE
- CONCRETE
- LOW AREA

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PROPOSED REMEDIATION PLAN - ALTERNATIVE 2

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Date **AUGUST 2020**

FIGURE 3

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