Remedial Investigation/Feasibility Study Work Plan -

OU-01 Addendum

McCaffrey Street Site

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Acronyms

AMSL	above mean sea level
bgs	below ground surface
COC	contaminant of concern
CSM	conceptual site model
FS	Feasibility Study
FSP	field sampling plan
GAC	granular activated carbon
GWC&T	groundwater capture and treatment
GWUDI	Groundwater Under the Direct Influence of Surface Water
IRM	interim remedial measure
MCL	maximum contaminant level
MGD	million gallons per day
ng/g	nanograms per gram
ng/L	nanograms per liter
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU-01	Operable Unit 01
PCBs	polychlorinated biphenyls
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
ppt	parts per trillion
PRAP	Proposed Remedial Action Plan
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
SVOC	semi-volatile organic compound
TAL	target analyte list
TCL	target compound list
TOC	total organic carbon
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WTP	water treatment plant
WWTP	wastewater treatment plant

1.0 Introduction

This addendum to the Remedial Investigation/Feasibility Study (RI/FS) Work Plan (C.T. Male, 2016) for Operable Unit 01 (OU-01), which is associated with the McCaffrey Street Site (Site), has been prepared in response to a request from the New York State Department of Environmental Conservation (NYSDEC; NYSDEC, 2021d). The specific NYSDEC request is provided below:

> *Considering the newly defined extent of OU-01, the department requests that the scope of the remedial investigation is revised to include the full extent and current understanding of the defined operable unit. The revised scope of the RI requires an addendum to the RI work plan to present and explain how the new scope fully delineates the nature and extent of contamination in OU-01. This addendum will include additional groundwater and soil sampling throughout OU-01, evaluation of the connection between OU groundwater and surface water, as well as evaluation of the municipal sewer as a transport pathway.*

OU-01 currently includes the 6.41-acre McCaffrey Street Site (the Site) located at 14 McCaffrey Street in Hoosick Falls, NY[1] and groundwater contamination emanating, or having emanated, from the Site.

NYSDEC is requiring this OU-01 work plan addendum to further refine the nature and extent of contaminants of concern (COCs) in OU-01 groundwater given the following potential migration methods identified in the current Conceptual Site Model (CSM):

A. Topographically-controlled flow of contaminated groundwater;
B. Subsurface geology and hydrogeologic conditions in the valley;
C. Historic distribution of contaminated groundwater via the municipal water supply system; and,
D. Preferential flow of contaminated groundwater via the municipal storm and/or sanitary sewer infrastructure.

Text and figures in the OU-01 RI Work Plan Addendum convey a conceptual understanding of the OU-01 extent based on current data. The OU investigation area may change upon evaluation of additional data generated from the investigation tasks identified in this work plan addendum and further refinement of the CSM. No further on-Site characterization or delineation is required at this time.

Two other operable units have also been defined for the McCaffrey Street Site. Operable Unit 02 (OU-02) includes the existing municipal water supply, which has a NYSDEC selected remedy presented in a Record of Decision (ROD; NYSDEC, 2021e). Operable Unit 03 (OU-03) encompasses the area associated with potential atmospheric deposition of Site-related contaminants or direct off-site disposal of Site-related liquid and/or solid wastes. OU-03 is still under investigation and is currently subject to multiple approved

[1] The Site is as designated in the Order on Consent and Administrative Settlement, Index No. CO 4-20160212-18, to address the Site, the municipal water supply and the private drinking water wells in the Town of Hoosick and Village of Hoosick Falls. In accordance with Appendix A of this Order, all elements of the remedial program shall be conducted under an approved work plan. Approved work plans are enforceable parts of the order and shall, in total, address both on-Site and off-Site conditions.

scopes of work. As OU-01 and OU-03 are focused on different release and transport mechanisms, the potential exists for overlap of the geographic boundaries of OU-01 and OU-03.

As discussed herein, multiple investigations related to per- and poly-fluoroalkyl substances (PFAS) have been conducted within and near the current OU-01 boundary, generating analytical data for thousands of individual samples, and extensive information and data regarding the physical setting (geology, hydrogeology, etc.). In order to meet the NYSDEC request provided above, this information and data were integrated and evaluated to provide the current understanding of OU-01. The current understanding of OU-01, including the physical setting, municipal water and wastewater systems, and the distribution of PFAS, is described in Section 2. The proposed scope of work detailed in Section 3 is designed to close data gaps, further evaluate transport pathways, and update the CSM with the further definition of nature and extent of PFAS in OU-01.

Also, prior to the current definition of OU-01, McCaffrey RI samples were analyzed for a broad range of chemicals[2] in accordance with the RI/FS Work Plan (C.T. Male, 2016). This previous sampling and investigation resulted in the delineation of all site-related non-PFAS chemicals analyzed and, as described in the Baseline CSM for OU-01 and the region (C.T. Male and BEC, 2021d), the primary contaminants of potential concern (COPCs) for OU-01 beyond the McCaffrey Street Site boundaries are PFAS. Based on this previous delineation and the objectives of this work plan, the focus of this Work Plan Addendum is PFAS. Nonetheless, new sampling locations will be analyzed for the full list of target compound list (TCL)/ target analyte list (TAL) analytes as requested by the NYSDEC (NYSDEC, 2022).

[2] Samples of soil, groundwater, surface water, sediment, and other media were analyzed for one or more of the following suite of chemicals in accordance with an approved Quality Assurance Project Plan (QAPP): PFAS; target compound list (TCL) of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides and polychlorinated biphenyls (PCBs); the target analyte list (TAL) of metals (including mercury); cyanide; major cations (calcium, magnesium, sodium, and potassium) and anions (chlorine, sulfate, carbonate, and bicarbonate).

2.0 Existing Information for OU-01

This section provides a summary of existing information and the current understanding of OU-01 based on this information. It focuses on the physical setting, potential contaminant sources, possible migration pathways including subsurface municipal utilities (specifically sewers and the water distribution system), and prior PFAS sampling results (including data summaries and interpretation). The current extent of OU-01 and sites of interest within and near OU-01, including NYSDEC Class 2 and Class P sites, are shown on Figure 1.

2.1 Physical Setting

2.1.1 Topography

OU-01 is divided by the Hoosic River and sits within its valley. The topography (see Figure 2) primarily reflects the weathered bedrock surface and increases in elevation outward from the Hoosic River to the east and west. The lowest elevations in OU-01 (400 feet above mean sea level [AMSL]) are found near the river and the highest elevations in OU-01 (800 feet AMSL) are found to the east along Fairbanks Road.

2.1.2 Geology

The bedrock geology within OU-01 is complex, consisting of folded and faulted rocks. The region was subject to multiple glaciations that scoured bedrock and removed and reworked deposits of previous glaciations. The last glaciation deposited thin, discontinuous lower permeability materials in river valleys. These unconsolidated materials atop bedrock in OU-01 (see Figure 3 for a bedrock elevation map), consisting of alluvium and glacial lake, outwash, and till deposits, range in thickness from 0 feet (i.e., bedrock outcrops are observed in the Hoosic River bed and other areas of OU-01) to greater than 200 feet (see Figure 4). The areas of thickest unconsolidated materials in OU-01 correlate with a bedrock valley and the hill found to the east along Fairbanks Road. The bedrock valley generally follows the course of the Hoosic River and correlates with a deep sand and gravel aquifer (i.e., highly transmissive zone) discussed below.

2.1.3 Hydrology

OU-01 is within a region with relatively high rates of precipitation, infiltration, groundwater recharge, and groundwater discharge to the Hoosic River. OU-01 lies entirely within the Hoosic River watershed. Smaller tributaries of the Hoosic River enter OU-01, including Woods Brook and several unnamed drainages from the east and west (see Figure 5). The tributary brooks in the region may lose water through discharge to the subsurface where they pass from upland areas to the major valleys (Kontis, et al., 2004). Infiltration of surface water may be induced from the rivers by pumping of wells near the rivers. During flooding, surface water recharges adjacent floodplains and aquifers.

2.1.4 Hydrogeology

Based on multiple investigations completed in the Hoosic River valley, the unconsolidated materials in OU-01 are heterogeneous, consisting of layered deposits with lower and higher hydraulic conductivities, and with varying thickness. As a result, the groundwater flow system is complex but well understood

within much of OU-01, with saturated thickness of unconsolidated deposits ranging from 0 feet to greater than 200 feet, and groundwater flow directions varying within different hydrostratigraphic units. Within the current boundary of OU-01, 397 monitoring wells have been installed, sampled, and gauged as a part of various investigations. Several area-wide gauging events have been conducted in coordination amongst several parties and data loggers have been temporarily deployed in more than 70 wells to understand the groundwater flow within OU-01. Several area-wide groundwater contour figures based on these efforts and illustrating groundwater flow within OU-01 have been submitted to NYSDEC (see Appendix A). The groundwater flow in the shallow unconsolidated materials (i.e., water table) is consistent with the topography-controlled pattern observed across the region, meaning that the water table can be roughly conceptualized as a reflection (lower-relief version) of the ground surface (see Figure 6). Throughout OU-01, shallow groundwater flow is largely toward the Hoosic River where it ultimately discharges under normal river stages. Water table lows occur along tributary brooks and both sides of the Hoosic River where there is groundwater discharge as shown on Figure 6. Based on groundwater elevation gauging and contouring, shallow groundwater flow from the McCaffrey Street Site may discharge to the Hoosic River along the reach from the unnamed drainage southeast of the facility to as far north as Center Street, but does not flow further west under the Hoosic River (Figure 6). Preferential discharge locations for shallow groundwater may exist along this stretch of the Hoosic River. Water table highs occur between brooks and the Hoosic River due to the mounding effects of recharge (Figure 6).

The groundwater flow patterns in the deep unconsolidated hydrostratigraphic unit exhibit a departure from the regional topography-controlled flow in the shallow unconsolidated materials. An area of lower groundwater elevations extends from the southern end of the Village well field through the northern extent of the investigation area (roughly defined by the 420-foot groundwater elevation contour and referred to herein as the deep transmissive zone) and groundwater ultimately discharges to the Hoosic River (Figure 7). A cone of depression centered on the pumped Village water supply well, typically PW-7, forms within the deep transmissive zone during Village water supply pumping. Deep groundwater flow within OU-01 is toward the Hoosic River (e.g., southeast of the Liberty Street Site, radially from the Mechanic Street Site, west of the McCaffrey Street Site, and east of the River Road Site) or toward the deep transmissive zone, which ultimately discharges to the Hoosic River in the vicinity of the First Street Site and in the reach between the River Road Site and the Village well field (see Appendix A Figures A4 and A5). Based on groundwater elevation gauging and contouring, deep groundwater flow (Figure 7) from the McCaffrey Street Site may discharge to the Hoosic River from the south end of Village well field (i.e., where the 420-ft contour intersects the Hoosic River) to as far north as Elm Street, as well as in the vicinity of the First Street Site. Several surface water samples were collected along the eastern shore of the Hoosic River near the First Street Site at identified preferential groundwater discharge locations in coordination with porewater sampling. This sampling was conducted as a part of the John Street Site investigations to evaluate the groundwater to surface water transport pathway (Honeywell, 2020), and demonstrate a completed transport pathway from groundwater to surface water that is consistent with hydrogeologic evaluations in this area. Additional preferential discharge locations for deep groundwater may exist along this stretch of the river. Deep groundwater elevations support discharge to the Hoosic River, but not flow under the Hoosic River.

The nature of the area of lower groundwater elevations has been characterized by temporarily deploying data loggers in more than 70 wells in the investigation area and examining the recorded data for responses to the cycling of the Village water supply wells. The known extent of the deep transmissive zone is based on observed responses to Village water supply well cycling and investigative borings. It occurs within the coarsest part of a deep sand and gravel unit near the center of the bedrock valley. The deep sand and gravel unit extends east and west of the deep transmissive zone, but has higher fines content (i.e., contains more fine sand, silt, and clay) moving away from the valley; wells installed in sand and gravel unit outside of the deep transmissive zone do not respond to Village water supply well cycling.

The deep sand and gravel unit is overlain by a semi-continuous confining layer consisting of 0 to 130 feet of glaciolacustrine silt and clay within OU-01. The semi-continuous confining layer is continuous over the deep transmissive zone but thins to the west and is absent at the McCaffrey Street and River Road Sites. Where the semi-continuous confining layer is absent, the shallow groundwater zone is not distinct from the deep groundwater zone. The extraction wells for the groundwater capture and treatment (GWC&T) interim remedial measure (IRM) at the McCaffrey Street Site capture groundwater from such an area and minimize the continued migration of groundwater from the McCaffrey Street Site to groundwater in the deep transmissive zone, including the Village well field (C.T. Male and BEC, 2021a). In monitoring well nests installed in other areas of OU-01, groundwater elevations in the shallow unconsolidated materials are generally higher than in the deep unconsolidated materials, indicating recharge is from the shallow toward the deeper unconsolidated materials.

2.2 Municipal Water System

The information presented in this section regarding the municipal water system is based on a preliminary review of publicly available records including prior reports, well installation logs, field sketches and notes, and maps. The Village municipal well field and water treatment plant (WTP) are located within the southwestern area of the Village on a 42-acre parcel (Figure 8).

The well field is sited within the Hoosic River valley flood plain and has historically drawn groundwater from shallow and deep aquifers, and river water through induced infiltration during operation of the production wells. The well field, originally constructed in the late 1800s to early 1900s, was comprised of four dug wells and an infiltration gallery within the shallow aquifer, which also captured river and flood water. Due to quality and quantity concerns of the groundwater within the shallow aquifer, a series of deeper production wells were constructed starting in circa 1960, the last having been installed in 2002.

The current average maximum daily water demand within the Village is 0.71 million gallons per day (MGD). Three water supply wells (PW03, PW06, and PW07) are currently available for pumping. PW07 is the primary well and is most often operated. PW03 is the secondary well and is operated periodically throughout the year for periods typically no longer than one month. PW06 is available for production but is rarely operated as the general water quality from the well requires more intensive treatment than wells PW03 and PW07. Daily cyclical pumping of wells PW03 or PW07 is normally conducted during daytime work hours and typically not performed during overnight periods. The current Village WTP was constructed in the late 1990s and involved treatment for iron and manganese and disinfection. In 2006, the Village wells were designated as producing Groundwater Under the Direct Influence of Surface Water

(GWUDI) by New York State Department of Health (NYSDOH), thus the treatment system was augmented with micro-filtration. This unit requires periodic backwashing. The backwash water is discharged to the municipal sewer.

To address PFAS detected in wells PW03 and PW07, temporary and full-capacity Granulated Activated Carbon (GAC) water treatment systems were designed and installed at the Village WTP beginning in early 2016. The temporary treatment system was operated from February 2016 to December 2016. During this operational period, the design, approval, and construction of the full-capacity GAC system was completed. The full-capacity GAC system began operating in January 2017. A municipal water supply study to assess alternate potable water supply sources for the Village was completed in coordination with NYSDEC (ERM and CHA, 2020; NYSDEC, 2021b). A Proposed Remedial Action Plan (PRAP) for the municipal water supply was issued by the NYSDEC in April 2021 (NYSDEC, 2021b).

The properties that are currently provided with municipal water based on information contained in Rensselaer County parcel data are also shown on Figure 8. Municipal water is provided to most occupied properties within OU-01, although there are several undeveloped properties within OU-01 that do not appear to receive water service at this time.

2.3 Municipal Sewer System

The information presented in this section regarding the municipal sewer system is based on publicly available information. Based on the available information, the current extent of the Village sewer system and the direction of flow within the sewer lines are depicted on Figure 9.

Historical records indicate that the Village of Hoosick Falls has had a sewer system since at least the early 1900s. This system is in part a combined system that receives both wastewater and stormwater. Based on an historical sewer map, wastewater from the Village was discharged directly to the Hoosic River prior to the construction of the original Village WWTP in the late 1960s. The historical sewer map (Morrell Vrooman Engineers, 1960) shows five sewer sections discharging to the river. These sewer discharge lines are referred to as the River Road Outlet, Water Street Outlet, Geer Outlet, Kokley Avenue Outlet, and Carey Avenue Outlet. The Carey Avenue Outlet is located near the McCaffrey Street Site and is still used as an overflow pipe for the Carey Avenue lift station (discussed below).

With the construction of the original WWTP in the late 1960s, several sewer lift stations were subsequently constructed in lower areas of the Village to collect and pump the sewage to the WWTP. The original Carey Avenue lift station (near the McCaffrey Street Site), for example, was constructed in approximately 1970 and replaced in 2005. Several other lift stations are located throughout the Village, but little information is publicly available regarding the history, construction, replacement, and use of these lift stations.

It is likely that the Village sewer system has been extended and improved (e.g., separating wastewater and stormwater connections) in phases over time. Based on historical sewer maps, it is also likely that the sewer lines located closest to the Hoosic River represent the oldest portions of the sewer system. During the remedial investigation of the McCaffery Street Site, the sewer overflow pipe from the Carey Avenue lift station (previously known as the Carey Avenue Outlet) was found to be constructed of bell-end concrete pipe sections and a manhole connecting sections of this overflow piping was constructed of un-mortared

brick with a soil bottom. It is unclear if the sewer piping and manholes installed in the oldest sections of the Village sewer system are of similar construction. Publicly available information indicates that the Village has implemented a large-scale sanitary sewer improvement project in recent years to address excessive infiltration/inflow and to upgrade lift stations (MRB, 2016). Municipal sewer expansions also appear to have been contemplated and potentially executed by the Village (MRB, 2016). Little or no information is publicly available concerning the details of improvements or expansions to the basic sewer system.

2.4 Potential Contaminant Sources and Migration

The Baseline CSM for OU-01 and the region (C.T. Male and BEC, 2021d) identifies presently known potential sources of contamination, types of contaminants and affected media, release mechanisms and potential contaminant pathways, and actual/potential human and environmental receptors. The locations of presently known sites of interest, including Class 2 or Class P sites and the Village WWTP, are shown on Figures 1 through 18. However, as described in the Baseline CSM for OU-01 and the region, other presently unidentified PFAS sites of interest could also exist within OU-01. Previous sampling and investigation for the McCaffrey Street RI has resulted in the delineation of all site-related non-PFAS chemicals analyzed in accordance with the RI/FS Work Plan (C.T. Male, 2016) and NYSDEC's DER-10 – Technical Guidance for Site Investigation and Remediation (NYSDEC, 2016) or demonstrated to be associated with background or other sources. Discussion and demonstration of this delineation for all non-PFAS chemicals analyzed is included as Appendix B.

As previously noted, OU-01 is defined as the 6.41-acre site, as well as groundwater contamination directly attributable to on-site disposal of hazardous waste (NYSDEC, 2021e). The primary PFAS release mechanisms and transport pathways relevant within the current OU-01 boundary can be categorized as follows:

- **Direct release to soil or surface water.** PFAS-containing material has been released directly to soil and/or surface water in OU-01 through mechanisms including, but not necessarily limited to, leaks (e.g., from sumps, piping), spills, onsite disposal or cleaning (e.g., septic systems and equipment washdown), and pump station overflows.

- **Groundwater transport.** Groundwater from the Site served as a transport pathway for PFAS. The area where groundwater contamination may have traveled from the Site has been well characterized and defined (Section 2.1.4).

- **Water and wastewater system transport.** Prior to the installation of the full capacity GAC treatment in 2016, the Hoosick Falls municipal water supply, which was impacted with PFAS, distributed water throughout water supply system network, which is the basis for the current OU-01 boundary. The municipal water distribution piping type or condition is not known, but it is likely that the piping was designed to be watertight and much of the distributed municipal water likely ultimately reached the municipal sewer system. The municipal water system could have also impacted soil with PFAS through irrigation at residential, commercial, and recreational properties.

Although the current boundary of OU-1 is defined by the potential release mechanisms and transport pathways (i.e., groundwater transport from the Site and through the municipal supply), additional potential release mechanisms and transport pathways for PFAS that may impact this area include:

- **Air emissions and deposition.** PFAS was released to the air (and subsequently deposited onto soil and/or surface water) within or near OU-01 through mechanisms including, but not necessarily limited to, the exhaust/emissions of industrial/manufacturing processes and the open burning of waste/trash. Upgradient or atmospheric sources of PFAS outside of OU-01 could have also impacted soils and surface water in OU-01. The nature and extent of air deposition is being investigated and addressed under OU-03.

The municipal sewer system has received and transported wastewater containing PFAS from sites throughout the Village. Additionally, much of the municipal water distributed and used in OU-01 prior to 2016 would have ultimately reached the sewer system. Therefore, the potential exists that wastewater in the sewer piping could leak into the soil surrounding the sewer and subsequently to other media through other transport mechanisms. Also, if the sewer piping is below the shallow water table, the potential exists that groundwater could leak into the sewer piping and be transported through the sewer. The direct impacts to soil and surface water described above could have led to indirect impacts in other media (e.g., groundwater, sediments) through various transport pathways as described in the Baseline CSM for OU-01 and the region.

2.5 Prior Sampling Locations and Results

PFAS data for soil, groundwater, sediment, and/or surface water samples from the following sites or investigations were used for this review and represent the existing OU-01 dataset:

- First Street Site (80 1st Street, Hoosick Falls, NY)
- Interface Solutions Site (12 Davis Street, Hoosick Falls, NY)
- John Street Site (3 Lyman Street, Hoosick Falls, NY)
- Liberty Street Site (1 Liberty Street, Hoosick Falls, NY)
- McCaffrey Street Site (14 McCaffrey Street, Hoosick Falls, NY)
- Mechanic Street Site (1 Mechanic Street, Hoosick Falls, NY)
- River Road Site (21410 and 21446 State Route 22, Hoosick, NY)
- Hoosick Falls Landfill (Route 22, Hoosick, NY)
- United States Environmental Protection Agency (USEPA) soil sampling (various locations in OU-01; USEPA, 2016a; USEPA, 2016b; USEPA, 2016c; USEPA, 2016d; USEPA, 2016e)
- NYSDEC Satellite disposal sites (various locations in OU-01 and the region)
- NYSDEC Screening Level Soil Sampling (NYSDEC, 2018)

This existing OU-01 dataset includes approximately 2,200 groundwater samples, 1,600 soil samples, 120 surface water samples, and 60 sediment samples located within OU-01. Samples within the above datasets, located outside of OU-01, were also evaluated. The sections below present the current understanding of the nature and the extent of PFAS in soils, groundwater, surface water, and sediment

within OU-01 based on the various investigation findings completed to date, and the current understanding of hydrogeologic conditions and transport mechanisms related to historical PFAS uses and releases. Because all data summarized for this Work Plan Addendum have been previously submitted to the NYSDEC, the data are presented in concentration maps rather than in tables. Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are the most frequently detected PFAS within OU-01 and are also the only PFAS with New York State maximum contaminant levels (MCLs) and proposed soil guidance values; therefore, discussion of PFAS data herein is limited to PFOA and PFOS.

2.5.1 PFAS in Soil

The existing OU-01 dataset includes more than 1,600 soil samples available for evaluation. For discussions and figures herein, soil samples collected within one foot below ground surface (bgs) that begin at the ground surface are referred to as surface soil samples (e.g., 0-2 or 0-6 inches bgs). Soil samples collected within one foot bgs, but beginning some distance below the surface (e.g., 2-12 inches bgs) are referred to as near surface soil samples. Samples with bottom depths deeper than one foot bgs, regardless of starting depth, are referred to as subsurface soil samples. Soil cleanup objectives for PFAS have not been established and NYSDEC soil guidance values (NYSDEC, 2021c) for PFOA and PFOS were used for screening and comparison only. Comparisons of these guidance values to the soil sample results for PFOA and PFOS are summarized on the following concentration maps for PFOA and PFOS in soil:

- Figure 10A: PFOA in Surface Soil
- Figure 10B: PFOA in Near Surface Soil
- Figure 10C: PFOA in Subsurface Soil
- Figure 11A: PFOS in Surface Soil
- Figure 11B: PFOS in Near Surface Soil
- Figure 11C: PFOS in Subsurface Soil

PFOA soil concentrations in OU-01 above the restricted residential guidance value (33 nanograms per gram [ng/g]) are limited to samples collected at or near the Liberty Street and McCaffrey Street Sites (i.e., either on-site or along the municipal sewer lift station and overflow piping near the McCaffrey Street Site). However, PFOA soil concentrations greater than the residential guidance value (6.6 ng/g) and the unrestricted guidance value (0.66 ng/g) are found throughout OU-01 at sites that have been investigated and in off-site areas (i.e., off-site sampling at individual sites, USEPA sampling at Village athletic fields, and screening sampling by NYSDEC). The distribution of these PFOA concentrations throughout OU-01 and across the depth intervals is indicative of non-point sources impacting soil quality. Based on the current CSM, these non-point sources include air emission and deposition from sources within OU-01 and other regional/global/background sources. Data collected as a part of the regional air deposition study (C.T. Male and BEC, 2021b) show PFOA soils concentrations up to 44 ng/g and data qualitatively consistent with historical emission sources within the Village. Since this investigation was conducted outside of OU-01, the entirety of OU-01 lies within the area likely under the influence of air deposition from one or more potential sources which is being investigated and addressed under OU-03.

PFOS soil concentrations in OU-01 above the residential guidance value (8.8 ng/g) are limited to seven samples not associated with the McCaffrey Street Site. The remaining soil samples collected within OU-01 (over 1,600 samples) have PFOS concentrations below the residential guidance value (8.8 ng/g) or are otherwise non-detect. Except for the seven samples described, PFOS concentrations in soil within OU-01 are below those determined by NYSDEC to be consistent with background (NYSDEC, 2021a).

2.5.2 PFAS in Groundwater

The existing OU-01 dataset includes more than 2,200 groundwater samples available for evaluation. Each groundwater sample collected within OU-01 was categorized as "shallow," "deep," or "bedrock" based on the depth of the screen in the well from which the sample was collected: 1) wells screened in shallow unconsolidated materials, 2) wells screened in deep unconsolidated materials (in some cases extending into weathered bedrock), and 3) wells completed in bedrock. In accordance with NYSDEC guidance (NYSDEC, 2021c), PFOA and PFOS in groundwater samples were compared to the New York State (NYS) MCL of 10 nanograms per liter (ng/L; or parts per trillion [ppt]). Maps of the maximum PFOA and PFOS concentrations in shallow, deep, and bedrock groundwater samples at each location are provided on Figure 12 and Figure 13, as listed below.

- Figure 12A: PFOA in Shallow Groundwater
- Figure 12B: PFOA in Deep Groundwater
- Figure 12C: PFOA in Bedrock Groundwater
- Figure 13A: PFOS in Shallow Groundwater
- Figure 13B: PFOS in Deep Groundwater
- Figure 13C: PFOS in Bedrock Groundwater

PFOA concentrations exceeding 10 ng/L are found in shallow groundwater throughout OU-01, with few exceptions. PFOA concentrations exceeding 1,000 ng/L have been detected in wells associated with investigations at several sites. In each case, shallow groundwater flow directions support the conceptual model that PFOA concentrations exceeding 1,000 ng/L generally originated from discharges to groundwater or are directly downgradient (i.e., along groundwater flow paths) from these sources. Thirty-one shallow monitoring wells in OU-01 are not currently on a groundwater flow path from a site (Table 1a). PFOA concentrations at these wells range from 78 ng/L to 5,300 ng/L, with a geometric mean of 412 ng/L. PFOA concentrations at these shallow wells not on a groundwater flow path from a site may be attributed to PFOA concentrations in soil (followed by leaching from soil to groundwater) from a variety of potential activities including historical air deposition, unregulated off-site disposal or burning by third parties, the municipal sewer system, or the pre-2016 municipal water supply.

In deep groundwater, PFOA concentrations exceeding 10 ng/L within OU-01 are generally limited to the extent of the deep sand and gravel unit (see Section 2.1). PFOA concentrations exceeding 1,000 ng/L primarily coincide with the deep transmissive zone and have been detected in wells associated with investigations at several sites. Deep groundwater PFOA concentrations are lower than shallow groundwater PFOA concentrations in nested wells throughout OU-01, reflecting the surficial sources and

downward migration of PFOA in most areas. The exception is in the area between the John Street and McCaffrey Street Sites, where PFOA may have migrated with shallow groundwater toward the deep transmissive zone where the semi-continuous confining unit is thinner or absent (primarily near the McCaffrey Street Site). In this area, shallow groundwater PFOA concentrations are similar to or lower than deep groundwater PFOA concentrations. Ongoing operation of the McCaffrey Street GWC&T IRM extraction wells minimizes migration of PFOA in groundwater southward toward the deep transmissive zone. Twenty-five deep monitoring wells in OU-01 are not on a groundwater flow path from a site under current conditions (Table 1b). PFOA concentrations at these wells range from 0.51 ng/L to 790 ng/L, with a geometric mean of 17 ng/L. Thirteen deep wells not on a groundwater flow path from a site have PFOA concentrations exceeding 10 ng/L; these wells generally underlie shallower nested wells with higher PFOA concentrations, so deep groundwater PFOA concentrations are likely attributed to downward movement of PFOA in shallow groundwater.

PFOA concentrations in bedrock exceeding 10 ng/L at known sites appear to be correlated with areas of relatively shallow bedrock (e.g., MC-MW-19 and RR-MW-015BR). Of the 19 bedrock wells installed in OU-01 during site investigations, five wells have non-detectable PFOA, eight wells have detectable PFOA less than 10 ng/L, and six wells have a maximum PFOA concentration exceeding 10 ng/L, of which one well (MC-MW-19) had a maximum PFOA concentration exceeding 1,000 ng/L.

PFOS concentrations in shallow groundwater exceeding 10 ng/L occur at several sites under investigation and at monitoring wells not on a groundwater flow path from a site. However, PFOS concentrations are much lower than PFOA concentrations throughout OU-01, and do not appear to be correlated with PFOA concentrations (that is, relatively high PFOS concentrations do not necessarily coincide with high PFOA concentrations). Only 36 of the 174 shallow monitoring wells within OU-01 (21%) have a maximum sampled PFOS concentration exceeding 10 ng/L and only two of those wells have PFOS concentrations exceeding 100 ng/L (160 ng/L and 120 ng/L at MC-GP22 and MC-GP02, respectively). Based on the concentrations and distribution, the PFOS in shallow groundwater may also be a result of sources other than those identified as sources of PFOA in OU-01 (i.e., background levels, unregulated disposal, commercial/consumer goods, firefighting foam).

PFOS concentrations in deep groundwater exceeding 10 ng/L occur at the seven wells within OU-01. These wells generally underlie or are downgradient from shallower monitoring wells with higher PFOS concentrations, so deep groundwater PFOS concentrations are attributed to downward movement of PFOS with shallow groundwater.

PFOS concentrations do not exceed 10 ng/L at any of the bedrock monitoring wells that have been sampled for PFOS.

As of April 2019, the NYSDOH and NYSDEC had sampled and tested for PFOA in more than 1,500 privately owned drinking water wells within the Town of Hoosick and surrounding areas (ERM and CHA, 2020). OU-01 is within and covers less than 5% of the broad area in which private well sampling has been conducted. The sampled private well locations are shown on Figures 12 and 13; however, due to data privacy considerations, PFOA and PFOS analytical data from the NYSDOH private well sampling program are not color-coded on these figures. The private well PFAS data provide information regarding PFAS

concentration occurrence and distribution, which supplements data collected from the OU-01 monitoring well network.

2.5.3 PFAS in Surface Water

Surface water samples have been collected within OU-01 as a part of investigations related to individual sites and screening level sampling conducted by NYSDEC. The existing OU-01 dataset includes more than 120 surface water samples available for evaluation. The samples have been collected from the Hoosic River, tributaries to the Hoosic River, ponds, springs, and manmade drainages. Although some samples were collected at sites, many others were collected at locations that were upgradient or downgradient from individual sites. Additionally, surface water samples have also been collected outside of OU-01 but are relevant to discussions herein as they are upstream or downstream of OU-01.

Several sampled tributaries and drainage swales that feed tributaries or the Hoosic River are unnamed and flow seasonally at highly variable rates of discharge. Some locations, within the Hoosic River for example, have been sampled periodically (up to 10 sampling events) and many others have been sampled only once. Additionally, several surface water samples were collected along the eastern shore of the Hoosic River near the First Street Site at identified preferential groundwater discharge locations in coordination with porewater sampling. This sampling was conducted as a part of the John Street Site investigations to evaluate the groundwater to surface water transport pathway (Honeywell, 2020).

In accordance with NYSDEC guidance (NYSDEC, 2021c), PFOA and PFOS in surface water samples were compared to the NYS MCL of 10 ng/L as surface water standards have not been established. Thus, evaluation of results in comparison to the MCLs for PFOA and PFOS is for screening purposes only, and a value greater than the MCL does not represent an exceedance or indication of risk. Maps depicting the maximum PFOA and PFOS concentrations in surface water samples at each sampling location are provided on the figures listed below.

- Figure 14: PFOA in Surface Water
- Figure 15: PFOS in Surface Water

PFOA concentrations in surface water greater than 1,000 ng/L have been detected in samples collected during investigations of the Hoosick Falls Landfill, Thayers Pond, and the Liberty Street Site. PFOA concentrations in surface water samples from various small tributaries, streams, and drainages of the Hoosic River within OU-01 have ranged from 200 to 600 ng/L, including locations upstream from known or suspected sources. Also, surface water samples collected from a drainage ditch adjacent to the former Village of Hoosick Falls Landfill, just north of the OU-01 boundary to the east of the Hoosic River, had PFOA concentrations of more than 10,000 ng/L.

The dataset evaluated includes more than 44 surface water samples from the main channel of the Hoosic River within OU-01, with a median PFOA concentration of 13 ng/L and a mean PFOA concentration of 17 ng/L. The two highest of these OU-01 Hoosic River PFOA concentrations (130 ng/L and 64 ng/L) were collected at preferential groundwater discharge locations near the First Street Site, as discussed above, and demonstrate a completed transport pathway from groundwater to surface water that is consistent

with hydrogeologic evaluations (Section 2.1.4). 2016 NYSDEC screening sampling of surface water upstream from OU-01 documented PFOA concentrations up to 14 ng/L within the main channel of the Hoosic River and up to 130 ng/L in major tributaries of the Hoosic River (NYSDEC, 2016).

PFOS concentrations greater than 10 ng/L are infrequent in surface water samples collected in OU-01 and are only found in four samples within OU-01. No surface water samples within the existing OU-01 dataset yielded PFOS concentrations greater than 100 ng/L. However, it is notable that a surface water sample from a drainage ditch adjacent to the former Village of Hoosick Falls Landfill, just north of the OU-01 boundary on the east side of the Hoosic River, yielded a PFOS concentration of 150 ng/L.

PFAS can be directly released or deposited to surface water, but also may reach surface water because of leaching and runoff from soils and discharges from groundwater. All these pathways are relevant within OU-01 and likely overlap. The PFAS concentrations in surface water are highly variable across short distances and appear potentially related to the size and flow of water bodies. Since many smaller tributaries and manmade drainages to the Hoosic River may flow only seasonally, dissolution of PFOA and PFOS from surface soils likely plays a larger role in surface water concentrations in smaller water bodies. Notwithstanding these challenges, PFAS concentrations detected in certain OU-01 surface water samples are indicative of sources within OU-01. However, PFAS surface water concentrations upstream of known and suspected sources within OU-01, and upstream of OU-01, are also indicative of other significant PFAS sources upstream of and near OU-01. Similar to soil, the broad distribution of these PFAS concentrations in surface water is indicative of non-point sources impacting the ground surface, potentially including air emissions and deposition within OU-01 and other regional/global/background emissions sources which is being investigated and addressed under OU-03.

In addition to the proposed investigation included in this Work Plan Addendum (Section 3.2), additional sampling and screening level evaluation of surface water and sediments was recently completed for the region (C.T. Male and BEC, 2021e). Also, analytical results from surface water and sediment sampling recently conducted as part of the OU-01 risk assessment have been received. Since surface water in the region flows into or from OU-01, the results of all investigations in the region will be considered when evaluating surface water within OU-01.

2.5.4 PFAS in Sediment

Sediment samples collected within OU-01 were generally collocated with surface water samples as discussed above (Section 2.5.3), when sufficient sediment for sampling existed. The existing OU-01 data set includes more than 40 sediment samples available for evaluation. NYSDEC guidance values do not currently exist for PFOS and PFOA in sediment, but the included figures and discussions employ the same guidance values as the soil figures for comparison. Maps depicting the maximum PFOA and PFOS concentrations in sediment samples at each sampling location are provided on the figures listed below.

- Figure 16: PFOA in Sediment
- Figure 17: PFOS in Sediment

PFOA detections in sediment are widespread in OU-01, with exceptions primarily existing in several of the Hoosic River sampling locations and three locations between the Hoosic River and the River Road Site. Most detections of PFOA in OU-01 sediment were less than 6.6 ng/g. Several samples within an unnamed creek flowing along the western edge of the Liberty Street Site, several samples associated the Hoosick Falls Landfill, one location associated with the McCaffrey Street Site, and two samples just outside of OU-01 associated with the NYSDEC satellite disposal site investigation yielded concentrations above 6.6 ng/g. The maximum PFOA concentration in these samples was 15 ng/g.

PFOS detections within OU-01 sediment are less frequent. PFOS detections in sediment were limited to samples collected within discrete areas at or near several sites. All PFOS detections in OU-01 sediment were less than 8.8 ng/g.

Concentrations of PFOA and PFOS in sediment within OU-01 generally correlate with surface water sampling results and are therefore likely indicative of the same sources within and outside of OU-01, and transport pathways as discussed above (Section 2.5.3). In addition to the proposed surface water sampling included in this Work Plan Addendum (Section 3.2), additional sampling and screening level evaluation of sediments, collocated with surface water samples, is planned for the region (C.T. Male and BEC, 2021e).

3.0 Proposed Scope of Work

The proposed scope of work addresses data gaps identified through the evaluation of prior sampling results (Section 2.5). The locations of proposed sample locations are presented on Figure 18, and Table 2 provides a summary of the proposed sampling, including proposed analysis, depths, and sample rationale.

3.1 Soil and Groundwater Investigation

The distribution of PFAS in soil and groundwater in OU-01 near sources/sites has been well characterized as described in Section 2.5. Additionally, hydrogeological conditions and groundwater flow within most of OU-01 are well understood as described in Section 2.1. Much of the soil and groundwater data collected to date within OU-01 were focused primarily to evaluate the nature and extent of impacts from direct discharges/leaks from specific industrial sites and downgradient locations. However, based on the thousands of soil and groundwater samples collected to date within OU-01 and the region, the following can be inferred.

First, there are multiple suspected sources for direct releases of PFAS to the environment within OU-01. The impacts from these suspected sources are well delineated in soil and groundwater at the scale of OU-01 given the well understood groundwater flow and the current CSM. Therefore, additional soil and groundwater sampling to delineate direct releases at these suspected sources is not necessary.

Second, relatively consistent concentrations of PFAS are observed in soil and groundwater throughout OU-01, including areas not located near suspected sources or on direct groundwater flow paths from suspected sources. This indicates that PFAS release mechanisms other than direct discharge/leaks from potential sources are largely the source of PFAS at these locations. Furthermore, surface soil PFAS concentrations in OU-01 also indicate that releases occurred to the ground surface. Potential widespread PFAS release mechanisms to the ground surface could be historical air deposition (being investigated under OU-03) and/or the pre-2016 municipal water supply (for example, through irrigation; being investigated under OU-01).

Data from the regional air deposition study (C.T. Male and BEC, 2021b) show PFOA concentrations in soils up to 44 ng/g. The sample locations were carefully vetted to preclude other potential sources (e.g., direct discharges, disposal, or pre-2016 water supply irrigation) and the results are indicative of PFAS emission sources within the Village. This investigation was conducted more than 1,000 feet outside of the Village and additional investigation farther away from the Village is ongoing (C.T. Male and BEC, 2021c). Therefore, the entirety of OU-01 and any sampling locations therein, likely lies within the area influenced by air deposition from historical PFAS emission sources within the Village (i.e., OU-03). Because nearly all of the prior soil and groundwater samples in OU-01 are from properties within the municipal water supply area, the existing dataset cannot be used to distinguish definitively between the relative impacts from historical air emissions (i.e., OU-03) and the pre-2016 municipal water supply (i.e., OU-01). This data gap is addressed herein.

The purpose of the soil and groundwater investigation proposed herein is to evaluate the relative impact of two PFAS release and transport pathways potentially responsible for the observed PFAS concentrations

within OU-01: historical air emissions and the pre-2016 municipal water supply. Specifically, the proposed sample locations have been selected because they would have been potentially subject to air deposition but would not have been subject to potential PFAS impacts from the pre-2016 municipal water supply (i.e., irrigation). The proposed scope of work includes (Figure 18 and Table 2):

- Installation of five groundwater monitoring well nests in locations that are outside of and upgradient to the municipal water supply area. The locations are also upgradient of known or suspected PFAS sources and have remained undisturbed since approximately 1960 based on a review of historical aerial photographs. Additionally, the proposed monitoring wells fill in geographic gaps along the eastern edge and northwestern corner of OU-01. Shallow groundwater monitoring wells will be installed in all locations and deep monitoring wells will be installed where unconsolidated deposits are sufficiently thick to screen a second well. In addition to sampling groundwater for PFAS and measuring groundwater elevations, soil samples (as described below) will be collected during well installation.

- Soil sampling at nine locations (five monitoring well locations plus four additional locations) not impacted from pre-2016 Village water distribution and undisturbed since approximately 1960. Soil samples will be collected from three depth intervals (0-2 inches bgs, 2-12 inches bgs, and 12-24 inches bgs).

Monitoring well installation, development, groundwater sampling, and soil sampling will be conducted according to the methods specified in the most recent Field Sampling Plan (FSP; C.T. Male and BEC, 2020a). Groundwater samples will be submitted for laboratory analysis of PFAS; TCL volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides and polychlorinated biphenyls (PCBs); TAL metals (including mercury); and cyanide. Soil samples will be submitted for laboratory analysis of PFAS; TCL VOCs, SVOCs, pesticides, PCBs; TAL metals (including mercury); cyanide; total organic carbon (TOC), and moisture content. All samples will be analyzed in accordance with the most recent QAPP (C.T. Male and BEC, 2020b).

3.2 Groundwater/Surface Water Connection in OU-01

The groundwater and surface water in OU-01 near sources have been well characterized as described in Section 2.5. Sampling surface water upstream and/or outside of OU-01 has been completed and with more planned. Groundwater flow within OU-01 is well understood as described in Section 2.1. Based on the data to date within OU-01 and the region, the following can be inferred.

First, both shallow and deep groundwater within OU-01 ultimately discharge to the Hoosic River with potential discharge areas including the reach of the river west and north of the McCaffrey Street Site as described in Section 2.1.4. A focused investigation at preferential groundwater discharge locations has also demonstrated that the transport pathway from groundwater to the Hoosic River in OU-01 is completed and additional preferential discharge locations may exist (Sections 2.1.4 and 2.5.3). Additional sampling and screening level evaluation of surface water and sediments has been conducted in the Region (C.T. Male and BEC, 2021e). This includes sampling in the Hoosic River upstream and downstream of OU-01 under baseflow conditions (e.g., conditions when groundwater accounts for its largest amount

of flow in the river). Results from this sampling may be used to evaluate potential influence of OU-01 groundwater discharge on PFAS concentrations in the Hoosic River.

Second, data from Hoosic River locations upstream of OU-01 and sampling from tributaries contributing to the Hoosic River indicate that PFAS is present in surface water before entering OU-01 (Section 2.5.3). The existing dataset is not sufficient to evaluate potential changes in overall PFAS concentrations within the full width of the Hoosic River as it passes through OU-01. This is because many of the existing surface water samples have been collected at different times (i.e., different flow rates and river stages) and were for near shoreline locations. This is addressed with sampling proposed herein.

The purpose of the surface water sampling proposed herein is to evaluate the PFAS concentrations across the full width of the Hoosic River as it passes through OU-01. This will be accomplished by conducting surface water sampling and evaluation at four proposed transects of the Hoosic River. The sampling transects are proposed at the following locations (Figure 18 and Table 2):

- Upstream of Village near OU-01 southern boundary (transect 1)
- Downstream of falls in the Hoosic River (transect 2)
- Downstream of Village WWTP near OU-01 northern boundary (transect 3)
- Downstream of Hoosick Falls Landfill and Thayers Pond (transect 4)

The proposed scope of work includes completing a cross-sectional survey of the river at each transect to obtain a width and depth profile. Throughout each transect, measurements will be completed for stream velocity, surface temperature, and bottom temperature. Additionally, up to six surface water samples will be collected across the width of the river at each transect. These grab samples will be collected at the mid-point of the water column along each transect based on the cross-sectional survey, with the goal of evaluating PFAS concentrations across the full width of the river at each transect. Also, the sampling at each of these transects will be coordinated so that they are collected within a similar time period under similar flow conditions. The results of this proposed scope of work will be utilized to evaluate in-river concentrations of PFAS upgradient, within, and downstream of OU-01.

Surface water samples will be collected according to the methods specified in the approved FSP (C.T. Male and BEC, 2020a). Surface water samples will be submitted for laboratory analysis of the following in accordance with the most recent QAPP (C.T. Male and BEC, 2020b): PFAS; TCL VOCs, SVOCs, pesticides and PCBs; TAL metals (including mercury); and cyanide.

3.3 Municipal Sewer Evaluation

The municipal sewer system will be evaluated to determine whether the sewer system functions as a transport pathway for PFAS in OU-01 under two potential scenarios:

1. Transport of PFAS-containing wastewater from Village homes and/or businesses to the WWTP,
2. Transport of PFAS-impacted groundwater through the sewers.

The proposed scope of work to evaluate each of these scenarios is provided in the following sections. To complete an evaluation of the municipal sewer system, a greater understanding of the Village sewer

conditions is necessary. Therefore, we may request the assistance of the NYSDEC in obtaining additional mapping, reports, and records of the sewer system from the Village.

There exists a potential for both direct impacts to subsurface soil in the direct vicinity of the municipal sewer structure, and also for indirect impacts to other media (e.g., groundwater, surface water) through various transport pathways as described above. These potential impacts would either be localized, or otherwise comingled and indistinguishable from other releases and pathways (e.g., other sites, plumes), and not likely to impact future remedial evaluations or activities. While the municipal sewer may have historically contributed PFAS into the environment, the available data do not indicate that this potential transport mechanism is a significant contributor of PFAS in OU-01 beyond those locations already identified through investigation. For this reason, additional borings near sewer piping are not included in this work plan.

3.3.1 PFAS Transport to WWTP

Two influent wastewater samples were collected from the Village WWTP for PFAS analysis on June 23, 2021. A description of the sample collection methods and results were submitted to the NYSDEC in an email on August 27, 2021. A table that summarizes the validated PFAS results for the two samples is provided in Appendix C. In summary, the concentration of each individual PFAS was less than 10 ng/L except for PFOA, which was detected at 210 ng/L and 190 ng/L. These results confirm that PFOA is the primary COC in OU-01, and PFAS-containing wastewater is being transported to the WWTP.

To determine the source(s) of the PFAS in the WWTP influent, wastewater samples will be collected from predetermined locations throughout the piping network following further evaluation of anticipated sewer system information from the Village and input from NYSDEC. If the requested sewer information is not obtained, the scope of work will include the collection of up to eight wastewater samples from major branches of the sewer system prior to their discharge into the main sewer line in an attempt to trace the source of PFAS in the WWTP influent.

An evaluation of the micro-filtration backwashing operations at the WTP will also be completed to estimate the volume of water used in the process and PFAS concentrations in the backwash water discharged to the sewer.

3.3.2 Transport of PFAS-Impacted Groundwater through Sewer

Evaluation of the potential for groundwater to infiltrate the sewer system requires an understanding of the sewer invert elevations (i.e., the elevation of the inside bottom of the sewer pipe within a manhole and extrapolation between manholes) relative to seasonal groundwater elevations, and sewer hydraulics (i.e., operation of lift stations). The goal of this evaluation is to identify and sample selected sections of the municipal sewer where infiltration of contaminated groundwater into the municipal sewer system would be the most likely (i.e., below the elevation of groundwater with relatively high PFOA concentrations) or least likely (i.e., well above the elevation of groundwater). With or without the sewer information (including invert elevations) from the Village, the following activities are proposed:

- Gather, review and evaluate groundwater levels in all shallow monitoring wells within the Village for which data is readily available.

- Prepare seasonally high and low groundwater elevation contour maps for the shallow groundwater within the entire Village. These will be based on historical gauging data in areas where available, or on inferred/estimated groundwater elevations in areas outside of the permanent monitoring well networks (Section 2.4.1).

- Review available sewer system record mapping and reports to establish, to the extent possible, the invert elevations of municipal sewer piping at select manholes throughout the Village. Develop a map of invert elevations (e.g. recorded, apparent, or inferred) throughout the Village.

- In consultation with NYSDEC, determine separation distances (between the seasonally high shallow groundwater elevation and the invert elevations) that will be used to identify high and low probability areas of groundwater contact with municipal sewer piping.

- Using separation distance, establish zones of low and high probability (e.g., sewer infrastructure maps overlayed with color shaded areas and PFOA isoconcentrations) where shallow groundwater may contact the municipal sewer infrastructure. Provide drafts for NYSDEC review and consideration prior to selecting or collecting the subject samples as described below.

- Sampling of sewer sections[3] will be conducted by collecting aqueous samples from specific sets of manholes (i.e., one manhole upstream and one manhole downstream). Ultimately, one (1) section within the low probability zone, and three (3) sections within the high probability zones will be selected for sampling using the following criteria:

    - Gravity drained piping, rather than pressurized piping (e.g., immediately downstream of a lift station);

    - Sections of piping that are constructed of a masonry material, such as Orangeburg, concrete or ceramic type materials. Sewer piping installed later than circa 1970 and confirmed to be constructed of a plastic material will not be selected for sampling. Manholes will be opened and inspected to confirm the piping material;

    - Sections of the municipal sewer system that have been repaired or replaced since circa 1970s will not be further evaluated; and

    - Sections near relatively higher PFOA concentration in the shallow groundwater will rank higher in terms of sampling. Sections near relatively lower PFOA concentrations will rank lower.

[3] A "section" of municipal sewer piping is defined as piping and associated manholes which are positioned in a straight line and could potentially incorporate several Village blocks.

- The results for sampling described above will be used to compare the upstream and downstream PFOA concentrations in these municipal sewer sections with shallow groundwater concentrations[4] nearby.

If necessary, wastewater-sampling methods will be developed and submitted to NYSDEC in a detailed sampling plan including plans for laboratory analysis. If necessary, groundwater samples will be collected according to the methods specified in the approved FSP (C.T. Male and BEC, 2020a), and submitted for laboratory analysis in accordance with the most recent QAPP (C.T. Male and BEC, 2020b):

[4] If the sections of the sewer piping selected for sampling are in areas of limited groundwater elevation and/or groundwater concentrations, direct push screen-point sampling equipment may be utilized if needed to collect a representative groundwater sample for PFAS analysis.

4.0 Data Validation, Reporting and Schedule

Analytical data validation will be conducted by an independent data validator in accordance with previously approved methods (C.T. Male, 2016). Analytical data gathered during the work described in this Work Plan Addendum will be shared with NYSDEC as part of periodic data submittals. The detailed evaluation of the data, conclusions, and recommendations will be included in the RI Report. Upon NYSDEC acceptance of this Work Plan Addendum, the work will be scheduled for completion as soon as practicable.

5.0 References

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Figures

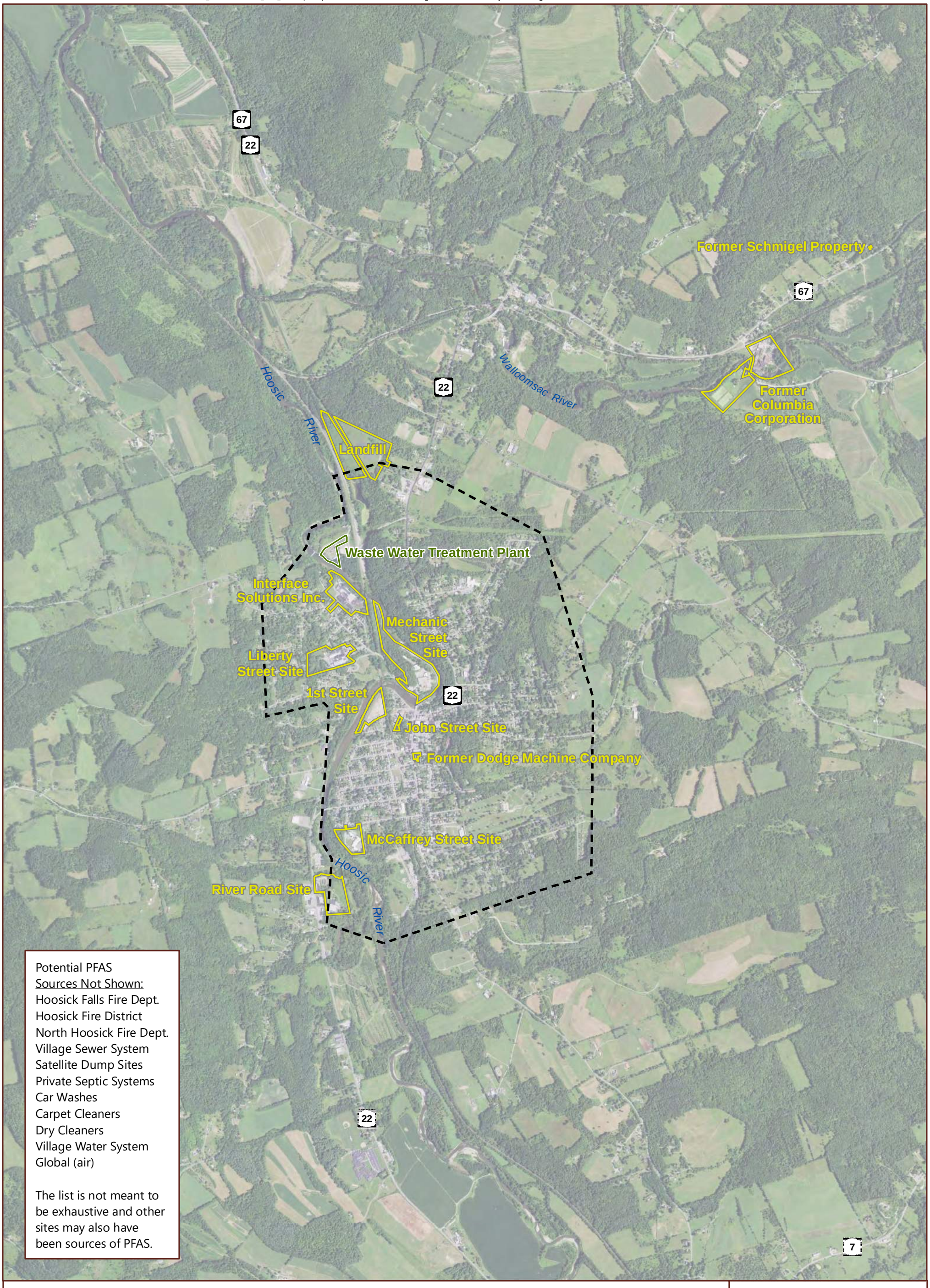
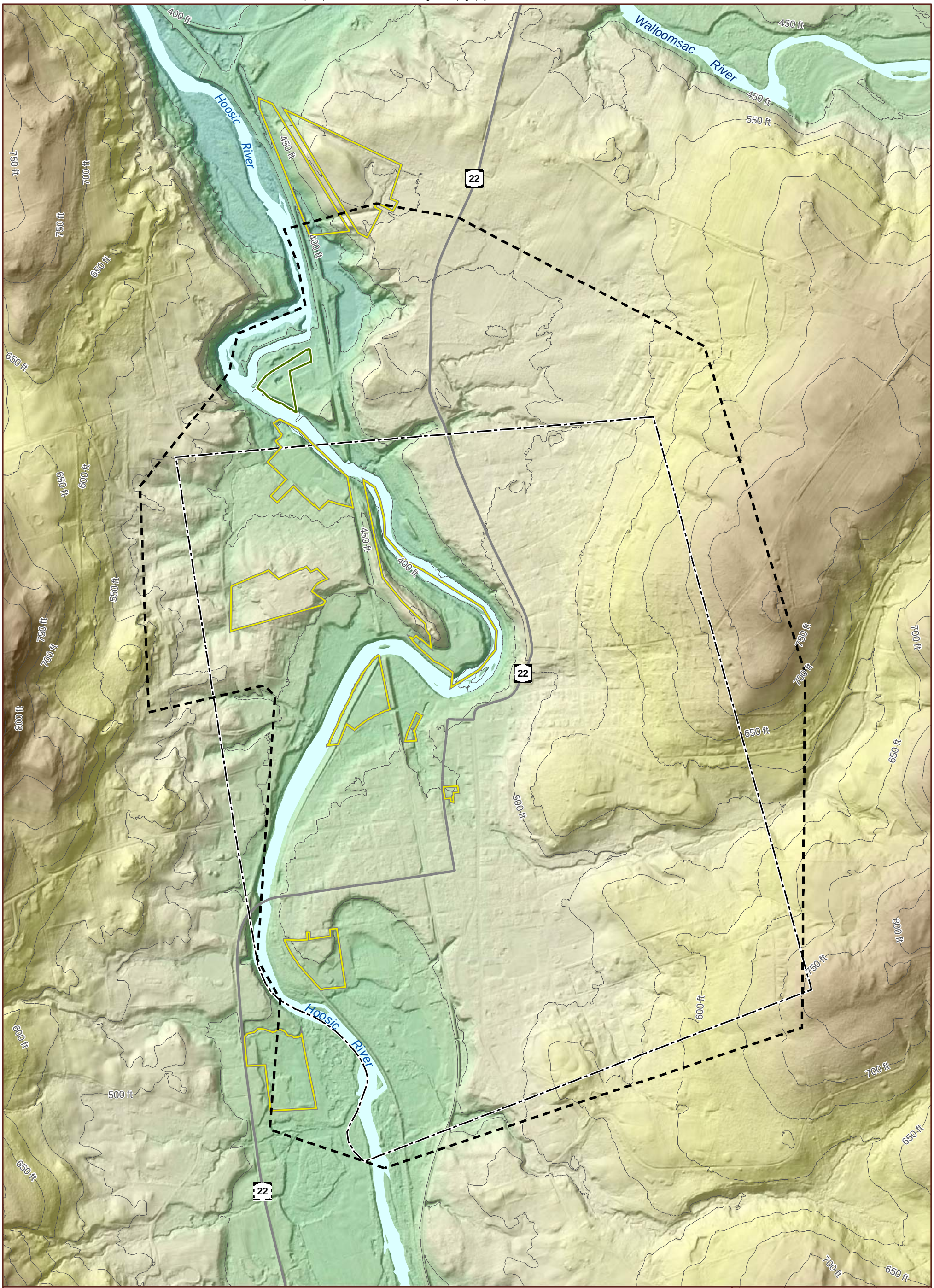


FIGURE 1

OU-01 BOUNDARY AND THE REGION

OU-01 Work Plan
Hoosick Falls, NY



50 ft Elevation Contour

Current OU-01 Boundary

DEC Class 2 or Class P Site

Waste Water Treatment Plant

Hoosick Falls Village Limits

N

0 500 1,000 1,500 2,000

Feet

FIGURE 2

TOPOGRAPHY OF OU-01

OU-01 Work Plan

Hoosick Falls, NY

BEC Footer: ArcGIS 10.8.1, 2022-06-02 11:06 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2022\OU-01 Work Plan\Figure 3 Bedrock Elevation.mxd User: bal

Bedrock Elevation Contour (20ft)

Bedrock Elevation

807 ft

252 ft

Current OU-01 Boundary

DEC Class 2 or Class P Site

Waste Water Treatment Plant

Hoosick Falls Village Limits

0 500 1,000 1,500 2,000

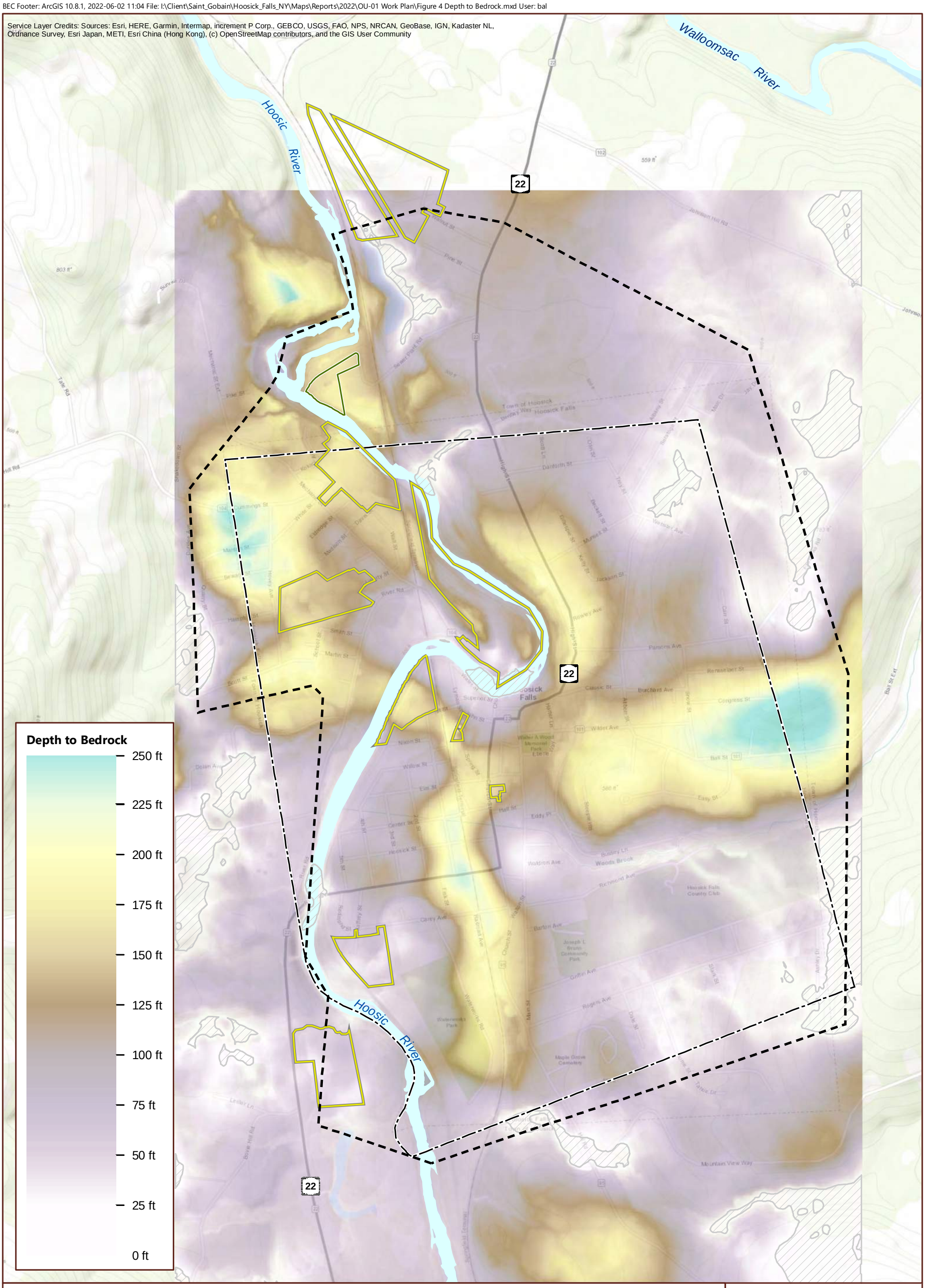
Feet

FIGURE 3

BEDROCK ELEVATION

OU-01 Work Plan

Hoosick Falls, NY



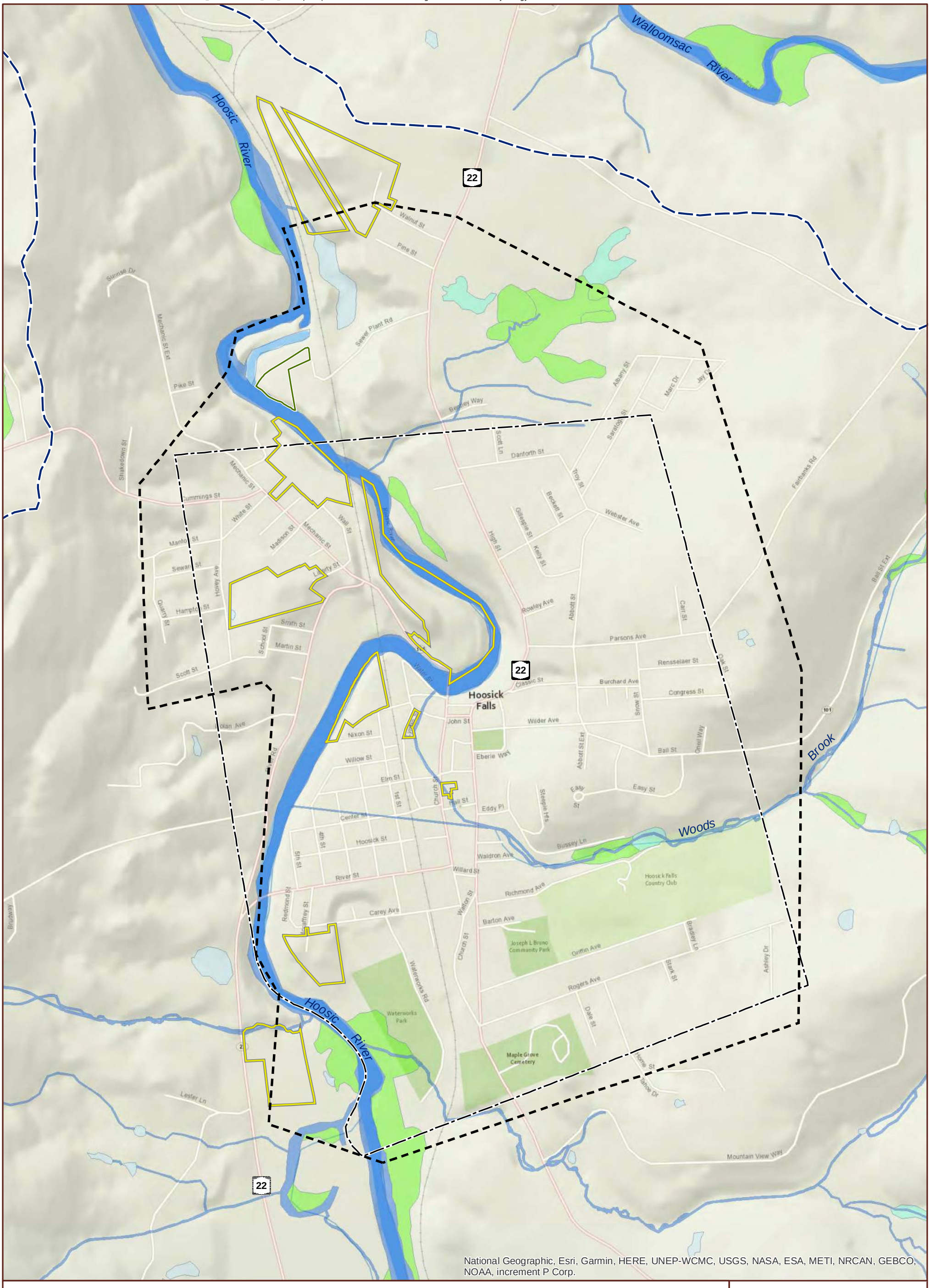
Bedrock at the Surface
Current OU-01 Boundary
DEC Class 2 or Class P Site
Waste Water Treatment Plant
Hoosick Falls Village Limits

N

0 500 1,000 1,500 2,000
Feet

FIGURE 4

DEPTH TO BEDROCK
OU-01 Work Plan
Hoosick Falls, NY



Wetlands (NWI)

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

- Watershed Boundary (HUC12)
- Current OU-01 Boundary
- DEC Class 2 or Class P Site
- Waste Water Treatment Plant
- Hoosick Falls Village Limits

N

0 500 1,000 1,500 2,000

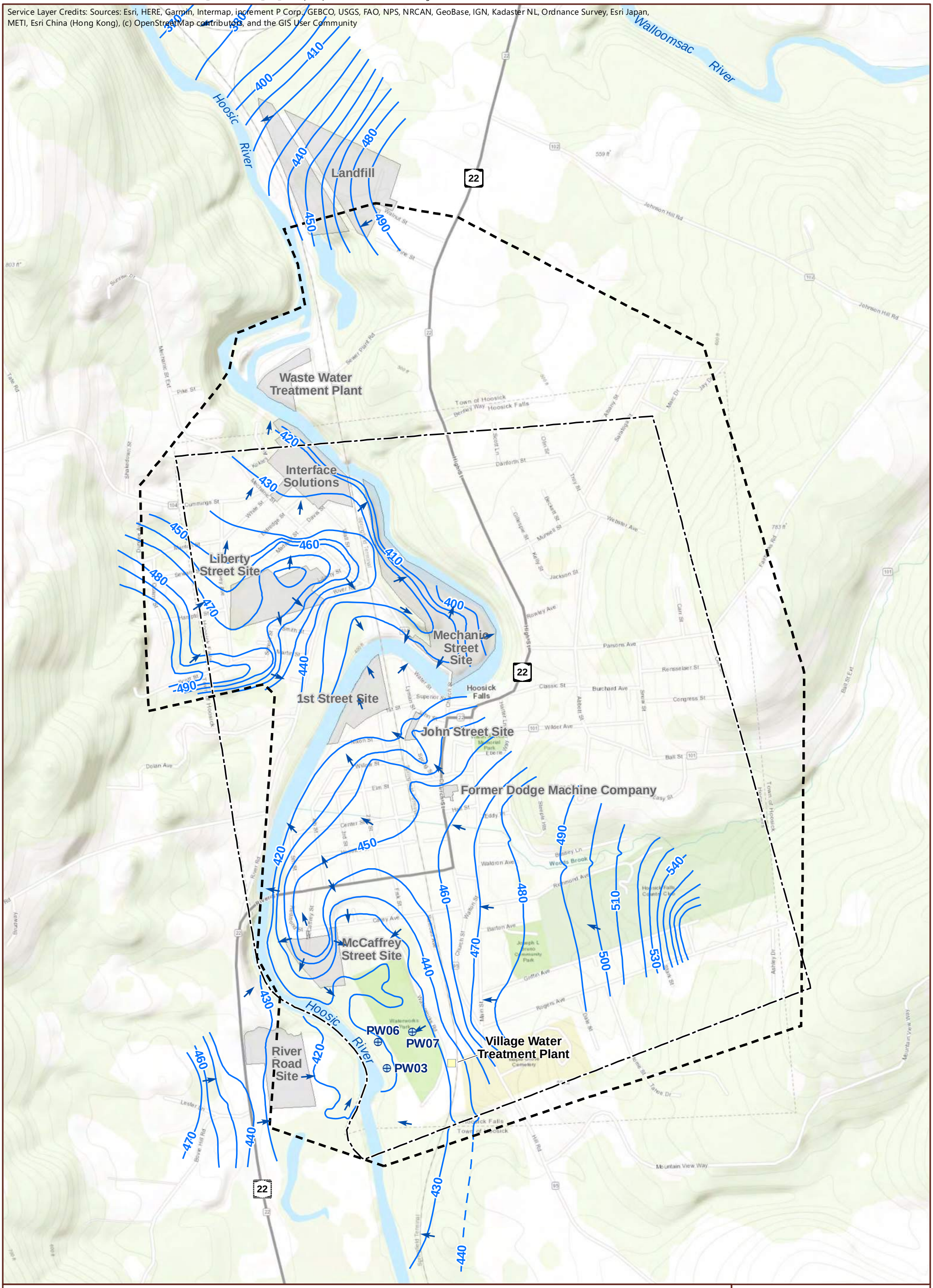
Feet

FIGURE 5

SURFACE WATER HYDROLOGY

OU-01 Work Plan

Hoosick Falls, NY



Groundwater Flow Direction
Groundwater Elevation Contour (10 ft)
Groundwater Elevation Contour (estimated)
Village Water Supply Well
Current OU-01 Boundary
Sites of Interest
Hoosick Falls Village Limits

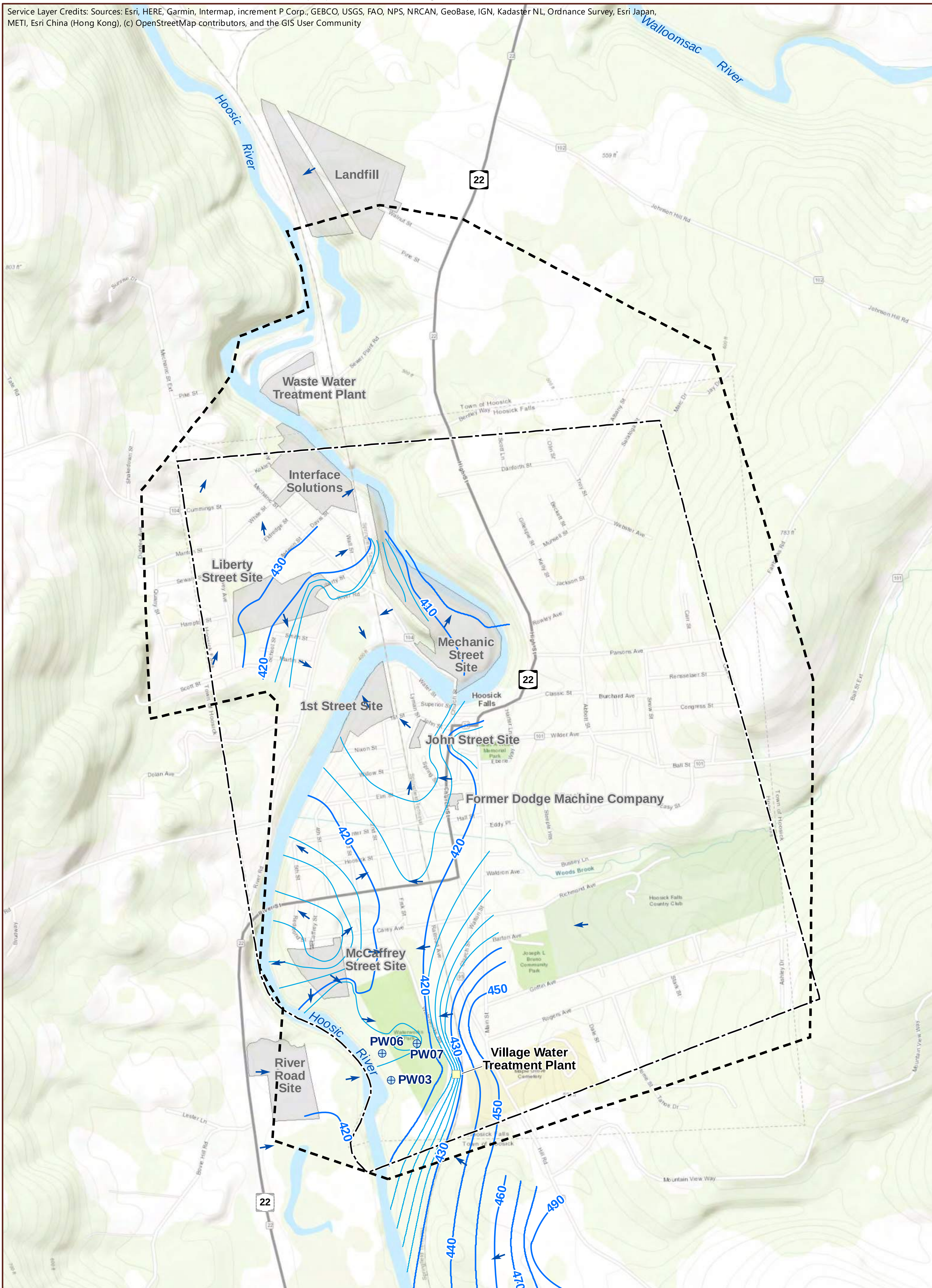
0 500 1,000 1,500 2,000
Feet

Further detail provided on Figure A1 included in Appendix A.

FIGURE 6

SHALLOW GROUNDWATER ELEVATIONS DECEMBER, 2020

OU-01 Work Plan
Hoosick Falls, NY



Groundwater Flow Direction

Groundwater Elevation Contour (10 ft)

Groundwater Elevation Contour (2 ft)

Village Water Supply Well

Current OU-01 Boundary

Sites of Interest

Hoosick Falls Village Limits

Further detail provided on Figure A4 included in Appendix A.

N

0 500 1,000 1,500 2,000

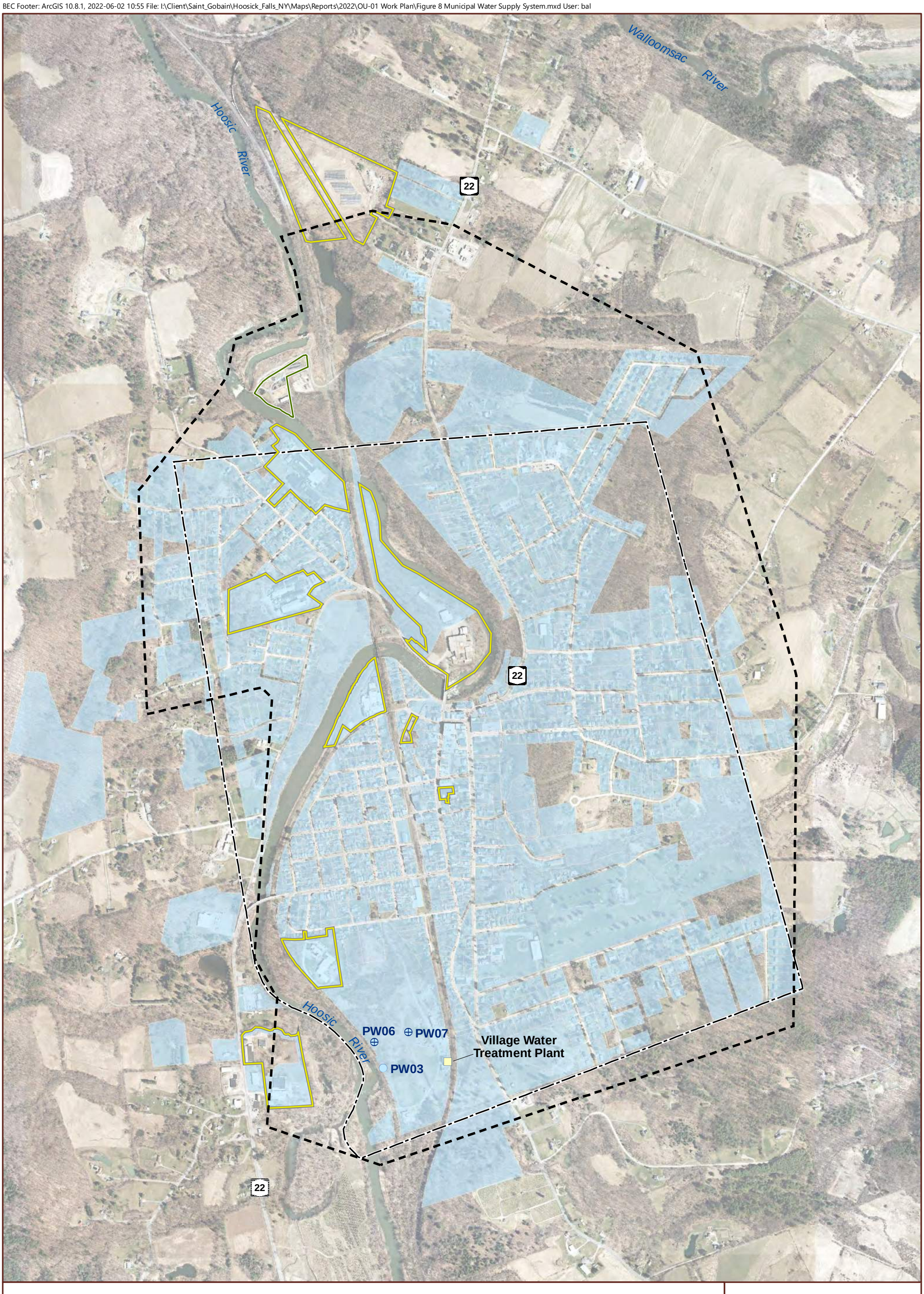
Feet

FIGURE 7

DEEP GROUNDWATER ELEVATION DECEMBER, 2020

OU-01 Work Plan

Hoosick Falls, NY



- Village Water Supply Well
- Village Water Supply Area*
- Hoosick Falls Village Limits
- Current OU-01 Boundary
- DEC Class 2 or Class P Site
- Waste Water Treatment Plant

*Based on information contained within Parcel data provided by Rensselaer County in August 2021.

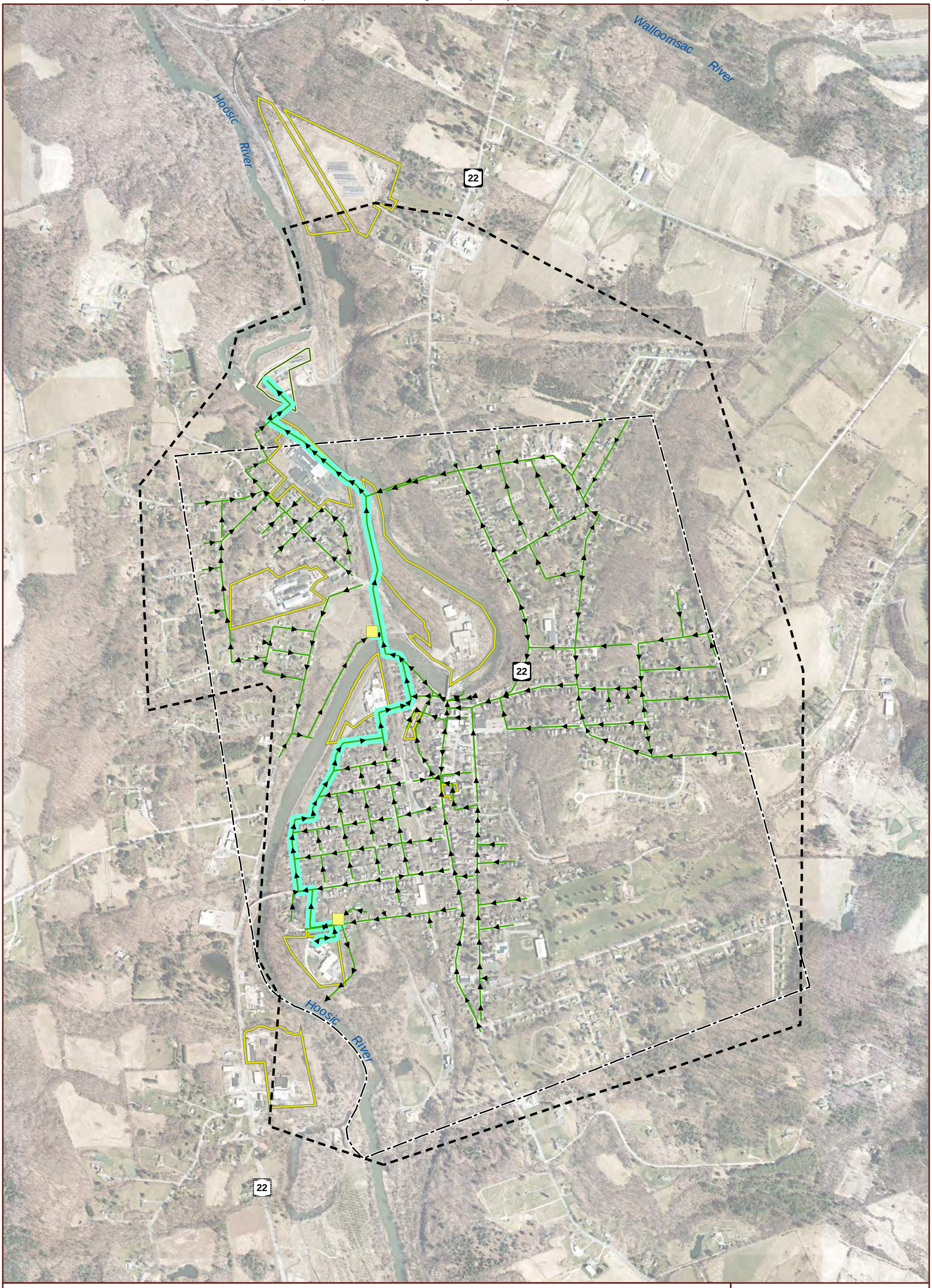
N

0 500 1,000 1,500 2,000
Feet

FIGURE 8

MUNICIPAL WATER SUPPLY SYSTEM
OU-01 Work Plan
Hoosick Falls, NY

BEC Footer: ArcGIS 10.8.1, 2022-06-02 10:50 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2022\OU-01 Work Plan\Figure 9 Municipal Sewer System.mxd User: bal



Lift Station
Sewer Line With Flow Direction
Main Sewer Line
(Potential Focus of Investigation)

Current OU-01 Boundary
DEC Class 2 or Class P Site
Waste Water Treatment Plant
Hoosick Falls Village Limits

N

0 500 1,000 1,500 2,000
Feet

FIGURE 9

MUNICIPAL SEWER SYSTEM
OU-01 Work Plan
Hoosick Falls, NY

Landfill
Waste Water Treatment Plant
Interface Solutions
Liberty Street Site
1st Street Site
Mechanic Street Site
John Street Site
Former Dodge Machine Company
McCaffrey Street Site
River Road Site
Hoosick Falls
Hoosick River
Walloomsac River
22
102
104
101
95

Maximum PFOA Concentration (ng/g)/Guidance Value Site Use

- Non-Detect - 0.66
- > 0.66/Unrestricted
- >6.6/Residential
- >33/Restricted Residential
- >500/Commercial

- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Limits

0 500 1,000 1,500 2,000
Feet

Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

FIGURE 10A

PFOA IN SURFACE SOIL
OU-01 Work Plan
Hoosick Falls, NY

Landfill
Waste Water Treatment Plant
Interface Solutions
Liberty Street Site
1st Street Site
Mechanic Street Site
John Street Site
Former Dodge Machine Company
McCaffrey Street Site
River Road Site
Hoosick River
Walloomsac River
Hoosick Falls
Town of Hoosick
22
102
104
101
95

Maximum PFOA Concentration * (ng/g)/Guidance Value Site Use

- Non-Detect - 0.66
- > 0.66/Unrestricted
- >6.6/Residential
- >33/Restricted Residential
- >500/Commercial

*Maximum concentration from all depths sampled.

- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Limits

Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

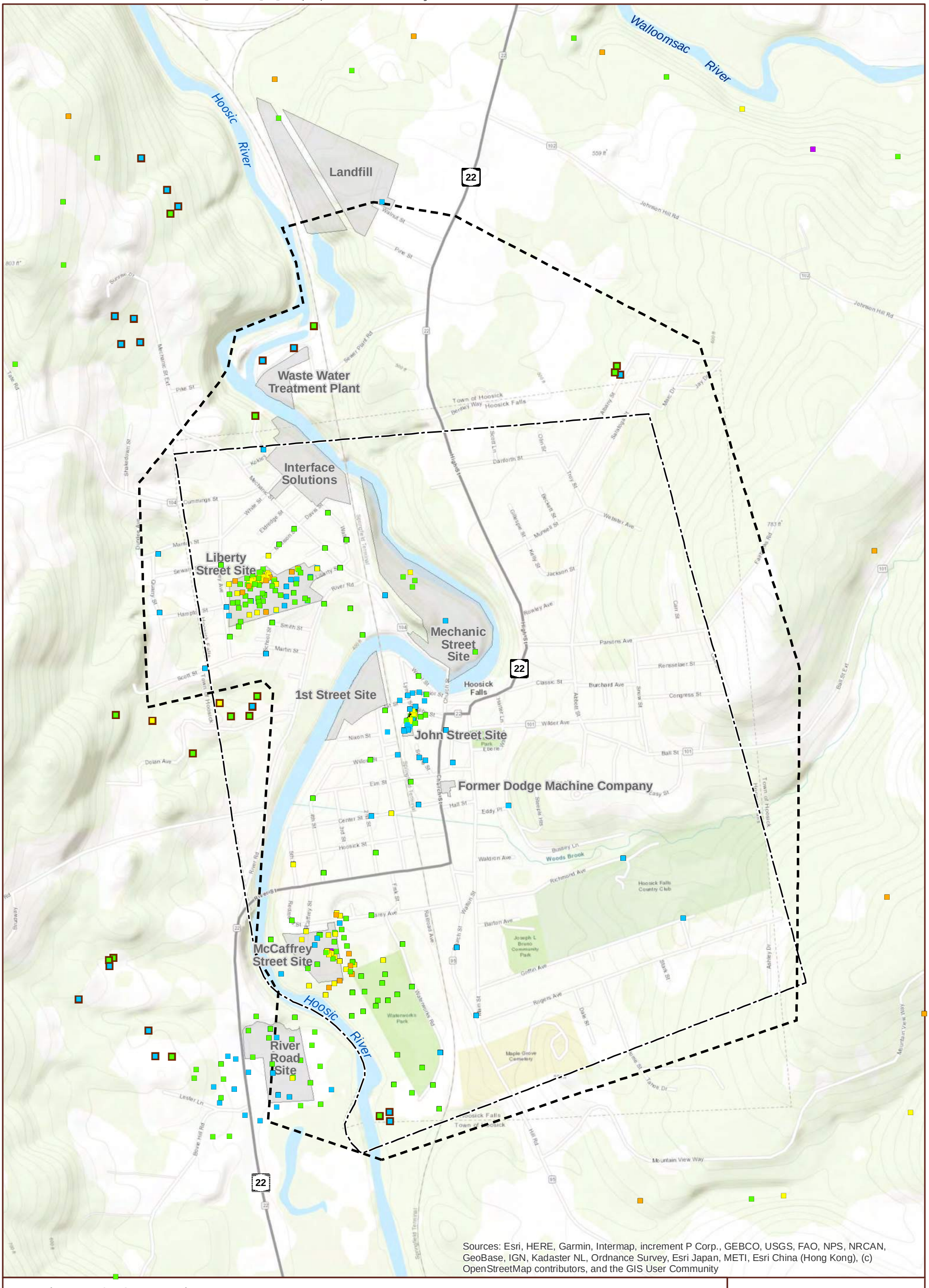
N

0 500 1,000 1,500 2,000
Feet

FIGURE 10B

PFOA IN NEAR SURFACE SOIL
OU-01 Work Plan
Hoosick Falls, NY

BEC Footer: ArcGIS 10.8.1, 2022-06-02 11:28 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2022\OU-01 Work Plan\Figure 10C PFOA in Sub-Surface Soil.mxd User: bal



Maximum PFOA Concentration* (ng/g)/Guidance Value Site Use

- Non-Detect - 0.66
- > 0.66/Unrestricted
- >6.6/Residential
- >33/Restricted Residential
- >500/Commercial
- Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

*Maximum concentration from all depths sampled.

- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Limits

N

0 500 1,000 1,500 2,000

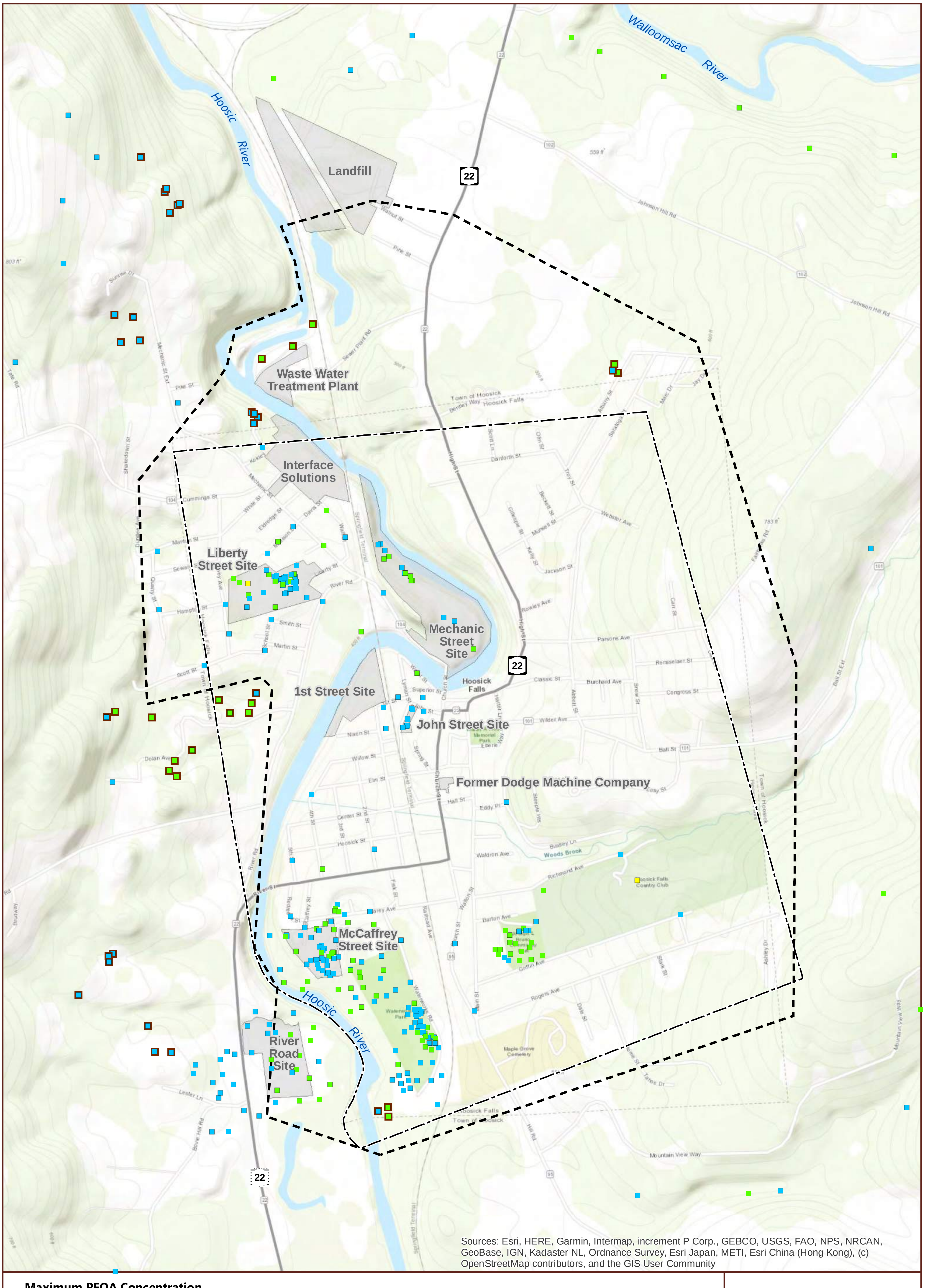
Feet

FIGURE 10C

PFOA IN Sub-SURFACE SOIL

OU-01 Work Plan

Hoosick Falls, NY



Maximum PFOA Concentration (ng/g)/Guidance Value Site Use

- Non Detect - 0.88
- >0.88/Unrestricted
- >8.8/Residential
- >44/Restricted Residential
- >440/Commercial & Industrial
- Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

Current OU-01 Boundary

Sites of Interest

Hoosick Falls Village Limits

N

0 500 1,000 1,500 2,000

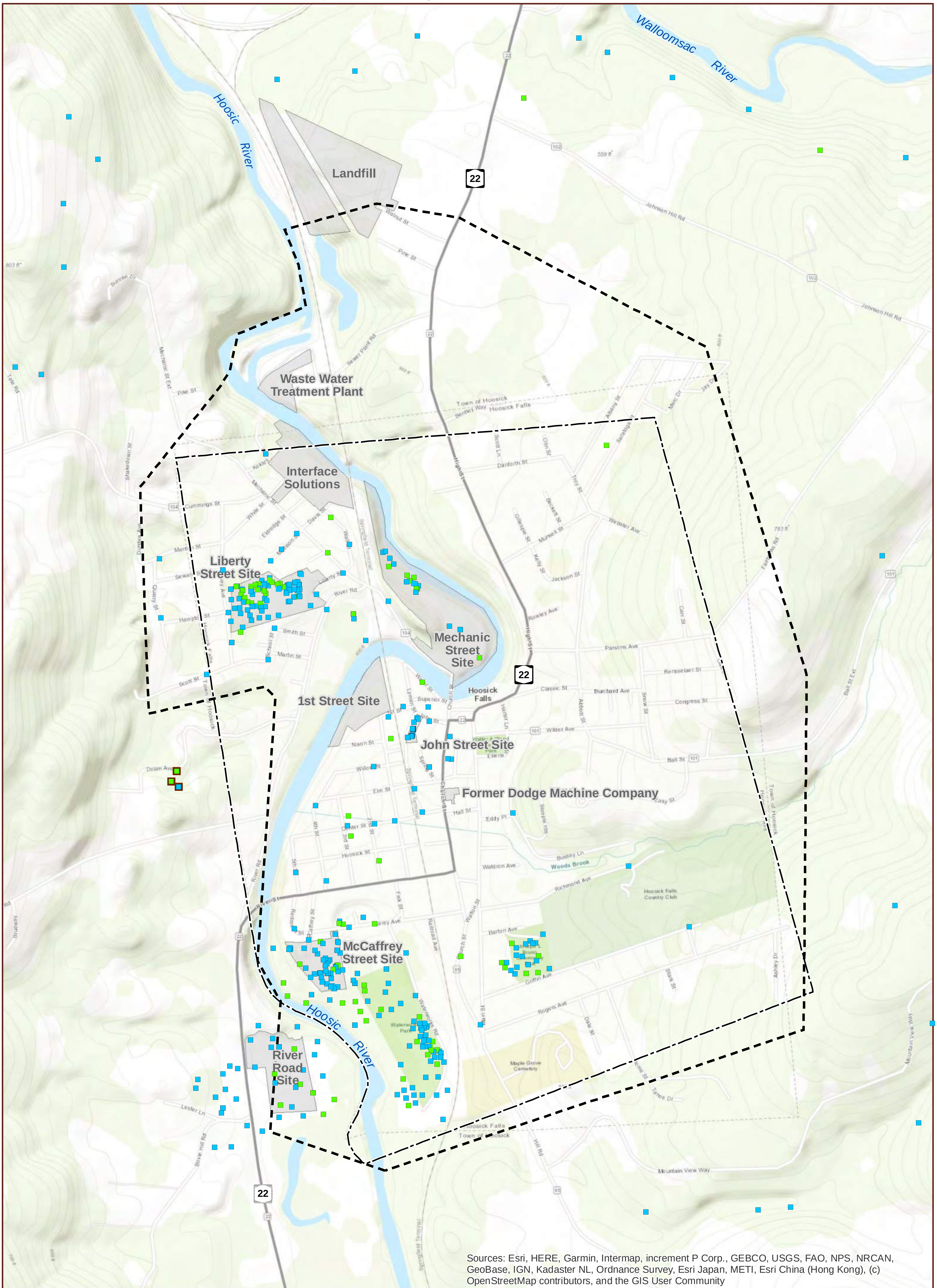
Feet

FIGURE 11A

PFOS IN SURFACE SOIL

OU-01 Work Plan

Hoosick Falls, NY



Maximum PFOA Concentration * (ng/g)/Guidance Value Site Use

- Non Detect - 0.88
- >0.88/Unrestricted
- >8.8/Residential
- >44/Restricted Residential
- >440/Commercial & Industrial
- Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

*Maximum concentration from all depths sampled.

- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Limits

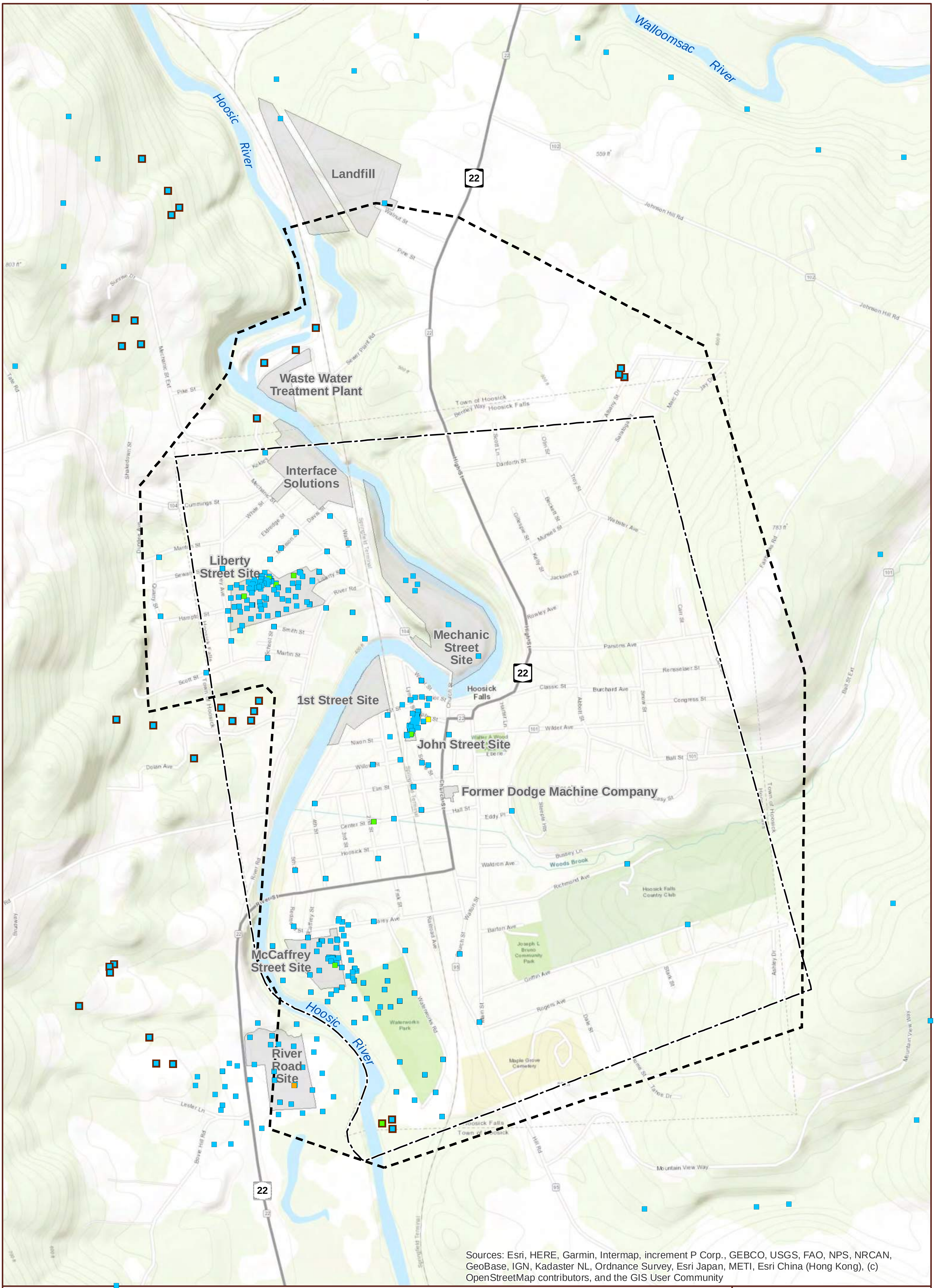
N

0 500 1,000 1,500 2,000
Feet

FIGURE 11B

PFOS IN NEAR SURFACE SOIL

OU-01 Work Plan
Hoosick Falls, NY



Maximum PFOA Concentration * (ng/g)/Guidance Value Site Use

- Non Detect - 0.88
- >0.88/Unrestricted
- >8.8/Residential
- >44/Restricted Residential
- >440/Commercial & Industrial
- Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

*Maximum concentration from all depths sampled.

- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Limits

0 500 1,000 1,500 2,000
Feet

FIGURE 11C

PFOS IN SUB-SURFACE SOIL

OU-01 Work Plan
Hoosick Falls, NY

Hoosic River
Walloomsac River
Landfill
Waste Water Treatment Plant
Interface Solutions
Liberty Street Site
LS-MW-29S
LS-MW-45S
LS-MW-46S
1st Street Site
OS-MP-10
Mechanic Street Site
OS-MW-037A
John Street Site
Former Dodge Machine Company
MC-MW-32S
McCaffrey Street Site
River Road Site
Hoosick Falls
Town of Hoosick
22
102
101
103
104
95

Maximum PFOA Concentration* (ng/L)
- <10
- 10 - <100
- 100 - <1,000
- 1,000 - <10,000
- 10,000 - <100,000
- 100,000 - 220,000

Approximate Isoconcentration Contour (ng/L) Dashed Where Inferred
- 10
- 100
- 1,000
- 10,000
- 100,000

- Groundwater Flow Direction
- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Boundary
- Approximate Location of Private Well Sample for PFAS by NYSDOH

* Maximum concentration from all samples collected from location

Data from temporary wells for NYSDEC satellite dump site investigation. Assumed to be shallow groundwater. No construction logs, boring logs, or groundwater elevation available.

N

0 500 1,000 1,500 2,000
Feet

FIGURE 12A

PFOA IN SHALLOW GROUNDWATER
OU-01 Work Plan
Hoosick Falls, NY

BEC Footer: ArcGIS 10.8.1, 2022-06-02 11:17 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2022\OU-01 Work Plan\Figure 12B PFOA in Deep Groundwater.mxd User: bal

Walloomsac River

Hoosic River

Landfill

Waste Water Treatment Plant

Interface Solutions

Liberty Street Site

LS-MW-40D

Mechanic Street Site

1st Street Site

John Street Site

Former Dodge Machine Company

McCaffrey Street Site

MC-PW-04

MC-PW-19

MC-MW-35

River Road Site

Hoosick River

22

DRAFT

Maximum PFOA Concentration* (ng/L)

- <10
- 10 - <100
- 100 - <1,000
- 1,000 - <10,000
- 10,000 - <100,000
- 100,000 - 220,000

Approximate Isoconcentration Contour (ng/L) Dashed where Inferred

- 10
- 100
- 1,000
- 10,000
- 100,000

- Groundwater Flow Direction
- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Boundary
- Approximate Location of Private Well Sample for PFAS by NYSDOH

N

0 500 1,000 1,500 2,000

Feet

* Maximum concentration from all samples collected from location

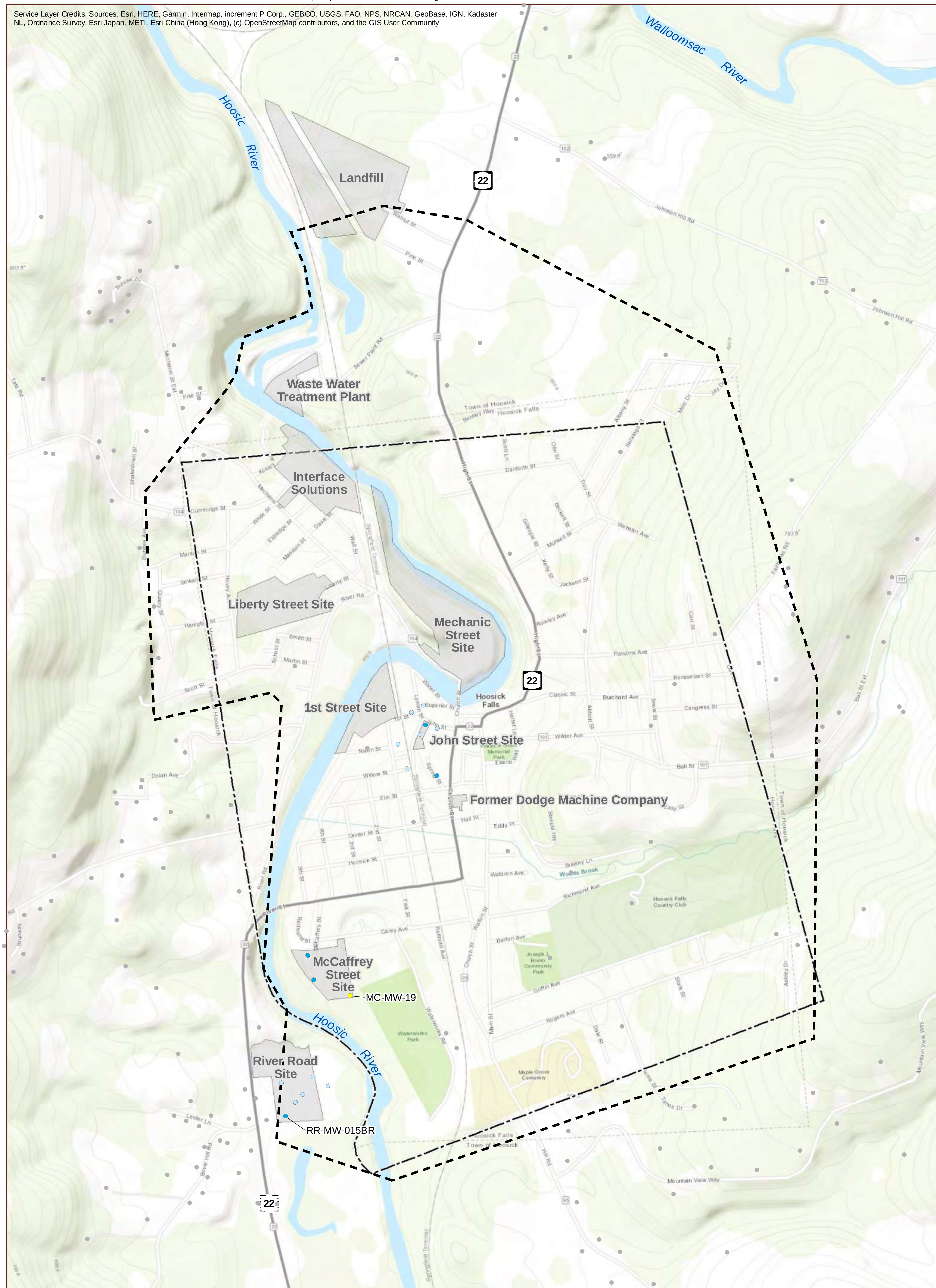
FIGURE 12B

PFOA IN DEEP GROUNDWATER

OU-01 Work Plan

Hoosick Falls, NY

BEC Footer: ArcGIS 10.8.1, 2022-06-02 11:14 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2022\OU-01 Work Plan\Figure 12C PFOA in Bedrock Groundwater.mxd User: bal



Maximum PFOA Concentration* (ng/L)

- <10
- 10 - <100
- 100 - <1,000
- 1,000 - <10,000
- 10,000 - <100,000
- 100,000 - 220,000

Approximate Location of Private Well Sample for PFAS by NYSDOH

Current OU-01 Boundary

Sites of Interest

Hoosick Falls Village Boundary

N

0 500 1,000 1,500 2,000

Feet

* Maximum concentration from all samples collected from location

FIGURE 12C

PFOA IN BEDROCK GROUNDWATER

OU-01 Work Plan

Hoosick Falls, NY

Walloomsac River

Hoosic River

Landfill

Waste Water Treatment Plant

Interface Solutions

Liberty Street Site

Mechanic Street Site

1st Street Site

John Street Site

Former Dodge Machine Company

McCaffrey Street Site

River Road Site

Hoosick Falls

Hoosick Falls

Woods Brook

Hoosick River

22

Maximum PFOS Concentration *

- <10
- 10 - <100
- 100 - <1,000
- 1,000 - <10,000
- 10,000 - <100,000
- 100,000 - 220,000

Approximate Isoconcentration Contour (ng/L) Dashed where Inferred

- 10
- 100
- 1,000
- 10,000
- 100,000

Data from temporary wells for NYSDEC satellite dump site investigation. Assumed to be shallow groundwater. No construction logs, boring logs, or groundwater elevation available.

- Groundwater Flow Direction
- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Boundary
- Approximate Location of Private Well Sample for PFAS by NYSDOH

* Maximum concentration from all samples collected from location

N

0 500 1,000 1,500 2,000

Feet

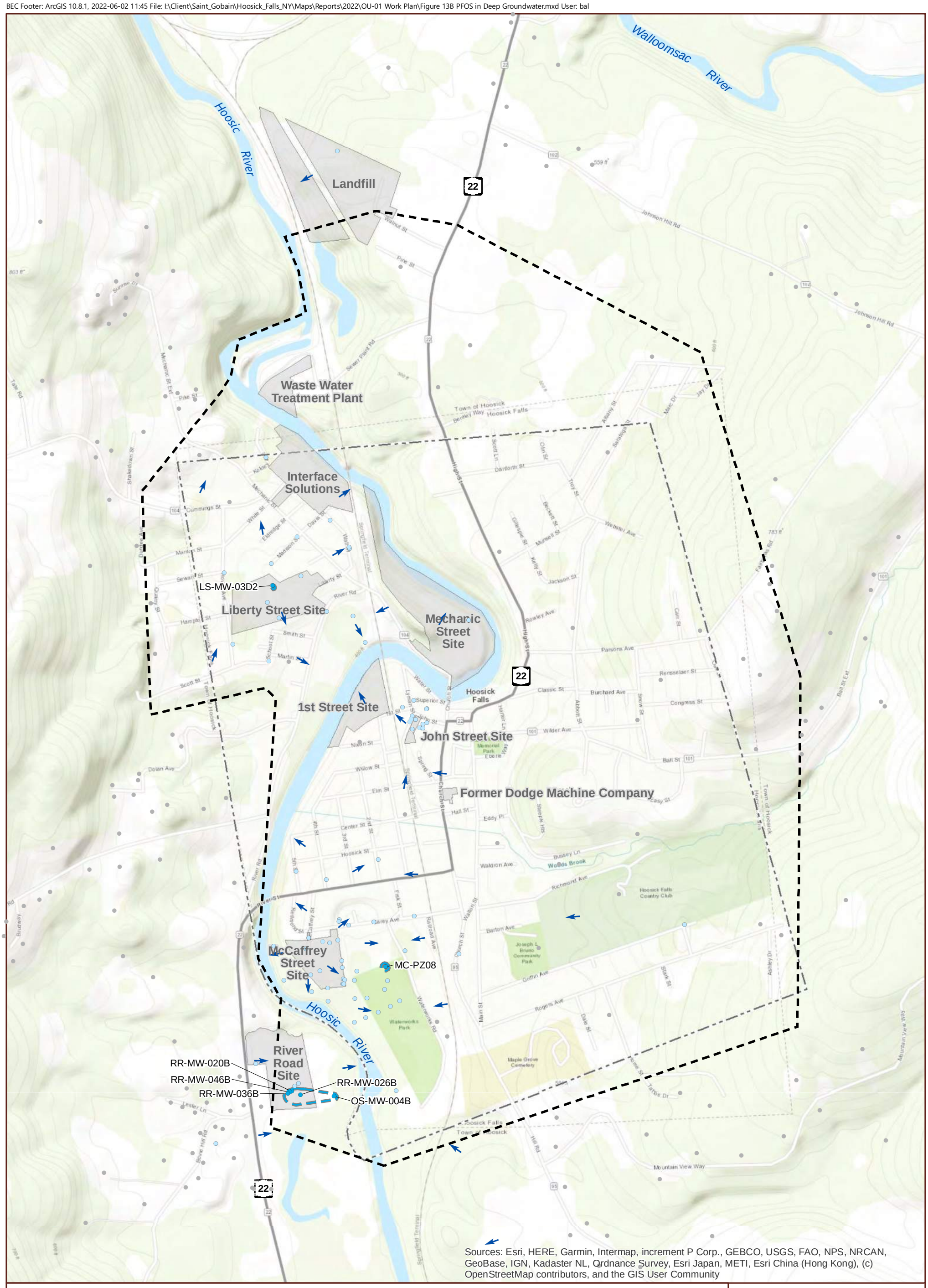
FIGURE 13A

PFOS IN SHALLOW GROUNDWATER

OU-01 Work Plan

Hoosick Falls, NY

BEC Footer: ArcGIS 10.8.1, 2022-06-02 11:45 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2022\OU-01 Work Plan\Figure 13B PFOS in Deep Groundwater.mxd User: bal



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Maximum PFOS Concentration* (ng/L)

- <10
- 10 - <100
- 100 - <1,000
- 1,000 - <10,000
- 10,000 - <100,000
- 100,000 - 220,000

Approximate Isoconcentration Contour (ng/L)
Dashed where Inferred

- 10
- 100
- 1,000
- 10,000
- 100,000

Groundwater Flow Direction
Current OU-01 Boundary
Sites of Interest
Hoosick Falls Village Boundary
Approximate Location of Private Well Sample for PFAS by NYSDOH

N

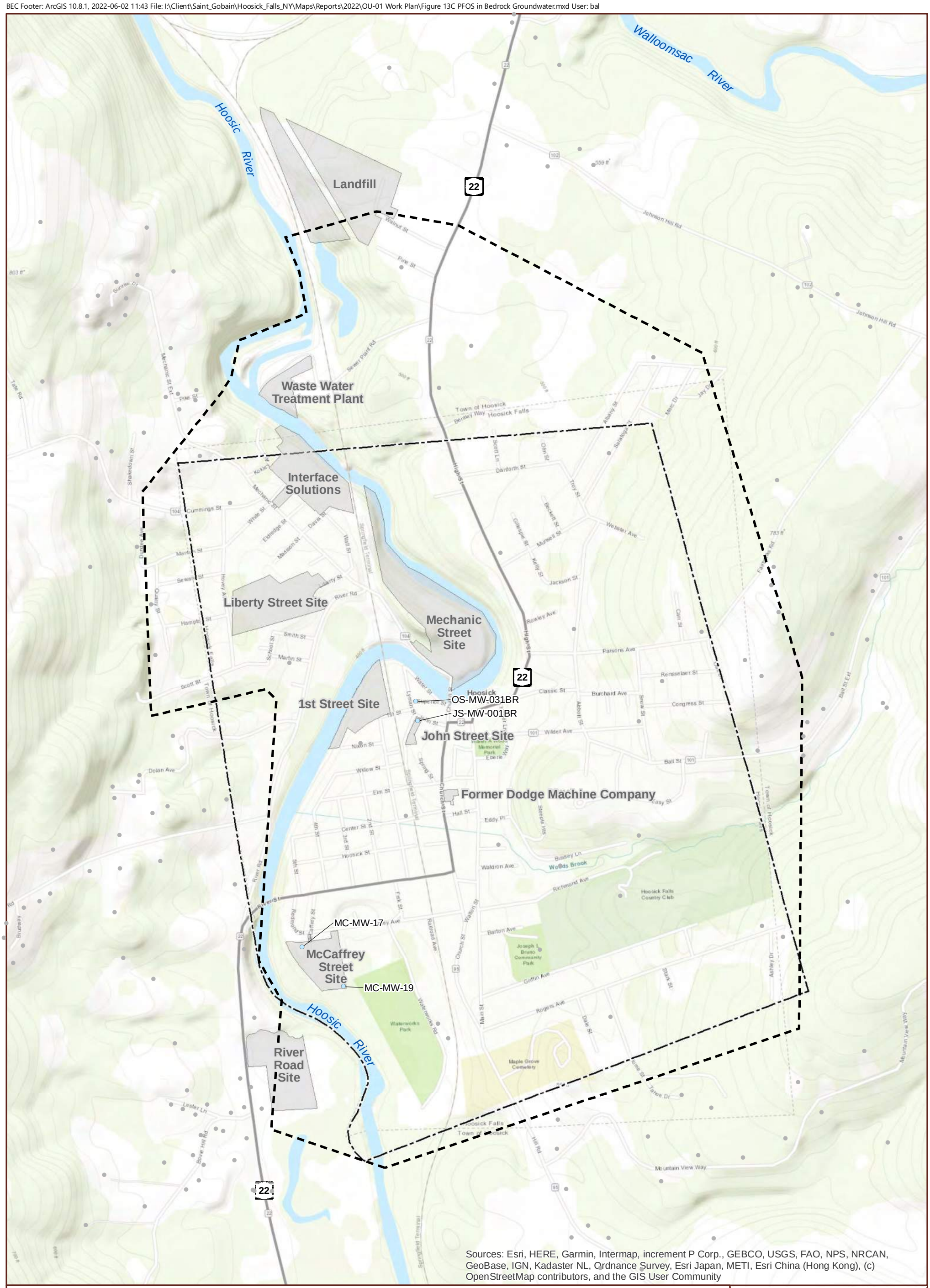
0 500 1,000 1,500 2,000
Feet

* Maximum concentration from all samples collected from location

FIGURE 13B

PFOS IN DEEP GROUNDWATER
OU-01 Work Plan
Hoosick Falls, NY

BEC Footer: ArcGIS 10.8.1, 2022-06-02 11:43 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2022\OU-01 Work Plan\Figure 13C PFOS in Bedrock Groundwater.mxd User: bal



Maximum PFOS Concentration* (ng/L)

- <10
- 10 - <100
- 100 - <1,000
- 1,000 - <10,000
- 10,000 - <100,000
- 100,000 - 220,000

* Maximum concentration from all samples collected from location

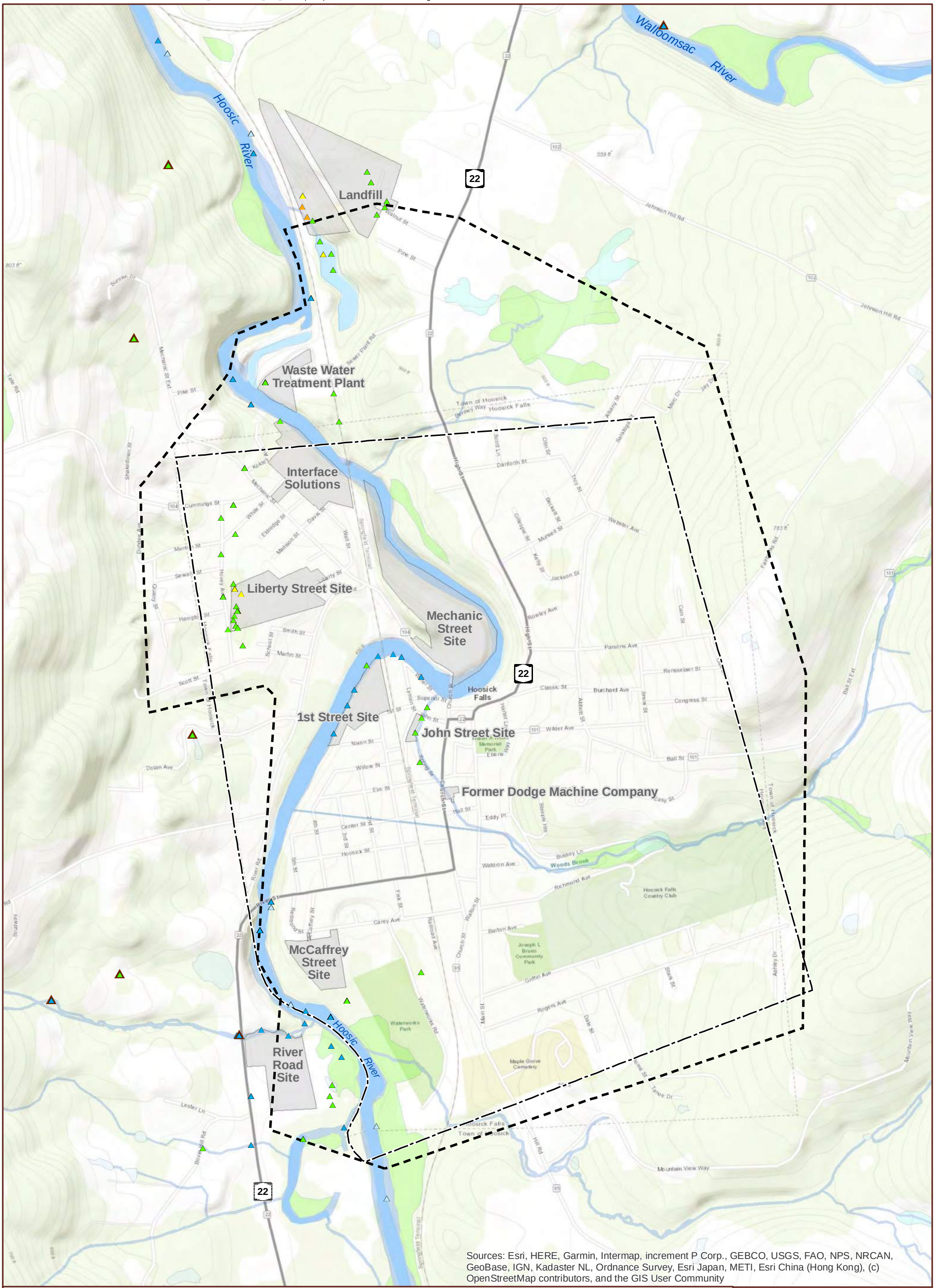
- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Boundary
- Approximate Location of Private Well Sample for PFAS by NYSDOH

0 500 1,000 1,500 2,000
Feet

FIGURE 13C

PFOS IN BEDROCK GROUNDWATER

OU-01 Work Plan
Hoosick Falls, NY



Maximum PFOA Concentration * (ng/L)

- <10
- 10 - <100
- 100 - <1,000
- 1,000 - <10,000
- 10,000 - <100,000

Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

Wetlands (NWI)

- Freshwater Emergent Wetland
- Freshwater Forested/ Shrub Wetland
- Freshwater Pond
- Riverine

- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Limits

* Maximum concentration from all samples collected from location

0 500 1,000 1,500 2,000
Feet

FIGURE 14

PFOA IN SURFACE WATER
OU-01 Work Plan
Hoosick Falls, NY

Hoosic River
Walloomsac River
Landfill
Waste Water Treatment Plant
Interface Solutions
Liberty Street Site
Mechanic Street Site
1st Street Site
John Street Site
Former Dodge Machine Company
McCaffrey Street Site
River Road Site
Hoosick Falls
Woods Brook
22
102
104
101
95

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Maximum PFOS Concentration* (ng/L)
- <10
- 10 - <100
- 100 - <1,000
- 1,000 - <10,000
- 10,000 - <100,000
- 100,000 - 220,000

Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

Wetlands (NWI)
- Freshwater Emergent Wetland
- Freshwater Forested/ Shrub Wetland
- Freshwater Pond
- Riverine

- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Limits

* Maximum concentration from all samples collected from location

0 500 1,000 1,500 2,000
Feet

FIGURE 15

PFOS IN SURFACE WATER
OU-01 Work Plan
Hoosick Falls, NY

BEC Footer: ArcGIS 10.8.1, 2022-06-02 11:39 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2022\OU-01 Work Plan\Figure 16 PFOA in Sediment.mxd User: bal

Hoosic River
Walloomsac River
Landfill
Waste Water Treatment Plant
Interface Solutions
Liberty Street Site
Mechanic Street Site
1st Street Site
John Street Site
Former Dodge Machine Company
McCaffrey Street Site
River Road Site
Hoosick Falls
Woods Brook
22
102
101
104
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Maximum PFOA Concentration (ng/g)
- Non Detect
- < 0.66
- 0.66 - 6.6
- 6.6 - 33
- 33 - Max
- Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

Wetlands (NWI)
- Freshwater Emergent Wetland
- Freshwater Forested/ Shrub Wetland
- Freshwater Pond
- Riverine

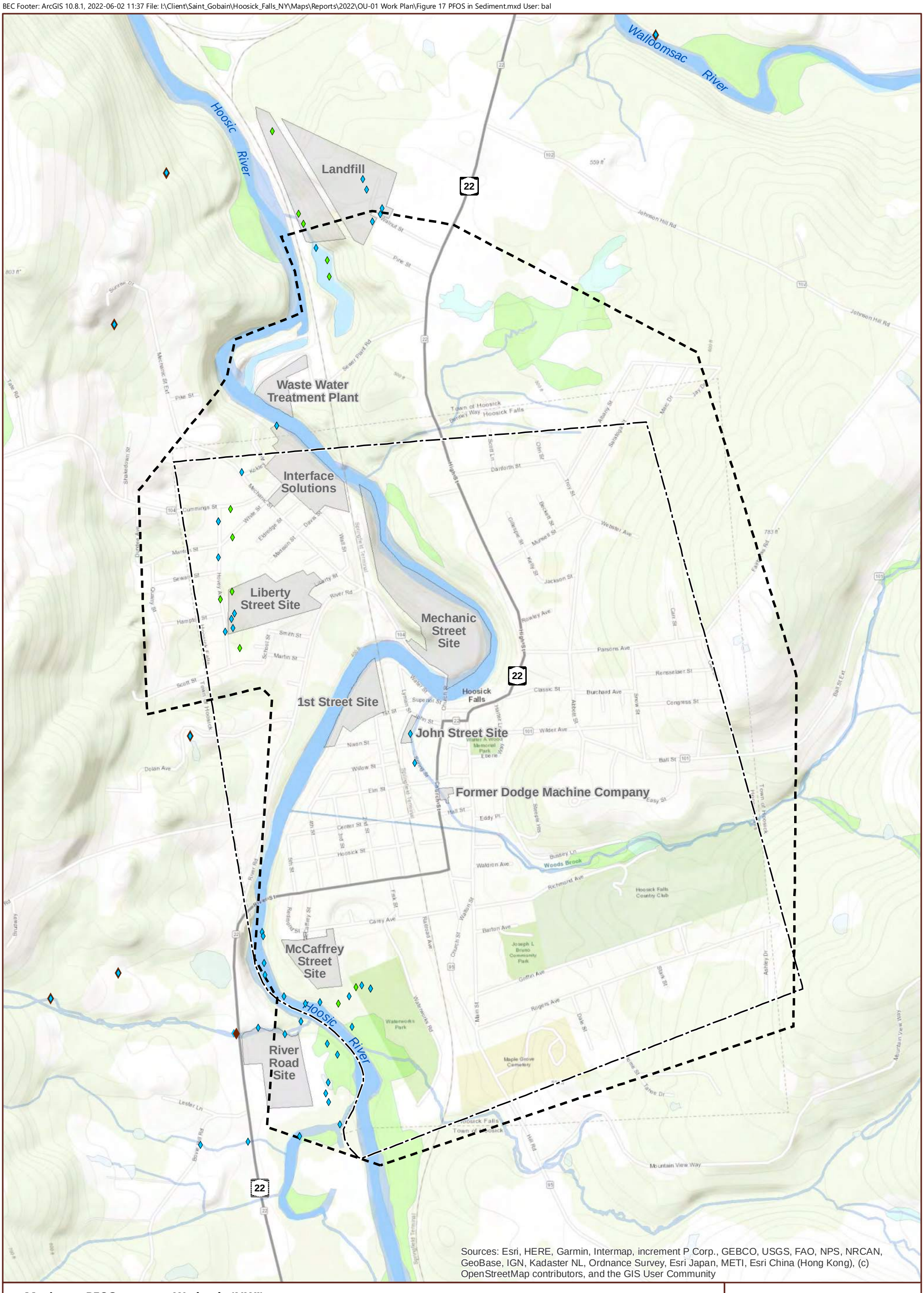
- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Boundary

N

0 500 1,000 1,500 2,000
Feet

FIGURE 16

PFOA IN SEDIMENT
OU-01 Work Plan
Hoosick Falls, NY



Maximum PFOS Concentration (ng/g)

- Non Detect - 0.88
- >0.88
- >8.8
- >44
- >440 - Max
- Brown outline indicates data from NYSDEC Satellite Dump Site Investigation. No sample details available.

Wetlands (NWI)

- Freshwater Emergent Wetland
- Freshwater Forested/ Shrub Wetland
- Freshwater Pond
- Riverine

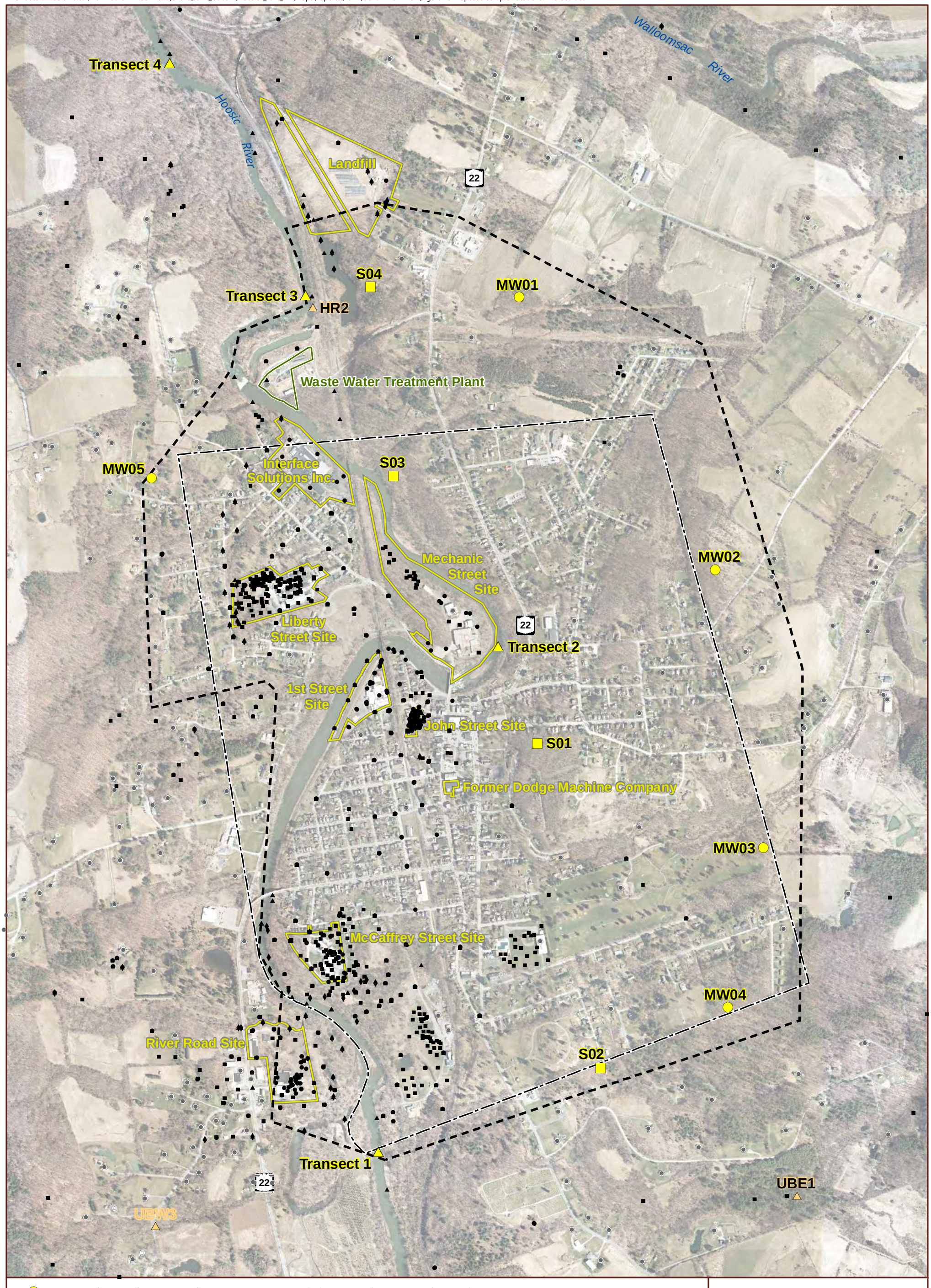
- Current OU-01 Boundary
- Sites of Interest
- Hoosick Falls Village Boundary

0 500 1,000 1,500 2,000
Feet

FIGURE 17

PFOS IN SEDIMENT
OU-01 Work Plan
Hoosick Falls, NY

BEC Footer: ArcGIS 10.8.1, 2022-06-02 11:36 File: I:\Client\Saint_Gobain\Hoosick_Falls_NY\Maps\Reports\2022\OU-01 Work Plan\Figure 18 Proposed Sample Locations.mxd User: bal



- Proposed Groundwater Sample
- Proposed Soil Sample
- Hoosic River Transect Sample (Surface Water)
- OU-03 Surface Water/Sediment Sample Location
- Current OU-01 Boundary
- DEC Class 2 or Class P Site
- Existing Groundwater Sample Location
- Existing Surface Water Sample Location
- Existing Sediment Sample Location
- Existing Soil Sample Location
- Approximate Location of Private Well Sample for PFAS by NYSDOH
- Waste Water Treatment Plant
- Hoosick Falls Village Limits

N

0 500 1,000 1,500 2,000
Feet

FIGURE 18

PROPOSED SAMPLE LOCATIONS
OU-01 Work Plan
Hoosick Falls, NY

Tables

Table 1A
Shallow Monitoring Wells Outside of Groundwater Flow Paths from Sites
Remedial Investigation/Feasibility Study Work Plan - OU-01 Addendum

Site	Well	Perfluorooctanoic acid (PFOA) - Max Data (ng/l)	Perfluorooctanesulfonic acid (PFOS) - Max Data (ng/l)
Landfill	HFL-MW-104	590	--
Liberty Street	MW29S	3100	11 J
Liberty Street	MW45S	2000	4.0 J
Liberty Street	MW46S	1500	2.0 J
Liberty Street	MW47D	450	56 J
Liberty Street	MW48S	930	3.4
John Street	OS-MW-027A	700 J	14 J
John Street	OS-MW-030A	520 J	6.8
John Street	OS-MW-034A	760	< 25 U
John Street	OS-MW-037A	78	11
John Street	OS-MW-039A	250	17
McCaffrey Street	MW23S	340	2 J
McCaffrey Street	MW25S	2000	9.6 J
McCaffrey Street	MW28S	2600	4.0 J
McCaffrey Street	MW32S	5300	2 J
McCaffrey Street	MW33S	2800	5.0
McCaffrey Street	MW34S	2000	3.1 J
McCaffrey Street	MW35I	36	0.39 J
McCaffrey Street	MW35S	320	10
McCaffrey Street	MW36I	6	0.86 J
McCaffrey Street	MW36S	190	9.5
McCaffrey Street	MW37	370	1.2 J
McCaffrey Street	MW38S	800	12 J
McCaffrey Street	MW39S	920	3.4 J
McCaffrey Street	MW40S	630	12
McCaffrey Street	PZ09	170	1.6 J
McCaffrey Street	PZ10	280	1.2 J
McCaffrey Street	PZ11	310	1.8 J
McCaffrey Street	PZ12	290	1.8
River Road	OS-MW-009A	120	8
River Road	OS-MW-011A	360	2.0 J
River Road	OS-MW-016A	230	4 J
River Road	OS-MW-020A	320	9.6
River Road	OS-MW-029A	180	7.4

Notes:
-- Not sampled/not analyzed.
J Estimated detected value. Either certain QC criteria were not met or the concentration is between the laboratory's detection and quantitation limits.
U The analyte was analyzed for, but was not detected.

Table 1B
Deep Monitoring Wells Outside of Groundwater Flow Paths from Sites
Remedial Investigation/Feasibility Study Work Plan - OU-01 Addendum

Site	Well	Perfluorooctanoic acid (PFOA) - Max Data (ng/l)	Perfluorooctanesulfonic acid (PFOS) - Max Data (ng/l)
Liberty Street	MW28D	270	2.0 J
Liberty Street	MW29D	46	0.94 J
Liberty Street	MW31D	250	< 0.45 U
Liberty Street	MW38I	61 J	< 0.44 U
Liberty Street	MW40D	790	< 0.45 U
Liberty Street	MW45D	1.8 J	0.57 J
Liberty Street	MW46I	130	< 0.46 U
Liberty Street	MW48I	88 J	< 0.46 U
John Street	OS-MW-035B	3.6	< 0.51 U
John Street	OS-MW-036B	12	< 0.51 U
John Street	OS-MW-039B	< 1.1 U	< 0.5 U
John Street	OS-MW-060B	< 0.79 U	< 0.5 U
John Street	OS-MW-061B	< 0.78 U	< 0.5 U
McCaffrey Street	GW-02	--	--
McCaffrey Street	MW24S	450	< 0.8 U
McCaffrey Street	MW35	0.51 J	< 1 U
McCaffrey Street	MW36	140	3.2 J
McCaffrey Street	MW38	4.3	1.3 J
McCaffrey Street	MW39	1.4 J	< 0.46 U
McCaffrey Street	MW40	120 J	< 0.44 U
River Road	OS-MW-001B	0.94	< 2 U
River Road	OS-MW-007B	7.3	< 2 U
River Road	OS-MW-009B	5	< 2 U
River Road	OS-MW-011B	260	6.5
River Road	OS-MW-020B	63	< 2 U
River Road	RR-MW-001B	4	< 2 U
Liberty Street	MW38D *	7	0.8
Liberty Street	MW46D *	0.63	< 0.43 U
Liberty Street	MW48D *	0.56	< 0.47 U
John Street	OS-MW-059C *	< 0.78 U	< 0.49 U
John Street	OS-MW-060C *	--	--
John Street	OS-MW-061C *	< 0.77 U	< 0.49 U
John Street	OS-MW-061D *	< 0.8 U	< 0.51 U
McCaffrey Street	MW24 *	8	< 2 U

Notes:
-- Not sampled/not analyzed.
J Estimated detected value. Either certain QC criteria were not met or the concentration is between the laboratory's detection and quantitation limits.
U The analyte was analyzed for, but was not detected.
* Well screened in unconsolidated deposits below the deep sand and gravel unit.

Table 2
Summary of Proposed Sampling
Remedial Investigation/Feasibility Study Work Plan - OU-01 Addendum

Sample Location Name	Sample Location Type	Proposed Samples	Analysis	Rationale
OU01-MW01	Monitoring Well Nest[a]	Groundwater Sample(s[a]) Soil Samples[b]	PFAS PFAS, TOC and pH	Location within OU-01, but outside of the municipal water supply area. Wooded and undisturbed since at least 1960. Provides additional geographic coverage in the northeast corner of OU-01.
OU01-MW02	Monitoring Well Nest[a]	Groundwater Sample(s[a]) Soil Samples[b]	PFAS PFAS, TOC and pH	Location within OU-01, but outside of the municipal water supply area. Wooded and undisturbed since at least 1960. Provides additional geographic coverage along eastern edge of OU-01.
OU01-MW03	Monitoring Well Nest[a]	Groundwater Sample(s[a]) Soil Samples[b]	PFAS PFAS, TOC and pH	Location within OU-01, but outside of the municipal water supply area. Wooded and undisturbed since at least 1960. Provides additional geographic coverage along the eastern edge of OU-01.
OU01-MW04	Monitoring Well Nest[a]	Groundwater Sample(s[a]) Soil Samples[b]	PFAS PFAS, TOC and pH	Location within OU-01, but outside of the municipal water supply area. Wooded and undisturbed since at least 1960. Provides additional geographic coverage in the southeast corner of OU-01.
OU01-MW05	Monitoring Well Nest[a]	Groundwater Sample(s[a]) Soil Samples[b]	PFAS PFAS, TOC and pH	Location within OU-01, but outside of the municipal water supply area. Wooded and undisturbed since at least 1960. Provides additional geographic coverage in the northwest corner of OU-01.
OU01-S01	Soil sample location	Soil Samples[b]	PFAS, TOC and pH	Location within OU-01, but on undeveloped property not subject to potential influence from pre-2016 municipal water supply. Locations selected to be undisturbed since at least 1960 and provide additional coverage through the center of OU-01.
OU01-S02	Soil sample location	Soil Samples[b]	PFAS, TOC and pH	Location within OU-01, but on undeveloped property not subject to potential influence from pre-2016 municipal water supply. Locations selected to be undisturbed since at least 1960 and provide additional coverage through the center of OU-01.
OU01-S03	Soil sample location	Soil Samples[b]	PFAS, TOC and pH	Location within OU-01, but on undeveloped property not subject to potential influence from pre-2016 municipal water supply. Locations selected to be undisturbed since at least 1960 and provide additional coverage through the center of OU-01.
OU01-S04	Soil sample location	Soil Samples[b]	PFAS, TOC and pH	Location within OU-01, but on undeveloped property not subject to potential influence from pre-2016 municipal water supply. Locations selected to be undisturbed since at least 1960 and provide additional coverage through the center of OU-01.
Transect 1	Hoosick River Sampling Transect[c]	Surface Water Samples[c]	PFAS	Location upstream of Village near OU-01 southern boundary. Provides data on the PFAS concentrations entering OU-01.
Transect 2	Hoosick River Sampling Transect[c]	Surface Water Samples[c]	PFAS	Location within the Village downstream of the falls. Provides data on the PFAS concentrations within OU-01.
Transect 3	Hoosick River Sampling Transect[c]	Surface Water Samples[c]	PFAS	Location downstream of Village near OU-01 northern boundary. Provides data on the PFAS concentrations exiting OU-01 downstream of the Village WWTP.
Transect 4	Hoosick River Sampling Transect[c]	Surface Water Samples[c]	PFAS	Location downstream of OU-01. Provides data on the PFAS concentrations downstream of the Hoosick Falls Landfill.

[a] Newly installed permanent monitoring wells. Shallow groundwater monitoring wells will be installed in all locations and deep monitoring wells will be installed where unconsolidated deposits are sufficiently thick to screen a second well.

[b] Soil samples will be collected from three depth intervals (0-2 inches bgs, 2-12 inches bgs, and 12-24 inches bgs).

[C] The proposed scope of work includes completing a cross-sectional survey of the river at each transect, measurements for stream velocity, surface temperature, and bottom temperature. Up to six surface water samples will be collected across the river at each transect.