New York State Department of Environmental Conservation

FACT SHEET

Manufactured Gas Plant Program

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Bay Shore Former Manufactured Gas Plant
January 2014
Site1-52-172 – Bay Shore, NY

Former Manufactured Gas Plant Site Cleanup Update

This Fact Sheet provides an update of remediation activities conducted at the Bay Shore Former Manufactured Gas Plant (MGP) site since the most recent Fact Sheet dated May 2013. The investigation and remediation are being performed by National Grid, with the oversight of the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH).

Summary:
Since May 2013, National Grid has conducted or continued remediation activities at all four of the Operable Units which make up the site. The cleanup of this site is not yet complete, but contaminant levels have decreased sharply throughout the area, and this trend is expected to continue.

About Operable Units:
The site has been divided into four separate areas called Operable Units (OU-1 through OU-4). Each OU includes a specific portion of the project area which is shown on the attached site map.

OU-1 consists of the main site area where gas manufacturing operations once took place (the primary source of contamination) and properties immediately to the east, west and south. OU-2 consists of the contaminated groundwater plume which originates in OU-1 and has moved southward towards Lawrence Creek. OU-3 contains the Brightwaters Yard, where fuel for the gas making process was stored, and the contaminated groundwater plume which originates from it. OU-4 is an area east of the main plant site where treated MGP wastewater was discharged to a surface waterbody.

Operable Unit No. 1:
Cleanup of the most significant source areas in the central portion of OU-1 where gas making operations took place was largely completed several years ago. The cleanup included the excavation of contaminated soils, installation of a subsurface barrier wall to stop further migration of coal tar, and operation of an ozone treatment system behind the wall to destroy the highly concentrated groundwater contamination found in this area. Treated groundwater which then passes through the subsurface barrier wall is free of site-related contaminants. This ozone system is functioning well and is designed to continue operating indefinitely into the future. In February 2013, an additional

recovery well was installed inside of the barrier wall to increase the physical removal of coal tar from the subsurface.

Outside the core area of OU-1, National Grid has completed investigations on properties immediately to the east and west of the former MGP site. In October 2012, National Grid removed shallow soil contamination from beneath the Long Island Railroad crossing of North Clinton Avenue, in conjunction with a planned upgrade of the crossing. In October 2013, National Grid relocated the existing oxygen injection line located west of the barrier wall to more effectively treat groundwater inside and outside of the barrier prior to flowing into OU-2. Between October and November 2013, an oxygen injection system was installed in OU-1 on the eastern side of the barrier wall to treat groundwater impacts in OU-1 and supplement the existing treatment at the OU-1/OU-2 boundary.

About the Manufactured Gas Plant Program:

NYSDEC has one of the most aggressive Manufactured Gas Plant (MGP) Programs site investigation and remediation programs in the country. Since the problems associated with the former MGP sites were identified, NYSDEC has been working with all the utilities on a state-wide basis to identify and address the issue of MGP sites for which they may have responsibility. This effort has resulted in approximately 2 3 5 sites identified for action by the eight utilities operating in New York State.

Currently we have multi-site orders or agreements with six utilities, including National Grid, and several other individual site volunteers, to address 222 MGP sites in NYS. Multi-site agreements are under negotiation with a seventh utility and several other responsible parties which have newly-identified sites.

NYSDEC continues to seek to identify any other possible MGP sites throughout the State.

For more information about the NYSDEC's MGP program, visit: www.dec.ny.gov/chemical/8430.html

Operable Unit No. 2:

The OU-2 groundwater plume consists of contaminated water which migrated southward from OU-1. This water moves very slowly through the subsurface. Without additional cleanup efforts, it would take several decades for natural groundwater flow to flush contaminants out of the aquifer beneath this predominantly residential area.

To date, National Grid has installed eight oxygen injection systems to treat groundwater in OU-2. The purpose of these systems is to increase the amount of oxygen dissolved in the groundwater throughout the OU-2 area, allowing naturally-occurring soil bacteria to consume the contaminants in place, rather than waiting for the flushing process to be completed.

The oxygen injection systems within OU-2 continue to operate as designed. NYSDEC and National Grid continue to monitor their effectiveness. Detailed results are posted on the Bay Shore MGP website: www.bayshoreworksmgp.com.

Groundwater contamination in OU-2 has responded very well to the oxygen injection treatment. The attached site map compares the original extent of the groundwater contaminant plume to the current extent, and demonstrates that the plume has been sharply reduced. In particular, contamination in shallow groundwater (the water closest to the ground surface, which presents the highest possibility for human exposure) has been reduced to levels which meet drinking water standards, with the exception of a small area near the corner of Union Boulevard and North Clinton Avenue. Even in this small area, contaminant levels are trending downward and this trend is expected to continue.

Pockets of contaminated groundwater remain in the rest of OU-2 at depths of 13 to 60 feet below the ground surface. These pockets are responding more slowly to treatment, but they are responding. Between August and October 2013, National Grid modified existing oxygen injection systems to better treat these impacted areas. Additionally, an interim remedial measure (IRM), including the injection of an oxygen releasing compound through temporary slurry injection points,

was completed in November 2013 in the shallow zone in the upgradient portion of OU-2. These points serve the same purpose as the oxygen gas injection wells, but they are a one-time application that is much simpler and quicker to implement. The slurry consists of a chemical compound ORC-A® which slowly dissolves and releases oxygen over a time period of several months.

Along with the modifications to the existing oxygen injection system discussed above, the IRM is designed to help further accelerate the reduction of groundwater concentrations in the area.

Operable Unit No. 3:

OU-3 is at the western end of the site. A large fuel storage tank and associated piping once stood in this area, containing a kerosene-like petroleum product that was used as the feedstock for the gas manufacturing process. Several other, smaller tanks were also present. OU-3 is defined to include the "Brightwaters Yard" portion of the original plant site west of N. Clinton Avenue, and the plume of contaminated groundwater which originates in this area and extends southward as a narrowband in the vicinity of Lanier Lane.

As was the case with OU-1 and OU-2, the cleanup strategy in OU-3 has been to remove as much of the contaminated source material as possible from the original MGP plant site, and to introduce oxygen into the groundwater to encourage soil bacteria to consume the contaminants that have already dissolved in groundwater and migrated beyond the site boundaries.

Contaminated soil in the Brightwaters yard was removed during several rounds of excavation. The most recent effort, in 2010, included temporary relocation of the LIRR tracks adjacent to the site to allow excavation of contaminated soil below the tracks.

A line of oxygen injection wells, similar to those in OU-2, was installed along the south side of Union Boulevard in 2000. This system was replaced in 2010 with a new system located on the north side of Community Road. An area of high groundwater contaminant concentrations remains in the area between the 2010 LIRR excavation and the new oxygen injection line. In response, National Grid upgraded the new Community Road injection system in 2012 and installed an additional oxygen injection system in August 2013 upgradient (north) of the Community Road system and south of the LIRR to accelerate the destruction of groundwater contamination in this area.

In the residential area along Lanier Lane, south of Union Boulevard, contaminant levels have declined sharply. Some pockets of contaminated groundwater remain, as shown on the attached figure. The same general pattern of contaminant decline observed in OU-2 is underway in OU-3, with deeper groundwater contamination taking longer to respond to the addition of oxygen.

A small area of shallow groundwater contamination was identified near the intersection of Lanier Lane and Cooper Lane in early 2013. A detailed investigation was performed to determine the scope of the problem. It appears that the installation of an upgraded basement dewatering system was drawing more heavily impacted groundwater upward from the deeper plume. In response, National Grid installed a treatment system to remove contaminants from the water being produced by the basement pumping system. The initial treatment system was upgraded in October 2013 to a system designed to handle the fluctuating flow rates produced by the basement pumping system. The upgraded system is also housed in a weather proof enclosure to allow operation throughout the winter months.

Under direction from NYSDEC, National Grid also initiated a more direct strategy for increasing oxygen levels in the surrounding groundwater beneath the property. To expedite the treatment, a

series of 21 slurry-injection points were installed surrounding the small contaminated area in March 2013. This is the same technique and compound that was used in November in OU-2, described above.

Monthly groundwater data indicate that these efforts were successful in treating the small area of groundwater impacts in this area. Monthly groundwater data collected in May 2013 indicated an isolated increase in groundwater impacts along Lanier Lane, upgradient (north) of the slurry treatment area. A second round of slurry injections was performed in August 2013 upgradient of the previous application, to address these impacts. Preliminary groundwater data indicates that this application will be successful in reducing groundwater impacts in this area.

Operable Unit No. 4:

There have been several significant remedial projects in OU-4 including the remediation and then creek bank restoration of Watchogue Creek/Crum's Brook at the start of this project in 2000, the removal of contaminated soils in the vicinity of the former cesspool structure and replacement of a portion of the Oak Street storm drain line which was completed in 2005. In 2009-2010 an in-situ chemical oxidation project was completed in the Cesspool Area of the site. In the spring and summer of 2011 the excavation of remaining contamination in the upper 10 feet was completed in designated areas throughout OU-4. Site restoration activities were completed in the spring of 2012.

Final restoration activities associated with the OU-4 excavation activities on the Town of Islip LIRR parking lot and two adjoining Union Boulevard properties were completed in April 2012. This concludes major remedial work in this area. Follow-up sampling has shown that the sediments in the streambed of Watchogue Brook, which was remediated in 2000, remain free of site related contamination.

Site Health Assessment

Some contaminated soils remain at the site near the source areas in Operable Units 1 and 3. However, these soils lie below clean soil, buildings, or asphalt, and people will not come in contact with contaminated soils unless they dig below the surface materials. Contaminated groundwater in each of the operable units is not used for drinking or other purposes and the area is served by a public water supply that obtains water from a different source not affected by this contamination. Measures are in place to control the potential for people to come in contact with subsurface soil and groundwater contamination that has migrated off the site. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. The potential for people to inhale site contaminants in indoor air due to soil vapor intrusion in off-site buildings has been extensively evaluated. Environmental sampling conducted to date indicates the potential is limited to one off-site building that is currently monitored to insure that indoor air remains unimpacted.

For More Information:
Project documents are available at the following location(s) to help the public stay informed.

Bay Shore/Brightwaters Public Library
1 South Country Road
Brightwaters, NY 11718
(631) 665-4350
Repository is open during normal library hours.

NYSDEC Region 1 Office
50 Circle Road
Stony Brook, NY 11790
Contact: Mr. Walter Parish
(631) 444-0240
Hours: M-F: 8:30 AM – 4:45 PM (by appointment)

For additional information about site activities and other related information about the site, please visit National Grid's website for the project at: www.bayshoreworksmgp.com.

Who to Contact:
Comments and questions are always welcome and should be directed to the following:

Project Related Questions
Richard Dana, Project Manager NYSDEC
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7014
(518) 402-9662 rhdana@gw.dec.state.ny.us

Bay Shore MGP Hotline
Terri Kelly
Community Liaison for National Grid
(516) 545-3839

Site-Related Health Questions
Steven Karpinski, BEEI Public Health Specialist II
NYSDOH
Bureau of Environmental Exposure Investigation
New York State Department of Health
Empire State Plaza
Corning Tower, Room 1787
Albany, NY 12237
(518)-402-7880
beei@health.state.ny.us

If you know someone who would like to be added to the site contact list, have them contact the NYSDEC Project Manager above. We encourage you to share this fact sheet with neighbors and tenants and/or post this fact sheet in a prominent area of your building for others to see.

Project Milestones	
1999	• KeySpan (now National Grid) and NYSDEC enter into Order on Consent • Smith Avenue remediation work start • Brightwaters Yard remediation work • Field work for Remedial Investigation planned
2000	• First Public Meeting (January) • Watchogue Creek/Crum's Brook Interim Remedial Measure (IRM) field work • Brightwaters Yard chemical oxygen injections
2001	• Planning for Supplemental Remedial Investigation • OU-3 chemical oxidation injections in the Brightwaters Yard
2002	• Supplemental Remedial Investigation • OU-3 underground storage tank excavation and chemical oxidation injections
2003	• Final Remedial Investigation Report
2004	• Remedial Action Plan and Record of Decision for Operable Unit 1 • OU-3 soil removal under a temporary movable fabric enclosure • OU-3 additional chemical oxidation injections • OU-3 installation of the Brightwaters Yard oxygen injection system • OU-4 background soil sampling
2005	• OU-2 oxygen system installations begin • OU-1 testing for sheet wall installation • OU-4 excavation of hot spots of contaminated soil in Cesspool Area
2006	• First quarterly Operations, Monitoring and Maintenance (OM&M) Report • Excavation IRM in south cell of OU-1 paves way for full excavation • Indoor air monitoring of OU-2 residences on request begins
2007	• Installation of OU-1barrier wall • Excavation of OU-1begins
2008	• OU-1 Barrier wall completed • OU-1 shallow and deep excavation program completed • Three additional oxygen injection lines planned and installed in OU-2 • Storm drain rehabilitation project was completed inOU-3 • www.bayshoreworksmgpsite.com is re-launched
2009	• An additional oxygen injection system installed at the tail end of OU-2 • Cooper Lane line extended • LIRR tracks relocated and excavation of contaminated soils began in OU-3 • In-Situ chemical oxidation injections performed in the cesspool portion of OU-4 • OU-1 Groundwater treatment facility completed and activated
2010	• Areas west of barrier wall inOU-1 investigated and remediated, an additional oxygen line installed • OU-3 excavations under LIRR tracks and in the Brightwaters Yard completed, tracks restored • Installation of Community Road oxygen injection line and abandonment of Union Boulevard oxygen injection system.
2011	• OU-2 installation of one additional and an extension of an existing oxygen injection system • OU-3 post LIRR excavation groundwater evaluation conducted • OU-4excavationof MGP impacts, backfilling and restoration completed

2012	**• OU-3 post LIRR excavation groundwater evaluation completed** **• OU-3 upgrade of Community Road oxygen injection line completed** **• OU-4 restoration of site following excavation activities completed** **• OU-4 post remediation sampling of Watchogue Creek sediment and surface water completed** **• OU-1 investigative work on adjacent property completed**
2013	**• OU-1 additional recovery well installed to remove additional coal tar from within the barrier wall** **• OU-1 installation of an oxygen injection system to treat groundwater contamination east of the subsurface barrier wall** **• OU-2 modification of existing oxygen injection system to better treat remaining areas of groundwater contamination** **• OU-3 installation of oxygen release slurry injection points to remediate a small area of shallow contamination near the corner of Lanier& Cooper Lanes and along Lanier Lane north of Cooper Lane completed** **• OU-3 installation of an oxygen injection system to treat shallow and intermediate groundwater contamination south of the Long Island Railroad tracks and north of Community Road**

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NYSDEC invites you to sign up with one or more contaminated sites county email listserv available at the following webpage: www.dec.ny.gov/chemical/61092.html. It's quick, it's free, and it will help keep you better informed.

As a listserv member, you will periodically receive site-related information/announcements for all contaminated sites in the county(ies) you select.

You may continue also to receive paper copies of site information for a time after you sign up with a county listserv, until the transition to electronic distribution is complete.

Note: Please disregard if you already have signed up and received this fact sheet electronically.

nationalgrid

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Hicksville, NY 11801

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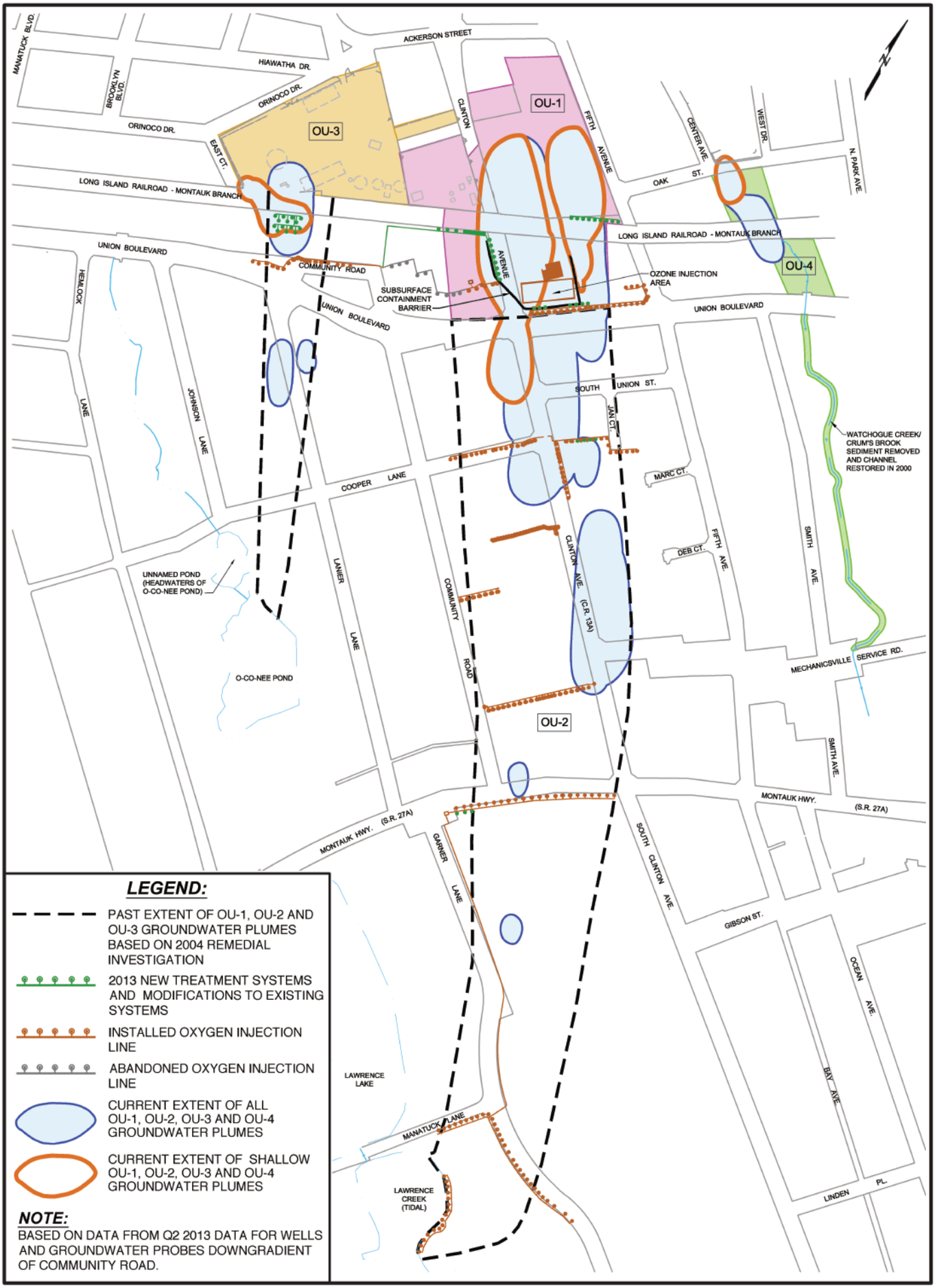
MANATUCK BLVD.
ACKERSON STREET
HIAWATHA DR.
BROOKLYN BLVD.
ORINOCO DR.
ORINOCO DR.
EAST CT.
OU-3
OU-1
CLINTON
FIFTH AVENUE
CENTER AVE.
WEST DR.
N. PARK AVE.
OAK ST.
LONG ISLAND RAILROAD - MONTAUK BRANCH
LONG ISLAND RAILROAD - MONTAUK BRANCH
OU-4
UNION BOULEVARD
COMMUNITY ROAD
AVENUE
OZONE INJECTION AREA
SUBSURFACE CONTAINMENT BARRIER
UNION BOULEVARD
UNION BOULEVARD
HEMLOCK
LANE
JOHNSON LANE
SOUTH UNION ST.
JAN CT.
WATCHOGUE CREEK/ CRUM'S BROOK SEDIMENT REMOVED AND CHANNEL RESTORED IN 2000
COOPER LANE
MARC CT.
DEB CT.
FIFTH AVE.
SMITH AVE.
CLINTON AVE. (C.R. 13A)
UNNAMED POND (HEADWATERS OF O-CO-NEE POND)
LANIER LANE
COMMUNITY ROAD
O-CO-NEE POND
MECHANICSVILLE SERVICE RD.
OU-2
SMITH AVE.
MONTAUK HWY. (S.R. 27A)
MONTAUK HWY. (S.R. 27A)
GARNER LANE
SOUTH CLINTON AVE.
GIBSON ST.
OCEAN AVE.
BAY AVE.
LAWRENCE LAKE
MANATUCK LANE
LAWRENCE CREEK (TIDAL)
LINDEN PL.
N
LEGEND:
PAST EXTENT OF OU-1, OU-2 AND OU-3 GROUNDWATER PLUMES BASED ON 2004 REMEDIAL INVESTIGATION
2013 NEW TREATMENT SYSTEMS AND MODIFICATIONS TO EXISTING SYSTEMS
INSTALLED OXYGEN INJECTION LINE
ABANDONED OXYGEN INJECTION LINE
CURRENT EXTENT OF ALL OU-1, OU-2, OU-3 AND OU-4 GROUNDWATER PLUMES
CURRENT EXTENT OF SHALLOW OU-1, OU-2, OU-3 AND OU-4 GROUNDWATER PLUMES
NOTE:
BASED ON DATA FROM Q2 2013 DATA FOR WELLS AND GROUNDWATER PROBES DOWNGRADIENT OF COMMUNITY ROAD.