

**SIXTH FIVE-YEAR REVIEW REPORT FOR  
LUDLOW SAND & GRAVEL SUPERFUND SITE  
ONEIDA COUNTY, NEW YORK**



**Prepared by**

**U.S. Environmental Protection Agency  
Region 2  
New York, New York**

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**March 27, 2024**

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## LIST OF ABBREVIATIONS & ACRONYMS

ARP	Approved Remedial Plan
BHHRA	Baseline Human Health Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
ICs	Institutional Controls
HQ	Hazard Quotient
MCL	Maximum Contaminant Levels
MHHW	mean higher high water
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NGP	North Gravel Pit
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation, Maintenance and Monitoring Manual
OU	Operable Unit
PCBs	Polychlorinated biphenyls
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PPM	Parts per million
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
ROD	Record of Decision
RI/FS	Remedial Investigation/Feasibility Study
SMP	Site Management Plan
VI	Vapor Intrusion
TAGM	Technical and Administrative Guidance Memorandum
TOGS	Technical and Operational Guidance Series
UU/UE	Unlimited Use / Unrestricted Exposure
VOCs	Volatile Organic Compounds

# **I. INTRODUCTION**

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substances Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the sixth FYR for the Ludlow Sand & Gravel Superfund Site (Site). The triggering action for this statutory review is the completion date of the previous FYR in July 2019. The FYR has been prepared due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of two operable units (OUs), both of which will be addressed in this FYR. The OU1 remedy addressed containment of the landfill, as well as polychlorinated biphenyl (PCB) contaminated soils located above the water table in the North Gravel Pit (NGP). OU2 addressed residual PCB contaminated soils remaining below the water table in the NGP and groundwater.

The EPA FYR team was led by Christopher O’Leary, EPA Remedial Project Manager. Participants included William Yeung, EPA hydrogeologist; Marian Olsen, EPA human health risk assessor and Detbra Rosales EPA ecological risk assessor. The potentially responsible party (PRP) for the Site was notified of the initiation of the FYR. The review began on June 12, 2023.

## **Site Background**

The Site is located in the Town of Paris, Oneida County, New York, approximately six miles south of Utica. The Site encompasses approximately 130 acres with landfill activities confined to approximately 18 acres. The landfill area is fenced on the western boundary along Holman City Road. The south and east sides of the landfill are bounded by a New York State designated wetland and an unnamed stream, while to the north, the landfill is bounded by a gravel pit which is also part of the Site (for Site location and Site plan see figures in Appendix A). The wetland is considered by EPA to be an area currently in use as an environmental resource.

The landfill is in a groundwater recharge zone to the principal aquifer along the Sauquoit Creek. The Creek serves as a major discharge point for groundwater flowing from uplands.

Water supplies in the area are mainly used for domestic and agricultural purposes with two municipally owned public water supplies within two miles of the Site. The Sauquoit Valley Water District is a spring source located approximately one-mile to the northwest of the Site and is upgradient of the Site’s groundwater flow patterns. The Village of Clayville’s water system is located about three-quarters of a mile northwest and upgradient of the landfill. The only individual water supply wells within 1,000 feet of the landfill are three homeowner wells along Mohawk Street which are located upgradient to groundwater flow around the landfill. Seven additional homeowner wells exist between 1,000 and 3,000

feet from the landfill, several of which are located downgradient of the landfill. Groundwater flow from the landfill is generally southwest.

The landfill began receiving municipal refuse from surrounding communities in the 1960s. The landfill also received bulk liquid, including septage, waste oils, coolants, and sludges containing metals. The bulk liquids were disposed of at the landfill by surface application. The NGP was also periodically used for the disposal of bulk waste oils. The drummed liquid wastes were reportedly not disposed of in the landfill. Drummed liquids were bulked using a vacuum truck and were applied to the landfill in a manner similar to the bulk liquids previously described. The landfill continued to accept waste until it was shut down by court order in 1988. The owner continues operating the gravel pit and some consideration is being given to potential reuse or redevelopment scenarios for the Site within restrictions described in the Institutional Controls (ICs).

See tables 1 and 2 in Appendix B, for a chronology of site events and documents utilized to perform this FYR, respectively.

### **FIVE-YEAR REVIEW SUMMARY FORM**

<b>SITE IDENTIFICATION</b>		
<b>Site Name:</b> Ludlow Sand & Gravel Superfund Site		
<b>EPA ID:</b> NYD013468939		
<b>Region: 2</b>	<b>State:</b> NY	<b>City/County:</b> Town of Paris/Oneida County
<b>SITE STATUS</b>		
<b>NPL Status:</b> Deleted		
<b>Multiple OUs?</b> Yes	<b>Has the site achieved construction completion?</b> Yes	
<b>REVIEW STATUS</b>		
<b>Lead agency:</b> U.S. EPA		
<b>Author name (Federal or State Project Manager):</b> Christopher O’Leary		
<b>Author affiliation:</b> U.S. EPA Remedial Project Manager		
<b>Review period:</b> 6/12/2023 - 1/31/2024		
<b>Date of site inspection:</b> 11/8/2023		
<b>Type of review:</b> Statutory		
<b>Review number:</b> 6		
<b>Triggering action date:</b> 7/31/2019		
<b>Due date (<i>five years after triggering action date</i>):</b> 7/31/2024		

## II. RESPONSE ACTION SUMMARY

### Basis for Taking Action

Special Metals Corporation of Utica, New York, a PRP, agreed to perform a Remedial Investigation/Feasibility Study (RI/FS) which was submitted in 1986. Subsequently, Mr. Ludlow, another PRP, engaged a contractor to perform additional investigations to supplement the initial investigation and prepare a closure plan. In addition, at the request of the New York State Department of Environmental Conservation (NYSDEC), EPA tasked a contractor to perform a supplemental RI/FS to further evaluate the cost of the alternatives.

Based upon the results of these investigations, the 1988 Record of Decision (ROD) for OU1 identified the lifetime risk from dermal exposure to polychlorinated biphenyls (PCBs) in soil was  $5 \times 10^{-5}$  or 5 in 100,000 for the worst-case scenario and the cancer risk from ingestion of soils was  $9 \times 10^{-6}$  or 9 in 1,000,000. The risks to the child from the ingestion, dermal contact, and inhalation of PCBs in groundwater were  $1 \times 10^{-6}$  or 1 in 1,000,000 for the most probable case and  $6 \times 10^{-5}$  or 6 in 100,000 for the worse case. It should also be noted that in 1987, a Federal District Court Judge in the District Court of Binghamton ordered the landfill to be closed pursuant to federal and state regulations.

A work plan for a supplemental RI/FS to address OU2 was approved for implementation under a Consent Judgment, by order of the court, dated August 3, 1996. The purpose of the supplemental RI was to characterize the extent of groundwater contamination further and to define the nature and extent of residual contamination at the NGP. The supplemental RI was conducted between November 1996 and January 1998.

OU2 receptors were evaluated for exposure to PCBs, the contaminant of concern. Receptors included the on-Site worker who may be exposed to surface soil and through ingestion of groundwater, the maintenance worker who may be exposed to surface soil, the adolescent trespasser who may be exposed to either surface or shallow soils, and the construction worker who may be exposed to soils deeper than two feet during future construction at the Site. The cancer risk to the reasonable maximum exposed individual is evaluated by comparison of the risks to the acceptable risk range of  $10^{-4}$  to  $10^{-6}$  or a risk of one in ten thousand to one in a million. The risk range was exceeded for the current/future on-Site worker exposed to surface soil at  $7.4 \times 10^{-4}$  or 7 in 10,000 and to the on-Site worker exposed to shallow soil core samples at  $5.4 \times 10^{-4}$  or 5.4 in 10,000. Risks to the following receptors were within the risk range: adolescent trespasser exposed to shallow soils at  $7.8 \times 10^{-5}$  or 7.8 in 100,000, and the future construction worker at  $5.2 \times 10^{-5}$  or 5.2 in 100,000.

The evaluation of noncancer for human health hazards for all scenarios evaluated exceeded EPA's Goal of Protection of a Hazard Quotient (HQ) of 1. The following HQs were calculated: an HQ of 52 for the industrial on-Site worker; an HQ of 37 for the on-Site worker exposed to shallow soils; an HQ of 16 for the adolescent trespasser exposed to surface soil; an HQ of 11 for the adolescent trespasser exposed to shallow soil; and HQ of 92 for the construction worker.

Evaluation of cancer risks from ingestion of groundwater on-Site indicates a risk to a worker of  $2.1 \times 10^{-7}$  or 2 in 10,000,000 that is below the risk range, based on exposure to Aroclor 1242, a commercial mixture of PCBs. The HQ for the worker was less than an HQ = 1. These results indicate that exposure to groundwater used as drinking water does not pose an unacceptable cancer risk or noncancer hazard to the worker.

Aroclor 1254 in surface soil, shallow core samples, and subsurface soil is the main cancer risk and non-cancer health hazard driver for the industrial/commercial worker, the trespasser (for non-cancer only), and construction worker (for non-cancer only).

An ecological risk assessment was not performed for either OU1 or OU2. However, the OU1 ROD stated that, PCBs would remain in sediments where they would be bioaccumulated within benthic organisms as well as transient organisms inhabiting the areas surrounding the landfill and the wetlands. Biota sampling conducted by the NYSDEC Division of Fish and Wildlife has indicated the presence of PCBs in the biota in the area. Additional studies were performed to adequately characterize the extent of PCB contaminants in the local biota. Because the leachate areas east, southeast and south of the landfill are flooded with surface and/or groundwater, degradation of these water bodies could occur. This would result in an adverse impact to aquatic life, vegetation and wildlife that may use these areas as a water source.

### **Response Actions**

Remedial Action Objectives (RAOs) were developed for the Site as a result of data collected during the remedial investigation to aid in the development and screening of remedial alternatives. They are: (1) minimize the potential for PCBs to migrate from soils into groundwater; and (2) eliminate any direct contact, ingestion, or inhalation threat associated with contaminated soil. The RAO for the NGP portion of the Site (OU2) was to remediate the PCB-contaminated soils above 10 parts per million (ppm).

Based upon the results of the RI/FS, the OU1 ROD issued on September 30, 1988, called for the following remedial measures:

- Consolidate approximately 10,000 cubic yards of contaminated soil and sediment located adjacent to the landfill and dispose of it in the landfill and then place either a clay or synthetic cover over it to prevent rain water from coming into contact with the buried materials;
- Collect leachate from seepage areas;
- Dewater the landfill, if necessary, by using either a passive drain system or groundwater extraction wells;
- Implement upgradient groundwater controls to lower the water table to prevent groundwater from coming into contact with the waste material;
- Treat the contaminated leachate and groundwater at an on-Site facility, or if the volume of water were small, transport the water and leachate to an approved disposal facility;
- Install a perimeter fence around the Site, including the wetlands;
- Recommend that ICs be established in the form of deed restrictions on future uses of the Site; and
- Monitor the groundwater, private wells, and surface water to ensure that remediation of the landfill is effective.

In addition, the ROD called for implementation of a soil/sediment sampling program to fully define the volume and extent of contaminated soils to be consolidated under the cap. New York State and the PRPs entered into a Consent Judgment in the Northern District of New York for the implementation of an Approved Remedial Plan (ARP). The ARP addressed the elements of the 1988 ROD. The ARP also included elements that were to be addressed as part of OU2, including the excavation and consolidation of contaminated sediments from the wetlands and PCB-contaminated soil from the NGP into the landfill. It also included a supplemental groundwater study that was completed by the PRPs in January 1990.

Many soil and groundwater samples were collected at the Site to characterize the nature and extent of contamination as part of the supplemental RI. These and other data indicated that PCBs were the principal contaminants which exceeded soil cleanup values. These PCB concentrations remained at depth in the NGP because of the limitations of the excavation equipment which was used when the NGP was excavated as part of the OU1 remedial activities. In addition, low levels of volatile organic compounds (VOCs) and inorganic compounds (metals) were also detected in soil and groundwater samples on a sporadic and limited basis. During the supplemental RI, quarterly groundwater sampling was performed at five wells around the perimeter of the NGP from September 1997 until March 1999 for a total of seven sampling events. Monitoring well MW11-R had detectable concentrations of PCBs (0.13 micrograms per liter ( $\mu\text{g/L}$ ) and 0.24  $\mu\text{g/L}$ ) in the unfiltered samples during two of the seven sampling events (September 1997 and June 1998). All other wells sampled, and all filtered samples did not demonstrate detectable PCB concentrations. This indicated that PCB contamination is not migrating in groundwater and is confined to the pit area. Based upon these data, it was determined that no further remedial action was necessary for the groundwater, with the assumption that the residual PCB contamination remaining below the water table in the NGP would be addressed as part of the OU2 remedy.

The remedy for OU2, specified in a ROD issued on March 31, 2003, primarily addressed residual PCB contamination at depth in the NGP and specifically called for:

- Solidifying soil at depth with PCB concentrations above 10 parts per million (ppm);
- Implementing a pre-design delineation sampling program to determine the area to be treated;
- Implementing soil bench-scale testing to determine the grout characteristics;
- Backfilling the NGP to its original elevation, covering the area with clean soil to raise the surface elevation to its original grade, and applying a vegetative cover;
- Limiting Site access and issuing a deed restriction to prohibit groundwater usage and limiting the land use to nonresidential purposes;
- Installing at least two downgradient deep groundwater monitoring wells to ensure that PCB migration in the groundwater is not occurring; and
- Implementing a groundwater monitoring program.

### **Status of Implementation**

The remedial action (RA) for OU1 was conducted by the PRPs pursuant to the Consent Judgment with the State. During the remedial design, the soil contamination in the wetlands areas and NGP were delineated. The remedial design report was approved by the NYSDEC in June 1990.

RA activities for OU1 started in 1990 and were performed under the oversight of the NYSDEC. Sediment from the wetlands was excavated to the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) No. 94-HWR-4046 surface soil guidance value of 1 ppm for PCBs and consolidated into the landfill prior to the cap completion. Approximately 40 cubic yards of sediment with PCB concentrations greater than 500 ppm were disposed of off-Site at an approved disposal facility. Approximately 60,000 cubic yards of soil were excavated from the NGP, of which approximately 40,000 cubic yards were found to be contaminated with PCBs and were consolidated into the landfill prior to completion of the cap. The other 20,000 cubic yards of material had nondetectable levels of PCBs and were placed on the bank of the NGP. The total amount of soil that was excavated from the NGP was greater than anticipated and the excavation using conventional excavation equipment became difficult when groundwater was encountered. Topsoil and seeding were placed over the entire capped area which was enclosed within a chain link fence. A leachate collection system, a leachate



treatment system, gas collection/lateral drainage layer and gas venting systems were also installed. Monitoring wells were installed downgradient from the landfill. Construction was completed in 1992.

A report documenting the cleanup efforts, Construction Document Report, was submitted by the PRPs and approved by the NYSDEC in May 1995.

The United States Army Corps of Engineers prepared the remedial design plans and specifications for OU2 through an interagency agreement with the EPA. The 2003 ROD identified pressure grouting as the method to be used to solidify the PCB-impacted soils in the NGP. The EPA performed a Value Engineering Assessment between the proposed pressure grouting technology and soil mixing technology. In-situ soil mixing, sometimes referred to as in-situ solidification/stabilization, was identified as having the potential to complete the project at a lower cost and in a shorter time frame. As a result, the EPA decided to use this technology to address the NGP soils containing PCB concentrations above 10 ppm in the NGP. The EPA Region 2 removal program staff directed and oversaw construction activities.

Following on-Site mobilization in June 2007, construction activities were conducted in two phases. Phase I of the remedial action included in-situ soil mixing of PCB-contaminated soils and installation of groundwater monitoring wells. Phase II included backfilling the pit with clean fill to its original elevation, seeding the area to provide a vegetative cover, and installing culverts, swales, and a retention basin for storm water runoff.

On September 25, 2007, a final inspection was conducted by EPA and NYSDEC for OU2. The Site was deleted from the National Priority List (NPL) on December 2, 2013.

### **Institutional Control Implementation**

Institutional controls (ICs) are in place to ensure that the future use of the site does not change, that the remedy components are not damaged and that groundwater is not used for potable purposes. The purpose of the cap is to prevent direct contact by human and ecological receptors.

**Table 1:** Summary of Planned and/or Implemented ICs

<b>Media, engineered controls, and areas that do not support UU/UE based on current conditions</b>	<b>ICs Needed</b>	<b>ICs Called for in the Decision Documents</b>	<b>Impacted Parcel(s)</b>	<b>IC Objective</b>	<b>Title of IC Instrument Implemented and Date (or planned)</b>
Groundwater and Soils	Yes	Yes	Entire Site	Restrict installation of groundwater wells and groundwater use; employ a Site Management Plan for excavation below demarcation layer	Environmental Protective Easement and Declaration of Restrictive Covenants, August 2013

### **Systems Operations/Operation & Maintenance**

The long-term monitoring program for the Site commenced in 2000. This program consisted of the following activities:

- Monthly inspections are performed to visually assess and document the condition of the landfill perimeter fence and access road, leachate management system building, gas

- collection system, monitoring wells and manholes, and overall integrity of the cover;
- Water level measurements are obtained from designated monitoring wells at the landfill to assess seasonal water level fluctuations and evaluate groundwater flow direction;
- Groundwater samples are collected from 17 monitoring wells, three residential wells and one public supply well during the monitoring events and analyzed for PCBs and VOCs;
- Surface water is sampled annually from the culvert where the ponded wetland discharges beneath Holman City Road to monitor PCBs;
- Annual methane monitoring at the landfill gas vents, manholes and monitoring wells is conducted; and
- Leachate collected from the landfill had been pumped through the on-Site leachate treatment facility prior to discharge in accordance with the operation and maintenance (O&M) Manual. However, operation of the leachate collection and treatment system was discontinued in 2008 after it was determined that there was minimal potential for the capped landfill to impact the downgradient water supply wells and groundwater.

No operation or maintenance for the stabilized soils is necessary for OU2.

Five wells installed during the OU2 remediation were sampled to establish a baseline. The monitoring of these wells has been incorporated into the OU1 long-term monitoring program for the Site.

Monitoring and maintenance continues to be performed by TRC Engineers Inc., under contract with NYSDEC, in accordance with a 2016 Site Management Plan (SMP). The long-term monitoring activities described in the SMP include groundwater elevation monitoring, monitoring well inventory and repair, groundwater sampling and analysis, surface water sampling, private and public water supply monitoring, and leachate sampling and analysis. The SMP requires inspections of the landfill access system, landfill cover system and landfill seep, storm water collection and drainage system, and landfill gas vents. From January 2008 to May 2016, monitoring locations were sampled at 15-month intervals. In 2016, the SMP revision altered the long-term monitoring event frequency for groundwater, surface water and private well sampling activities to five-year intervals, with groundwater gauging, landfill gas monitoring and site inspection activities occurring annually. The next long-term monitoring event is scheduled for 2026.

The NYSDEC currently contracts with TRC Companies for monitoring and maintenance tasks. The following is a summary of the SMP activities conducted at the Site from December 2018 to June 2023:

Groundwater Elevation Monitoring: During the groundwater monitoring events from 2021 through 2022, water level measurements were obtained from shallow and deep monitoring wells at the landfill to assess seasonal water level fluctuations and evaluate groundwater flow direction.

Monitoring Well Inventory and Repair: Repairs were made to MW-15D and MW-103 in December 2019.

Groundwater Quality Monitoring: Samples for laboratory analysis were collected from monitoring wells in May 2021. They were analyzed for VOCs, PCBs, phenolics and metals to ensure detection of potential threats to human health. While PCBs are the primary contaminant of concern at the Site, VOCs, phenolics, and metals are present within the landfill, but only have been sporadically and infrequently detected in groundwater.

Surface Water Monitoring: One surface water sample was collected in May 2021 from the wetland outfall culvert located at the southern end of the OU1 landfill.

Landfill Gas Monitoring: Methane monitoring at the landfill gas vents, manholes and monitoring wells is conducted on an annual basis.

Leachate System Monitoring: Leachate collected from the landfill had been pumped through the on-Site leachate treatment facility prior to discharge in accordance with the O&M Manual. An evaluation of leachate and groundwater data conducted in 2007 concluded that operation of the treatment system was not necessary. As a result, the leachate collection system was shut down in June 2008. In May 2021, water samples were collected from pump station #1 and a manhole at the southern edge of the landfill and analyzed for PCBs, VOCs, target compound list (metals), and total phenolics.

Residential Water Supply: Samples were collected for both long term monitoring events from three downgradient residential wells and were analyzed for PCBs, VOCs, target compound list (TCL) metals, and total phenolics. In addition, samples were collected from these same wells and four other downgradient residential wells in July 2020 and November 2020 for per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane.

OU2 North Gravel Pit: Groundwater samples were collected from three monitoring wells and analyzed for VOCs, phenolics, metals and PCBs.

Potential impacts from climate change have been assessed at the Site using the following tools, Climate Explorer, Flood Factor, and Sea Level Rise Viewer as identified in Appendix C, attached. The performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site.

### III. PROGRESS SINCE THE LAST REVIEW

**Table 2:** Protectiveness Determinations/Statements from the 2019 FYR.

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The remedy is protective of human health and the environment.
2	Protective	The remedy is protective of human health and the environment.
Sitewide	Protective	The implemented remedy for the site is protective of human health and the environment.

There were no issues and recommendations identified in the last FYR.

### IV. FIVE-YEAR REVIEW PROCESS

#### Community Notification, Involvement & Site Interviews

On August 7, 2023, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at Superfund sites in New York, New Jersey, Puerto Rico and the U.S. Virgin Islands, including the Ludlow Sand & Garvel Superfund Site. The announcement can be found at

the following web address: <https://www.epa.gov/superfund/R2-fiveyearreviews>. In addition to this online posting, a notice of the commencement of the FYR was sent to local public officials. The notice was provided to the Town of Paris and the Village of Clayville by email on December 11, 2023, with a request that the notice be posted in municipal offices and on the respective town and village webpages. The purpose of the public notice was to inform the community that the EPA would be conducting a FYR to ensure that the remedy implemented at the Site remains protective of public health and is functioning as designed. In addition, the notice included contact information, including addresses and telephone numbers, for questions related to the FYR process or the Site.

Once the FYR is completed, the results will be made available on EPA’s Ludlow Sand and Gravel Site webpage ([www.epa.gov/superfund/ludlow-sand-and-gravel](http://www.epa.gov/superfund/ludlow-sand-and-gravel)) and at the Site repositories, which are:

Utica Public Library 303 Genesee Street Utica, New York 13501	NYSDEC Region 7 Office State Office Building 207 Genesee Street Utica, New York 13501	US EPA Region 2 Superfund Records Center 290 Broadway, 18th Floor New York, New York 10007
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**Data Review**

The 2021 and 2022 results reveal the groundwater flow directions in the shallow and deep aquifers were generally similar to previous Site conditions. Groundwater in both shallow and deep aquifers flow west-southwest, while the groundwater in the deeper aquifer has a more southerly flow component southwest of the landfill.

No phenols or PCBs were detected in the OU1 groundwater samples in this period. VOCs were detected at concentrations less than New York State Class GA Water Quality Standards. Seven metals were detected at concentrations exceeding the standards or guidance values; arsenic, iron, lead, magnesium, manganese, selenium and sodium. These results are consistent with historically observed results.

No other contaminants were detected above New York State Class GA Water Quality Standards. No PCBs were detected in either event at the OU2 monitoring wells. At the residential wells, no PCBs, VOCs or phenols were detected in either event. Metal concentrations were typically less than the GA standard or guidance values with the exception of PW-28 which had a sodium concentration of 157,000 µg/L (NYS Class GA Water Quality Standards for sodium is 20,000 µg/L). Sodium levels in this well have fluctuated during previous sampling events, but the concentration identified during this FYR are generally consistent with previous result ranges. No PCBs were detected in the surface water sample.

Results have demonstrated that the landfill gas venting system is operating well. PCBs and phenols were not detected in samples collected from the former leachate system.

It should be noted that during the May 2021 sampling event, groundwater samples were not collected from MW-14S and MW-15S due to a lack of groundwater entering the monitoring wells. Dry conditions were observed in these wells during other sampling events within this FYR period. However, groundwater is able to enter wells MW-14D and MW-15D and the water level elevations measured have remained consistent. Therefore, the absence of samples from these wells do not alter the conclusions in the paragraph above.

**Per- and Polyfluoroalkyl Substances (PFAS) and 1,4-Dioxane Groundwater Sampling**

Residential and monitoring well sampling for 1,4-dioxane and PFAS has been conducted at the request

of New York State Department of Health (NYSDOH) to evaluate the presence/absence of PFAS and 1,4-dioxane at the Site. In 2020, New York State established Maximum Contaminant Levels (MCLs) of 10 nanograms per liter (ng/L) for PFAS chemicals perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), and 1 µg/L for 1,4-dioxane.

During the last five year review period, samples were collected from five monitoring wells (MW-10, MW-103, MW-14D, MW-15D, MW-6S) in October 2017. Although State MCLs were not yet established for PFAS at that time, PFOS in MW-6S (11 µg/L) slightly exceeded its current State MCL of 10 ng/L. PFOA concentrations exceeded the State MCL at MW-14D (12 ng/L) and MW-6S (30 ng/L). 1,4-Dioxane concentrations also exceeded the State MCL at MW-14D (23 µg/L), MW-15D (5.1 µg/L), and MW-6S (18 µg/L).

During this five year review period, samples for 1,4-dioxane and PFAS were collected from residential wells RES-01 and RES-02 in July 2020 and RES-03, RES-04, RES-05, RES-06, and RES-07 in November 2020. 1,4-Dioxane concentrations were non-detect for the seven residential wells during the July and November 2020 sampling events. The reporting limit of 0.35 µg/L was below the New York State MCL. With the exception of the November 2020 sampling event at one residential well (RES-06), PFAS were not detected in any of the samples. The concentrations of PFAS detected, as well as the reporting limits for the non-detect results, were below state MCLs.

Therefore, although emerging contaminants were identified at the Site in 2017, the concentrations were relatively low and residential well sampling performed in 2020 shows that these contaminants have not impacted residential wells off-site. No additional emerging contaminant sampling is anticipated for the Site.

### **Site Inspection**

The inspection of the Site was conducted on November 8, 2023. In attendance were Jeff Dyber and Robert Strang with the NYSDEC, Matthew Hoskins with TRC Companies, and Christopher O’Leary, Detbra Rosales and William Yeung with the EPA. The purpose of the inspection was to assess the protectiveness of the remedy. During the Site inspection, there were no visual complications or deviations observed with respect to the on-going operation and maintenance activities.

## **V. TECHNICAL ASSESSMENT**

**QUESTION A:** Is the remedy functioning as intended by the decision documents?

PCBs have not been detected in groundwater downgradient of the landfill or the north gravel pit. Therefore, it is concluded that the stabilization and capping activities implemented have effectively immobilized all PCB contaminants in soils. Groundwater monitoring will continue to verify that the remediation is effective. Institutional controls are in place to ensure that the future use of the Site does not change, that the remedy components are not damaged and that groundwater is not used for potable purposes. The cap is in good condition and prevents direct contact by human and ecological receptors. Thus, the remedy is functioning as intended by the decision documents.

**QUESTION B:** Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the Site, or land use that would affect the

exposure assumptions or the protectiveness of the remedy for human health. The exposure assumptions used to estimate the potential cancer risks and non-cancer health hazards in the risk assessments supporting the OU1 and OU2 RODs followed EPA's Risk Assessment Guidance for Superfund available at the time and the processes that were used remain valid. The property zoning is not expected to change in the next five years. The remedy components: landfill capping; groundwater containment; and solidification of PCB-contaminated soil located below the water table, are designed to prevent exposure to contaminants in soil and groundwater. The toxicity data, cleanup levels, and RAOs used at the time of the remedy remain valid as well. There are no changes in the toxicity or exposure assumptions that will change the overall conclusions of the baseline risk assessment.

### ***Groundwater Exposure Pathways***

The evaluation of the groundwater focused on direct ingestion of groundwater as a potable water source and the possibility of vapor intrusion if buildings were to be constructed over the groundwater plume. The evaluation of the direct contact pathway showed that all nearby residents are using well water. Sampling conducted for the OU1 Periodic Review Report did not reveal PCBs or phenols above their respective New York State Class GA Water Quality Standards. The non-detect concentrations at the method detection limit of 0.009 µg/L are below the federal, New York State Class GA Water Quality Standards for phenols, and the current MCL for PCBs of 0.5 µg/L. No VOCs were detected above standards. As in previous years, PCBs and VOCs were not detected in the samples collected from the residential wells sampled as part of the Site monitoring program or the Village of Clayville Water System (water district) public supply wells, sampled by the provider. In addition, PCBs were not detected in the OU2 NGP groundwater samples collected from wells MW-10, MW-A and MW-AS.

The previous FYR soil vapor intrusion (VI) evaluation found that trichloroethylene and tetrachloroethylene were not detected in groundwater and VI was not a concern. Groundwater monitoring over the past five years shows no detections of VOCs including trichloroethylene and tetrachloroethylene. Therefore, this exposure is screened out as a pathway of concern.

Although emerging contaminants were identified at the Site in 2017, the concentrations were relatively low and residential well sampling performed in 2020 shows that these contaminants have not impacted residential wells off-site. No additional emerging contaminant sampling is anticipated for the Site.

### ***Changes in Toxicity Values***

The main Site contaminant of concern was PCBs. At the current time, the Integrated Risk Information System (IRIS) program is re-evaluating the non-cancer toxicity of PCBs and any potential changes in the toxicity values will need to be evaluated in the next FYR. Nevertheless, the remedy for OU1 was a source control remedy for soils, sediments, leachate seeps and groundwater in contact with wastes. The remedial actions have interrupted potential exposures to PCBs. The remediation goal of 10 ppm for PCBs in soil identified in the 2003 ROD is consistent with values for industrial properties identified under the Toxic Substances Control Act. The industrial remediation goal of 10 ppm includes the currently available toxicity and this value is also protective.

### ***Ecological Risk Assessment***

As described in the previous FYR, contaminated soils from wetlands were excavated and deposited into the landfill prior to capping. Site contaminants and leachate discharges were controlled and the potential risk to ecological receptors were removed. Based on the information collected in 2020-2022 monitoring

reports, PCBs were not detected in surface water. Ecological exposure pathways have been eliminated and remedies are still functioning as intended to protect the environment and wildlife.

**QUESTION C:** Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has come to light to call into question the protectiveness of the remedy.

## VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations	
<b>OU(s) without Issues/Recommendations Identified in the Five-Year Review:</b>	
OU1 and OU2	

There are no issues/recommendations at the Site.

## VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU1	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedy is protective of human health and the environment.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU2	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedy is protective of human health and the environment.	

Sitewide Protectiveness Statement	
<i>Protectiveness Determination:</i> Protective	
<i>Protectiveness Statement:</i> The implemented remedies at the Site are protective of human health and the environment.	

## VIII. NEXT REVIEW

The next FYR report for the Ludlow Sand & Gravel Superfund Site is required five years from the completion date of this review.



## Appendix A – Figures

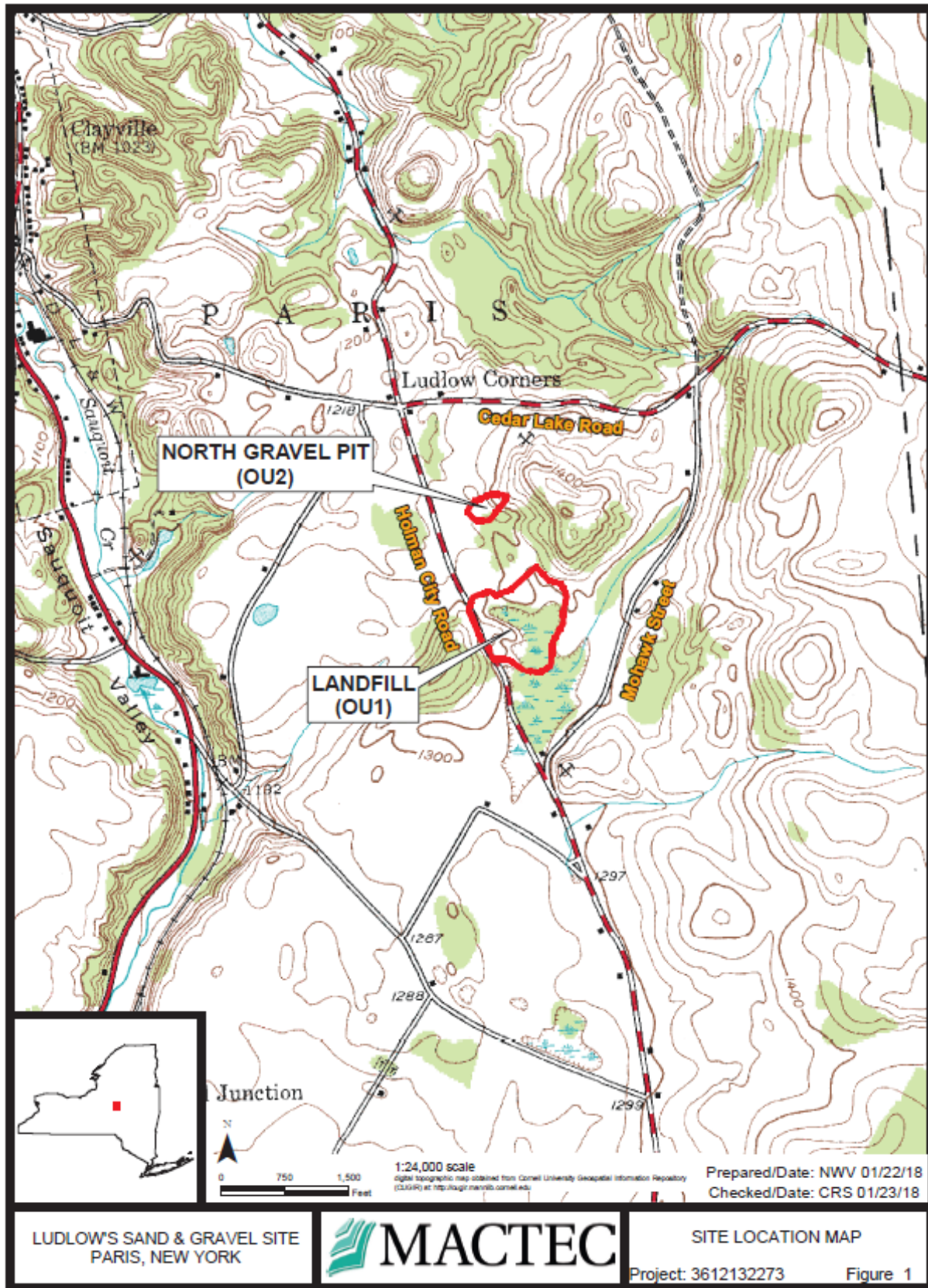


Figure A-1: Site Location Map



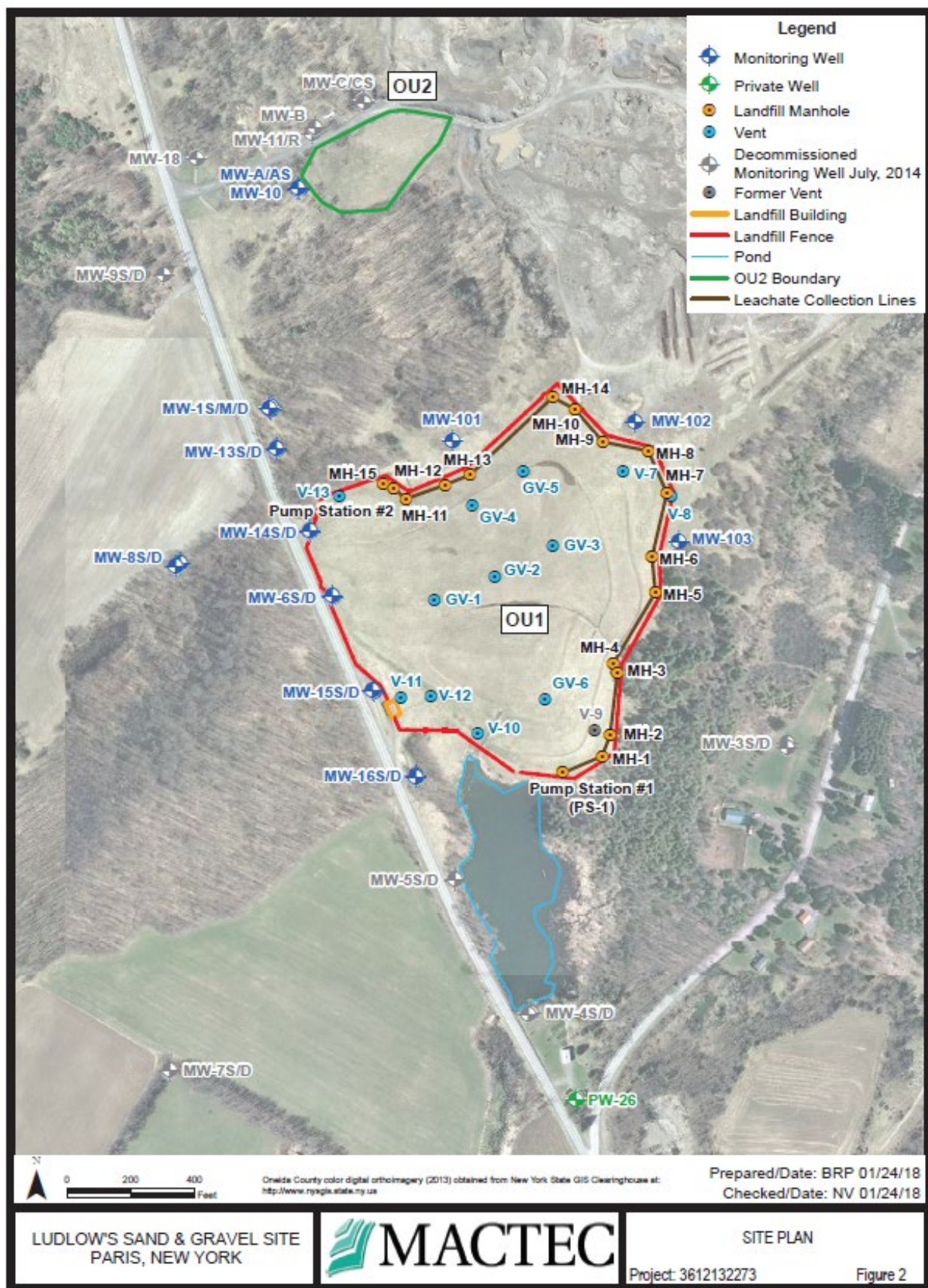


Figure A-2: Site Plan

## Appendix B – Tables

**Table 1: Chronology of Site Events**

<b>Site Event</b>	<b>Date(s)</b>
Pre-NPL responses	1982
Final NPL listing	1983
Remedial Investigation/Feasibility Study completed	1988
Record of Decision – OU1 (landfill capping, leachate collection and treatment, groundwater controls)	1988
Consent Judgment for the performance of the OU1 Remedial Design and Remedial Action	1989
OU1 Remedial Design performed by the PRP	1990
OU1 Remedial Action performed by the PRP	1990-1996
First Five-Year Review conducted by EPA	1999
Record Decision – OU2 (gravel pit, solidification of PCBs)	2003
Second Five-Year Review conducted by EPA	2004
OU2 Remedial Design performed by EPA	2006
OU2 Remedial Action performed by PRP	2007
Third Five-Year review conducted by EPA	2009
Deletion from NPL	2013
Forth Five-Year review conducted by EPA	2014
Fifth Five-Year review conducted by EPA	2019

**Table 2: Documents, Data and Information Reviewed to Complete the Five-Year Review**

<b>Document</b>	<b>Date</b>
Record of Decision	1988-2003
First Five-year Review	07/01/1999
Second Five-Year Review	07/01/2004
Third Five-year Review	07/01/2009
Forth Five-year review	09/23/2014
Periodic Review Report	January 2018
Fifth Five-year review	07/31/2019
Periodic Review Report	August 2023

## Appendix C – Climate Change Evaluation

In accordance with the Region 2 Guidance for Incorporating Climate Change Considerations in the Five Year Reviews, three climate change tools were utilized to assess the Ludlow Sand & Gravel Superfund Site in the Village of Clayville (formerly called Paris Furnace), Oneida County, New York. Screenshots from each of the tools assessed are included below.

The first tool used to assess Clayville, New York was [\*The Climate Explorer\*](#). The top climate concerns for Clayville, New York were: changes in seasonal patterns affecting ecosystems, environments and economies; the increase in intense rainstorms; and the increases of extreme temperatures as noted in Figure C-1. There are projected increases in the average temperature and number of days per year with maximum temperatures greater than 100°F as depicted in Figures C-2 and C-3. The variations in the annual number of dry days and days with greater than one inch of rain are shown in Figures C-4 and C-5.

The second tool utilized is called the [\*Flood Factor\*](#). According to this assessment tool, there are 53 properties in Clayville, New York that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 30% of all properties in Clayville. Overall, Clayville County has an “extreme risk” of flooding over the next 30 years, which means flooding is likely to impact day-to-day life within the community. This is based on the level of risk the properties face rather than the proportion of properties with risk (see Figure C-6). The current and 30-year flood risks for Clayville, New York are shown in Figures C-7 and C-8, respectively.

The final tool utilized is called [\*Sea Level Rise\*](#). Figure C-9 shows the current mean higher high water (MHHW) elevation while Figure C-10 depicts the impacts of sea level rise of up to 10 feet. This tool reveals the site is likely not to be impacted by sea level rise.

Despite the changing climate trends, increases in flooding events, and the potential for sea level rise indicated above, there is no active remedy at this Site. O&M consists of periodic site inspections and groundwater monitoring. Additional inspections of the site are performed after severe weather events as well and this will continue into the future. Therefore, potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site.

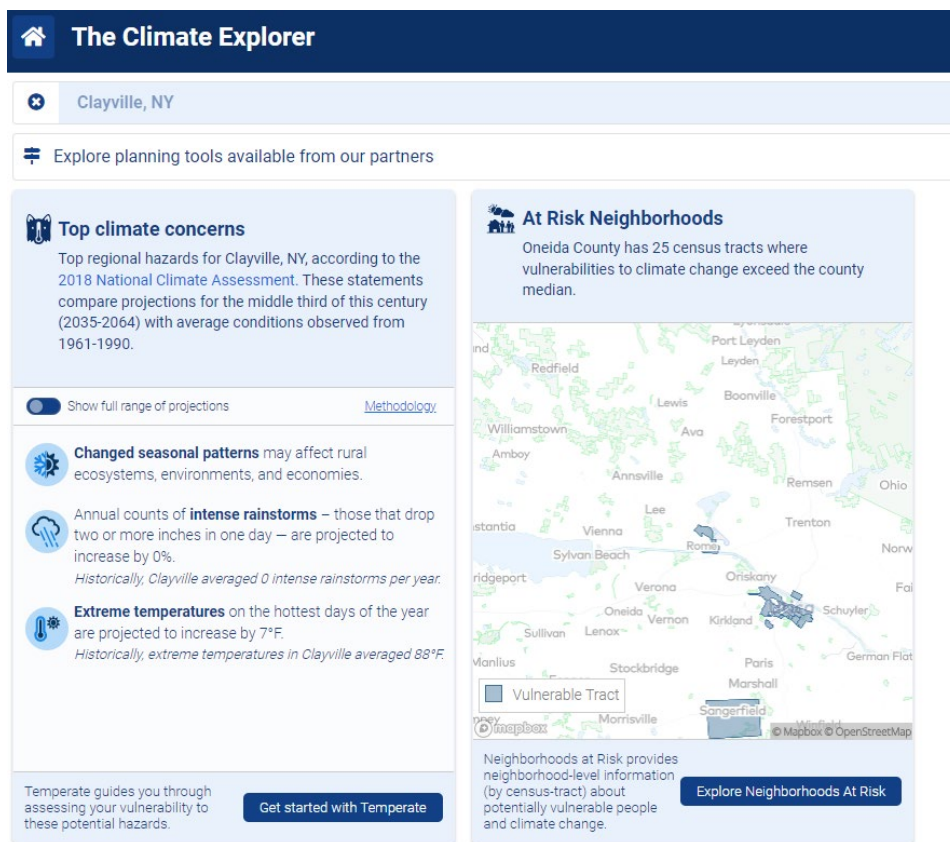


Figure C-1: The Climate Explorer - Top Climate Concerns for Clayville, New York

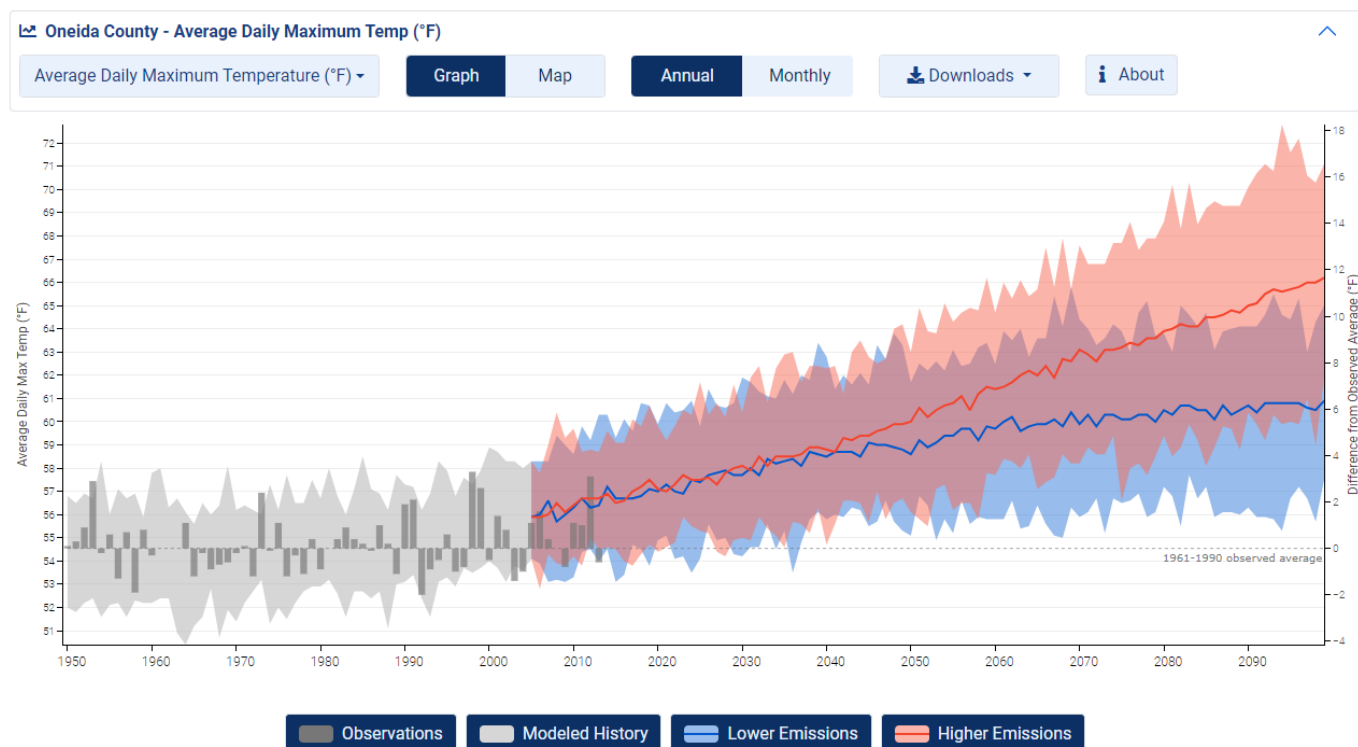


Figure C-2: The Climate Explorer - Average Daily Maximum Temperature (°F) for Oneida County, NY



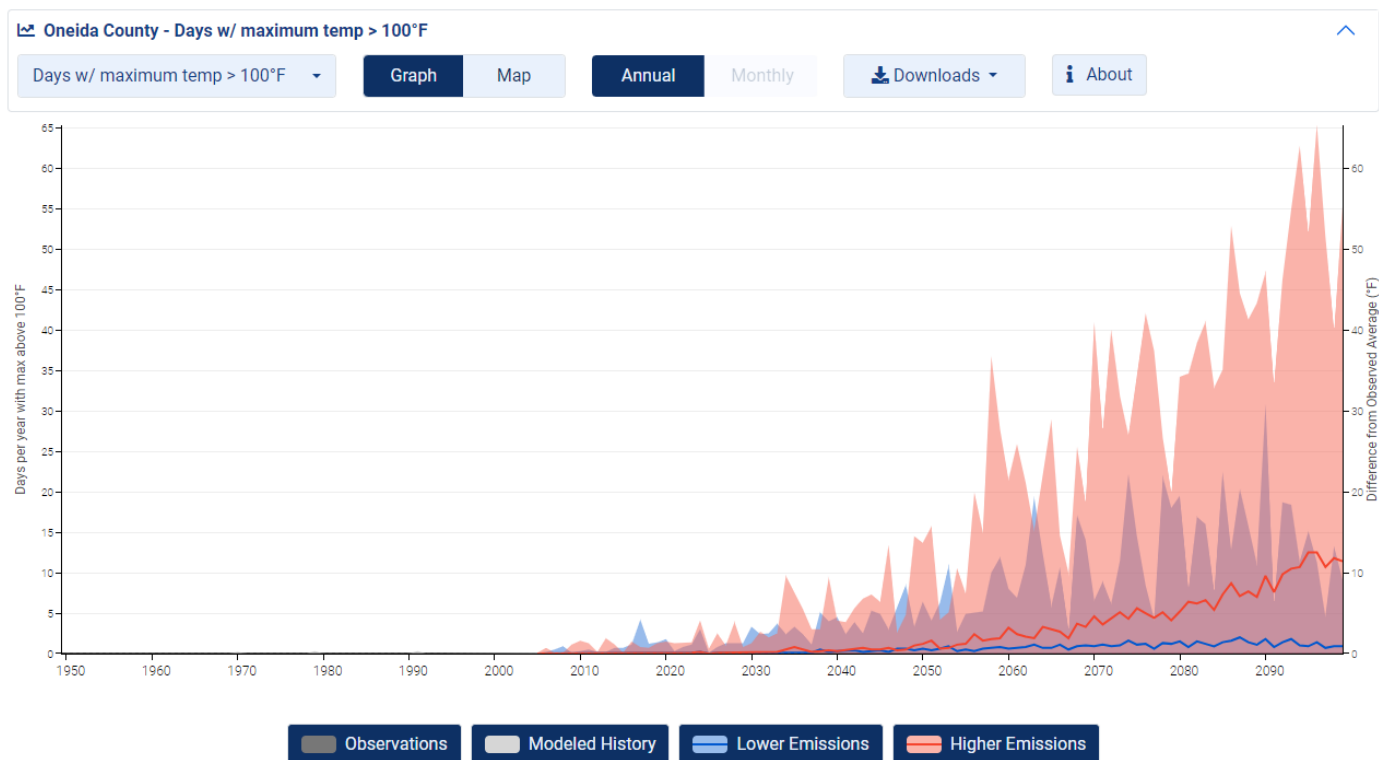


Figure C-3: The Climate Explorer - Days w/ Maximum Temperature > 100 °F for Oneida County, NY



Figure C-4: The Climate Explorer - Dry Days for Oneida County, NY

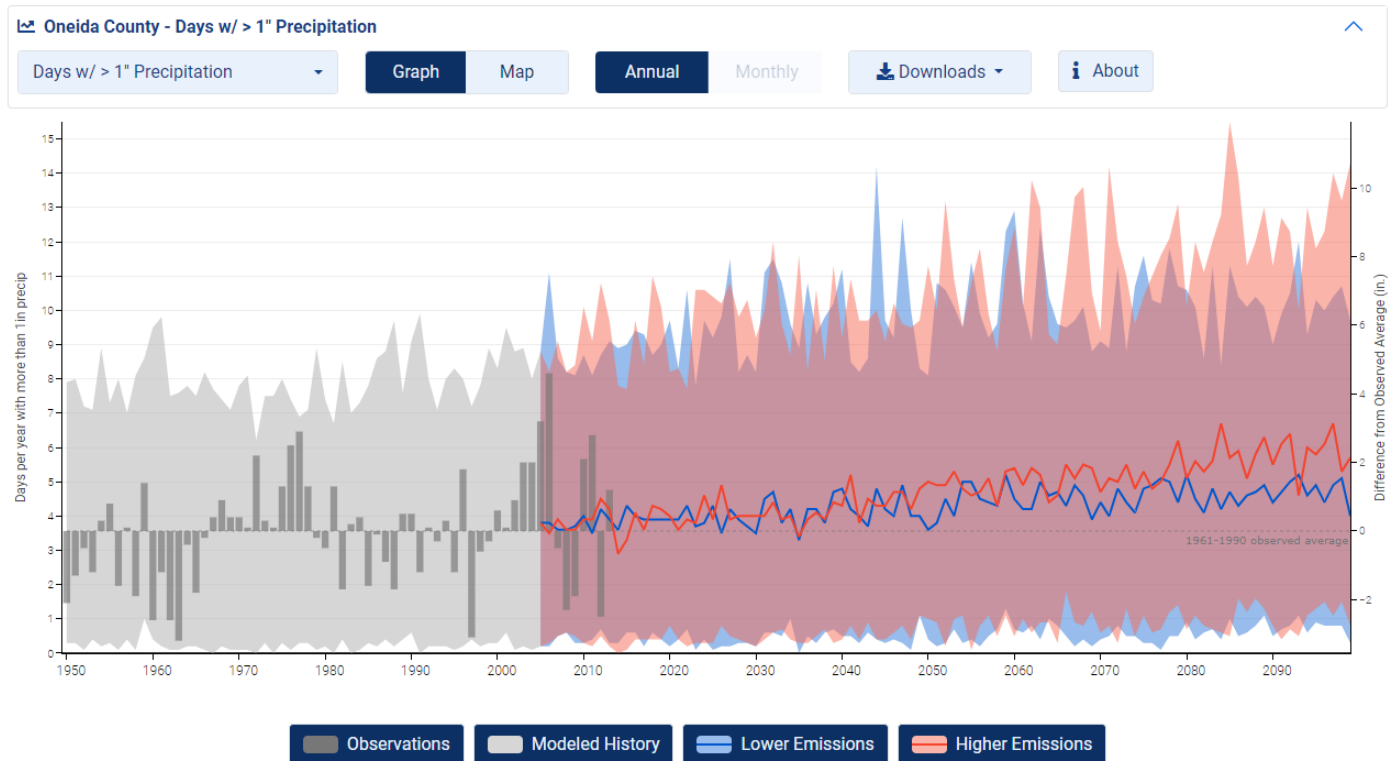


Figure C-5: The Climate Explorer- Days w/ greater than 1 inch of Precipitation for Oneida County, NY

### Extreme

### FLOOD FACTOR

There are 53 properties in **Clayville** that have greater than a 26% chance of being severely affected by flooding over the next 30 years. This represents 30% of all properties in Clayville.

In addition to damage on properties, flooding can also cut off access to utilities, emergency services, transportation, and may impact the overall economic well-being of an area. Overall, **Clayville** has an **extreme risk of flooding** over the next 30 years, which means flooding is likely to impact day-to-day life within the community. This is based on the level of risk the properties face rather than the proportion of properties with risk.

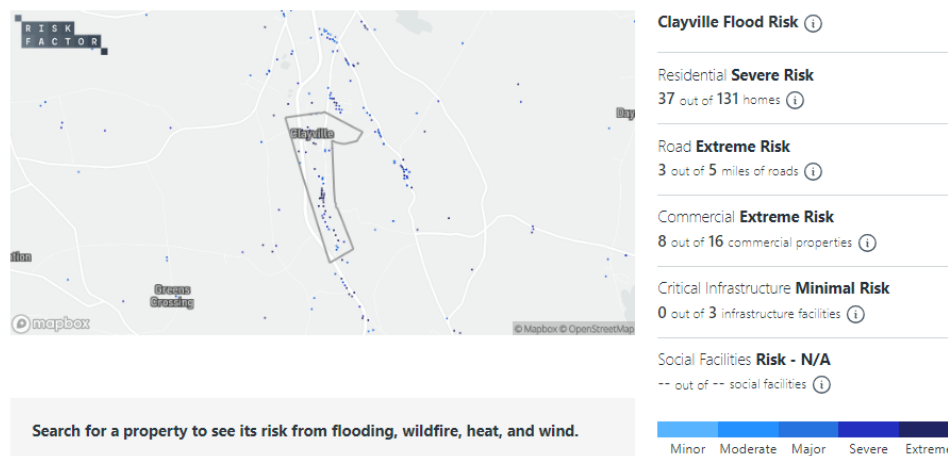


Figure C-6: Flood Factor for Clayville, NY

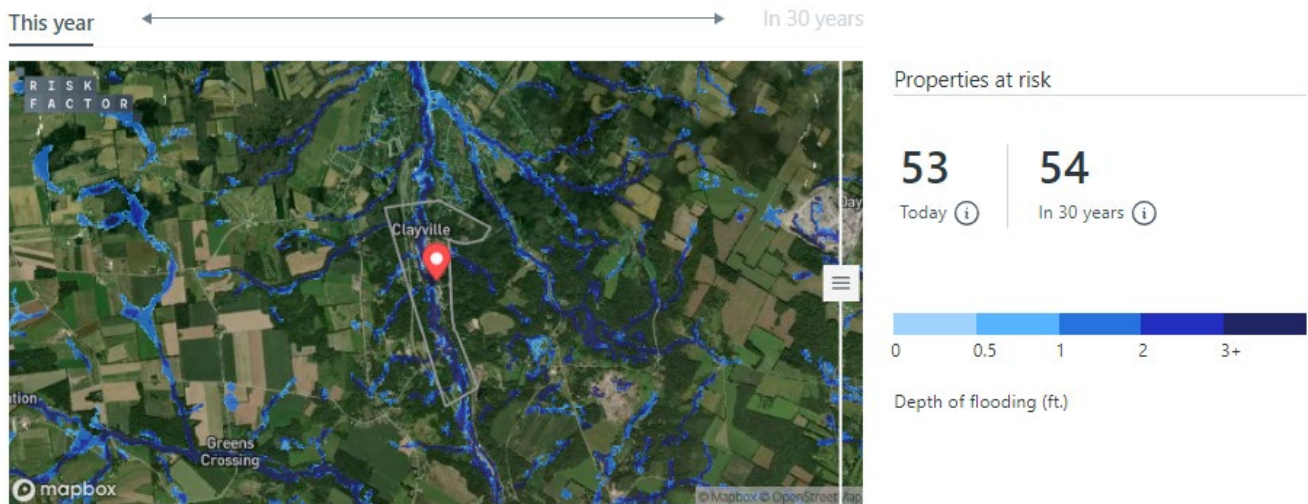


Figure C-7: Flood Risk – Anticipating Changes in Flood Risk for Clayville (Current Risk)

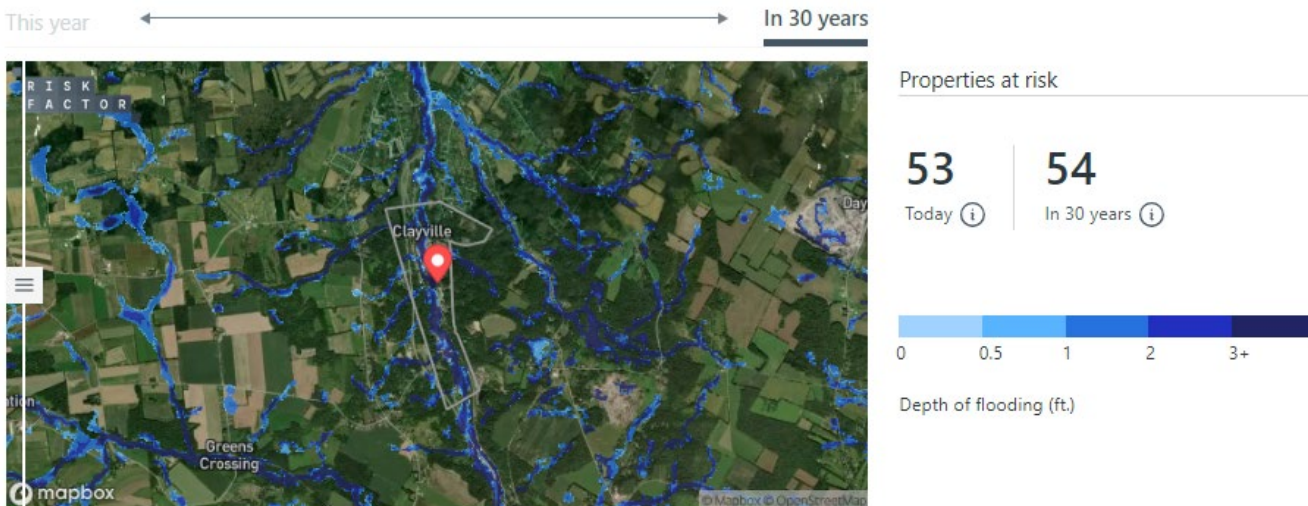


Figure C-8: Flood Risk – Anticipating Changes in Flood Risk for Clayville (Future Risk in 30 years)



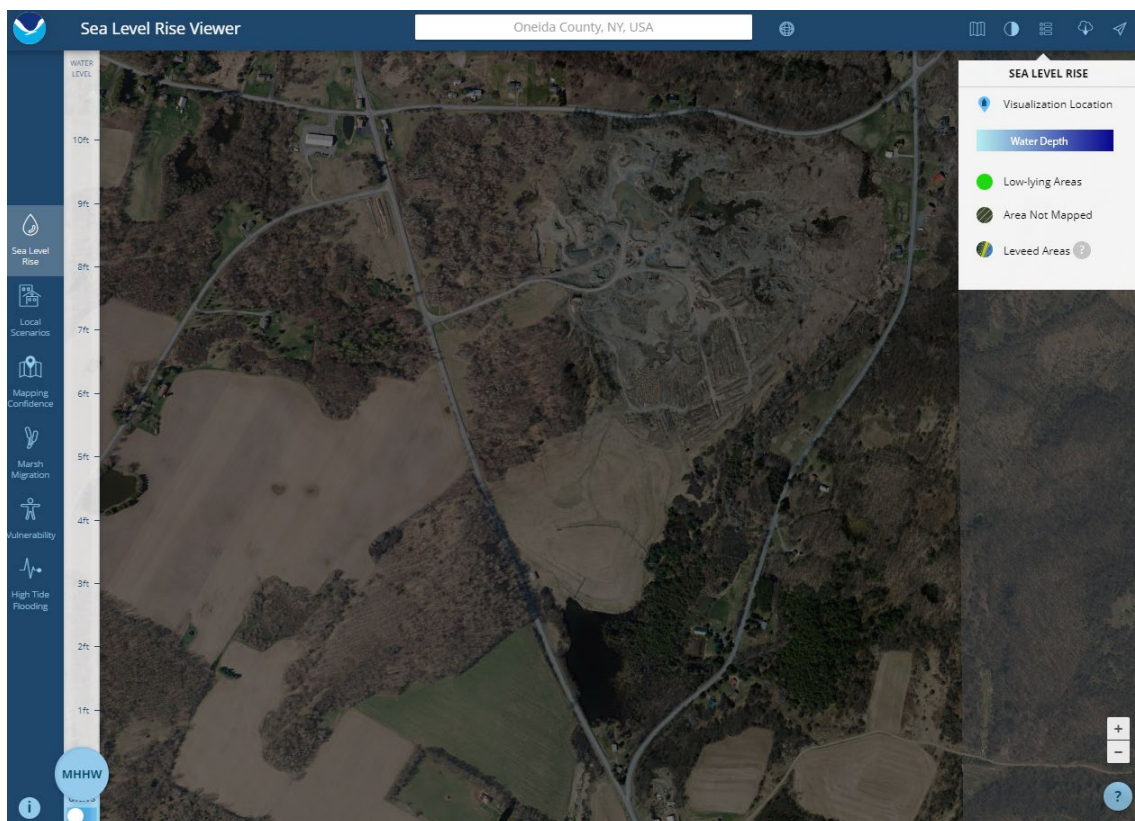


Figure C-9: NOAA Sea Level Rise Viewer - Current Sea Levels

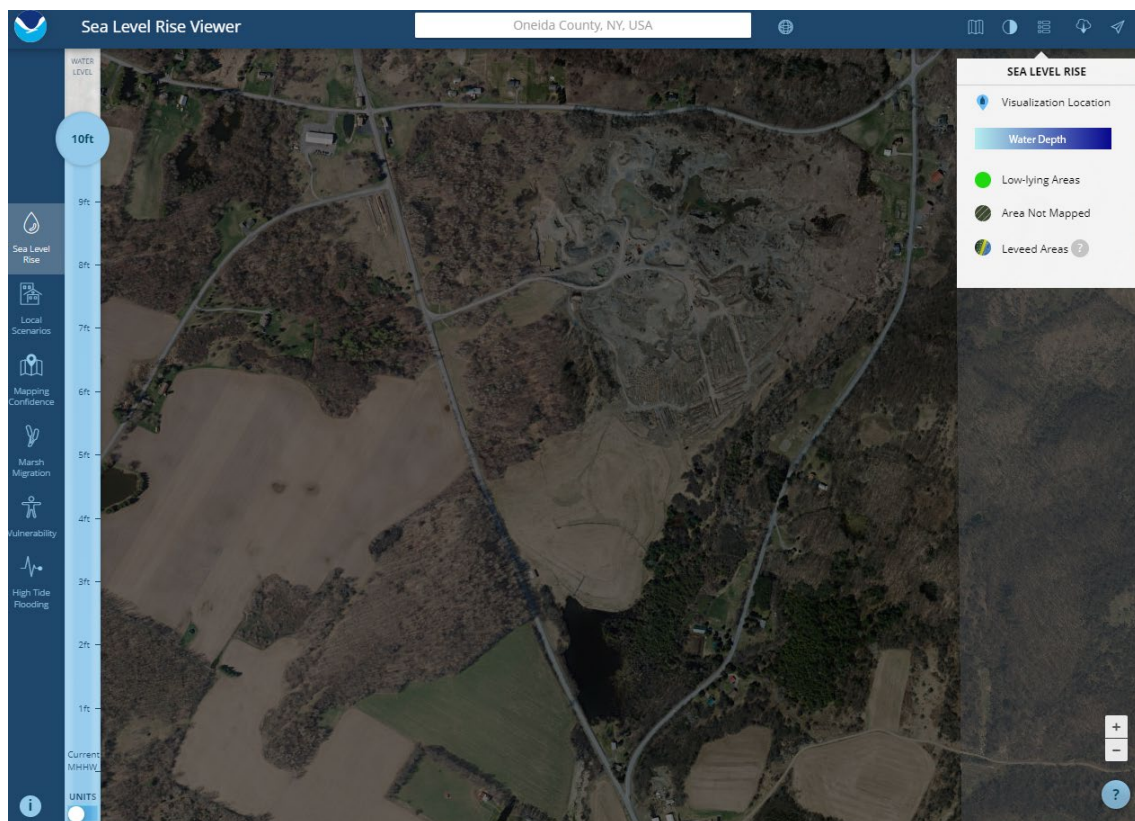


Figure C-100: NOAA Sea Level Rise Viewer - 10ft Sea Level Rise